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2015 **Hayley Pallan**

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The Role of Innovation and Competitive Pressure: A Case Study of Czech and Slovak Firms

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Author: Bc. Hayley Pallan

Supervisor: PhDr. Pavel Vacek, Ph.D.

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Abstract

This thesis examines the role of competition and innovation for firm performance, particularly during financial crises, through empirical analysis. The thesis first reviews the literature related to competition, innovation and financial crises. It next provides context of the economic legacies the transition economies in Central Eastern Europe have shared and how these legacies meant a lack of an environment for competitive firms (to operate most efficiently) and innovation (defined as new product development). Similarities and differences between the economies of the Czech Republic and Slovakia (which have a shared history over seventy years as Czechoslovakia) during the transition period and leading up to the 2009 financial crisis are reviewed, with attention to factors affecting the competitive and innovative environment in each country. Using cross-sectional regression analysis and comparing results for Czech and Slovak firms, this thesis confirms the positive influence of innovation and competition. Two variables for competition types are used in the regression – one for foreign pressure and one for domestic pressure. Both sets of firms indicate a positive influence of foreign competitive pressure to develop new products on firm performance (which is represented by firm sales in this analysis), although to varying degrees and significance levels. For both Czech and Slovak firms, competitive pressure to develop new products originating from domestic firms does not have a significant role for firm performance in the year 2009. In sum, since the analysis utilizes data for the year 2009, this thesis has additional policy implications and lessons for firms to operate effectively under crisis conditions, in addition to implications for how governments can intervene to support their domestic firms in more strongly and effectively responding to competitive pressure.

Keywords

foreign competition, domestic competition, innovation, product development, transition economies, entrepreneurship, financial crisis

Abstrakt

Tato práce zkoumá prostřednictvím empirické analýzy roli hospodářské soutěže a inovací pro výkonnost podniku, a to zejména během finančních krizí. Práce nejprve hodnotí literaturu vztahující se k hospodářské soutěži, inovacím a finanční krizi. Dále přináší kontext historického dědictví, který sdílejí transformující se ekonomiky ve střední Evropě a jak toto dědictví vedlo k nedostatečně konkurečnímu (aby byly schopné pracovat co nejefektivněji) a inovačnímu prostředí pro firmy (vývoj nových produktů). Práce charakterizuje podobnosti a rozdíly mezi ekonomikami v České republice a na Slovensku (které mají společnou historii více než sedmdesáti let v Československu) v období tranzice a finanční krize 2009 s přihlédnutím k faktorům, které mají vliv na utváření konkurenceschopného a inovativního prostředí v každé zemi. Použitím průřezové regresní analýzy a porovnávání výsledků českých a slovenských firem tato práce potvrzuje pozitivní vliv inovací a hospodářské soutěže. Regrese používá dvě proměnné pro jednotlivé typy hospodářské soutěže - jednu označující zahraniční a druhou pro domácí tlak na firmy. V obou typech firem působí jako pozitivní vliv zahraničního konkurenčního tlaku na rozvoj nových produktů v rámci zvýšení celkové výkonnosti podniku (kterou v této analyze představuje prodejní potenciál firmy), i když v různém rozsahu a míře významnosti. Pro české a slovenské firmy, nehrál v roce 2009 konkurenční tlak na vývoj nových produktů, vycházející z tuzemského prostředí, významnou roli. Jelikož analýza využívá údaje za rok 2009, tato práce přináší v souhrnu další politické implikace a poučení pro firmy, aby efektivně pracovaly v krizových podmínkách, resp. jak vlády mohou zasahovat ve prospěch podpory domácích firem, aby mohly výrazněji a účinněji reagovat na konkurenční tlaky.

Klíčová slova

zahraniční konkurence , domácí konkurence , inovace , vývoj produktů , transformující se ekonomiky , podnikání , finanční krize

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Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague, May 15th, 2015 **Hayley Pallan**

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Institute of International Studies

M.A. Thesis Proposal

Name: Hayley Pallan

E-mail: hayleypallan@gmail.com

Term: Summer

Academic year: 2014/2015

Title: The Role of Competition and Innovation in Financial Crises: A Case Study of Czech and Slovak Firms

Supervisor: PhDr. Pavel Vacek, Ph.D.

Aim of the project:

To understand the role of innovation and competition in financial crises. Especially in the case in previously transition economies, with shared communist histories and legacies that left them with a lack of innovation culture and incentives.

Research question/questions:

What is the role of innovation and competition in financial crises?

Proposed methodology:

I will approach the reseach question through a combination of literature and theory review and qualitative analysis. I will further examine the research question through an empirical case study using cross-section regression analysis and comparison.

Proposed structure of chapters:

The thesis will begin with an introduction and overview of the chapters. Chapter 1 will review relevant literature, including theory and empirical studies. A range of literature will be surveyed, including competition, innovation and financial crises related research. Chapter 2 will build upon the material presented in Chapter 1 by applying the theory to the economic development and challenges for transition economies in Central Europe. Chapter 2 will further focus on the application of innovation and competition ideas and indicators for the Czech Republic and Slovakia. Chapter 3 will present the empirical part of the thesis. This chapter will include a methodology section which will explain the econometric model's development and the theoretical justification of the model and variables. Another subsection of Chapter 3 will focus on the data used for the case study. As the thesis seeks to compare Czech and Slovak firms, there will be two sets of data, one for each set of firms. These data sets will be described and analyzed in turn. Finally, the results of of the empirical part will be presented and analyzed, with particular attention to similarities and differences across the results obtained from the Czech firm data and Slovak firm data. In the conclusion, the thesis will be summarized, ultimate findings will be mentioned and implications/policy recommendations will be suggested.

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Students signature, date: Hayley Pallan, 4/30/2015

Approved by: Head of the MA Thesis Seminar, IMESS guarantor at Charles University,
PhDr. Jiri Vykoukal, Ph.D.

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‘The best antidote to stagnation is innovation, the creation of products and services that make life better—whether it's air conditioning, vaccines, or text messaging. Every country wants to foster a culture of innovation, but it's not easy to do.’

- The Bloomberg Innovation Index 2015

Introduction

This thesis aims to demonstrate the important role that innovation and competitive pressure play in firm performance and whole economies. Debates about the merits of competition and concerns regarding innovation policy, are important considerations, especially today in the context of disappearing business boundaries as global business and exchange become the norm. For example, the top 10 countries with the highest World Competitiveness Index for 2015 and the subsequent rankings of the Innovation Index for the same year (both published by the World Economic Forum) both contain 8 of the same countries.[1] This suggests that 'innovativeness' is positively associated with 'competitiveness' within nations. If their importance is so clear, the solution seems clear: all countries should encourage innovation in their domestic economies and support a competitive global business environment. But is that really the case? Is it really so simple? In short: no and no. These issues are especially cumbersome during financial crises, and arguably more so in transition economies in Central and Eastern Europe (CEE) with their associated economic legacies. This thesis seeks to explore relevant issues and ideas to answer the main question: What is the role of innovation and competitive pressure?

Another hot topic and an especially controversial subject of debate during the financial crisis and beyond has been the presence of foreign firms in less developed countries, typically those that can be described as 'emerging' or countries that have previously gone through the transition to a market economy. Investors see them as attractive destinations for investment.[2] Foreign companies are not always welcome by the domestic firms because it is argued that the domestic firms cannot compete with the foreign firms. On the other hand, opening up

[1] The eight countries that are ranked in the top 10 of both lists for 2015 are: Finland, Germany, the Netherlands, Japan, Singapore, Sweden, Switzerland, the United States. (World Economic Forum, 2015)

[2] Campos and Kinoshita (2003) explain the attractiveness of this group: 'The collapse of the socialist system in the late 1980s created myriad investment opportunities in the Central and Eastern European and former Soviet Union countries. These economies were industrialized and could count on a relatively cheap yet highly educated workforce (p.3).'

economies produces spillover effects, from which domestic firms can benefit and which can help them become more competitive with foreign firms. But what is the truth? How do firms react to competition? And how does it influence their decisions to innovate? Does the origin of the competitive pressure matter?

An attempt to answer these questions is carried out through an empirical case study of Czech and Slovak firms in 2009. By employing cross-sectional regression analysis to two datasets (one for each country) the impact of innovation and competition on firm sales is determined. This analysis is facilitated by using Enterprise Survey data from the World Bank. In this thesis, innovation can be defined as the development of new knowledge through research or the direct introduction of new products to the market, while competition types refers to where competitive pressure comes from, either domestic or foreign.[3] There is support for this approach (i.e. Carlin et al. (2004)), which this thesis draws from especially in the model development section, as the authors explore the relationship between firm sales and foreign or domestic competition. Wolszczak-Derlacz (2014) researches the differences between foreign and domestic competition and their impact on total factor productivity (TFP), an indicator of innovative progress and firm performance.

The role of competition is traditionally studied through an economic approach, which this thesis follows. However, the implications of an economic study of competition and innovation has wide ranging implications. For example, 'Competitive pressure manifests itself in a wide-range of economic and societal phenomena and is an agent of structural and societal change' (Korosi et al., 2006, p.2). The Harvard Institute for Strategy and Competitiveness also poses a question fundamental for economic development emphasizing the important role of further understanding of competition and related policies:

> 'Why are some nations or regions more prosperous than others? What conditions enable global corporations or local businesses to innovate and grow?

[3] It is noted that this approach to competition is a non-traditional way of looking at competition's role at the firm-level, which would typically involve focusing on the number of competitors (i.e. Aghion et al., 2005).

> Traditional economic theories fail to capture many of the underlying forces at work in today's global economy. Competitiveness is the only way to achieve sustainable job growth, improve wages, and raise the standard of living—yet the real meaning of competitive advantage is poorly understood.'

Though innovation and competition are clearly their own concepts, their relationship cannot be denied. This justifies the joint focus on competition and innovation in this thesis, and their roles are explored throughout the subsequent chapters.

Chapter 1 explains the economic theory and literature that supports the idea that innovation and competition are sources of economic success and improvement of firm performance (i.e. firm sales). This chapter details the role of innovation and competition in financial crises, and how economic theory is affected in these situations.

Chapter 2 explains the economic history that the Czech Republic and Slovakia were a part of. It focuses on the particular characteristics of transition economies in CEE. It explains what defined the communist economic system, and as a result, the challenges the lack of innovation and competition posed for transition economies. This chapter additionally reviews and analyzes aggregate innovation and competition-related indicators for the Czech Republic and Slovakia to establish the comparative development of each country in these economic areas.

Chapter 3 presents an empirical study of Czech and Slovak firms. First, it seeks to develop the model to provide answers to the main research question and to compare the results of Czech and Slovak firms. This chapter ties the model development to economic theory. Hypotheses are also made in this section, to be tested later. Following the methodology, this chapter presents the data used in testing and estimating the model for each country. It explains the main data source and key variables from the BEEPS (Business Environment and Enterprise Performance Survey) provided by the World Bank. In addition, summary statistics and OLS assumptions are checked for both data sets individually. Finally, this chapter presents the estimation of the model and results of the empirical study. It interprets the results and

additionally includes post-estimation analyses. It finishes with a discussion of the differences between the Czech and Slovak results and possible explanations.

In Chapter 4, policy recommendations are made based on the model and with further support from theories and other empirical studies. It also explains other insights regarding innovation, competition, financial crises and transition economies that the author has found. Such as, the striking similarity between conditions of the financial crisis in 2009 and the experience in the transition phase for CEE economies.

The conclusion of the thesis aims to summarize the main points and findings related to the main research question. It concludes with ways to expand this research area and policy recommendations. For example, how to make firms more receptive to foreign competition and thus increase the development of new products (innovation, improvements), while also having a positive impact on firm performance? The need for radical innovations suggests that an environment conducive to developing and supporting entrepreneurs is necessary (Baumol et al., 2007). Entrepreneurs commercialize innovations that are completely novel and solve real problems and generate demand. Entrepreneurs are also incentivized to develop new products for their firm's survival – what Schumpeter explained as 'creative destruction,' a virtuous cycle of new and improved products at the expense of old firms and their outdated products. Societal support for an open economy is also essential, which the financial crisis conditions and the hesitancy of foreign involvement in the economy during the transition period both demonstrate.

Chapter 1: Economic Theory and Background

Here, economic theories are reviewed. They are further analyzed in the context of empirical findings related to competition and innovation factors. Analyzing the literature points to a clear theoretical and real-world link between innovation and competition, and their joint importance for economic prosperity. Because of the general economic importance of these aspects it preempts the question: 'What is their role in economic and financial crises?' Thus, following the review of theory and relevant empirical studies, financial crisis literature is presented. The review of this literature demonstrates the shock of financial crises on the real economy, and further has implications for the role of competition and innovation and their associated policies.

1.1 Competition and Innovation Literature

There is a vast amount of literature which supports the positive linkage between innovation and the level of competitiveness in an economy. The literature consists of both theoretical analysis as well as empirical evidence that this link plays an important role in growth and development (at both the micro (i.e. firms) and macro (i.e. nations) levels).

1.1.1 Leading Theories

Schumpeter is well-known in the area of innovation economics and entrepreneurship, which has had implications for the development and study of competition. He is particularly famous for his dissemination of the idea and explanation of creative destruction. Creative destruction is the idea that products and services will consistently be replaced by new and better ideas. He argues that through this process of innovation (and as a result 'destruction' of older ways and methods) this generates growth and is a fundamental of capitalism and a well-functioning market economy (Hayami and Godo, 2005).[4] Schumpeter's view of growth supports the notion that innovation and the introduction of new products should result in an

[4] 'Schumpeter considered innovation 'the engine of development' in a capitalist economy' (Hayami and Godo, 2005, p.185)

improvement in firm performance. Schumpeter also supported the notion that history matters, especially for economic study.[5]

Beyond Schumpeter's emphasis on the important role for innovation as a positive force for growth, competition plays an equally if not more important role in creating an appropriate environment for growth and innovation. As Hayami and Godo (2005) explain: 'investment in scientific education and research is a necessity, but is not a sufficient condition to accelerate technological progress' (p. 187). Here they are referring to support for innovation through investment, and emphasizing that technological progress (innovation) requires more. Many economists and previous literature on similar topics would agree with their statement that 'competitive markets should be the core of such a mechanism' (Hayami and Godo, 2005, p.188). This perfectly sums up the important and intertwined role that both innovation and competition have for growth.

In 2007, Baumol et al. presented variations of capitalism, explaining that there are many forms with varying degrees of individual initiative and government guidance. At points in this seminal book, they explain the dilemma faced by CEE economies (the Czech Republic and Slovakia included): 'But these systems were embedded in a political and economic atmosphere - socialism or communism - that was the very antithesis of entrepreneurship' (p. 9). They specifically define their view of entrepreneurship as a major source of radical innovation in economies, essential for development and growth, beneficial for maintaining and creating a competitive environment (for firms) and better prospects and options for consumers.

In suggesting specific policies for developing countries, Baumol et al. (2007) acknowledge the difficulty and complexity of proposing a single solution, because of the various stages of development among this group of countries and their specific institutions. Here in my thesis, more prescriptive and applicable solutions can be drawn, because it focuses a sub-

[5] History and its implications are the focus of Chapter 2.

category of 'developing countries': the region of CEE and further narrowed to a comparison of the Czech Republic and Slovakia.

However, the ideas of Baumol et al. are reflected in other studies, further providing support for the theoretical link between entrepreneurship and innovation, which will be important in developing policy recommendations for innovation. For example, Radosevic (2007) explains that there is a demonstrable link between entrepreneurship and innovation.

1.1.2 Empirical Studies and Policy Review

Based on a theoretical understanding of innovation and competition, we can understand how policy can approach the problem if these economic factors are not working as they theoretically should. Schumpeterian growth theory[6] supported the entrepreneur as a leader of innovative change and the development and introduction of new ideas to the marketplace (Leonard, 2009). As a result of Schumpeter's well-established argument, it would make sense to develop policies and incentives in favour of entrepreneurship. *The Prophet of innovation: Joseph Schumpeter and Creative Destruction* provides an encapsulating description and understanding into the mind and work of Schumpeter and his views on economic theory (McCraw, 2007).

Carlin et al. (2004) explores the impact of competition on firm-level innovation and growth. In support of standard economic theory described above, their study provides a panel data empirical analysis of firms in transition economies which confirms the positive association in both the innovation-competition relationship and the competition-firm performance (sales growth). They also use BEEPS data, which allows them to analyze a unique set of competition variables to understand what influences new product development[7]. These variables distinguish between the pressure from foreign competitors to innovate and the pressure from domestic

[6] 'Schumpeter's hero, of course, was the entrepreneur, "the agent of innovation," and, Schumpeter said, "the pivot on which everything turns."' (Leonard, 2009, p. 191)

[7] This view of innovation is increasingly being explored: 'There is an emerging literature on what can be called "product" innovation, which focuses on the introduction of new products by firms (Lederman, 2007, p. 1).'

competitors to innovate. This study by Carlin et al. (2004) provides support and guidance in my methodological approach described later.

Other authors have also tried to understand and distinguish between the impacts of foreign and domestic competition. Furthermore, it is understandable that this is an increased area of interest given the increased degree of globalization and as a result, global competition for firms worldwide (Wiersema and Bowen, 2008). For example, in a much more recent article, Wolszczak-Derlacz (2014) questions the relative impacts of domestic and foreign competition. They note that complete understanding of this area is still an 'unresolved question (p.1).' Therefore, this thesis adds to the discussion of this question through the empirical study which begins in Chapter 3. For comparison sake, Wolszczak-Derlacz (2014) ultimately find that their measure for firm performance (productivity) is positively associated with an increase in domestic competition and the same association with their proxies for foreign competition. We will see later how these findings compare and contrast with the results of this thesis, but regardless, the empirical study of Wolszczak-Derlacz (2014) certainly provided inspiration for the study of foreign vs. domestic competitive pressure in the following chapters.

Beyond academic research and discussion of the topic of competition (which encompasses entrepreneurship and innovation), European policy has noticed the importance of entrepreneurship and innovation as seen in recent policy initiatives and programs. A green paper from the commission in 2003 on the subject of Entrepreneurship in Europe, addressed that 'Competitive pressure drives firms to continuously exploit knowledge and innovation (p.19).' This thesis will test this statement and see how effectively the EU has managed to encourage the positive benefits of competitive pressure. The same green paper further elaborates on how product development can manifest and thus indicates potential areas for policy to focus on: 'Firms can innovate in different ways, including technological development, quality management, new ways of organising work or distribution channels, brands or design. Human capital is critical to generating creative or innovative ideas (p.19).' This provides support for the importance of understanding the drivers of innovation and related incentives for designing effective policy.

1.1.3 The Competition vs. Protection Debate

Why is competition encouraged, and why are there people, firms and governments who oppose it? On one end, those in favour of it see the benefits that are possible that the theoretical explanations propose (and empirical studies support). A large benefit of competition are spillover effects. These are positive externalities that certain parts of the economy, typically firms within the same industry of a commercialized innovation (intra-industry spillovers) gain knowledge and advantages thanks to increased competition or the introduction of a new technology or other innovation in the market. Hamida (2007) explain that 'there are "competition-related spillovers", when the increase in competition that occurs as a result of foreign entry forces domestic firms to introduce new technology and/or work harder.' For example, when a new firm introduces an updated or completely novel technology, it is logical to assume that other firms in the same industry can learn from these new developments and build upon them within their own organization, leading to even better products. If this cycle continues, this is a practical reflection of Schumpeter's theory of creative destruction. Furthermore, this virtuous cycle should contribute to increased growth, continuous innovation and increased competitive pressure amongst firms.

The theoretical logic behind spillovers has also been demonstrated empirically. For example, Javorcik (2004) analyzes firm level data for Lithuanian companies and finds that there are positive effects even across industries that results from foreign firm activity in the domestic market. However, she does note the need of shared ownership, rather than isolated foreign firm activity. The impact of FDI and foreign firms can be also viewed as the pressure that outside (foreign competition) create for domestic firm to deal with (i.e. through investing more in research and development (subsequently referred to as R&D) in order to be able to introduce new products and effectively compete with foreign firms and their domestic counterparts as well – this is what the empirical portion of this thesis attempts to understand).

On the other end, there are still those that are opposed to competition and typically justify their position and policies based on nationalist or protective measures. However, history has demonstrated that when countries or regions employ policies to protect their anti-

competition position, the results are not favourable. For example, South America's failure to achieve economic development by import substitution industrialization and protection of infant industries is a classic example.[8] The failure of the soviet economic system can also be partially attributed to the lack of a competitive environment to induce and incentivize innovation.[9] This is to demonstrate that there are numerous examples where these measures have failed, and further supports the importance of always studying and understanding innovation and competition and how to continuously develop supportive policies so as to not return to anti-competitive economies (and indirectly anti-innovation economies).

Even more relevant for this analysis are the communist economies of the eastern bloc and the struggle they endured in transitioning from such protective, globally insulated economies to market economies integrated with the international economy. In a way the case of these countries was a real 'economic experiment' during the late 1980s and early 1990s.[10] The approach to economic transformation in the region varied from country to country, but

[8] Starting in the 1950s Latin American countries employed measures to protect their domestic industries from foreign competition. They thought that this would allow their domestic industries to develop and build up to the same level as foreign firms from more developed and industrialized countries. However, the ISI policies insulated their domestic economies too much, and in general, their firms did not succeed because they was no incentive to innovate and make improvements due to the anti-competitive environment.
Franko (2007) explains the problems of this system: 'The benefits, however, were limited to countries and sectors with internationally competitive products. In many cases nationally manufactured goods did not meet international quality standards after growing up under protective tariffs, and firms were not forced by competition to become efficient (p. 73).'

[9] Hogselius explains '… an important consequence of central planning of innovation was that the relationships between actors were not allowed to emerge and evolve in any spontaneous way… this was because the very emergence of organizational structures and networks, similarly to technological proprieties and product ranges, was subject to central planning. (p.86)' Because of the lack of experience with innovation and competition, it was certainly seen as a challenge for these countries to develop business relationships with foreigners and benefit from their experience.

[10] Many authors in the field of economic transition would agree with the following: 'The transitions from economic planning to a market economy posed a natural experiment that allowed studying the impact of the introduction of competition.(Boheim, 2014, p.4)'

their approach was typically grounded in theory and involved the speed at which firms and the overall economy would exposed to the global economy (i.e. increased competition). A major part of increasing competition was the privatization process[11]: transforming the large, communist, state-owned enterprises into privately held firms with the theoretical support that such a move would increase efficiency, innovation and quality of products. The specific case of this shift and what it meant for the communist legacies impact on competition and innovation among these countries is further explored in the following chapter on economic history.

The inefficiency and ultimate inability to develop a well-functioning, sustainable economy without competition and innovation as numerous cases in history demonstrate, helps to justify the inclusion of both competition and innovation in this thesis, as both are related, especially for economic development and growth. Another important, theoretically and empirically linked factor is foreign involvement in an economy which has been relatively successful in fostering competition and innovation.[12] Though this is only part of a well-

[11] Privatization was a major part of the transition process, in fact, numerous authors would agree with Osborne's (1998) description of privatization in CEE as a 'monumental task'. The transfer of ownership in the countries ultimately impacted the role of foreign investors in the economy.

[12] Since transitioning from command economies, the eastern bloc countries sought to make themselves attractive to foreign investment. In nearly all aspects of the transition process these countries sought advice from international policy makers and researchers to understand how best to develop and integrate themselves in the global economy. It seems that overall, the consensus was to allow an inflow of FDI. This consensus is also described as the motivation for further research in this area, especially transition economies, like Javorcik's article exploring the spillover effects of FDI in Lithuania. 'It is often hoped that technology transfer resulting from FDI will go beyond actual projects undertaken by foreign investors and, through knowledge spillovers, will benefit domestic firms (Javorcik, 2004, p. 605).'

But have these benefits paid off for Czech and Slovak firms (and what were the ramifications of these initial post-transition policies and goals during the recent financial crisis)? Benefits should typically be seen in spillover effects in empirical studies, as Javorcik and others confirm. So this thesis will answer whether increased foreign involvement and outside competition has had the desired effect to increase innovation and improve the performance of the regions own businesses and organizations. Of course, during a financial crisis traditional theory is likely not applicable due to the volatility and uncertain economic conditions. So this thesis also explores the changing role of competition and its various channels, whether through foreign firms or domestic ones.

developed capitalist society (the role of innovation, foreign openness and competition) they are all linked and certainly have a degree of explanatory power. In *Good Capitalism, Bad Capitalism,* Baumol et al. (2007) also argue that entrepreneurial capitalism is the 'best' kind of capitalism, and they explain the importance of any kind of innovation (whether new products/services/methods developed by a large firm, or new, or small firm), this is a crucial component for economic growth and development. They also admit that they are not attempting to say that this is all that matters in the economy, only that this particular area (that of innovation which comes from entrepreneurial thinking) is important, and is seen to have historically allowed the development of economies and their productivity and competitiveness. They pay much attention to the US and this country's success in this type of structured economy and how developing nations can learn from this experience by understanding what drove the US and its citizens to be so successful. This thesis applies the theory and logic of these authors to a firm level comparisons between Czech and Slovak firms.

1.2 Financial Crisis Literature

Why focus this thesis on the role of innovation and competition specifically for the year 2009? The time choice of this thesis adds an interesting dimension to the empirical study and leads to further lessons and insights as a result. In addition, financial crises have historically been well-documented and analyzed situations. Since the most recent financial crisis, academic literature and policy reports have explored the role for innovation and competition and the specific implications for CEE economies (including those of the Czech Republic and Slovakia). Given that these countries experienced a drastic economic transformation beginning in the early 1990s, the way they have been affected and reacted to the most recent financial crisis in 2009 can provide further insight into the effectiveness and progress of their transition.

1.2.1 Opportunity to Practice New Economic Ideas

In the past, financial crises have been precursors to changes in economic ideology – which have changed the receptiveness that countries and their firms have to outside competition (and inside included). These economic disasters have also been historically followed by a shift in the economic paradigm, and political economy environment. Policy

changes and experiments have been products of financial and economic crises – the largest of which was arguably the experience of economic and political transformation in post-eastern bloc and post-soviet countries.

A key example from history is the Great Depression, whose events and consequences helped to justify a shift in economic ideas and economic strategy of nations. During the Great Depression, the world saw the effects of a crisis in a globally connected and minimally regulated environment. As a results, more support and recognition was given to the need for effective government intervention, of which Keynes is well-known. Raupach (1969) explained the consequences of the Great Depression on the leading economic ideologies of the time in the CEE region: 'It took the Great Depression to pull the veils of illusion aside, revealing the shortcomings in the foreign trade relations of east-central Europe and the imbalance in its production structure' (p. 76). This is an example of how financial and economic turmoil present a window of opportunity for radical change and implementation of new economic systems (and equal opportunity for political change).[13]

Later in history, when the CEE region's system of central planning collapsed with the fall of the Soviet Union and dismantling of communist policies in the eastern bloc, the region experienced a period of economic and financial crisis. When communism collapsed in the countries of CEE this presented both political and economic shocks. This period of shock further provided opportunities for radical change. Again it was imperative to initiate reform quickly, for the following reasoning Aslund (1994) explains: 'It is vital to take advantage of this window of opportunity in order to craft a constitution and hold parliamentary elections while idealism briefly holds sway' (p. 65). This time around the radical change was a shift from command economies controlled by communists to market-based economies controlled by market forces and well-integrated in world economics and competition.

[13] Chase (2011) explains the window of opportunity seized by the communists following: 'Communist planners saw in the immediate post-war period an opportunity to start again and build an economy and society on completely different bases, rather than a mandate to 'reconstruct' what had once been' (p.73).

1.2.2 The Crisis in CEE

To begin with, the countries of CEE suffered economic and financial turmoil after the collapse of the Soviet Union and the failure of the planned economic systems in the eastern bloc. The shift from the soviet system to globally integrated market economies posed specific challenges for the financial and economic development of CEE. The countries each had unique problems and tackled them in equally unique ways. However, in general, the collapse of the economic system allowed the introduction of a new one, based on completely different principles: primarily, openness and market development. Naczyk's (2014) research comparing the economics and narratives in Poland and Hungary sums up a crucial issue (foreign economic involvement) related to the region's development and integration:

> 'After the collapse of communism, political elites in Central and Eastern Europe (CEE) implemented economic reforms that were largely inspired by the prevailing neoliberal paradigm. One of the consequences of these reforms was that the region's economies became very open to foreign direct investment [subsequently referred to as FDI] and their growth became increasingly dependent on the capital and technologies brought by foreign multinational companies. This developmental path has been gradually challenged since the global financial crisis. (p. 1)'

This suggests that the global financial crisis is another 'window of opportunity' for radical change. By 2009, the global financial crisis was affecting Europe and especially the foreign investment exposed countries of CEE[14] (the Czech Republic and Slovakia included). The

[14] Sobjak (2013) explains a main reason CEE countries were drastically hit by the financial crisis in 2009: 'the highly export-oriented nature of the CE [Central European] economies, which are open and (with the exception of Poland) small, and thus much exposed to swings in the global economy and demand in the main export markets.' These countries were highly dependent on foreign forces, through both foreign investment and foreign demand for their products. With such exposure to the global economy, the crisis resulted in a contraction of foreign involvement in their economies and lead to their own national financial contractions, which included negative GDP growth and increasing the unemployment rate.

history leading up to the developments in these countries, their differences and similarities are discussed in the following chapter in more detail. But this chapter provides a general description of the impact financial crises can have on economic systems and the important drivers that promote competition and innovation (the driver being foreign investment and competition presence for CEE, which previously lacked domestic knowledge and incentives to foster an environment for these economic factors under central planning).

In a way, the recent financial crisis which struck Europe in 2009 and its negative consequences presented opportunities for radical change, which is consistent with financial crisis literature and historical experience. One effect is that is has contributed to anti-market[15] literature, or at least the more active listening to their ideas and persuasive arguments given the practical and current example they could draw on. This may bring into question the success of the transition in instilling anti-communist and pro-market ideology. How these countries with communist pasts respond to economic shocks has implication for future policy, the global economy and integration. For example, their response impacts the prospects of innovation which lead to new products and overall improvements in welfare and economic development

[15] For example, during and after the global financial crisis, the leading political parties in Hungary have been successful by focusing on: 'the economic issues of poverty and inequality triggered by capitalism. (Varga, 2014)' By questioning the transition process and the global acceptance of capitalism, politicians in CEE have (in general, and especially in Hungary) demonstrated that they identify with the sentiments felt by a large part of the population. For example, in a 2014 speech, Orban (the prime minister of Hungary since 2010) explained the need to look to other countries and to find a new path for the economy other than the strict-capitalist approach of the West. In response to his speech, many agreed with him: 'That's why the speech won't provoke any angry public backlash. About two-thirds of society were harmed by the transition and only one third benefited from it (Budapest Telegraph, 2014).' These feelings of insecurity and hesitancy with regard to accepting capitalism as the new form for the economy, is reflective of sentiments in the region following the initial collapse of communism and the early transition period.

and opportunities. Just as there were two ideological sides to the debate on how to approach the transition process in the early 1990s in CEE, the debate has returned in the countries that proved so vulnerable during the financial crisis in 2009.[16] This debate questions the practice of economics itself and there is no wonder why economic policy makers face such difficult challenges in order to convince nations of their suggestions: 'The importance of this crisis was underscored by The Economist (2009) 'Of all the economic bubbles that have been pricked, few have burst more spectacularly than the reputation of economics itself. For in the end, economists are social scientists, trying to understand the real world. And the financial crisis has changed that.' (Thakor, 2011, p. 1).

1.2.3 Competition, Innovation and Other Factors in the Crisis

An OECD paper published during the financial crisis in 2009, provides insights into the state of the crisis as seen through policy makers and analysts in the moment. They note that though the crisis started in the financial sector, it subsequently had an 'important impact on the real economy' (OECD, 2009, p. 3). The real economy is where innovation policies can arguably have the most impact because the real economy is the side of the economic system which produces goods and services as opposed to the financial side of the economy. For this reason, we see more emphasis on how the crisis impacted innovation and how to develop policy solutions to the negative impact on innovation only later after the onset of the crisis. Initially,

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[16] When economic transition became the priority for CEE countries, the main debate was regarding shock therapy versus gradualism. As Hellman (1998) explains, the shock of the initial transition period lead to a slump in output and other economic variables until they could recover. As a result, people in CEE countries experience, 'Economic hardship, unemployment, lower income and even poverty for many, and social polarization played a role in disappointment (Berend, 2007).' It was especially difficult to develop capitalist markets in CEE because there was not a well-functioning financial system (Sachs and Lipton, 1990. Beyond these economic issues, there were political issues that had to be addressed to gain society's support for the transition programs (Osborne, 1998). This is reflective of the political backlash experienced in many countries following the recent financial crisis, when capitalism and the role of foreigners in CEE countries was blamed.

the focus was (and to a large degree continues to be) on the financial side, and on designing and debating the best solutions to prevent a financial side crisis from happening again. Certainly the initial worry regarding the financial sector is important, but as has been seen as the crisis progressed, the crisis leaked into the real economy as well (OECD, 2009, p.17).

In a review and analysis of the state of innovation after the financial crisis, the OECD (2012) explains that 'the global financial crisis negatively affected business innovation and R&D (p.21).' One reason for the increased academic and policy interest in innovation after the crisis seems to logically be 'the urgency to implement better growth enhancing policies' especially in Europe. (Izsak et al., 2013, p. 3) The authors of a European Commission report present this reasoning and their qualitative and quantitative analysis on this topic: First they note that 'general and knowledge intensive activity indicators shows a downturn' in some European countries (including the Czech Republic), while others only experience a downturn in their general economic indicators (including Slovakia) (Izsak et al., 2013, p. 3). This is important for the subsequent empirical analysis of this study as Izsak et al. demonstrate that the CEE region is not as homogenous as some authors and policy-makers tend to classify previous transition economies. It further demonstrates that these countries experienced different impacts of their economic transition in the early 1990s and that these countries may still be undergoing a type of transition as they accumulate experience and knowledge of the market economy. Regardless of the impact the crisis had on European economies, Izsak et al, 2013 conclude that policies supportive of private R&D and entrepreneurial activity are likely to create an environment for positive effects on innovation outputs (not only inputs), and thus positive effects on the real economy (p. 7).

The impact of the crisis has had varying effects across different countries, and the OECD (2012) place special emphasis on the importance of the policy context leading up to the crisis (p.22). Beyond that, a key point is that in the area of innovation, countries at all levels of development were affected and have a long way to repair and build up their innovation systems. However, they do note that one of the regions hit harder than others was Eastern Europe (p.22). For developed countries, however, they note that 'innovation performance

remains uncertain' and that macroeconomic situation and policy will play a role in shaping innovation performance (p.22). Certainly, the OECD considers a major constraint to recuperate innovation to be the lack of investment in innovation (due to the unstable international economy) (p.22). This point is very applicable to CEE, which was heavily dependent on FDI, and it as will later be discussed. They seemed to be quite receptive to foreign competition which resulted in new product development and thus increased sales performance for domestic firms. Without the economic forces generated by foreign involvement in the economy, it is no wonder why innovation policies are the topic of current academic and practical debates.

Thakor (2011) looks at innovation and importance of patent protection in the financial industry during the financial crisis. He discusses how innovation creates risk and how it is important to strike the right balance of innovation and risk. The notion that innovation is risky and that it can potentially be disruptive is reminiscent of Schumpeter's explanation of 'creative destruction.' Based on this we see that Schumpeter's ideas of innovation and competition for economic growth and development are implicitly woven into current research, despite the theories age, it has certainly been continuously applied and questioned.

One approach which goes against pro-competition theory and policy is the following: 'during times of recession and/or depression it is sometimes suggested that lighter enforcement of competition laws would be appropriate. (OECD, 2009, p.18)' However, this same article acknowledges that this would inhibit the timing of recovery (OECD, 2009, p.18). As discussed in the OECD report on competition and the financial crisis, Fingleton (2009) has demonstrated that ignoring competition laws during times of financial crisis only prolongs the period of economic deceleration and stagnation. He has empirically tested this notion on the period of the Great Depression and on the Japanese recession in the 1990s (OECD, 2009, p. 18-19). While the OECD report from 2009 focuses on the implications and solutions for the financial side of the economy, many of their insights can be applied to the real economy, and used to rationalize innovation policy and efficient market competition. For example, the authors explain the importance of 'exit strategies to address distortions to competition instituted by crisis responses (OECD, 2009, p. 22).' Here they acknowledge that anti-competitive

measures may be necessarily taken in the midst of a financial crisis. This is understandable in both the financial sector and in the real economy: subsidies provided to domestic firms in order to support them through an economic downturn and ensure domestic firm survival for a period of time are a perfect example. However, as has been noted, countries that solely depend on protectionist, anti-competitive policies for their firms to thrive are unsustainable as history has plenty of examples. These include Latin America's period of import substitution industrialization and protection of infant industries which ultimately failed to develop because of their insulated environment, and the Soviet Union's collapse and privatization of its state-owned enterprises due to its inability to create an efficient model of central planning and connect demand with supply. So, this comes back to the conclusion the authors of the OECD report supports: applying anti-competitive policies should only be a temporary measure, there must be a plan ('exit strategy') for those types of policies to be diminished and ultimately dismantled in order to return to a competitive environment and overcome the crisis conditions.

Kindleberger and Aliber (2005) use the case of Japan's rise as an economic powerhouse in the 1980s to demonstrate that anti-competitive measure can work for developing new industries, and that a country can be successful in reducing those barriers overtime, ultimately being able to compete on a level-playing field with international firms (Kindleberger and Aliber, p. 149). For example, they explain how Japanese government agencies provided selected firms with 'low-cost loans and favored government procurement and tariff protection from foreign competitors, at least until firms had perfected their products and reduced their unit production costs to such low levels that they could challenge established American and European firms (Kindleberger and Aliber, p.149).' This model of business development was successful for Japanese firms because they had an incentive to truly become competitive. In other countries, firms did not always have the incentive and true threat that they would eventually be fully exposed to foreign competition. Without this 'threat' there is a logical tendency to coast rather than innovate, that is, take advantage of the government support without using it to generate better products and invest in the development of a globally competitive firm.

The role of animal spirits[17] proposed by Akerloff and Shiller (2009) also supports inclusion and analysis of human and qualitative factors that influence decisions during times of financial crisis. Their framework can be utilized to understand the role of economic ideology and how the legacies of CEE under communism have impacted the role of important factors affected by the financial crisis (such as the innovation and competition environment and their associated policies). For example, one of the animal spirits that the authors propose has an effect on the economy is corruption. Corruption certainly has a long history in the previous communist economies of CEE, and this legacy is still an issue today.[18] Another animal spirit is the concern for fairness, this concern is particularly relevant in post-communist societies and further impacts the economic ideologies[19] among a nation's citizenry. Economic ideology (as discussed above) can change overtime, but supporters of one economic idea or another are developed overtime based on their historical experience (for example, the experience of communism and the promotion of equality under such regimes). These country and region specific factors cannot be ideally implemented into econometric regression and analyses, therefore, a qualitative mention of these factors affecting the economic environment is necessary.

All of these factors have implications for innovation and competition during financial crisis or a changing economic environment, like the experience of transition economies. Based on this, we can conclude that the conditions of the shock of the market transition in CEE are

[17] Akerloff and Shiller explain the role of non-traditional factors to explain human economic behaviour. They call these factors 'animal spirit.' The book was published in 2009, perfect timing for the role of animal spirits during the financial crisis to be explored.

[18] For example, Hanousek and Kochanova (2015) explore the role of corruption in terms of bribery in CEE countries.

[19] Economic ideology played an important role in both the communist period of CEE countries and the post-communist period during the transition. Kornai (2006) explains that many people in CEE countries view 'their experience of the change that occurred in the system is as a failure, rather than a success (p. 240).' This is often the case because of the initial negative consequences and the time it takes to reap the benefits of transition. This issue has been especially important in shaping the perspectives of older generations, which cannot see their own generation or even their children benefiting from the transition because of the slowness, as a results it is hard to imagine the consequences in the long term.

reflected in financial crises, such as unemployment, inflation etc. Particularly interesting are the similar roles of innovation and competition during these periods. There is hesitancy and uncertainty during transition or financial crises, which are already characteristic of innovative ventures. But these factors are made worse by shocks, whether it is the global financial crisis or the collapse of communist society in CEE.

Chapter 2: Economic History

To draw from Schumpeter again, aside from his belief in the crucial role of entrepreneurship and innovation for economic growth and development of a capitalist system, he believed that 'economic historians and economic theorists can make an important and socially valuable journey together, if they will' (McCraw, 2010, p. 475). This thesis continues to apply Schumpeter's ideas not only of theory but of his emphasis on the importance of understanding the economic history of the context that is studied. Especially since the most recent financial crisis, understanding economic history can certainly inform policy decisions, in both normal and crisis times, and yet economic history is often not seen as important as economic theory and complex modelling. However, Oxford University Professor O'Rourke, explains why we need economic history (also the title of a recent publication of his). 'Far from being seen as a 'soft' alternative to theory, economic history should be seen as an essential pedagogical complement (O'Rourke, 2013).' An application of the theory to the historical situation of the transition economies in CEE, and a more focused analysis of the Czech and Slovak economies is the goal of this chapter.

It is also important to note that even though the Czech Republic and Slovakia were agglomerated under the same country of Czechoslovakia, both regions of this country shared different levels in the development process and economic performance. Data for the period pre-1993 is scarce and not the most reliable given it being in the early stage of the transition process. So an understanding of the diversity across the two regions prior to the split is best understood by a review of literature written on this subject, which draws mostly on qualitative descriptions of the economy.

An understanding of the aggregate context for firms in the Czech Republic and Slovakia, allows one to understand how individual firms might operate in terms of their competition and innovation environment. The aggregate (national-level) indicators presented and analyzed below demonstrate the general trends in each country. Furthermore, each indicator chosen here is relevant to the role of competition and innovation as justified by economic theory and empirical studies. The focus is on the availability of data from the year 1993 until the most

recent available. In some cases, data is not available immediately in 1993, and in such cases, the nearest available date is used. Most indicators are available up until at least 2012, which is beyond the date of study of this project (2009) however these later years indicate trends, and help understand the position of indicators in the focus year of this thesis (2009) compared to before and after.

2.1 Transition Economies in Central and Eastern Europe

Janos Kornai has written widely on the issues of transition economies. For example, in his paper *Innovation and dynamism: Interaction between systems and technical* progress (2010), he explains the key differences between socialism and capitalism and he explores the challenges faced during economic transformation from a centrally planned society to a market economy. As a result, key characteristics for a well-functioning market economy are described as the following: 'decentralized initiative, gigantic reward, competition, extensive experimenting and flexible financing'. All of these elements were key to innovation and a competitive economy, and all of them were equally challenging to implement in CEE countries without recent histories or experience in these areas. Despite the numerous obstacles the transition process encountered, it can be seen as a success that many CEE countries are now open economies, the opposite of what they were a couple decades earlier. This is the case of both Slovakia and the Czech Republic. To understand their progress, a review of the disparities between the two countries that emerged from the break-up of Czechoslovakia is presented.

2.1.1 Issues for Transition Economies

Lack of competition and innovation makes it interesting to see the progress in these countries. To emphasize the lack of an innovative and independent economic environment, Kornai (2010) explains the key characteristics that made the communist economic system so restrictive for innovators[20]. Kornai even refers to 'the impossibility of innovative

[20] Kornai (2010) lists the characteristics of socialism as the following: Centralization, bureaucratic commands and permissions; No or only insignificant reward; No competition between producers and sellers; Tight limits of experimenting, Investment allocation is rigid (p. 644-645). It is no wonder that innovation was not thriving. There

entrepreneurship under socialism' (p.643). This quote exemplifies the challenges the controlled economic system created for innovations to develop and the constraints on individuals who may have desired to commercialize a new product.

One constraint that contributed to the 'impossibility of innovative entrepreneurship' was the lack of financing. Under central planning, individuals could not pursue their own ventures, since (theoretically) every part of the economy was controlled. Despite the removal of central planning and the strictness of the previous economic and political regime with the fall of communism, initially, entrepreneurship was still not so accessible to Central Europeans. This can be attributed to the lack of financial institutions and finance experience in these countries.

Because entrepreneurial finance and especially finance for more risky projects (for example in innovation) it makes sense that these countries were instructed to and subsequently allowed for large inflows of FDI. Bevan et al. (2004) explains the important and positive role that FDI inflows into European transition has had (p. 775). Figures 1 and 2 are graphical representations of growth and FDI data for selected transition economies. These figures indicate similar trends across the region in the post-communist period.

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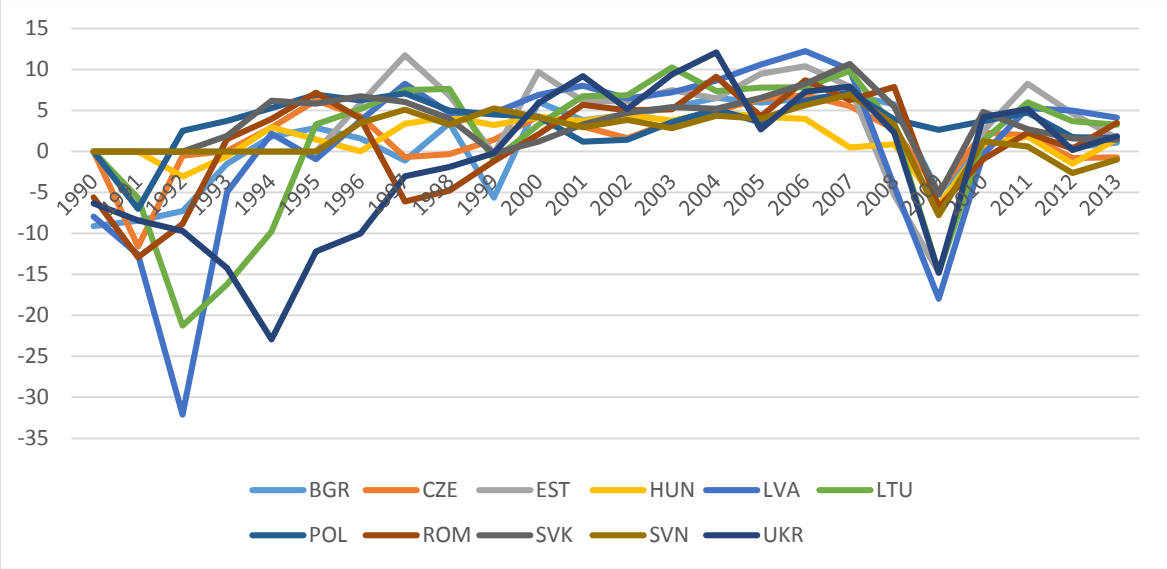
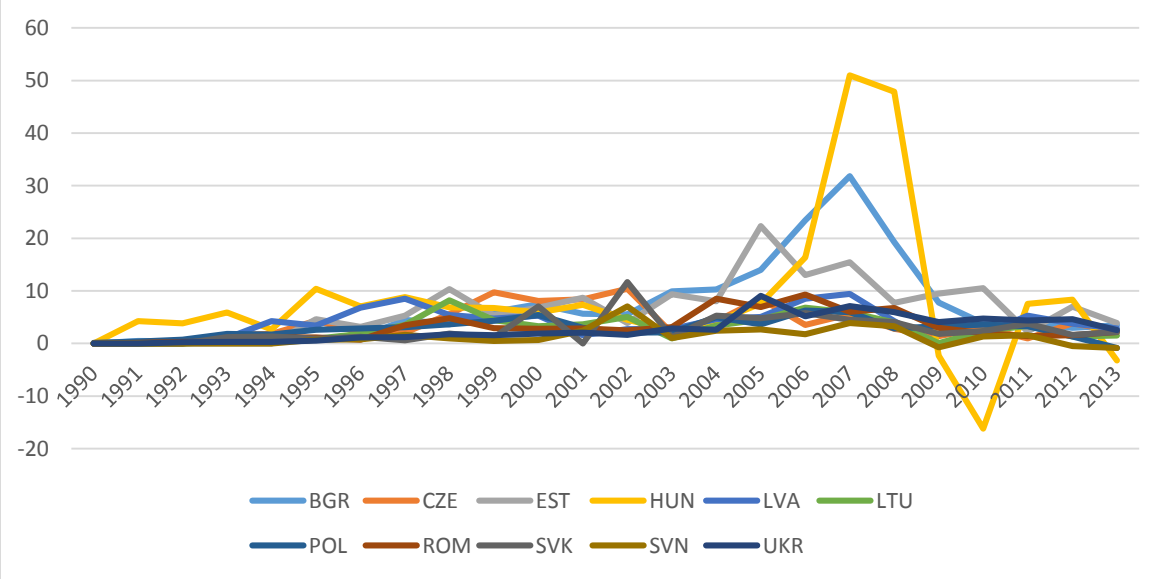
was a clear absence of incentives and support, and a complete lack of an entrepreneurial environment with centralization taken to the extreme.

Figure 1: Economic growth in transition economies (GDP growth – annual %)



(Data source: World Bank[21])

Figure 2: FDI into transition economies (Foreign direct investment, net inflows (% of GDP))



(Data source: World Bank, same country codes as in Figure 1)

[21] Country codes for Figure 1 and Figure 2: Bulgaria (BGR), Czech Republic (CZE), Estonia (EST), Hungary (HUN), Latvia (LVA), Lithuania (LTU), Poland (POL), Romania (ROM), Slovakia (SVK), Slovenia (SVN), Ukraine (UKR)

Another main issue for firms in the immediate post-communist phase was the lack of competition. In an EBRD paper, Carlin et al. (2001) examine the competitive environment in transition economies. They find that firm performance (both productivity and sales) in transition economies were positively impacted by competition and that competitive pressure lead to increases in new product development (p. 1). These conclusions have important implications for assessing post-communist economies, and exemplify how important it was for firms in the post-communist environment to be restructured. Boheim et al. (2014), sums up the benefits of market competition: 'Market competition reduces prices, drives inefficient firms out of the market and is associated with innovation (p. 10).' If this is true (and it has been demonstrated in empirical studies[22]), then communist economies were missing out on many of the benefits brought by elimination of state-control of the economy and restructuring of the enterprises that created it.

Aghion et al. (2002) explore both the financial constraints faced by firms and the competitive environment, they find that competitive pressure had a positive effect on both old (existing firms from the communist period) and new firms. However, at the time of their writing, they indicated that financing was still a large constraint for new firm development. This suggests that countries that facilitated financing through a market system (not through subsidies which may only generate inefficient firms because they can rely on direct government support rather than firm-level innovation) subsequently benefited from more new firms, developing and producing more products, creating incentives for others to do the same.

Beyond the financing and competition issues, post-communist societies were also wary of the lack of economic security in a capitalist economy. Despite the negative aspects of the

[22] An OECD Paper by Mark Dutz and Maria Vagliasindi (1999), assesses firms in transition economies in the early 1990s (the immediate post-communist phase of their transition process). Through their empirical study, they conclude that there is a 'positive relationship between competition policy implementation and expansion of more efficient private firms (p.2).' Their study is one of many that supports the link between competition and economic growth, which logically seem mutually reinforcing once they are both in place (much like competition and innovation).

communist lifestyle (lack of economic and political freedom, shortages, etc.[23]), generations had become used to the economic security a job provided by a state-owned enterprise created[24]. Despite the personal benefits of the communist system, due to the lack of competition (because nearly everything was ultimately owned by the same entity – the communist party and the state) there was a lack of incentives to innovate and develop better quality products and new ideas, which has been the key to growth and development in many economies. The fact that this was lacking in communist societies certainly hurt them once the system had collapsed and they were exposed to the innovations and efficiency in the global economy.

2.1.2 Progress of Transition and Persisting Challenges

Additionally, Kornai contributed further explanations for the collapse of the communist economies and CEE: 'one {factor} was the technical impossibility of airtight isolation of the Soviet Union and other communist countries from the voice coming from the rest of the world' (p. 647). This assessment certainly has a political dimension, but it can also be attributed to opening the eyes of CEE society to the opportunities and developments beyond their borders. This statement may be applied to the current globalized economy, in which less developed countries (such as transition economies, including the Czech Republic and Slovakia) receive FDI inflows which allows for further development. It is understandable that countries see the benefit of having a role for foreign money in their economies due to the potential of spillover effects. The ability to pursue and act on these opportunities and awareness was clearly lacking under the communist regimes. Furthermore, the collapse of the communist economies may be

[23] Boheim (2014) explains the disadvantages present in communist societies: 'From an economic perspective, the objective of the transition was to remove the shortcomings of economic planning, including its anti-consumer bias, over-industrialisation, the manufacturing sector's low productivity and the economy-wide inward orientation. The communist economies were largely closed, and provided only a reduced variety of goods' (p. 4)

[24] Despite the lack of freedom, there some relative 'benefits' to the communist economic system. As Kornai (1992) explains there was economic security, which consisted of full-employment, public education, public pensions and the provision of public housing (p. 312). Additionally poor performing firms was not such a concern with the frequent use of soft budget constraints: 'managers will expect a rescue if losses are made, and this expectation will shape their behaviour' (Kornai, 2001, p.1574). All in all, people and firms were not held accountable or responsible for themselves, due to the reliance on the state.

an indication of the detriment of having a lack of pressure of foreign firms. Under communism, the economies of CEE were isolated from foreign competition, and thus had no outside pressure or incentive to innovate and develop better ways to produce better products. The main benefits of transformation has been exposure to incentives that encourage innovation and entrepreneurial risk-taking.

Radosevic and Auriol (1999) examine the progress of innovation factors for six transition economies in CEE – including the Czech Republic and Slovakia. They explain that prior to the economic transition, CEE countries did invest in R&D at very high levels (p. 354). However, as the collapse of the system exemplified, their investments did not work effectively, due to the lack of market forces in their economic system. It was impossible for central planners to gauge the supply and demand of all goods and services (as would still be the case today). With the collapse of the economic and political system, R&D investment did not diminish with it. Instead these countries '[still had] relative R&D investment and patenting well above the levels of most of the least developed OECD-25 countries (Radosevic and Auriol, 1999, p. 375).' This statement is contradictory to theory (high R&D should produce a high level of innovation, which should lead to higher growth and development). In fact, the data in the region showed that R&D was not linked with many growth and development factors (Radosevic and Auriol, 1999, p. 375). This suggests that analyses of R&D expenditures are not the best approach to understanding the positive market development in these countries.

However, in contrast to general R&D investment, Cadil and Lengyel (2009) find that 'foreign business R&D' is a positive force for economic development in transition economies. They develop case studies of Czech and Hungarian innovation policy and find that the role of foreign investment and multinational companies contributed to the development of national and regional innovation systems (p. 186). Beyond this key conclusion, Cadil and Lengyel argue that motivating factor for investment in these countries was 'inherited factors' which they describe as the 'quality and a long tradition of domestic R&D' in the region (p. 185)'. So, despite the initial discrepancy between R&D spending and the state of the economic transition as presented by Radosevic and Auriol (1999), this legacy of investing in innovation activities seems

to have paid off by attracting foreign investment and opening their domestic firms up to potential spillover effects.

So, beyond introducing their economies to FDI, what other measures have been taken and what are the largest changes that can be seen for CEE economies over the past couple of decades?

Domestic firms have had an important role in the economic transformation as well. The role of domestic firms changed drastically during the post-communist transition. Kornai (2010): 'many large (formerly state-owned) companies went out of business, and small business entered in huge numbers' (p.654). There was constant change in the domestic economies of the region: 'Total firm turnover (entry+ exit) was … more than 10 percent in some of the transition economies in the 1990s' (Kornai, 2010, p.654). Based on these facts regarding how the economies of CEE reacted to the new market environment, it would be interesting to see how these countries have developed their level of domestic competition and to see if domestic competitive pressure has an important impact on firm performance.[25]

Despite increased firm turnover, new firm formation and privatization during the transition, Bastic (2004) brings to light the issue of the technology gap between transition countries and others in Europe. She explains that despite the competitiveness of the transition countries in terms of price, they lack competitiveness in terms of 'new designs, product innovation or new manufacturing methods (p. 65).' She concludes that in order for transition countries to successfully transform themselves, new product development is an important factor and an area in which progress has lacked. Based on Bastic's insights nearly a decade ago, it will be interesting to see the progress (or lack of) in the selected transition countries (the Czech Republic and Slovakia).

[25] This is part of the main research question, which will be tested in the empirical section of the thesis.

2.1.3 Czechoslovakia and The Result of Its Break-up in 1993

Czechoslovakia has a long and complicated history. The nations the Czech and Slovak people have historically been separate, merged and separated again (Dedek, 1996). The countries of the Czech Republic and Slovakia as we know them today were officially established in 1993, following the 'Velvet Separation' of these two parts that made up Czechoslovakia during the communist period and for a few years afterward (from 1989-1993). Though the split was peaceful (an uncommon historical experience when new countries are created), the political and economic results were a challenge as separation required separation of Czechoslovakia's resources (Hajek, 1996, p.181). Because of their shared history, a comparison of the Czech and Slovak economies and firms is an interesting way to understand the heterogeneity in the transition process and outcomes, including how these countries have managed and reacted to the financial crisis.

During the post-communist period, Czechoslovakia proceeded with the transition as other countries in the region did. As a whole, Czechoslovakia was relatively well-off and had well-developed resources at the fall of communism[26]. However, the differences across the country became apparent with the creation of two separate countries. Hajek (1996, p.182) explains that the most striking difference was 'in the area of foreign trade.' As Czechoslovakia, the Czech and Slovak regions traded many goods and services between them (mutual trade). It is understandable that the level of mutual trade decreased following their split (they were separate countries, with their own sets of institutions and political systems and trade rules). The result of lower mutual trade had initial negative effects for both countries. However, the Czech Republic managed to 'compensate for the decline of exports to the Slovak Republic with expansion to other markets (Hajek, p.182).' In contrast, Slovakia did not manage to do the same

[26] 'The transitional [CEE] economies faced relatively unfavorable initial conditions in terms of the stock of physical capital and the vintage of its technology. The Czech Republic fared somewhat better than others, having been a worldwide leader in industry before World War II and remaining a leading industrial center within the Soviet bloc (Svejnar, 2013, p. 3).' Though after the separation both countries did experience negative effects: 'the decrease of read GDP in the Czech Republic was 0.9%; in the Slovak Republic it was 4.1% (Hajek, 1996, p.181)' However, both countries rebounded with positive growth the following year.

for their economy. Sujan and Sujanova (2013, in Svejnar) explain that this can be attributed to the idea that Slovakia was seen as 'less stable politically and economically' (p.126). It seems that their historical experience with foreign trade had long-lasting implications.

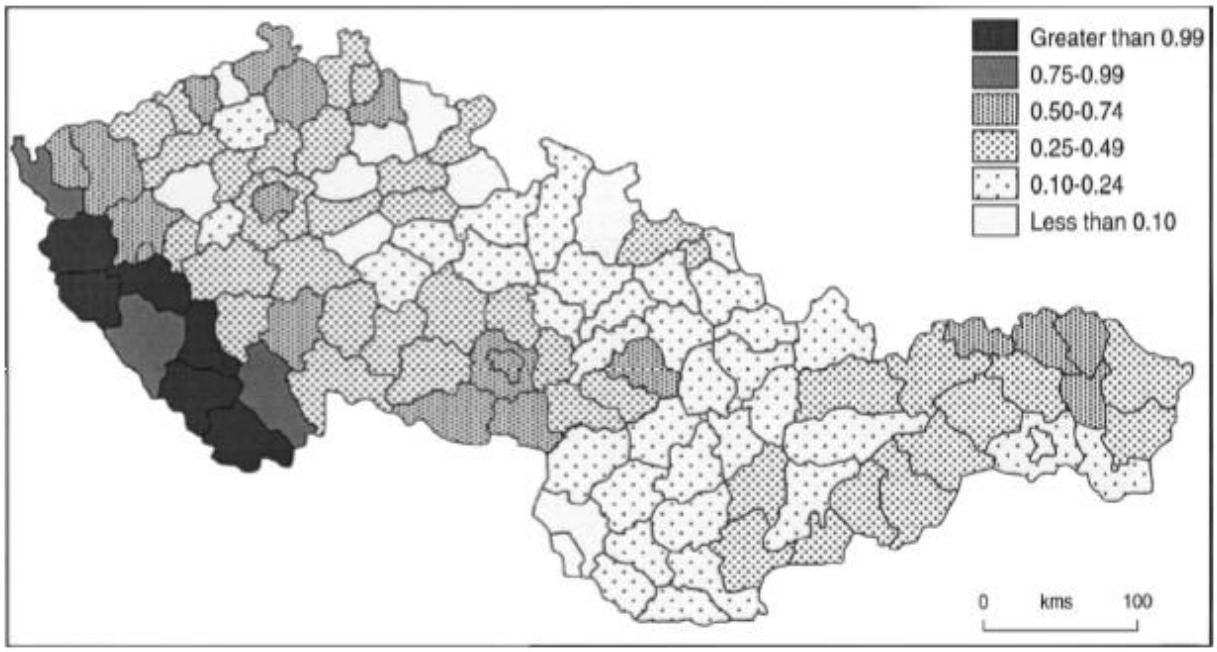
The starting points of these two countries in 1993 and the individual transition[27] paths they proceeded with appear to have had a different impact on the later progress and economic development of these countries in comparison to each other. For example, Figure 3 shows the distribution of foreign capital across the areas of the Czech Republic and Slovakia in 1994. This map shows a higher concentration of foreign capital in the region of the Czech Republic, which is reflective of the differences in FDI both countries received later in the early 2000s. Because of the initial distribution of resources and productive capacity, it seems that the Czech Republic had an advantage which has continued and contributed to its general stability[28] in comparison to other CEE economies. By contrast Sujan and Sujanova (2013, in Svejnar) explain that the break-up was 'clearly a loss for Slovakia and a gain for the Czech Republic (p. 126).' This opinion was based on the reduction and eventual elimination of transfers[29] from the Czech part of the country to the Slovak part. To understand the impact this would have had on Slovakia once it could not depend on these transfers, in 1992, they were 7% of the Slovak land's GDP (p. 126).

[27] After all, one of the reasons for their peaceful split was their consensus that they could not come to a consensus on most aspects of the transition process (Dedek, 1996). Miroslav Singer (2013) also explains the difference in the transformation strategies of the Czech Republic and Slovakia: 'The Czech transformation advanced relatively quickly,' while the 'Slovak transformation was hindered by policies of PM Vladimir Meciar.'

[28] The Czech Republic has a reputation of stability and progress, especially relative to other CEE countries. For example, it was the first among the CEE transition economies to join the OECD, in addition to having attracted the largest amount of FDI per capita (Business and Investment Development Agency, 2011). Svejnar (2013) also explains that the stability of the Czech Republic can be traced back to the fact that 'Czechoslovakia entered the transition with very low inflation. It also had low budget deficit and foreign debt (p. 4)'

[29] These included 'allocation of tax revenues and budget expenditures in favor of Slovakia, non-market pricing of some deliveries in favor of the Czech lands' (Sujan and Sujanova, in Svejnar, p. 126).

Figure 3: Distribution of Foreign Capital in the Czech Republic and Slovakia

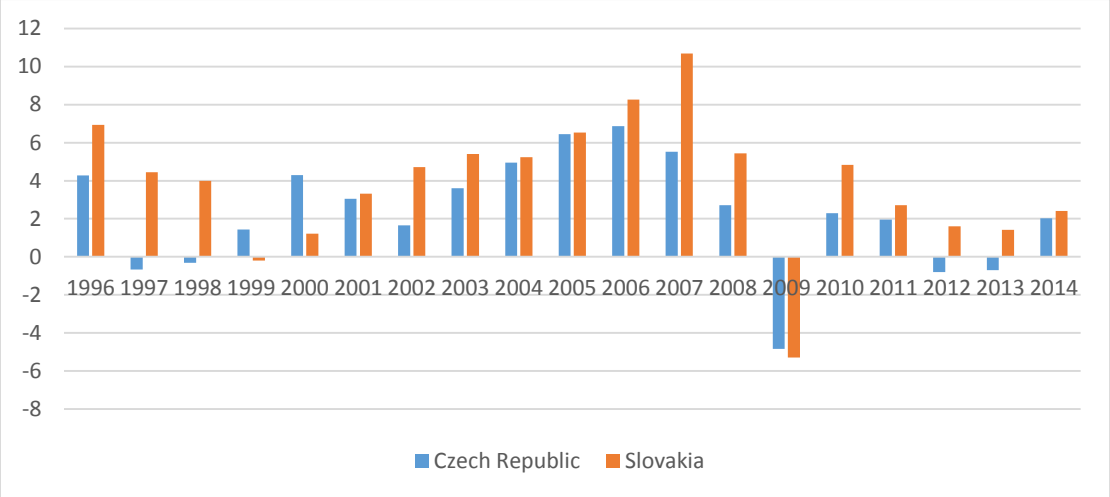


(Source: Pavlinek and Smith, 1998, p. 625.) This figure indicates: 'Enterprises with foreign capital per 1,000 jobs in the Czech Republic and Slovakia, Note: Data for Czech Republic are for 1994; data for Slovakia are for 1995. Sources: Czech data courtesy of David Uhlir; Slovak data elaborated from information provided by the Slovak Statistical Office (Pavlinek and Smith).'

Due to the initial conditions[30], Slovakia has been continuously in a 'catch-up' phase (Singer), and despite higher growth rates compared to the Czech Republic demonstrated in Figure 4, Slovakia is still characterized as less-developed.

[30] De Melo et al. (1997) explain the important role of initial conditions in Circumstance and Choice: The Role of Initial Conditions Policies in Transition Economies. Others, like Campos and Kinoshita (2003) have argued that initial conditions can have particular relevance for attracting foreign investment, and once the initial investments are there, there is a kind of agglomerations effect, in which they continue to attract more and more foreign investment and presence of foreign firms. Through an empirical study Compos and Konoshita (2003) demonstrate the importance of initial conditions for economic progress and FDI, which may play a role in generating competitive firms and commercializing innovations.

Figure 4: GDP growth



(Data source: IMF Data for 'Gross domestic product, constant prices (Percent change)')

2.2 Innovation and Competition in the Czech Republic and Slovakia

In this section, graphs comparing the Czech Republic and Slovakia demonstrate the general innovation and competitive environments in each. An understanding of the innovation and competition differences between the two countries since their break-up might shed light on why they have followed their country-specific development trajectories and the relative importance of innovation and competition types in the transition and subsequent development process. Data to demonstrate the comparison of these two countries is used from the OECD and World Bank. Based on clear differences in aggregate indicators related to innovation and competition across the Czech Republic and Slovakia since the Velvet Separation, it seems that this pair would make an interesting, dynamic case study during the 2009 financial crisis.

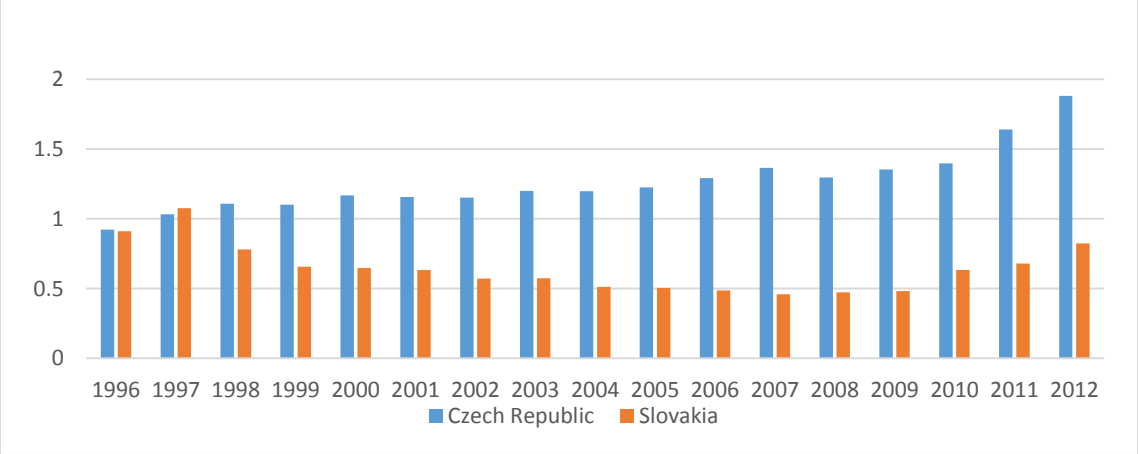
2.2.1 Innovation

The innovation context can be gauged by the level of 'Research and development expenditure (% of GDP)'[31]. This indicator and data was obtained from the World Bank. Figure 5

[31] 'Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and

graphically demonstrates the much higher proportion of GDP which the Czech Republic spends on research and development activities. Even though both countries appear to have started at similar levels (approximately 0.9% of GDP in both the Czech Republic and Slovakia was spent on R&D in 1996), since the late 1990s the data demonstrates the divergence of the two, with the Czech Republic increasing expenditures as a % of GDP up until the late 2000s, while Slovakia steadily decreased expenditures over the same period. Interestingly, after the recent financial crisis, there is clearly growth in R&D expenditures as a % of GDP in both countries. Could this be a possible indication that a lesson of the crisis was to focus more on R&D? This seems like a potential explanation for the sudden change in Slovakia (though the Czech Republic still far surpasses Slovakia, with 1.88% and 0.82% expenditures respectively).

Figure 5: Research and development expenditure (% of GDP)



(Data source: World Bank)

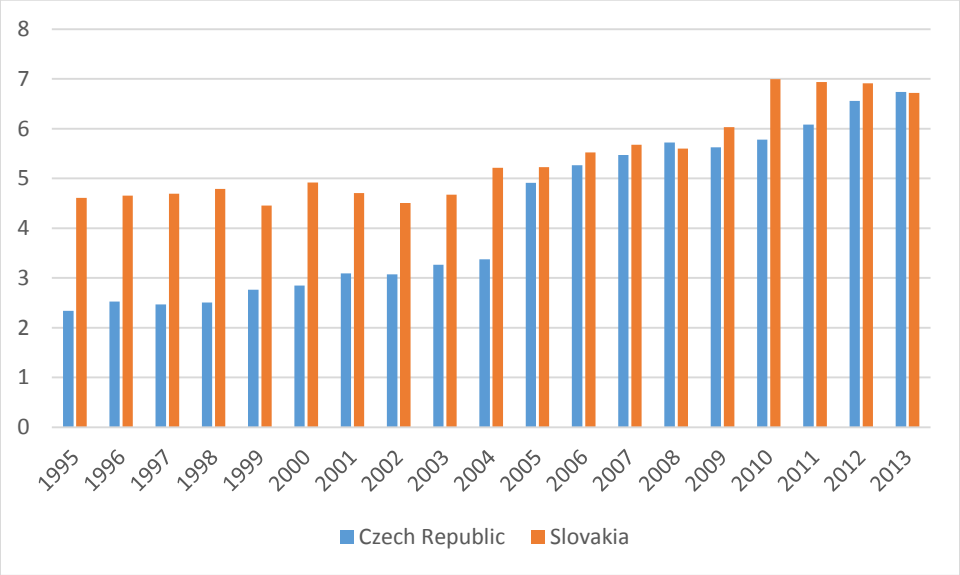
Strikingly, Figure 6 which graphically represents the number of researchers per 1000 employed[32] (data obtained from the OECD) paints a different innovation environment. Here, we see that researchers are much more noticeable in Slovakia than in the Czech Republic until the

society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.' (World Bank Data)

[32] 'Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, as well as in the management of the projects concerned.' (OECD)

mid-2000s. For example during this period, there were 4.5 per 1000 employed in Slovakia compared to approximately 2 in the Czech Republic. Similar to R&D expenditures, there was a noticeable change in the comparison in the mid-2000s. The graph clearly demonstrates that the proportion of researchers in both countries started to converge, as the Czech Republic appears to have caught up and consistently converged with the proportion in Slovakia until 2013.

Figure 6: Researchers, Total, per 1000 employed



(Data source: OECD Database)

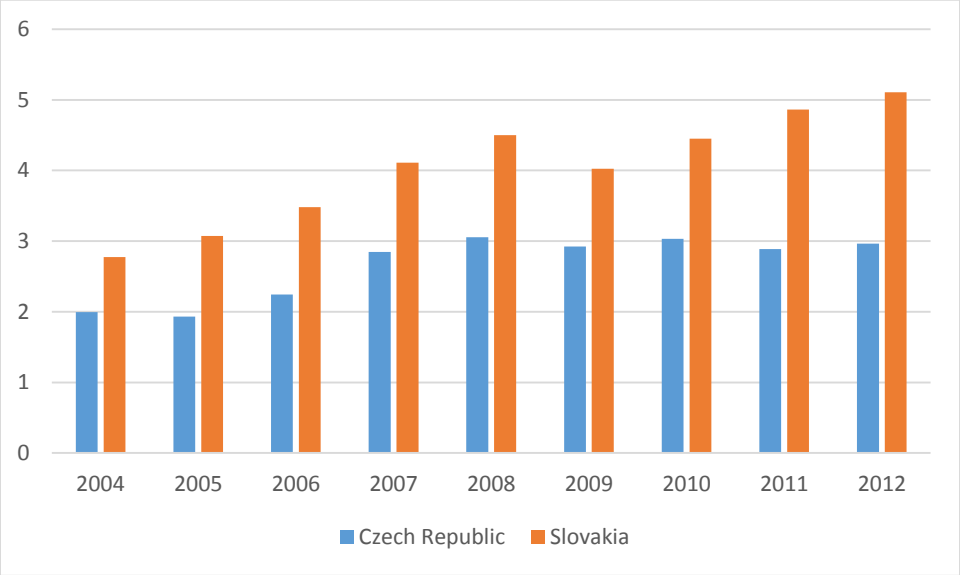
In sum, based on the lack of clarity in understanding the innovation context across both countries, it would be interesting to see the role innovation has played in each during the year 2009. This may explain and hint to which is the ultimate rival in terms of innovation environment.

2.2.2 Competition

In this thesis, I will focus on two main sources of competition in order to see how they contribute to the competitive environment and new products, which links this area to innovation. At the aggregate level, the domestic competition environment might be understood

by looking at the progress of the new business density[33] overtime. This connection between business density and domestic competition is justified based on the importance of barriers to entry for the competitiveness of an economy. Looking at Figure 7, it is visually clear that new business density in Slovakia consistently outperforms new business density in the Czech Republic. This might suggest that pressure from domestic competitors is stronger in the former.

Figure 7: New business density (new registrations per 1,000 people ages 15-64)



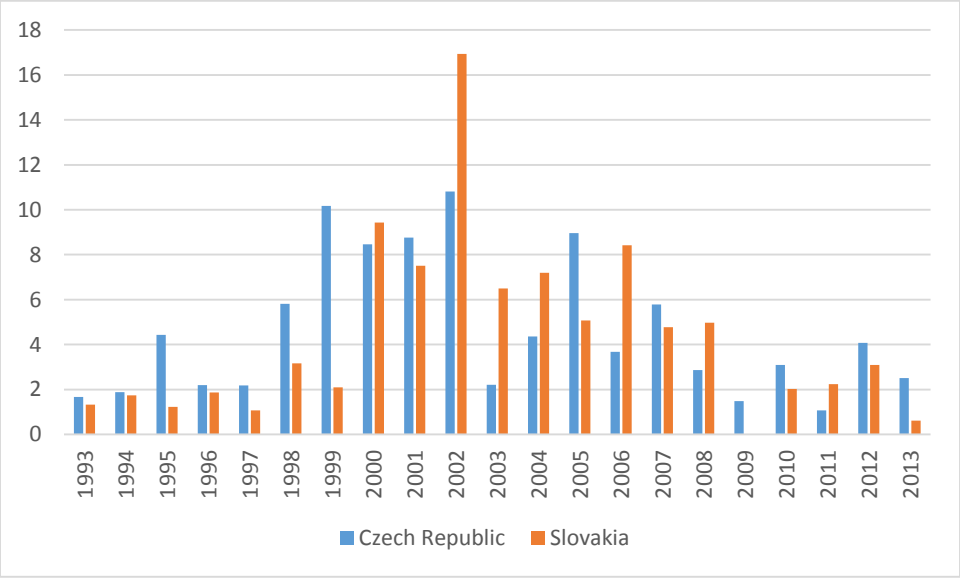
(Data source: World Bank)

Beyond domestic competition, foreign competitors can also put pressure on domestic businesses to develop new products. An analysis of the role of a foreign presence in the economy might indicate the degree of pressure from foreign competitors. For example, it would not be a stretch to assume that greater exposure to foreign ideas or business approaches would increase the awareness level of domestic firms, and subsequently raise their interest and ability to compete with foreign firms. Based on this justification, FDI is taken to be a possible aggregate indicator of the influence of foreign competitors, and thus they exert additional

[33] 'New businesses registered are the number of new limited liability corporations registered in the calendar year.' (World Bank)

pressure on domestic to develop new products. FDI flow, inward[34] (% of GDP) obtained from the OECD and graphically shown in Figure 8 shows that this measure has been much more sporadic than previously analyzed indicators. Most noticeable is the year 2002, when FDI inflows (% GDP) were highest in both countries, and Slovakia experienced a particular surge of foreign economic involvement in which it received nearly 17% of GDP in inward FDI, while the Czech Republic received about 11% of GDP. However, since then, FDI inflows appear to have tapered off, particularly after the crisis. Between 2009-2013, FDI inflows in both countries remained at about 4% or below, a noticeable drop from the FDI boom in 2002.

Figure 8: FDI flows, Inward (% of GDP)



(Data source: OECD Database)

Based on the analysis of these aggregate indicators, which can arguably be representative of the general innovation and competitive environment, it appears that Slovakia

[34] 'Foreign Direct Investment (FDI) flows record the value of cross-border transactions related to direct investment during a given period of time, usually a quarter or a year. (…) Inward flows represent transactions that increase the investment that foreign investors have in enterprises resident in the reporting economy less transactions that decrease the investment of foreign investors in resident enterprises. FDI flows are measured in USD and as a share of GDP. FDI creates stable and long-lasting links between economies.' (OECD)

is more susceptible to domestic pressure while it seems impossible to make an educated hypothesis about the difference in foreign pressure between both economies due to the sporadic nature of FDI inflows over the years.

2.2.3 Implications as a Result of the Crisis and Economic History

Based on the above presentation and analysis of competition and innovation related factors, it seems justified to suppose that improvement in these variables has coincided with economic growth and development. However, the financial crisis and the effect it had on these economies brings to question the nature of the economic transition and if the best decisions were really made. Though theory dictates the logical importance of competition (in both the domestic sphere and with the global economy) for innovation and development, experience may matter more (as demonstrated by the huge opportunity financial crises have historically presented for new or shifting economic ideas and principles). A main factor that has certainly contributed to the accumulation of knowledge and innovation capacity is inward FDI into transition economies. And yet, it is the level of foreign openness that made these economies so receptive to global economic shocks. So, it is understandable that people and policy makers may be questioning the decisions made in the early transition period which have persisted to this day.

Despite initial success, open economies in the CEE region have been classified as dependent market economies (DMEs). Initially, foreign investment helped propel these countries to a more 'developed' status, however, over the past couple of decades, these initial transition decisions have made them extremely vulnerable to global economic shocks – which the global financial crisis proved to be a vital concern. One author explains the challenges of countries classified as DMEs: 'They [DMEs in Central Europe] failed to nurture their own competitive high-tech industries and extricate themselves from the dependency on multinational corporations (X, p. 3).' Beyond the problem of dependency, the DME model of development has been a failure in terms of improving the well-being of tis citizens: the DME model 'failed to lift the standard of living of the whole population (X, p. 3).' It will be important for these open economies to find ways to develop innovate domestic firms and apply the

spillover effects in order to not fall back into the trap of dependent market economies as they continue to develop and integrate with the global economy.

What can be done now? Should foreign investment and the presence of foreign firms be encouraged based on the initial positive impacts? Or should foreign involvement in any capacity be scrutinize with more caution, given the recent impacts of the crisis to countries that are overly open to foreign investors? Currently, this global debate seems to be leaning to the side of more protective measures[35] and more skepticism towards foreign investment. Birdsall and Fukuyama (2011) refer to it as the end of the 'foreign finance fetish (p.47).[36]' As a result, the common perception that foreign involvement is undeniably best for an economy is up for debate.

However, there is a way forward, and suggested reforms for innovation and competition. For example, Sobjak (2013) explains the necessity of reform for sustainability. She suggests that these areas for reform include: R&D and competitiveness. It seems illogical to consider that by closing off the drivers (foreign finance and foreign firm involvement) that have supported development and progress in these areas there can be sustainable reform. Again, the roles of innovation and the competitive environment that supports it are necessary complements to achieve thriving business environment.

[35] These are clearly not policies not aligned with the view that competition should be encouraged. Instead, it goes against the openness and privatization that contributed to successful transitions. This shift in policies (away from market led forces) is the opposite of the initial path of the economy during the transition, and would have detrimental effects for the future of innovation in these countries.

[36] In their article they explain that the countries that were most reliant on FDI ultimately were the most adversely affected by the crisis.

Chapter 3: Empirical Study

This chapter is dedicated to an empirical study of the issues presented above regarding competition and innovation applied to Czech and Slovak firms in the year 2009. This is the quantitative part of the paper, to complement and raise additional issues and perspectives of the qualitative analysis of innovation, competition and economic transformation.
First the methodology of the quantitative approach is explained and analyzed. Second, the same is presented for the data used in running the econometric models. Finally, the results and economic interpretation and reasoning are discussed and analyzed.

3.1 Methodology

The methodology further allows to distinguish between foreign competitive pressure and its domestic counterpart. Below provides an explanation of the model used, including its development, theoretical justification and hypotheses to be explored. The preliminary data analysis, the regression and subsequent tests are executed in STATA. Wooldridge (2010) was also useful in understanding the econometrics behind the model.

3.1.1 Model Development

This thesis uses cross-sectional data regression[37] to understand the impacts of innovation and competition types at the firm level for the Czech Republic and Slovakia during the arguably worst year of the most recent global financial crisis. Two regressions will provide the basis for comparison and analysis of innovation and competition types (one regression including data for Czech firms, the other with data for Slovak firms). The model's goal is to understand the contribution to firm performance explained by domestic and foreign competition to develop new products.[38] The following regression (Equation 1) will be run for each set of firms.

[37] Though there are drawback to a cross-sectional study, there is currently a lack of data for a panel data analysis of this topic incorporating Czech and Slovak firms in 2009 (see Appendix 10 and Appendix 11). The data and its shortcomings are discussed in section 3.2.

[38] New product development is synonymous with innovation in this thesis.

(Equation 1):

$$\textit{Firm Performance} = B_0 + B_1(\textit{importance of domestic competitors for innovation}^{39}) + B_2(\textit{importance of foreign competitors for innovation}) + B_3(\textit{control variable 1}) + \ldots + B_k(\textit{control variable})$$

The model was developed in STATA by starting with the control variables and subsequently adding foreign and domestic competition. With each addition, the explanatory power of the regression increased (increase in R-squared) for both Czech data and Slovak data. In addition, as analyzed in the data description below, there is no significant multicollinearity[40] among the independent variables of the model (so they can all be used in the same model). To represent firm performance, sales is used. Preliminary data analysis also suggests that Ln(sales) has a better linear relationship with the independent variable than the untransformed version of the sales variable. Including the appropriate variables in place of the general categories represented in Equation 1 the final model is the following:

(Model 1):

$$\textit{Ln(sales)} = B_0 + B_1(\textit{foreign competitive pressure}) + B_2(\textit{domestic competitive pressure}) + B_3(\textit{number of competitors}) + B_4(\textit{number of employees}) + B_5(\textit{capacity utilization}) + B_6(\textit{size of locality}) + B_7(\textit{government regulation}) + B_8(\textit{corruption})$$

[39] This indicates competitive pressure from domestic firms. The same logic for foreign firms is applied.

[40] Based on looking at the correlation matrix and variance inflation factors of all independent variables in both data sets used for the regression, further presented and discussed in post-estimation checks.

The variables in Model 1 are described in the data description section, along with their theoretical justification for inclusion in the model.

Aside from the use of cross sectional data that limits the reliability of the results, another main issue is endogeneity bias. Endogeneity makes it difficult to make claims regarding causality. Therefore, this thesis can only make conclusions about the associations between competitive pressure and firm performance. For example, if there is a positive link between these two measures, this could suggest that competitive pressure improves firm performance. On the other hand, a positive link could also suggest that with better firm performance, the competitive pressure in the economy increases (as more firms have incentives to develop more products in order to survive and compete with others).

3.1.2 Important Variables

Variables are also organized in Table 1 for a snapshot of variable categories related to the question at issue. This section explores the theory behind the use of the firm performance variable and competition/innovation variables. The methodology approach is justified by defending the theoretical link between firm performance, competition and innovation.

Table 1: Variable Types

Variable Type	**Measures Used**
Firm performance (Dependent Variable)	Sales in last fiscal year
Competition/innovation (Independent Variables)	Pressure from foreign firms to develop new products, Pressure from domestic firms to develop new products
Control (Independent Variables)	Number of competitors, Employment, Capacity utilization, Size of locality, Government regulation, Corruption

The dependent variable of the model is the logarithm of sales[41] in the last fiscal year. Total sales of a firm is a crucial part in the valuation of a business. This variable is representative of a firm's performance. There are of course other variables used in the literature and empirical studies to describe and represent firm performance. For example, productivity[42] is often used, which follows from the total factor productivity (TFP) often used to represent technological change (i.e. innovation). Here, sales are used due to the availability of data and the fact that sales reflect a firm's output and organizational results.

The two sources of competition included represent the competitive pressure of domestic firms and the competitive pressure of foreign firms that influence decisions to develop new products. These variables are further described and analyzed in the data section of this study. Their use in the model follows economic theory and follows the logic of the methodology used by Carlin et al. (2004) in part. Logical economic reasoning explains the importance of competition and innovation for economic growth and firm performance demonstrated Chapter 1. Carlin et al. (2004) also use the same data source (for earlier years) and begin their analysis with an OLS regression (though they use panel data over more years and across more countries).

Finally, the control variables used from the BEEPs data are the following: Number of competitors, Employment, Capacity utilization, Size of locality, Government regulation, Corruption. These variables are also justifiable control variables as they can be theoretically and practically understood to be important factors in determining and understanding the environment of the business operation and firm performance. Further explanation is given once the data and important variables have been defined in section 3.2.

[41] Carlin et al. (2004) also use firm sales to measure the performance of firms.

[42] For example, productivity is used to measure firm performance by Driffield et al. (2013). They use productivity as the dependent variables in their exploration of how reforms (including increased competition) affect firm performance.

3.1.3 Hypotheses

Based on this methodological structure, the question: 'What is the role of innovation and competition types for firm sales?' can be explored, while focusing on these hypotheses. Each hypothesis relates to a different level of the competition and innovation environment:

- *Hypothesis 1* (general): Both types of competitive pressure will have a positive relationship with firm sales. This is based on the general theoretical logic: competition (arguably regardless of the source) → innovation to maintain market position or improve it → positive outcome for the firm. This hypothesis tests the important role of competition for innovation that Schumpeter promoted for economic growth under capitalism.
- *Hypothesis 2* (origin comparison): Domestic competitive pressure will have a greater association with firm sales than foreign pressure with firm sales. In comparing origins of competition, domestic pressure seems to be more likely to have a stronger force given that both countries relied on a smaller share of FDI in their economies during the crisis years (so their economies should have a larger presence of domestic competition than foreign).
- *Hypothesis 3* (country comparison): Slovak firms will have a greater positive relationship between competitive pressure and sales. This is supposed based on theory that innovation and competition (both of which are incorporated in the competitive pressure variable) drive growth. As a result, based on the fact that Slovakia experienced higher growth levels leading up to the crisis (refer to Figure 4), this assumption is in line with theory.

These hypotheses are made from logical economic reasoning. However, given that the data utilized is for 2009, it is expected that the hypotheses will not be fully satisfied. The confirmation and rejection of these hypotheses will be discussed in the review of results. Furthermore, the interpretation of the results and understanding the implications for the hypotheses will be analyzed using the theories and ideas of the complications (and opportunities) that accompany financial crises and previous transition economies.

3.2 Data

The main source of data for analysis of the question during the crisis period comes from Enterprise Surveys conducted by the World Bank. This collection of data is referred to as BEEPS (Business Environment and Enterprise Performance Survey) data, commonly used in other economic studies, known for its reliability and well-established and supported methodology.

Upon further data analysis, omitting observations that are incomplete (those lacking the necessary variables for the Model presented above) there are 46 observations for Czech firms and 45 for Slovak firms of use for this analysis. The following chapter includes a general data description, descriptions specific to the Czech and Slovak data, and a section dedicated to a discussion of data issues.

3.2.1 General Data Description

Important variables are listed below (Table 2), with their name (as presented in the results section) and their definition. This will allow for clear analysis of the data and can be referred to when interpreting later results. Summary statistics and preliminary data analysis are presented separately for Czech and Slovak firm-level data.

Table 2: Important Variables Definitions

Variable	**Definition**[43]
Ln(sales)	ln(sales in fiscal year 2009)
foreigncomp	'Effect on decisions to develop new products: Pressure from foreign competitors'
domesticcomp	'Effect on decisions to develop new products: Pressure from domestic competitors'
competitors	'How many competitors did this establishment's main product/product line face?'
employment	'No. permanent, full-time employees of this firm at end of last fiscal year'
capacity	'In last fiscal yr, what was the % capacity utilization of this establishment?'
location	'Size of locality'
corruption	'What % of senior management time was spent in dealing with govt regulations?'
govtregulation	'How often do firms like you pay additional payments/informal gifts?'

To summarize: number of competitors, employees, capacity utilization, size of locality, government regulation and corruption are important control variables for the regression described in the methodology.

In economic terms, the inclusion of many of these control variables is drawn from Carlin et al.'s (2004) reduced form OLS regression model (p. 26) in which they too seek to understand the role of foreign and domestic competitive pressure to develop new products in firm sales. However, they do use a much broader context – including 26 transition economies, so the data issues of this thesis is further discussed and justified at the end of this section – 3.2.4. Employment ('[number of] permanent, full-time employees of this firm at the end of last fiscal year' (World Bank)) and capacity utilization ('In last fiscal [year], what was the % capacity utilization of this establishment' (World Bank) represent the contributions of labour and capital

[43] Definitions taken directly from Enterprise Survey Data (World Bank)

inputs respectively that contribute the output of the firm (sales). Carlin et al. (2004) also use a variable similar to 'location', which ranges from 1-5 depending on the size of the locality in which the firm primarily operates. (Where 1=less than 50,000 population, 2=50,000 to 250,000, 3=over 250,000 to 1 million, 4= city with population over 1 million and 5=capital city.) There is literature on the role of agglomeration economies[44] and how centralization of certain specific resources and specialization can contribute to firm development and thus, sales. So, inclusion of this variable has a recent history of literature to support it. The final variable that coincides with both my model and that used by Carlin et al. (2004) is the number of competitors. There is plenty of research, particularly Aghion et al. (2005) which has assessed the impact of the number of competitors and the correlation with sales. In this thesis, the data for 'number of competitors' ranges from 1 to 4, where 1=None, 2=One, 3=2 to 5 and 4=more than 5 in response to the question, 'How many competitors did this establishment's main product/product line face?' (World Bank).

Beyond these controls, this thesis includes variables for corruption and government regulation. It seems justifiable to include such variables given the potential impact such variables could have on a firms output and ability to operate efficiently. Particularly, in the context of the Czech Republic and Slovakia, previous communist economies, certain legacies are bound to influence business even today. For example, Kochanova (2012) explains the contradictory yet undeniable role of corruption on firm performance. In her research, she conduct an empirical analysis of firms in CEE. There is literature which discusses and analyzes

[44] Acs and Varga (2012) explain these issues and the potential relevance of the locality size in which the firm operates. 'Krugman, a prominent international trade theorist, had turned to economic geography issues after recognizing that regions and not countries are the real units of economic analysis….An issue having central importance in economics is the explanation of why economic activities concentrate in certain areas while others remain relatively underdeveloped (p. 133).' Examples of industries and firms benefiting from their particular location include technology firms in Silicon Valley (Acs & Varga, 2012) and economic zones in China (Zhang, 2014) among others. Using the natural experiment that resulted in Germany thanks to the fall of the Berlin wall, Ahlfeldt et al. (2014) emphasize the importance of including this variable, especially in studies seeking to draw policy conclusions: 'Understanding the strength of the agglomeration and dispersion forces that underlie these concentrations of economic activity is central to a range of economic and policy questions.

the effects of corruption on economies in other parts of the world as well.[45] Beyond that, corruption and firm performance has been the topic of working papers, like De Rosa et. a. (2010). In this thesis, a variable for 'How often do firms like you pay additional payments/informal gifts' is used as a proxy for corruption. Firms provided answers to this variable on a scale of 1-6, where 1=Never, 2=Seldom, 3=Sometimes, 4=Frequently, 5=Usually and 6=Always.

Government regulation also plays an important role in general for how a business operates, it can provide an environment of certainty for investment decisions (Qureshi and Velde , 2007[46]), or it can be unpredictable or may be so costly and time consuming that firms operate informally, to the detriment of the rest of society.[47] Of course, a certain measure of regulation and government oversight is necessary, as we have seen since the most recent financial crisis, where regulation was extremely lax and some have argued that deregulation is what ultimately lead to the global financial crisis, but a balance somewhere in the middle seems like the best approach based on history.[48] To measure the implication of government regulation on business activity, a proxy is used: 'What % of senior management time was spent in dealing with [government] regulations' (World Bank). The responses from this variable cover a range

[45] For example, Gaviria (2002) explores the effects of corruption on firms' performance in Latin America, while Athanasouli et al. (2012) does the same for Greek firms and Sahakyan & Stiegert (2012) for Armenian firms. This is a small selection, yet still demonstrates the global interest in the role of corruption on firm performance.

[46] These authors explore the importance of state-business relations, especially regarding regulation for foreign firms and their investment decisions.

[47] Excess government regulation and the extra work it creates may also lead to growth of an informal economy. For example, La Porta & Shleifer (2014) explain the seminal work of Hernando de Soto (1989,2000) who explained 'informal firms as an untapped reservoir of entrepreneurial energy, held back by government regulations' (p. 109).

[48] There are evident market failures and government failures, which the other can work to correct. However, it has been historically difficult striking the right balance: 'To be sure, governments can make matters worse. No doubt, the Washington Consensus represented, in part, a reaction to the failures of the state in attempting to correct those of the market. But the pendulum swung too far in the other direction and for too long (Stiglitz, 2004).' This supports a balanced, combination approach to regulation and market forces, and cautions against extensive reliance on either government regulation or market mechanisms.

from 0%-90%. Business decisions, from starting a new operation, to launching a new product in a well-established firm are often influenced by regulation[49], having logical impact on firm performance.

Where pressure comes from to develop new products represents different types of competition, this is represented by pressure from domestic competitors and pressure from foreign competitors. The values for this variable are on a scale from 1-4, with the following breakdown: 1=not at all important, 2= slightly important, 3= fairly important, and 4=very important. These values refer to how the firm survey-takers perceive the importance of different types of competition in their decisions to develop new products (or rather, their decisions to pursue innovative action, including both R&D and the actual introduction of new products to the market).

There are a variety of industries and firm sizes represented in the data. Appendix 1 represents the overall data availability from the Enterprise Surveys for 2009 for both countries. Based on the depth of both industries and firm size included in each, comparability of individual country results seems acceptable (Carlin et al. (2004) uses a similar approach).

Next, individual data analysis for Czech and Slovak firms is carrier out to demonstrate the data's properties and appropriateness for the use in an OLS cross-sectional regression.

3.2.2 Czech and Slovak Data

The total number of observations (firms) used to arrive at the model of Czech firm performance is 46. The summary statistics in Appendix 2 show that there were many more firms in the Czech dataset than this final number. This was due to missing data for one or more important variables used in the model. Only observations that included all necessary data were

[49] The 'Doing Business' rankings provided by the World Bank demonstrate the importance of regulation in a variety of areas that influence the overall business environment, especially with regard to starting a new business. This is certainly important, given that radical innovations often come from new and smaller firms. Some of the areas of regulation the rankings incorporate into the 'Ease of Doing Business' index include: 'construction permits', 'registering property' and 'getting credit', all of which can take up time.

included in the final regression. Based on the summary statistics for the firms in 2009, it is evident that there is much missing data, which indicates room for improvement in its collection to avoid distortions due to selection bias in future research in this area. Similar conclusions can be made regarding the Slovak firm data for 2009 (total number of observations used in the final model is 45) based on the summary statistics for this dataset (in Appendix 3). These tables also summarize how the coefficients in the regression results can be interpreted, based on their minimum and maximum values.

The correlation matrices (Appendix 4 and Appendix 5) for both datasets help to confirm that there does not appear to be issues of multicollinearity across the independent variables (supported by the variance inflation factors). The presence of multicollinearity would violate an important OLS regression assumption. Further assumptions are tested and presented with the results in section 3.3.

To further understand the range of data supplied by the Enterprise Surveys, Appendix 6-Appendix 9 are included to demonstrate the importance of types of competitive pressure (foreign or domestic) for different firm sizes (where a small firm has less than 20 employees at the time of the survey, a medium firm has between 20-100 and large firm has more than 100). Looking at these tables, it is not clear whether foreign or domestic competitive pressure has a particular relevance across different firm sizes or across countries.

3.2.3 Data Issues

Lack of data (small sample size, approximately 40 final observations used per country analysis) is certainly an issue for the robustness of the results, which is why an in-depth qualitative literature analysis of the historical and current economic climate and changing sentiments are discussed to justify and interpret the consequences of the results. Cross section analysis also has its restrictions, which is again, constrained by data availability. For the variables used in the model, an appropriate panel dataset was difficult to compile (Appendix 10 and Appendix 11), so this is an area for further data collection and subsequent analysis.

Controls that could not be included present another issue, despite a lack of omitted variable bias (see results table below – neither regression indicates omitted variables bias, which further justifies the model in statistical terms and satisfies an OLS assumption). However in economic terms, the interpretation should be taken with more care and attention to other important variables affecting growth (and business development) present in the literature[50]. For example, there exists many hard to measure variables that have been found to influence economic progress, however, these are often especially difficult to measure and compile at the firm-level (more are available at the national level). Some of these 'difficult' variables include culture, history and institutions, any of which might contribute to firm performance.

A final issue to be addressed here is the interpretation of the foreign and domestic competitive pressure variables. In the Enterprise Survey data, it is not clear how firms that responded to the survey identify firms as foreign and firms as domestic. If a firm is more than 50% domestic, is it considered a domestic competitor? Or does the presence of a certain percentage of foreign ownership designate it as a foreign firm for the surveys sake. This in unclear, and it is an area for further data collection and subsequent analysis.

3.3 Results

This section presents the regression results using the methodology and data discussed above. Interpretation of the economic implications and discussion of how the results compare to the hypotheses is provided. It will seek to understand and compare the roles of innovation and competition in Czech and Slovak firms in 2009. Post-estimation checks are also conducted, followed by a discussion and further explanation of the results and discrepancies across the datasets for Czech and Slovak firms.

[50] In North's (1990) seminal work, he explains the important role of institutions for economic progress. Of particular interest here is the important role of institutions for innovation, an arguably large component and important channel for progress. Barborosa and Faria (2011) explain the difficulty of developing and implementing the appropriate environment and policies for innovation: 'innovation systems literature have repeatedly proposed that key technologies need supporting institutions that may defer over time (p. 1157).'

3.3.1 Interpretation of Results

The regression results for both Czech firms and Slovak firms are presented in Table 3 below. It appears that despite differences in the aggregate economic environment in the Czech Republic and Slovakia (as described in earlier figures in Chapter 2), the results at the firm level are similar. The main difference comes across in the role of foreign competitors and their influence on new product development decisions. The STATA output of these regressions is provided in Appendix 17 and Appendix 18.

As a reminder, the 'foreigncomp' variable is defined as: 'Effect on decisions to develop new products: Pressure from foreign competitors' (World Bank). The firms surveyed responded based on their perception of how important foreign competitors are in their decisions to innovate on a scale of 1-4. (Where 1=not important and 4=very important.) This the same variable used in the paper: A Minimum of Rivalry by Carlin, Schaeffer and Seabright (2004).

The regression results show that foreign competitive pressure is statistically significant for firm sales among Czech firms. This indicates that the presence of foreign competitors influencing firms to innovate (potential R&D expenditures, patents and the ultimate introduction of new products), has a positive influence on firm performance. The economic openness of the Czech Republic appears to be working for Czech firms, since there is a positive relationship between foreign competitive pressure and firms sales.[51] The empirical evidence presented here can be interpreted as the following: For Czech firms, foreign competitive pressure is statistically significant and an increase in this variable by 1 (perceiving foreign competitors as having more influence on their new product development decisions) increases sales by 30%.[52] Overall, foreign competition and incentives to innovate seem to be beneficial for firm output based on these results. This interpretation further reflects the economic power

[51] There is clear positive relationship. However this thesis does not present evidence of direct causality.

[52] Radosevic and Kaderabkova (2011) also explain that lower competitive pressure is associated with lower firm performance (they use productivity). They also explain that increasing the competitive pressure in transition economies can lead to more intense innovation and lead to catching up with other countries at the technological frontier (p. 59).

of globalization and the influence of foreign firms in small, open economies. Additionally the results for Czech firms indicate the presence of competition-related spillovers, as competitive pressure is positively and significantly associated with firm sales.

Table 3: Regression Results (Dependent Variable: Logarithm of Firm Sales)

Variable	**Czech Firms Data**	**Slovak Firms Data**
foreigncomp	0.3027* (0.1706)	0.1601 (0.2136)
domesticcomp	-0.1672 (0.2222)	-0.0500 (0.2603)
competitors	0.0460 (.02626)	0.0755 (0.1140)
employment	0.0080*** (0.0015)	0.0066*** (0.0019)
capacity	0.0085 (0.0073)	0.0019 (0.0071)
location	0.3088 (0.1243)	-0.0468 (0.1369)
corruption	-0.1659 (0.1164)	-0.0795 (0.0841)
govtregulation	-0.0062 (0.0129)	-0.0033 (0.0149)
Number of obs.	46	45
Prob > F	0.0000	0.0275
Adj. R-squared	0.5203	0.2165
OV Test – Prob>F	0.0862	0.1102
Breusch-Pagan Test -- Prob > chi2	0.8799	0.6234

For each variable, the first number is the coefficient, followed by the standard error in parentheses. (Significance levels: 1% (***), 5% (**), 10% (*))

The results for Slovak firm data tell another story. The most noticeable difference is that foreign competitive pressure is not statistically significant for firm performance. Given the shared history and subsequent individual transition paths of the Czech Republic and Slovakia, this is an interesting comparison. Potential explanations for this discrepancy between the results of the Czech and Slovak firms is discussed below.

Another important aspect of the results is that in neither the Czech nor Slovak case does domestic competitive pressure appear to be statistically significant for firm performance. This is reflective of the findings of Carlin et al. (2004)[53]. Further discussion of the thesis results and the implications for policy are discussed later.

Finally, it should be clarified why statistically insignificant control variables are presented in the results table. The inclusion of control variables has been theoretically justified in the description of the data and the methodology. Despite, the fact that most of the control variables in both results for Czech firms and Slovak firms are statistically insignificant, they are still included because their inclusion in the model makes economic sense and they have been found to shape and influence firm performance.[54] Including all of the controls variables as the model does, incorporates an individual firm's unique conditions as well as the perceived business conditions in which they operate, make decisions and ultimately provide a good or service (a firm's output/performance).

3.3.2 Results vs. Hypotheses

The table of results partially agrees with the hypotheses presented in the methodology section. Below, the results will be interpreted with reference to them.

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[53] Carlin et al. (2004) explain what they find in their research: 'Pressure from domestic customers was not significant and has been dropped [from the model] – suggesting that domestic and foreign competitors are far from being close substitutes in terms of their effects on firm behavior. (p.23)' Despite these findings, perhaps policies can be developed to support the role of domestic competition.

[54] As supported by the theory in the previous sections and the paper from which the core model of this thesis was drawn (Carlin et al., 2004).

First, the origin of competitive pressure appears to matter for its association with firm sales. Foreign competitive pressure has a positive relationship with firm sales, while domestic competitive pressure does not (however, the fact that the latter variables is insignificant means this can be ignored). So, the results did not fully meet the prediction of Hypothesis 1.

Second, due to the relationship between Hypothesis 1 and Hypothesis 2. Hypothesis 2 is not satisfied by the results either. Hypothesis 2 predicted that domestic competitive pressure would have a larger and more statistically significant relationship with firm sales. This is clearly not the case.

Finally, the third hypothesis predicted that innovation and competition variables would have a more positive impact on sales in Slovakia compared to its relationship with the Czech Republic. The results show (again) that the assumption made by Hypothesis 3 is not satisfied. The results show that in the year 2009, the earlier high growth rates in Slovakia did not mean success for firm performance from either foreign or domestic competitive pressure (at least not in a statistically significant way).

Despite the inconclusive results that do not support Hypotheses 1-3, there are still important lessons and implications that can be drawn from the results. In fact, the counterintuitive nature of the results questions the applicability of some economic theory (namely the positive role of innovation and competition for growth) in the context of financial crises. However, despite the discrepancy with traditional theory related to innovation and competitive pressure as drivers of growth, literature on financial crises suggests that this may not be so surprising[55]. Based on this analysis and the previous presentation of the economic history of these countries, their firms' performance may be linked to factors that are reflective of the post-communist and early-transition period (and not included in the regression, so they alternative explanations will be discussed later).

[55] There have been suggestions to employ protective measures and other policies that would in effect reduce the competition, innovation capacity and incentives within society.

3.3.3 Post-Estimation Checks

Overall the regression results are appropriate based on the F-statistic and the adjusted R-squared (see Table 3) for both datasets. This suggests that the independent variables in the model describe a statistically significant amount of the change in the logarithm of firm sales. Beyond the interpretation of important and significant variables above, post-estimation checks of the two regressions analyzed here are necessary to debate the model's overall viability. A number of tests in STATA are conducted. Their explanations are included below, and the STATA output can be found in the results table or the appendices.

First, the specification of the model is checked. It is confirmed that omitted variable bias is not an issue for the model. The output of 'ovtest' demonstrates this in the regression results table. Next, an rvf plot line allows for graphical analysis of heteroskedasticity. See Appendix 13 and Appendix 14 for these results, which confirms the heteroskedasticity assumption (also provided by Breusch-Pagan test in the regression results table). To check for further misspecification problems, the output of 'linktest' is used (Appendix 12). Again, the model specification appears to be justified in statistical terms (the values of '_hat' for both the Czech and Slovak firm datasets are statistically significant at the 10% and 5% levels respectively). This provides statistical support for the model, which can be added to the economic and theoretical reasoning demonstrated in the methodology and data sections of this thesis.

Additionally, the residuals of each regression are generated, and the normality of residuals is confirmed (see Appendix 15). It is also useful to test for multicollinearity among the dependent variables (see Appendix 16 for variance inflation factors (VIF)). All independent variables have a VIF less than 10, indicating multicollinearity is not a problem in the model. The VIF output also provides some support to the number of observations used in the regressions (often, if the number of observations is low, the VIF will be high), though lack of data is still acknowledged to have been a drawback to the methodology and final results.

3.3.4 Discussion

There are two main issues to discuss regarding the results: Why does domestic competitive pressure not matter in either case (it is statistically insignificant in both cases)? And, why is there such a clear difference between the results for foreign competitive pressure for Czech firms and Slovak firms (the first produces a statistically significant result, while the latter does not)?

To start with the first issue, the results found that domestic competitive pressure is an insignificant factor for firm sales. This may be an indication of the domestic competition environment. While both countries have demonstrated success in terms of developing open, market economies, they may still suffer from economic legacies and ill-developed institutions[56] which inhibit the effective role of domestic competitive pressure for firm performance.

The seeming ineffectiveness of domestic competitive pressure is reflective of the fact that the empirical findings were not consistent with the hypotheses based on sound economic theory. For example, during times of financial crisis, because of the large disruptions and shocks to the economy, economic theory cannot be used to understand all the decisions and conditions present (especially with regard to competition and innovation factors). This is reminiscent of the economic transition process in CEE. So, some differences in their approach to the transition process, legacies accrued throughout their development, in addition to steps made in more recent years, might suggest potential parts of the explanation.

Focusing on the second issue, to understand the differences in the results across both countries, further insights may be found in discussing additional reasons and factors that are

[56] Economic legacies from the communist and transition period continue to play a role in the informal institutional landscape in CEE countries. As Mickiewicz and Estrin (2010) explain, understanding them and working to adapt them takes time, but is essential for economic progress. 'Research in the sociology of culture documents that communism left a legacy of values and norms that are not conducive to entrepreneurship. Sztompka (1996) describes this legacy as a 'bloc culture' which comprised priority of dependence over self reliance; of conformity over individualism; and of rigidity and extremism in beliefs over tolerance and innovation' (Mickiewicz and Estrin, 2010, p.9).

not included in the regression analysis. An understanding of both why the Czech Republic had 'better' results and Slovakia 'worse' results are equally important, as this demonstrates the role of country specific factors. Though both can be characterized as small and open economies at the time the financial crisis hit, it seems their historical legacies of the transition process and their individual policy paths had an impact on the outcome of the regression results. For example, Singer (2013), explains the 'overheating' (inflow of excess FDI) of the Slovak economy leading up to the crisis, and he argues that this certainly contributed to Slovakia's economic downfall in 2009 (this is in contrast to the Czech economy, which did not experience such 'overheating' prior to the crisis, and though it did experience economic contraction, is was to a relatively less extent). Furthermore, as a possible consequence, Slovakia experienced a larger blow to economic growth than the Czech Republic. It is interesting that while the Czech Republic did not such a relatively negative macroeconomic environment[57], Czech firms also benefitted from foreign competitive pressure. This suggests a potential link between the macro-environment and the micro-level performance of firms. Baumol et al. (2007) also suggests the importance of macro-stability for innovative entrepreneurship.[58]

Finally, the comparative case study of Czech and Slovak firms provides support for the well-established academic opinion that there is no one size fits all approach[59] to economic reform (largely due to historical legacies and institutions which are ingrained in the

[57] For example, Singer (2013), explains that Slovakia may have had such an adverse reaction to the financial crisis in part due to its adoption of the euro. Meanwhile, Singer explains that depreciation of the Czech currency gave the Czech economy an advantage.

[58] These conditions were certainly not present during the financial crisis, nor was macro-stability successful during the early transition period.

[59] Critique of the Washington Consensus and its inability to bring about the expected outcomes and changes provides evidence that it is difficult (and most likely impossible) to apply the same solution with success in difference economic contexts: 'There is no consensus except that the Washington consensus did not provide the answer (Stiglitz, 2004).'

population[60]). This is especially telling given their shared history as Czechoslovakia and long history under communism.

To sum up, it would be interesting in further research and if the data can be collected, to see if the macroeconomic recovery of Slovakia can be seen at the firm-level through the effects of competitive pressure (especially foreign pressure) on firm performance after the crisis. Further data collection and empirical assessment would provide insight for understanding if increased development of the market economy, macro stability and openness generate a 'better' domestic competitive environment, in which firms respond to domestic competitive pressure and the effects are seen in firm performance.

[60] Roland (2004) explains that institutions like culture are 'slow-moving'. There include 'values, beliefs, and social norms, which tend to change gradually (Roland).' Because of their slowness, Roland's analysis provides support of the 'difficulty of transplanting institutions into different cultural context and the advantages of diverse institutional blueprints for efficient growth and development.'

Chapter 4: Insights and Policy Implications

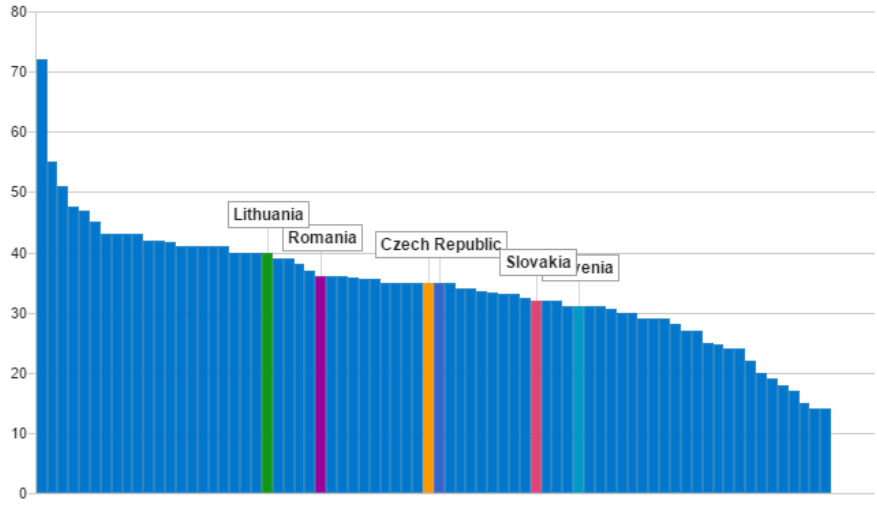
Transition countries in CEE experienced the largest natural experiment of shifting economic structure during the transition phase. It is still debated if this phase is really over which makes this particularly pertinent for the case of the Czech Republic and Slovakia even in 2009, decades after the initial transition date. For example, as discussed above and largely established by Schumpeter, innovation and competition are the cornerstone on with market economies are based and rely on these aspects for the well-functioning of itself. It seems that one of the largest detriments to innovative progress is the lack of the factors necessary to make it happen. As had been discussed finance is an issue. CEE economies have not fully embraced market mechanisms for finance utilized in say, the United States, which saw tremendous growth in the 1990s in large part due to innovation developments (Baumol et al., 2007, p.VIII).

However, this did not occur randomly. The appropriate institutions were in place, such as well-developed securities markets. This is in contrast to the history of transition countries. An example of the lack of financial development in their economies is explained by Glaeser et al.: 'financial regulation was designed essentially from scratch. (p. 4)' Many still have underdeveloped stock markets, which have contributed to high growth and innovative firms in other countries. Baumol et al. (2007) gives other examples of the contrasting environments of other countries versus countries like the United States which foster 'entrepreneurial capitalism', where new, innovative companies play an important economic role. This type of capitalism was not present in other countries (i.e. CEE) – instead there were national champions (large business organizations) and smaller shops – but they did not promote or instill innovation and the entrepreneurial spirit (Baumol et al., 2007, p. VIII).

It is interesting to see if CEE countries have embraced these new ideals presented by Baumol et al. (2007) since their transition? As noted in the historical introduction and analysis of transition issues, both innovation and competition were severely lacking in these countries a couple of decades ago. These aspects further go hand in hand with the idea of economic liberalization, and they have been especially successful in opening their economies and attracting FDI. However, we see in this region hesitancy to truly embrace a culture of

innovation and entrepreneurship. One indication of this hesitancy is suggested by the fear of failure rate[61] (Figure 9), and further described below.

Figure 9: Fear of Failure Rate for selected CEE countries (2011)



(Data Source: Global Entrepreneurship Monitor (GEM). 2011 data for the variable: 'Fear of Failure Rate: Percentage of 18-64 population with positive perceived opportunities who indicate that fear of failure would prevent them from setting up a business. (GEM)' (Labelled above from left to right: Lithuania, Romania, Czech Republic, Slovakia and Slovenia.))

So, what policies might be adopted to improve the innovation and competitive environment in the region? Based on the regression results and given that the model is justified via assumptions and overall viability, policy implications can be drawn.

First and foremost, governments can develop and implement policies which create an entrepreneurial environment, because entrepreneurs are often described as the drivers of innovation.[62] Based on the regression results for Czech firms it is clear that foreign competitive

[61] Here the fear of failure rate is taken to be a potential indication of the entrepreneurial and innovative culture.

[62] A European Commission report indicates policy areas for governments and areas of focus for businesses: 'to meet the challenge of fiercer competition, entrepreneurs should be encouraged to innovate and to internationalise. For this, they should have access to knowledge, relevant contacts, training and top-class business support services (Green Paper, 2003, p. 19).'

pressure has potential to positively impact firm performance and through the channel of businesses, the rest of the economy and society can benefit. So foreign firms should be encouraged to operate and compete with domestic firms. It is worth exploring how governments can encourage or support a more significant response from competitive pressure. Promoting and informing society of the benefits from spillover effects might be part of the solution.

R&D tax incentives are an 'easier' way for governments to support innovation efforts (as opposed to direct innovation subsidies), however, their effectiveness is questionable in empirical studies (Gaillard and Straathof, 2015). Despite the outcome discrepancies of R&D tax incentives, in a financial crisis, or even a minor economic downturn, R&D tax incentives are a way to incentivize firms to continue innovation activities regardless of the economic conditions (Gaillard and Straathof, 2015).[63] Some R&D tax incentives should be used in economies to make domestic firms more able to respond to competitive pressure by developing new products through R&D.

Patents are often portrayed as a proxy for the innovation-level in an economy. This would be most logical if all patents granted were for entirely new products or processes. However, in many countries, the patenting process allows people and firms to file (and receive) trivial patents, that may not be truly innovative. Despite the criticisms regarding the use of patents as a proxy for innovation[64], intellectual property rights law (which include patents, trademarks etc.) can have an important role as an incentive or deterrent for innovation. So, finding the right balance between sharing information and intellectual property protection, including enforcement, is essential. It has also been found that R&D spending can be more

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And there has been academic research in this area: 'A related theoretical literature has emphasized the role of entrepreneurship that is responsible for commercializing research outputs, which are then reflected in the introduction of new products [where new products = innovation] (Michelacci 2003) (Lederman, 2007, p.1))'

[63] Gaillard and Straathof conclude that R&D is only a part of creating an entrepreneurial and innovation friendly environment. So, though this tool is important, it should be accompanied by complementary innovation policies.

[64] See Jalles (2010) for issues relating to measuring innovation in empirical economic research.

effective in producing innovation if it occurs where intellectual property is well protected (Fritsch and Gorg, 2013). As a result, patent protection and the filing process should not be a deterrent to new firms and those developing new, patentable products.

Governments can further support innovation and healthy competition by promoting a culture of innovation, which may involve changing attitudes towards risk and developing entrepreneurial education programs. For example, changes in bankruptcy laws might make firms more willing to take the risk of developing a new product (if they are assured the potential consequences of failure are not so bad). This would allow firms to more effectively respond to competitive pressure. The nature of education can also play a role in creating new entrepreneurs, especially in emerging economies. Even in the United States the lack of entrepreneurship education has been deemed a problem[65], so it possible for other countries to be leaders in this area and develop successful entrepreneurial programs.

In sum, there is not one policy or tool, but instead a variety of measures that in combination can create a thriving entrepreneurial and innovative business environment. These policies and tools include: R&D tax incentives, well-protected intellectual property, bankruptcy law and entrepreneurship education. It is worth noting, that prior to the transition process in the early 1990s, these measures were not present (or they did not incentivize people) in any of the CEE economies. So, it is understandable that the introduction of innovation-related measures may be more difficult due to the challenges brought by the lack of historical experience and institutions that support this culture.

During the process of research and writing, this thesis finds that there seems to be similar scenarios and priorities in countries experiencing economic transformation (as in the early 1990s for CEE countries) and in countries experiencing a financial crisis. The fear of failure rate also supports this. It appears (from Figure 9) that countries in the CEE region are discouraged from starting a new business. Similar feelings are also present for all countries if

[65] '"If we don't come up with a rigorous way to teach entrepreneurship … there's going to be a backlash," he [Aulet, the Director of the Martin Trust Center for MIT Entrepreneurship] said. Young people with entrepreneurial dreams will be alienated from the field, and big societal problems will go unsolved. (Clark, 2013)'

they are experiencing a financial crisis, due to the uncertainty and risk.[66] Though the fear of failure is not completely unfounded given the risky nature of many entrepreneurial ventures and the uncertainty that accompanies it, we can see that CEE countries rank in the middle in comparison to other countries. Despite the uncertainty of entrepreneurship and innovation, Brouwer (2000) finds that the uncertainty ultimately has net-positive effects for society, which is an interesting finding and further research on this could provide support for governments to support new ideas.

[66] In 2011, the lowest fear of failure rate among countries surveyed by the Global Entrepreneurship Monitored was 14. This is lower than the same variable for 2009, which was 18. We see the same trend looking at the higher end of the fear of failure rate. Both observations combined suggest that during the financial crisis there was a 'decline' in the entrepreneurial and innovation environment, and a subsequent increase following recovery by 2011.

Conclusion

This thesis explored economic theory relevant to answering the main research question: What is the role of innovation (new product development) and competition types (domestic and foreign) in financial crises? The theoretical understanding of innovation, competition and financial crisis, coupled with review of empirical studies provided the foundation for subsequent analysis.

To provide reasoning for the decision to conduct an empirical comparative case study of Czech and Slovak firms, economic history and development were important. A review of transition economies and the transition process is provided with attention to CEE economies in the 1990s. This was followed by an economic history of the breakup of Czechoslovakia and the subsequent consequences for the two newly established states in 1993. This provided a starting point of the comparison of the Czech and Slovak economies, which was continued up to and beyond the financial crisis in 2009.

Why innovation and competition in the Czech Republic and Slovakia? Entrepreneurial education and a culture of acceptance of risk and new ideas is encouraged in the Western world. This is currently lacking in CEE, probably, at least in part, due to communist legacies as there was a clear of lack of incentives and support for pursuing innovative ideas, which reinforced the anti-competitive environment under these regimes. The area of competition and innovation was (and continues to be) an area of catchup for CEE today and is important in order to increase the region's ability to compete internationally and cultivate a sustainable, welfare increasing economic environment. Large inflows of FDI and foreign competition since opening up also makes it interesting to see how domestic firms react to different types of competitive pressure in the decisions they make.

By employing cross-sectional regression analysis to two datasets (one for Czech firms and one for Slovak firms) the impact of innovation and competition on firm sales is determined focusing on a variable which encompass both factors. This analysis is facilitated by using Enterprise Survey data from the World Bank. In this empirical case study, innovation can be defined as the development of new products and their introduction to the market, while

competition types refers to where competitive pressure comes from, either domestic or foreign.

The main finding is that foreign competitive pressure is statistically significant and positively associated with firm performance for Czech firms. These result for Czech firms indicate the presence of competition-related spillovers, and demonstrate that it is possible to benefit from foreign presence in the economy. Despite the fact that domestic firms are often opposed to foreign firms in their market, it seems it has ultimately contributed to larger sales (increased firm performance) for firms in the Czech Republic. Interestingly, for Slovak firms, foreign competition is not statistically significant, however it does have a positive role (though smaller). Overall, in both cases, the perception of domestic competition does not seem to matter as much (it is statistically insignificant in both regressions).

The results of the empirical assessment and research have led to some suggestions for further research and policy implications. Areas for further research have been suggested in previous sections of this paper. For example, continuous data collection of the variables used in this thesis in order to be able to perform robust time-series and panel data analyses in the future. It would also be useful to collect information regarding the firms' domestic and foreign ownership: for example it would be useful in interpreting the data if the researcher can understand what domestic firms (survey takers) perceive as a foreign firm or domestic firm, given that many firms are not strictly tied to one country in such a globalized business world. Further research is also needed to understand the issues this thesis found: Why are there such differences in the impact of foreign competitive pressure across countries? Why does the role of domestic competition not matter? In which countries does this matter, at what stage of development and with what factors in place?

In terms of policy, for now, policies supportive of entrepreneurs, and policies which make it more attractive and worthwhile to commercialize innovations are essential for developing and maintaining a thriving competitive economy. These policy implications are also reflective of Schumpeter's theory of creative destruction. The link between entrepreneurs and

innovation is further discussed by Baumol et al. (2007): 'innovation is the specific instrument of entrepreneurship[67].'

The Harvard Institute for Strategy and Competitiveness explains the important role of a clear economic strategy involving innovation, regardless of the size of the 'organization' one is overseeing. For firms this may be the decisions and ways to develop new products, while for governments this may be developing the best policies supportive of innovative business and people (for example, entrepreneurship). Policy should address: how to make firms more receptive to domestic competition and foreign competition and thus increase the development of new products (innovation, improvements). The solution to all of these issues indicates the need for an entrepreneurial environment:

> 'Strategy is also an essential tool for leaders of cities, states, regions and nations. Clear economic strategies that engage all stakeholders, boost innovation and ultimately improve productivity are especially critical in times of austerity or economic distress.' (Institute for Strategy and Competitiveness)

This thesis has implications for economics at all levels (at the level of the firm through to the level of national and global economic development). It seems these issues are particularly relevant for CEE economies with histories of state planning and lack of innovation incentives, which are prone to return (to some degree) during financial crises. This thesis finds that economies in financial crisis reflect the conditions of economies in economic transition. So, this analysis is particularly relevant for CEE economies (as the choice of Czech and Slovak firms demonstrates) due to their 'reexperiencing' of conditions and hesitancies during the year 2009 which reflect their economic experience during the early period of transition in the early 1990s and the subsequent legacies that still play a role in their development.

[67] This quote is in reference to Drucker (2007).

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List of Appendices

Appendix 1: Number of Firms by Industry and Size

	Czech Firms				Slovak Firms			
Industry	**Small**	**Medium**	**Large**	**Total**	**Small**	**Medium**	**Large**	**Total**
Other manufacturing	6	10	8	24	8	7	6	21
Food	2	6	4	12	4	3	8	15
Textiles	0	2	2	4	1	0	2	3
Garments	0	0	1	1	1	3	1	5
Chemicals	1	1	3	5	0	2	1	3
Plastics and Rubber	2	6	1	9	2	1	0	3
Non metallic mineral	0	2	2	4	1	2	0	3
Basic metals	0	1	3	4	0	1	3	4
Fabricate metal products	2	6	8	16	10	6	4	20
Machinery and equipment	5	8	7	20	2	3	5	10
Electronics	2	4	2	8	0	3	0	3
Construction	5	10	7	22	12	10	9	31
Other services	2	3	2	7	2	5	5	12
Wholesale	3	6	3	12	10	17	5	32
Retail	35	24	6	66	33	23	26	82
Hotel and restaurants	7	3	1	11	7	6	2	15
Transport	6	6	5	17	1	4	6	11
IT	2	2	4	8	1	1	0	2
Total	81	100	69	250	95	97	83	275

(Data source: Enterprise Surveys by the World Bank)

Appendix 2: Summary Statistics for 2009 for Czech Firms

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln(sales)	186	14.90139	1.915279	10.58206	20.01554
Foreigncomp	243	2.596708	1.186141	1	4
Domesticcomp	243	2.979424	.9977187	1	4
competitors	57	3.526316	.629775	1	4
Employment	243	99.8107	257.6042	1	2750
Capacity	92	72.63043	38.48268	0	100
Locality	243	3.555556	1.595448	1	5
Govtreg	243	9.337449	16.99615	0	90
Corruption	243	.9917695	2.752897	0	6

Appendix 3: Summary Statistics for 2009 for Slovak Firms

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln(sales)	198	18.07212	1.769416	13.90897	22.71384
Foreigncomp	265	2.350943	1.337629	1	4
Domesticcomp	265	2.841509	.9949558	1	4
competitors	55	2.945455	1.928521	1	4
Employment	265	133.3094	237.8097	1	1700
Capacity	84	71.9881	35.3105	0	100
Locality	265	4.10566	1.26886	1	5
Govtreg	265	3.890566	12.75228	0	80
Corruption	265	.4792453	3.958179	0	6

Appendix 4: Correlation Matrix (obs = 46) for Czech Firms

	Ln(sales)	Foreigncomp	Domesticcomp	Competitors	Employment	Capacity	Locality	Govtreg	Corruption
Ln(sales)	1.0000								
Foreigncomp	0.3662	1.0000							
Domesticcomp	0.0873	0.3870	1.0000						
competitors	-0.0094	-0.0659	0.0487	1.0000					
Employment	0.6993	0.3005	0.1089	0.0253	1.0000				
Capacity	0.0617	-0.1362	0.0908	0.0256	0.0944	1.0000			
Locality	0.3254	0.0117	-0.1068	-0.1044	0.1431	-0.1425	1.0000		
Govtreg	-0.0565	0.0753	-0.2642	0.1606	-0.0195	-0.2017	0.0949	1.0000	
Corruption	-0.1823	-0.1843	-0.1747	-0.0527	-0.0820	0.4215	0.0504	0.1612	1.0000

Appendix 5: Correlation Matrix (obs = 45) for Slovak Firms

	Ln(sales)	Foreigncomp	Domesticcomp	Competitors	Employment	Capacity	Locality	Govtreg	Corruption
Ln(sales)	1.0000								
Foreigncomp	0.1734	1.0000							
Domesticcomp	0.0268	0.4002	1.0000						
competitors	0.0319	-0.1105	0.4237	1.0000					
Employment	0.5614	0.1430	-0.0800	-0.0997	1.0000				
Capacity	0.0535	-0.1896	-0.0479	-0.1467	0.0665	1.0000			
Locality	-0.0552	0.0486	0.0348	-0.0808	-0.0669	0.1776	1.0000		
Govtreg	-0.0687	0.1701	0.1809	0.1725	-0.0824	0.1746	0.2275	1.0000	
Corruption	-0.3292	-0.1018	-0.0743	-0.0622	-0.3056	-0.1823	-0.0224	0.2134	1.0000

Appendix 6: Foreign competitive pressure importance and firm size for 2009 in Czech Firms

Effect on decisions to develop new products: Pressure from foreign competitors	small(<20)	medium(20-100)	large(>100)	Total
Not at all important	31	22	10	63
Slightly important	18	22	10	50
Fairly important	9	27	16	52
Very important	19	28	31	78
Total	77	99	67	243

Appendix 7: Domestic competitive pressure importance and firm size for 2009 in Czech Firms

Effect on decisions to develop new products: Pressure from domestic competitors	small(<20)	medium(20-100)	large(>100)	Total
Not at all important	6	9	11	26
Slightly important	14	17	14	45
Fairly important	24	39	17	80
Very important	33	34	25	92
Total	77	99	67	243

Appendix 8: Foreign competitive pressure importance and firm size for 2009 in Slovak Firms

Effect on decisions to develop new products: Pressure from foreign competitors	small(<20)	medium(20-100)	large(>100)	Total
Not at all important	34	27	20	81
Slightly important	24	21	12	57
Fairly important	17	23	27	67
Very important	15	23	21	59
Total	91	94	80	265

Appendix 9: Domestic competitive pressure importance and firm size for 2009 in Slovak Firms

Effect on decisions to develop new products: Pressure from domestic competitors	small(<20)	medium(20-100)	large(>100)	Total
Not at all important	15	10	13	38
Slightly important	12	21	8	41
Fairly important	39	36	36	111
Very important	25	27	23	75
Total	91	94	80	265

Appendix 10: Unbalanced Panel of Czech Firm Data

Interviewed in these years:	Year of survey:	2002	2005	2009	Total
Only in 2009		0	0	233	233
Only in 2005		0	292	0	292
Only in 2002		232	0	0	232
Only in 2002, 05		32	32	0	64
Only in 2005, 09		0	13	13	26
Only in 2002, 05, 09		4	4	4	12
Panel ID can't be matched		0	2	0	2
Total		268	343	250	861

Appendix 11: Unbalanced Panel of Slovak Firm Data

Interviewed in these years:	Year of survey:	2002	2005	2009	Total
Only in 2009		0	0	242	242
Only in 2005		0	163	0	163
Only in 2002		141	0	0	141
Only in 2002, 05		24	24	0	48
Only in 2005, 09		0	28	28	56
Only in 2002, 05, 09		5	5	5	15
Panel ID can't be matched		--	--	--	--
Total		170	220	275	665

Appendix 12: Linktest

Linktest for Czech Firms:

Number of obs = 46

F(2, 43) = 34.73

Prob > F = 0.0000

R-squared = 0.6177 , Adj R-squared = 0.5999

Total | 116.11245 45 2.58027668 Root MSE = 1.0161

lnsales	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_hat	2.969617	1.695851	1.75	**0.087***	-.4503927	6.389627
_hatsq	-.0624638	.0536442	-1.16	0.251	-.1706477	.0457201
_cons	-15.35672	13.3086	-1.15	0.255	-42.19608	11.48264

Linktest for Slovak Firms:

Number of obs = 45

F(2, 42) = 15.86

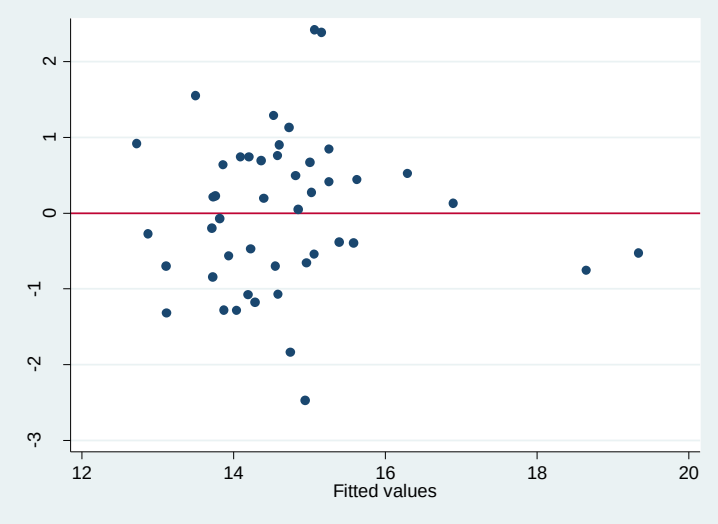
Prob > F = 0.0000

R-squared = 0.4302 , Adj R-squared = 0.4031

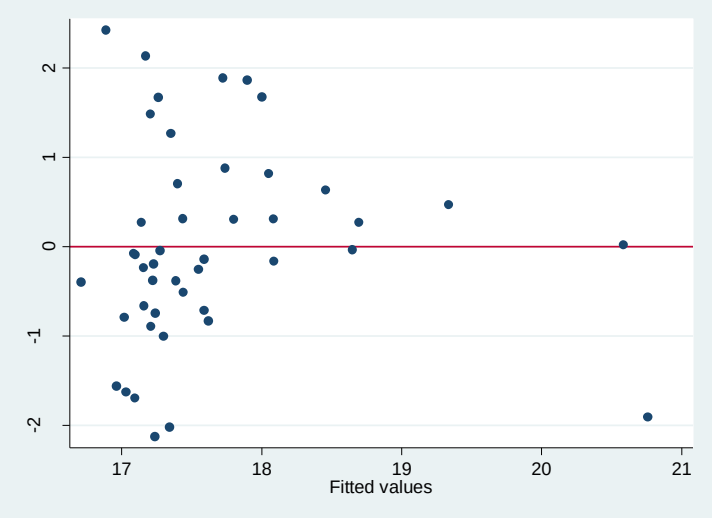
Total | 86.8291597 44 1.97338999 Root MSE = 1.0853

lnsales	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_hat	14.54773	5.915374	2.46	**0.018****	2.610024	26.485
_hatsq	-.3641879	.1589302	-2.29	0.027	-.6849221	-.0434537
_cons	-125.4127	54.83731	-2.29	0.027	-236.0788	-14.74651

Appendix 13: Czech Firms Graphical Analysis for Heteroskedasticity (command rvfplot, yline(0))



Appendix 14: Slovak Firms Graphical Analysis for Heteroskedasticity (command rvfplot, yline(0))



Appendix 15: Normality of Residuals

Normality of Residuals for Czech Firms

Skewness and Kurtosis Tests for Normality (command sktest)

			------- joint ------		
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
resczech	46	0.7311	0.4985	0.59	0.7433

Normality of Residuals for Slovak Firms

Skewness and Kurtosis Tests for Normality (command sktest)

			------- joint ------		
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
resslovak	45	0.5451	0.7849	0.45	0.7983

Appendix 16: Variance Inflation Factors

Variance Inflation Factor for Czech Firms

Variable	VIF	1/VIF
Capacity	1.46	0.683432
corruption	1.42	0.702930
foreigncomp	1.42	0.704334
domesticcomp	1.37	0.728773
Government Regulation	1.29	0.775293
Employment	1.18	0.848351
Locality Size	1.09	0.916943
Competitors	1.09	0.920741
(Mean VIF =1.29)		

Variance Inflation Factor for Slovak Firms

Variable	VIF	1/VIF
Domesticcomp	1.69	0.593106
foreigncomp	1.63	0.613259
competitors	1.59	0.629372
Government Regulation	1.35	0.740819
Capacity	1.31	0.765405
Corruption	1.30	0.766354
Employment	1.16	0.858588
Locality Size	1.10	0.906478
(Mean VIF =1.39)		

Appendix 17: STATA output for Czech firms

```
reg lnsales foreigncomp domesticcomp competitors emp capacity loc govtreg corruption

      Source |       SS       df       MS              Number of obs =      46
-------------+------------------------------           F(  8,    37) =    7.10
       Model |  70.3183775     8  8.78979719            Prob > F      =  0.0000
    Residual |  45.7940729    37  1.23767765            R-squared     =  0.6056
-------------+------------------------------           Adj R-squared =  0.5203
       Total |   116.11245    45  2.58027668            Root MSE      =  1.1125

------------------------------------------------------------------------------
     lnsales |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 foreigncomp |   .3027249   .1706104     1.77   0.084    -.0429645    .6484143
domesticcomp |    -.16721   .2222904    -0.75   0.457    -.6176131    .2831932
 competitors |   .0460625   .2626999     0.18   0.862     -.486218    .5783431
         emp |   .0080949   .0015764     5.14   0.000     .0049008    .0112891
    capacity |   .0085137   .0073001     1.17   0.251    -.0062777    .0233051
         loc |   .3088306   .1243876     2.48   0.018     .0567975    .5608637
     govtreg |  -.0062441   .0129504    -0.48   0.633    -.0324841     .019996
  corruption |  -.1659028   .1164086    -1.43   0.162    -.4017691    .0699635
       _cons |    12.0002   1.401758     8.56   0.000     9.159971    14.84043
------------------------------------------------------------------------------
```

Appendix 18: STATA output for Slovak firms

```
reg lnsales foreigncomp domesticcomp competitors emp capacity loc govtreg corruption

      Source |       SS       df       MS              Number of obs =      45
-------------+------------------------------           F(  8,    36) =    2.52
       Model |  31.1698514     8  3.89623142            Prob > F      =  0.0275
    Residual |  55.6593083    36   1.5460919            R-squared     =  0.3590
-------------+------------------------------           Adj R-squared =  0.2165
       Total |  86.8291597    44  1.97338999            Root MSE      =  1.2434

------------------------------------------------------------------------------
     lnsales |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 foreigncomp |   .1601019   .2136246     0.75   0.458    -.2731489    .5933527
domesticcomp |  -.0500019   .2603962    -0.19   0.849     -.57811    .4781061
 competitors |   .0755639   .1140141     0.66   0.512    -.1556673    .3067952
         emp |   .0066325   .0019086     3.48   0.001     .0027617    .0105033
    capacity |   .0019921   .0071257     0.28   0.781    -.0124596    .0164437
         loc |  -.0468825   .3169557    -0.15   0.883    -.6896984    .5959333
     govtreg |  -.0033075   .0149264    -0.22   0.826    -.0335797    .0269647
  corruption |  -.0795438   .0841194    -0.95   0.351    -.2501457    .0910582
       _cons |    16.9611    1.7381     9.76   0.000     13.43607    20.48613
```