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volume 13

# ACTA VŠFS

## Economic Studies and Analyses
## Ekonomické studie a analýzy

SCIENTIFIC ARTICLES
VĚDECKÉ STATĚ



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**Milan Kašík** – Managing Editor / ředitel redakcí

**EDITORIAL STAFF / REDAKCE:**
**internet:** http://www.vsfs.cz/acta
VŠFS, Estonská 500, 101 00 Praha 10

**Radim Valenčík** – Executive Editor / výkonný redaktor (radim.valencik@vsfs.cz)
**Lenka Pokorná** – Secretary / tajemnice (lenka.pokorna@vsfs.cz)
**Petr Mach** – Publishing Editor / vydavatelský redaktor (petr.mach@vsfs.cz)




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## EDITORIAL



## SCIENTIFIC ARTICLES / VĚDECKÉ STATĚ



## DISCUSSION / DISKUSE

# *Editorial*
# *Editorial*

**RADIM VALENČÍK**

Dear readers,

Even if it is already late, on the occasion of the publication of our original scientific journal ACTA VŠFS let me wish for you a lot of scientific and creative power in the year 2019 because only with you, the readers and authors, will we be able to further increase its level. As you probably noticed, this year's first issue has managed to include materials in line with the new concept of the journal in its relationship with the research priorities at our university and the doctoral and other accredited study programs. We want to create favorable conditions for international cooperation on socially relevant topics. In this issue we focused on small and medium-sized enterprises in different countries in the current conditions of globalization, which is a very fast-moving topic, and for example, the Association of Small and Medium-sized Enterprises of the Czech Republic devotes next year the issue of digitization of production processes of SMEs and their preparation for Industry 4.0. We proceeded to sort the articles from those that are specifically targeted to those that touch on more general aspects.

The first article *Economic Returns from Social and Political Globalization: Does Signaling Help Developing and Transition Countries to Attract Foreign Direct Investment?* was written by Raju Parakkal. It deals with the relationship between the political and social globalization of the country in terms of the ability to attract foreign direct investment. It uses the knowledge of signaling theory in the original way. Given that there is strong competition among developing and transition economies in foreign direct investment, a high degree of political and social globalization can potentially serve as a positive signal to foreign investors.

The second article *Entrepreneurship Support Agencies (ESA) and Development of Small and Medium Enterprises (SMEs) in Nigeria* was prepared by Olufemi Amos Akinbola, Sekinat Arike Sanni and Omolola Sariat Akinbola. Using effective theoretical methods, they analyse extensive empirical material on the role of business support agencies in supporting the development of small and medium-sized enterprises in Nigeria. This is followed by institutions such as the SME Development Agency of Nigeria (SMEDAN), the Manufacturers Association of Nigeria (MAN) and the Bank of Industry (BOI), which were established to support small and medium-sized enterprises.

The third article *The Effect of Financial Ratios on Stock Prices: Evidence from the Polish Stock Exchange* is from Marie Ligocka. She analyses the relationship between selected financial indicators and prices of shares of food, energy, metallurgical and chemical companies registered on the Polish stock exchange. She uses Johansen's test to analyse the long-term equilibrium between stock prices and financial ratios.

The fourth article *The Key Factors in the Textile Industry* from David Mareš deals with the key factors of the Czech textile industry in terms of sectoral specifics of the textile industry, such as number of units, number of employees, gross added value, labour productivity, exports, imports and balance. It concludes that all surveyed variables show growth excluding the number of people employed, indicating the possibility of sustainability of the sector.

The fifth contribution is *Bargaining Power: Significance, Structure and Development*, written by Jan Červenka, contains a comprehensive overview of the forms of bargaining within co-operative games that influence the various negotiating forces of the actors. Based on the theoretical analysis, are some practical recommendations, which can be used in the area of cooperation of differently strong, respectively differently developed entities.

As a stimulus to the discussion, we included the study of *Game Modeling of the Organization's Management Strategy and Training in Strategic Thinking Based on Game Analogies*, by Evgeny Genkin, Liubov Maximov, Vladimir Velikorossov, Maxim Maksimov, which examines the problems arising in modern economic conditions in organizations of various sectors of the national economy in the implementation of strategically oriented management systems.

The reading of articles from the point of view of their relatedness or continuity opens a number of questions: How to use the theory of signaling in the activities of entrepreneurship agencies in the context of globalization to support the development of small and medium-sized enterprises? How to use the comparison of financial indicators and indicators provided by financial markets (stock prices, etc.) in determining sustainability and prospective different industries? Which methods used in this area give the best results? How is the inequality of the relationship between developing or transition economies on the one hand and developed countries on the other hand in the different negotiating power under the conditions of globalization and what are the tools to model different bargaining power? What should we consider from this point of view when implementing strategically oriented management systems and what games are being played in this area? We assume that these and other questions that the readers will come up with will inspire the creation of additional original and usable articles that will appear on our journal's pages in the following years.

**Doc. Radim Valenčík, CSc.**
Executive Editor

Vážení čtenáři,

dovolte, abych ještě opožděně v termínu vydání prvního našeho vědeckého časopisu ACTA VŠFS popřál hodně vědeckých a tvůrčích sil do roku 2019, neboť jen s Vámi autory se podaří dále zvyšovat jeho úroveň. Jak jste si asi všimli, do letošního prvního čísla se podařilo zařadit materiály v souladu s novou koncepcí časopisu v jeho sepětí s prioritami výzkumné činnosti na naší univerzitě a doktorským a ostatními akreditovanými studijními programy. Chceme tak vytvořit příznivé podmínky pro mezinárodní spolupráci na společensky relevantních tématech. V tomto čísle jsme se věnovali problematice malých a středních podniků v různých zemích v současných podmínkách globalizace, což je velmi akcelerující téma, a např. Asociace malých a středních podniků ČR věnuje příští rok problematice digitalizace výrobních procesů MSP a jejich přípravu na Průmysl 4.0. Při řazení příspěvků jsme postupovali od těch, které jsou zaměřeny konkrétně, k těm, které se dotýkají obecnějších aspektů.

První příspěvek, *Ekonomický výnos ze společenské a politické globalizace: Pomáhá signalizujícím rozvojovým a tranzitním zemím přilákat přímé zahraniční investice?*, zpracoval Raju Parakkal. Zabývá se vztahem mezi politickou a sociální globalizací země z hlediska schopnosti přilákat přímé zahraniční investice. Využívá přitom původním způsobem poznatky z teorie signalizace. Vzhledem k tomu, že mezi rozvojovými a tranzitními zeměmi existuje silná konkurence v oblasti přímých zahraničních investic, může vysoký stupeň politické a sociální globalizace potenciálně posloužit jako pozitivní signál zahraničním investorům.

Druhý příspěvek, *Agentury na podporu podnikání (ESA) a rozvoj malých a středních podniků (MSP) v Nigérii*, zpracovali Olufemi Amos Akinbola, Sekinat Arike Sanni a Omolola Sariat Akinbola. S využitím efektivních teoretických metod analyzuje rozsáhlý empirický materiál týkající se role agentur podporujících podnikání při podpoře rozvoje malých a středních podniků v Nigérii. V návaznosti na to se zabývá institucemi, jako je agentura pro rozvoj malých a středních podniků Nigérie (SMEDAN), Asociace výrobců v Nigérii (MAN), Banka průmyslu (BOI), které byly vytvořeny právě k podpoře malého a středního podnikání.

Třetí příspěvek, *Vliv finančních ukazatelů na ceny akcií: Aplikace na polskou burzu cenných papírů*, je od Marie Ligocké. Analyzuje vztah mezi vybranými finančními ukazateli a cenami akcií potravinářských, energetických, metalurgických a chemických společností registrovaných na polské burze. Používá Johansenův test k analýze dlouhodobé rovnováhy mezi cenami akcií a finančními poměry.

Čtvrtý příspěvek, *Klíčové faktory v textilním průmyslu*, Davida Mareše se zabývá klíčovými faktory českého textilního průmyslu z hlediska odvětvových specifik textilního průmyslu, kterými jsou počet jednotek, počet zaměstnaných osob, hrubá přidaná hodnota, produktivita práce, vývoz, dovoz a saldo. Dospívá k závěru, že všechny zkoumané veličiny vykazují růst vyjma počtu zaměstnaných osob, což naznačuje možnost udržitelnosti tohoto odvětví.

Pátý příspěvek, *Vyjednávací síla: Význam, struktura a vývoj*, jehož autorem je Jan Červenka, obsahuje ucelený přehled forem vyjednávání v rámci kooperativních her, v nichž se

projevuje vliv různé vyjednávací síly aktérů. Na základě teoretické analýzy formuluje některá praktická doporučení využitelná i v oblasti spolupráce různě silných, resp. různě vyvinutých subjektů.

Jako podnět do diskuse jsme zařadili studii *Modelování her ve strategii řízení organizace a vzdělávání v oblasti strategického myšlení založené na herních analogiích*, jejímž autory jsou Evgeny Genkin, Liubov Maksimova, Vladimir Velikorossov, Maxim Maksimov, která zkoumá problémy vzniklé v moderních ekonomických podmínkách v organizacích různých sektorů národního hospodářství při zavádění strategicky orientovaných systémů řízení.

Studium příspěvků z hlediska jejich příbuznosti či návaznosti otevírá řadu otázek: Jak v podmínkách globalizace využít teorii signalizace v činnosti agentur podporujících podnikání při podpoře rozvoje malých a středních podniků? Jak využít porovnání finančních ukazatelů a indikátorů, které poskytují finanční trhy (ceny akcií apod.) při zjišťování udržitelnosti a perspektiv různých odvětví? Které metody používané v této oblasti dávají nejlepší výsledky? Jak se projevuje nerovnost vztahu mezi rozvojovými či tranzitními zeměmi na jedné straně a vyspělými zeměmi na straně druhé v různé vyjednávací síle v podmínkách globalizace a jaké jsou nástroje k modelování různé vyjednávací síly? Co z tohoto hlediska vzít v úvahu při zavádění strategicky orientovaných systémů řízení a jaké hry se v této oblasti hrají? Předpokládáme, že tyto i další otázky, které čtenáře napadnou, budou inspirovat vznik dalších původních a využitelných příspěvků, které se objeví na stránkách našeho časopisu.

**Doc. Radim Valenčík, CSc.**
Výkonný redaktor

# *Economic Returns from Social and Political Globalization: Does Signaling Help Developing and Transition Countries to Attract Foreign Direct Investment?*

# *Ekonomický výnos ze společenské a politické globalizace: Může signalizování pomoci rozvojovým a tranzitním zemím přilákat přímé zahraniční investice?*

RAJU PARAKKAL

**Abstract**

I examine whether a developing or transition country's political and social engagement in the international system – labeled as a country's political and social globalization – has a positive influence on its ability to attract foreign direct investments (FDI), and hence, on the amount of FDI that it receives. My research is motivated by insights from signaling theory, which posits that actors provide information about themselves through signals in situations where the underlying quality or nature of such actors is less than perfectly discernible. A high degree of political and social globalization can potentially serve as a positive signal to foreign investors that a country is "invested" in the international system, global society, and in the larger global political economy, thereby lowering the perceived risk of investing in this country. As part of the empirical analysis, I undertake multivariate regressions using panel data on more than 100 developing and transition countries. The results show that both political and social globalization lower the perceived country risk in terms of attracting FDI. While social globalization helps attract FDI through both strategic and non-strategic signaling, the same is true for political globalization only with strategic signaling and not with non-strategic signaling. Given the importance of FDI to growth and development, the findings of this study can particularly inform policymakers in developing and transition countries.

**Keywords**

foreign direct investment (FDI), political globalization, social globalization, signaling theory, developing countries, transition countries

**JEL Codes**

F21, F53, F60

**Abstrakt**

Příspěvek se zabývá otázkou, zda politická a společenská angažovanost rozvíjející se nebo přechodné země v mezinárodním systému – označovaná jako politická a sociální globalizace země – má pozitivní vliv na její schopnost přilákat přímé zahraniční investice (PZI) a tím i na objem PZI tím, že je přijme. Výzkum je motivován poznatky z teorie

signalizace, která předpokládá, že aktéři poskytují informace o sobě prostřednictvím signálů v situacích, kdy základní kvalita nebo povaha těchto aktérů je méně než dokonale rozpoznatelná. Vysoká míra politické a sociální globalizace může potenciálně sloužit jako pozitivní signál zahraničním investorům, že země je „zainvestována" do mezinárodního systému, do globální společnosti a do širší globální politické ekonomiky, čímž se snižuje vnímané riziko investování do takové země. Jako součást empirické analýzy je provádena mnohořetězcová regrese s využitím panelových údajů o více než 100 rozvíjejících se a transformujících se zemích. Výsledky ukazují, že jak politická, tak sociální globalizace snižují vnímané riziko země, pokud jde o přilákání PZI. Zatímco sociální globalizace pomáhá přilákat PZI strategickou signalizací, totéž platí pro politickou globalizaci pouze se strategickou signalizací, ale ne s nikoli-strategickou signalizací. Vzhledem k významu přímých zahraničních investic do růstu a rozvoje mohou zjištění této studie obzvláště informovat tvůrce politik v rozvojových a přechodových zemích.

**Klíčová slova**
přímé zahraniční investice (PZI), politická globalizace, sociální globalizace, teorie signalizace, rozvojové země, tranzitní země

# I. Introduction

Foreign direct investment (FDI) is commonly understood as a long-term investment by an entity located in a country different from the one where the investment takes place. It is "the purchase of physical assets or a significant share of the ownership (stock) of a company in another country to gain a measure of management control" (Li and Vashchilko 2010)[1]. Compared to other forms of foreign investment, such as foreign portfolio investment in financial instruments, FDI is considered more stable, less volatile, and better at employment-generation (Jensen 2003). Given these properties of FDI, countries around the world have viewed this form of investment as a critical factor in their economic growth and development process. This is particularly so in the case of developing and transition countries (hereafter, developing countries).

In this study, I explore whether a country derives any economic benefits in the form of FDI inflows by politically and socially engaging with the rest of the world. These engagements are labeled as political globalization and social globalization, respectively. Examples of a country's global political engagement comprise membership in international organizations, signing of international treaties, participation in United Nations (UN) peacekeeping missions, and hosting of international non-governmental organizations (NGOs) and foreign embassies. Similarly, examples of a country's social globalization include international migration and tourism, trade in cultural goods and services, and access to the internet and telephones. The argument, as further developed later in the article, is that these two forms of global engagement reduce the perceived risks of investing in a country and such countries should, therefore, attract higher levels of FDI, versus countries that are not high on political and social globalization.

1 *A threshold foreign equity ownership of at least 10% is technically considered for an investment to quality as FDI. However, countries also differ in their threshold values. See United Nations Conference on Trade and Development's definition here: http://www.unctad.ch/Templates/Page.asp?intItemID=3147&lang=1*

It is a widely acknowledged fact that many developing countries compete with each other to attract multinational corporations (MNCs) and the FDI that these firms bring with them (Jensen 2003). The primary motivation for this is the role that FDI plays as an investment vehicle in capital-scarce developing countries. Since income and savings levels are low in many developing countries, FDI represents a key source of revenue and growth for many of these countries. Given this fact, one of the ways in which a developing country can attract FDI is by improving its attractiveness as a potential destination for MNCs.

The standard FDI literature notes various factors in destination countries that help attract FDI, chief among them being a growing economy, size of the market, income levels of consumers, and the investment and regulatory environment.[2] Political scientists and some economists have considered a few domestic political economy variables as influencing the inflow of FDI, notable among them being political risk and corruption, political stability, policy stability, and the nature of the political system. At the international level, research has focused on whether entering into bilateral investment treaties (BITs) and preferential trade agreements (PTAs) and being part of the World Trade Organization (WTO) increases a country's FDI inflows.

While the above-mentioned factors discussed in the literature have proven to be major country-level determinants of FDI inflows, what is missing is a systematic examination of the impact of a country's political and social engagements with the rest of the world on its FDI inflows. With respect to international political engagements, studies focused on BITs and PTAs come close to such an examination since these treaties and agreements represent a country's engagement with the international system (Büthe and Milner 2008; Neumayer and Spess 2005; Sokchea 2007). Another close determinant in this regard is military alliance and its impact on bilateral investment flows (Li and Vashchilko 2010). However, BITs and PTAs still represent international *economic* commitments, even though they are undertaken by states as political entities. As for military alliances, their relevance in correctly signaling the extent of political risk has vastly diminished with the end of the Cold War and the rapidly decreasing incidents of inter-state wars.

Research on the effect of social globalization on FDI inflows comes in the form of studies in international business and strategy that have focused on the cultural aspects of social globalization and used Hofstede's measures of cultural distances (Hofstede 1980). In his widely used and cited work, Hofstede developed four dimensions – power distance, individualism-collectivism, masculinity-femininity, and uncertainty avoidance – to understand and analyze cultural values as observed and exercised at work places in different countries. Later researchers in international business and strategy have used these four measures, and a fifth measure from Hofstede (1991), to examine cultural differences – or, cultural distances – between the origin country of MNCs and the destination country of the foreign investments. Hofstede's measures have since become the bedrock of cross-cultural studies, especially related to international business and strategy. Relevant to the present research are prominent works by Kogut and Singh (1988), Mitra and Golder (2002), Johnson and Tellis (2008), and Tang (2012) that have used Hofstede's measures to

2 *It is beyond the scope of this paper to provide a detailed analysis of the determinants of FDI. Interested readers can refer Blonigen (2005) and Lim (2001).*

examine the influence of cultural distances on the direction and outcomes of firm-level and country-level investment flows.

Even as they are related to the present research, the aforementioned 'cultural distances' studies, however, differ from the present study as they are not focused on the cultural or social globalization profile of destination countries, but rather on the differences between the origin and destination countries. One reason for the conspicuous absence of the large-sample, quantitative type of social globalization studies in the FDI literature is the conceptual difficulty of defining 'social globalization.' The absence of conceptual clarity concerning this term has arguably impeded the development of quantitative measures of this phenomenon. In this paper, I use a novel dataset that provides workable conceptual definitions and quantitative measures of both political and social globalization, thereby making significant contributions relative to the existing literature on FDI. Furthermore, this study makes an important contribution to the existing signaling literature in FDI studies by examining the impacts of intentional signaling (strategic) and unintentional signaling (non-strategic) on attracting FDI. The study also contributes by examining how non-economic forms of globalization – namely, the political and social – impact an economic activity such as FDI. Finally, it advances our overall understanding of developing and transition economies in terms of their relationships to FDI and various forms of globalization.

Given the changed systemic environment in the post-Cold War period, a true international political variable for a developing or transition country would be its political and social relations with other countries, especially with those in the West, and its participation in various international fora. In using the labels of 'political globalization' and 'social globalization' to signify these relations, I am motivated by the more common 'economic globalization' label which reflects the extent to which a country engages economically with the rest of the world. The main question that I examine in this paper is whether there are any economic returns from political and social globalization in the form of increased FDI inflows. I argue that a high degree of political and social globalization can potentially serve as a positive signal to foreign investors that the developing country is "invested" in the international system, both politically and socially. Therefore, these signals lower the perceived risk of investing in this country, *ceteris paribus*, which can theoretically attract more FDI. This would be the case for many developing countries, because these countries first need to transmit positive and credible signals about themselves as political and social units. I further develop this argument in a later section of this paper.

The findings of this study show that both political and social globalization have statistically significant positive relationships with FDI inflows. Countries that politically and socially engage more with the international system of states, international organizations, and global community do attract more FDI. This finding is robust to the inclusion of other variables that have been found to impact FDI inflows. The study also reports that intentional, or strategic, signaling via political globalization has a higher impact on FDI than unintentional, or non-strategic, signaling. This finding differs from that for social globalization where both intentional and unintentional signaling attracts FDI inflows. This finding related to intentional versus unintentional signaling is robust to the inclusion of control variables and to different lag periods for the independent variables but not to the joint inclusion of all the explanatory variables.

The rest of this paper is organized as follows. In section 2, I undertake a brief review of the literature related to the country-level determinants of FDI. I discuss signaling theory, describe the theoretical basis of my argument, and present the conceptual model in section 3. In section 4, I present the research design and the variables, sample, and data. Methodological considerations are also discussed in this section. Section 5 presents the econometric model, reports the results, and undertakes a discussion of the findings. Section 6 provides the conclusions of the study, together with the implications of the findings.

## II. Country-Level Determinants of FDI: Discussion of Relevant Literature

In the relevant literature, the determinants of FDI have been studied both from firm-level and country-level perspectives. Firm-level factors and country-level economic determinants have primarily been examined in the international business, economics, and industrial organization literature. On their part, political scientists and international relations scholars working in the area of international political economy have mostly focused on the political factors at the level of the destination country that have influenced FDI inflows. As this study examines FDI at the country-level, I restrict the discussion in this section to the determinants identified in the extant literature.

The country-level elements that influence FDI inflows can be categorized into economic and political factors, with both sets of determinants having been incorporated by the relevant literature in economics, business, political science, and international political economy. Most research has found a positive association of economic factors, such as the levels of gross domestic product, GDP per capita, and economic growth, with FDI inflows (Tsai 1994; Demirhan and Masca 2008). This is to be expected as these economic aspects of a country serve as indicators of the potential market size. Associated with the understanding of market size is the role of population size in impacting FDI inflows (Petrović-Ranđelović, Janković-Milić, and Kostadinović 2017). The economic openness of a country, measured as the share of trade in GDP, is a factor that has been studied and documented in the context of its impacts on FDI inflows. The argument is generally that more open economies receive export-oriented foreign investments while less open economies attract "tariff-jumping" foreign investments that target the destination countries' markets while avoiding the trade restrictions (Demirhan and Masca 2008). Other economic variables that have been used in FDI literature include exchange rate volatility (Ullah, Haider, and Azim 2012) and corporate tax incentives in destination countries (Hunady and Orviska 2014). These variables, especially the latter, have, however, produced mixed results in terms of their association with FDI flows.

There is a large number of political and policy variables that FDI research has included as possible determinants, with a few of them dominating the literature. Political risk is one of the most thoroughly examined political determinants of FDI in both the business and the international political economy literatures. Political risk is commonly understood in this literature to reflect, among other things, the extent of political corruption that foreign

firms face, with political risk being higher in countries characterized by greater levels of corruption (Busse and Hefekar 2007). The principal political risk that foreign firms face in the investing country is of expropriation, that is, the sudden nationalization of the business by the national government (Henisz 2000). Such risks have been waning in recent decades because of the increasingly vertical nature of FDI entering developing countries.[3] However, there is still evidence that outright expropriation occurs in some parts of the developing world.[4]

Besides political risk, scholars have primarily focused on the relationship between a democratic political system and FDI inflows. Traditional literature contended that MNCs would be more attracted to countries governed by autocratic regimes given the control that such governments have over political institutions and FDI policy (O'Donnell 1978). In other words, autocratic governments would be immune to public opinion since they do not seek re-election. This presents greater certainty regarding FDI policy, a feature greatly valued by MNCs. However, more recent studies have found a positive association between levels of democracy and FDI inflows (Rodrik 1996; Harms and Ursprung 2002; Jensen 2003; Busse 2004). Other political variables in potential destination countries that have been featured in FDI studies include policy stability and the role of veto players (Tsebelis 2002; Jensen 2003; Li 2009) and the importance of bilateral investment treaties (BITs), preferential trade agreements (PTAs), and membership in international organizations, such as the WTO (Büthe and Milner 2008). The number of variables identified and evidenced in the FDI literature as possible determinants is indeed large and growing. While this is reflective of an active research agenda concerning FDI, it also presents a challenge to researchers in terms of potential variables to consider for further research on this topic. As will be explained in section 5, the present study has adopted a parsimonious empirical model that adequately captures the effects of the key economic and political determinants of FDI.

## III. Signaling Theory: Globalization and FDI

The present study recognizes the wealth of research undertaken on this topic but argues that the relevant literature is missing an examination and analysis of how FDI inflows are influenced by both intentional and unintentional signaling by a developing country as it engages in the processes of political and social globalization. Definitions and explanations abound for the term 'globalization,' but for the purposes of this study, it can be understood as "the process of increasing interconnectedness between societies such that events in one part of the world more and more have effects on people and societies far away" (Baylis and Smith 1999: 7). The idea is that globalization represents a trend that has led

3 *Under vertical FDI, a firm does not locate its entire line of production and business in a foreign country, and hence, the FDI does not represent a stand-alone business unit. As such, vertical FDI is less vulnerable to expropriation risk since the expropriating government would be left with a worthless asset (Büthe and Milner 2008).*

4 *For example, in both Bolivia and Venezuela, left-leaning governments have nationalized foreign-owned businesses in the past decade (The Economist 2010a, b).*

the world to a state of interdependence (Keohane 2002). Furthermore, globalization is understood differently here from internationalization, liberalization, universalization, and Westernization, although these terms maybe closely related and are sometimes used interchangeably (Scholte 2008; Caselli 2012; Gygli, Haelg, and Sturm 2018). Conceptually, "social globalization expresses the spread of ideas, information, images and people" while "political globalization characterizes the diffusion of government policies" (Gygli, Haelg, and Sturm 2018: 3). With social globalization, one finds greater cultural, interpersonal, and informational engagements between citizens and residents of different countries. A country is assumed to be more socially globalized if it permits and engages in the aforementioned interactions between its citizens and the rest of the world. Political globalization, on the other hand, is characterized by a country's formal involvement in international organizations, international treaties, UN missions, and international investment treaties. This concept captures the extent to which a country's government legally and practically involves itself with the affairs of the global political world. These two forms of globalization are, therefore, distinct from the more commonly known form of globalization – economic globalization – that is reflected in the exchange and flows of goods, capital, and services among countries.

In drawing a connection between the two distinct dimensions of globalization – political and social – and FDI inflows, the present study is motivated by insights from signaling theory, which posits that actors provide information about themselves through signals in situations where the underlying quality or nature of such actors is less than perfectly discernible and when such actors seek to provide information about themselves. An early work that contained the idea of signaling was Thorstein Veblen's (1899) celebrated piece on the "leisure class" (Bagwell and Bernheim 1996). Veblen argued that wealthy individuals often engaged in conspicuous and wasteful expenditure to signal their wealth, thus elevating themselves to a higher social status. The underlying idea is that it is not just enough to be wealthy; one has to flaunt it through *costly* expenditure to signal the extent of one's wealth to one's peers and competitors. This idea forms the basis of the theoretical and empirical literature related to costly signaling, where the cost of signaling is so high that the signals are treated by recipients as credible.[5] For the present study, this costly signal is transmitted by developing countries when they engage with the international community, both socially and politically. And this signal is costly for developing and transition countries because, relative to developed economies, many of these countries face challenges in terms of resources and capacity. International engagement in this context is, therefore, a costly signal.

The need for signaling arises when asymmetric information prevails, that is, when all the relevant actors do not have the same amount of information. This is typically observed in market interactions where sellers know more about the quality of the products or services they offer for sale than the buyers do (Boulding and Kirmani 1993). With respect to FDI, the relevant actors are the MNCs and the potential destination countries, with MNCs typically possessing less information about potential destination countries compared to

5 *An everyday occurrence of costly signaling from the job market is when job applicants signal their worth to prospective employers through their educational qualifications, which were costly and time-consuming to acquire for the applicants (Spence 1973).*

what these countries know about themselves and their own country-level characteristics. One manner in which these countries can transmit positive information about themselves is through a process of stable and credible engagement with the rest of the countries in the international system. Such engagements, on both social and political fronts, can potentially serve as a positive signal to foreign investors that the country is 'politically invested' in the international system and 'socially integrated' with the rest of the world. These positive signals, in turn, lower the 'perception' of the underlying risk of investing in this country. In other words, it lowers perceptions of the destination's 'country risk,' which also includes political risk as a major component. Given the negative relationship that exists between country risk and foreign investments, it is argued that higher levels of political and social globalization that mitigate the perceptions of country risk have the potential to attract more FDI.

There is support for this theoretical argument in mainstream international relations literature that has led us to understand international relations, including international economic relations, as characterized by strategic interactions that are based on incomplete information (Lake and Powell 1999; Keohane 1984). Given this scenario, costly signaling becomes a credible mechanism to provide positive information in an environment of incomplete information and uncertainty. For example, in the context of global peace and inter-state relations, signaling is important for countries to convey peaceful intentions and to inform the credibility of their commitment to collaborative effects (Kertzer, Rathbun, and Rathbun 2018). In the case of foreign investments, political and social globalization lowers the perceived political risk of a country by making it costly for it to violate internationally accepted norms and standards of conduct, including as they relate to foreign investment inflows.

The theoretical argument in this study is that political and social globalization can impact FDI through the signaling process by sending out two kinds of signals: intended and unintended. In the case of intentional signals, countries strategically 'market' themselves as credible, invested, and integrated in the international system and society of states. The idea that there exists an 'international society' where countries form social bonds based on a societal understanding of inter-state relations was long and influentially established by the English School of international relations (Kaczmarska 2017). Hedley Bull most famously stated that an international society "exists when a group of states, conscious of certain common interests and common values, form a society in the sense that they conceive themselves to be bound by a common set of rules in their relations with one another, and share in the working of common institutions" (Bull 2002: 13). Following this understanding, it is assumed that a developing country that engages in various forms of political and social globalization transmits positive signals about the credibility of its engagement with the international community and of its commitment to adhere to international norms.

Developing and transition countries also send unintended positive signals about themselves when they join international organizations, host embassies of other countries, and engage in U.N. missions. That is, countries transmit positive information about themselves in an unintended manner when they interact with international organizations and other states in the international system. These actions might have been undertaken

not with the expectation or intention that they will exert a positive impact on the extent of FDI, although that is also a possibility that this study incorporates in its analysis. The theoretical framework, therefore, provides for two possible channels through which the signaling process works to enable the more politically and socially globalized developing countries to receive more FDI – the intentional and the unintentional.

**Figure 1**: Conceptual Model of the Impact of Political and Social Globalization on Foreign Direct Investment (FDI) Inflows

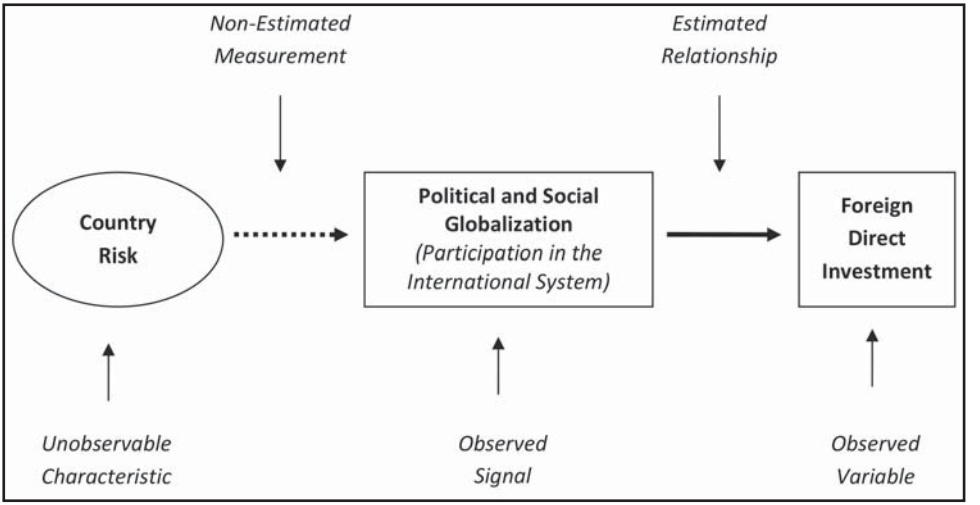


Figure 1 presents the conceptual model that demonstrates the nature of the hypothesized relationships. Country risk constitutes the *unobserved* country characteristic that is of interest to MNCs while taking their foreign investment decisions. However, by their participation in the international system – denoted here as *political globalization* and *social globalization* – developing countries transmit signals that can be *observed* by foreign investors. The degree of *political globalization* and *social globalization* are then hypothesized as having positive impacts on the amount of FDI that such countries receive. For obvious reasons, the extent to which these types of globalizations serve as signals of the level of country risk inherent in a country is a non-estimated measurement. The estimated measurement is the relationship between these two types of globalization and FDI inflows.

## IV. Research Design

This study comprises three main variables of interest: *FDI, political globalization*, and *social globalization*. On the basis of prior literature, I also incorporate numerous control variables to account for their influences on FDI. I first explain the variables, together with their operationalization and data sources, and then present the sample. In this section, I also discuss the methodological considerations that underpinned the choice of the regression models.

**Outcome Variable – Foreign Direct Investment**: In defining *FDI*, I use a commonly-accepted definition that it is "an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)" (UNCTAD 2003: 231). The overarching idea is that FDI represents an investment in which the foreign entity holds a non-trivial financial interest and exerts considerable influence on its management and investment outcomes. For this study, I use net inflows of FDI that account for any disinvestments by foreign investors in a country.[6] The data is sourced from the World Development Indicators database of the World Bank. For the analysis, *FDI* is measured as the net inflows of FDI as a percentage of GDP, thereby, both normalizing FDI inflows across countries and accounting for the near-universal finding of GDP being a strong determinant of FDI (Büthe and Milner 2008).

**Explanatory Variable – Political Globalization**: Political globalization constitutes one of the two explanatory variables in this study and represents the extent to which a country engages politically with the international system. Put differently, political globalization captures the "inter-national relations" of a country in terms of the following (Dreher 2006: 1093): "the number of embassies in a country, the number of international organizations to which the country is a member and the number of UN peace missions a country participated in…" The data for *political globalization* was sourced from the 2018 KOF Index of Globalization that measures political globalization exactly as defined above and on an increasing scale from 1 to 100 (Dreher, Gaston, and Martens 2008).[7]

**Explanatory Variable – Social Globalization**: *Social globalization* is the second explanatory variable of interest in this study and is also sourced from the 2018 KOF Index of Globalization. As previously explained, it is understood as the cultural, interpersonal, and informational exchanges between countries. The KOF Index of Social Globalization measures *social globalization* exactly by this definition and, as is the case with *political globalization*, measures it on an increasing scale from 1 to 100 (Dreher, Gaston, and Martens 2008).

**Control Variables**: A wide range of determinants have been identified in the FDI literature and incorporating all of them would present both sample-size and methodological issues. I, therefore, draw on prior literature to include three of the more prominently identified factors as the control variables, two of which are economic and the third captures the political effects: *market size, economic growth*, and *political regime*. Market size positively impacts FDI inflows and is measured by the natural logs of both GDP per capita and population size. Both the GDP and GDP per capita data is in constant 2010 US dollars. The rate of economic growth is measured as annual percentage changes in GDP. In light of the numerous political variables used in prior FDI research and the competing need to choose parsimonious models, I include one possible political determinant – *political*

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*6 Note that "net inflows" of FDI does not refer to FDI inflows less the FDI outflows undertaken by entities located in the recipient countries.*

*7 The percentage weights for both the Political Globalization Index and the Social Globalization Index are provided in the appendix. Note that each of these aggregate indices are averages of the respective de facto and de jure indices that KOF Index of Globalization has constructed for these globalization indices.*

*regime* – that captures most of the political features that the analysis seeks to include in the models and that has been found to be a significant determinant in past FDI studies. Political regime types vary from autocratic to democratic and this continuum is captured on a 21– point scale from – 10 (fully autocratic) to +10 (fully democratic), that is, on an increasing scale of democracy.

The data for *GDP*, *GDP per capita, population*, and *economic growth* were sourced from the World Development Indicators database of the World Bank. *Political regime* data is from the POLITY 2 time-series variable from the POLITY IV database.[8] The data for each variable are annual observations that run from 1970 to 2015 for each country. However, for some variables, data is missing both across a few countries and for some of the years. Hence, the panel data in this study is unbalanced. The initial sample consists of 150 developing and transition countries that were not members of the economically advanced countries that comprise the Organization for Economic Cooperation and Development (OECD) as of the start of the data period, that is, 1970. However, due to missing data the effective sample is 125 countries. The exclusive focus of this study on developing and transition countries is consistent with the theoretical arguments advanced here: as discussed earlier, signaling their investment credibility through political and social globalization is costlier for developing and transition countries due to the resource and capacity constraints that they face relative to economically advanced countries.

Panel data analysis incorporates both the longitudinal and the cross-sectional variation into the estimation process. This helps capture the temporal (over many years) and spatial (across countries) dimensions of the data, and thus provides for a richer analysis. However, the richness that panel data analysis provides calls for the careful choice of regression models. For panel data analysis, the main methodological problem is that of choosing between a fixed effects model and a random effects model. This is because these two models differ in their handling of omitted variables across the units and over time. While fixed effects models are generally preferred in panel data analysis because they provide consistent results, they are not necessarily the most efficient models. Random effects models are more efficient, provided it is statistically reasonable to use them.

The classic test that has been used to choose between a fixed effects model and a random effects model is the Hausman test. This test compares the estimated results from a fixed effects model with that of a random effects model to verify if the two test results are significantly different from each other in a statistical sense. If they are significantly different, then a fixed effects model must be used. For the present study, a Hausman test was undertaken and the results between running a fixed effects model and a random effects model were found to be significantly different from each other. Therefore, the fixed effects model was chosen to conduct the analyses, the results of which are reported and discussed in the next section. I employed an econometric technique that was appropriate for use with unbalanced panel data, as is presently the case. I ran fixed effects models with an adjusted Driscoll-Kraay estimator and standard errors that are robust to heteroskedasticity, autocorrelation, and cross-sectional (spatial) and temporal dependence (Hoechle 2007).

*8 http://www.systemicpeace.org/inscr/inscr.htm*

# V. Empirical Analysis: Model Specification, Results, and Discussion

The full model using both *political globalization and social globalization* and the control variables is specified below. However, I also ran various models based on the same general specification. In the analysis, the dependent variable is converted into percentages. Following Büthe and Milner (2008), the right-hand side variables are lagged by one year, since the independent variables do not impact FDI inflows contemporaneously. However, as part of robustness checks, I run models with different lag years. In all the models, the expectation is of positive signs for all the coefficients.

$$\left(\frac{FDI_{i,t}}{GDP_{i,t}}\right) = \beta_0 + \beta_1 PolGlob_{i,t-1} + \beta_2 SocGlob_{i,t-1} +$$

$$+ (\gamma_1 Z_{1,i,t-1} + \ldots + \gamma_k Z_{k,i,t-1}) + u_{i,t-1}$$

where, $i$=1…150 (countries in the sample)
$t$=1970…2015 (data period)
$Z_{k,i,t-1}$= control variables
$\beta_1$,$\beta_2$= coefficients for the explanatory variables
$\gamma_\kappa$= coefficients for the control variables

I undertook a series of tests using different model specifications. The results are reported in table 1. Model 1 is the controls-only model that uses variables identified in existing literature as determinants of FDI inflows. Models 2 and 3 include only *political globalization* and *social globalization*, respectively, apart from the control variables. Model 4 is the full model with both *political globalization* and *social globalization* and all the control variables. Model 1 results show that all the coefficients are statistically significant and take the expected positive signs. These results are in line with the findings from existing FDI literature.

The results from models 2 and 3 show that both *political globalization* and *social globalization* are positive and statistically significant. We find that the same result holds for the full model no. 4, where both *political globalization* and *social globalization* are included in the same model and both these variables of interest are statistically significant with the hypothesized signs. Between the two variables, we do find that *social globalization* has a greater impact on FDI inflows and a higher level of statistical significance. Of the control variables in these three models, *economic growth* and *population* are consistently significant and take the expected positive sign. *GDP per capita and political regime* are positive and significant only in model 1. The overall results provide strong empirical support for the research hypothesis that countries with higher degrees of political and social globalization attract more FDI. The theoretical argument that underpinned this expectation was that countries that politically and socially engaged more with the international system signaled a greater commitment to the principles of international engagement, which in turn lowered their perceived risk levels.

**Table 1**: Fixed Effects Models of Signaling and FDI Inflows

| Variable | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| *Political Globalization* | | .05***<br>(.01) | | .02*<br>(.01) |
| *Social Globalization* | | | .13***<br>(.02) | .12***<br>(.02) |
| *Market Size* | | | | |
| *GDP per Capita* | 1.65***<br>(.46) | 1.01*<br>(.56) | .006<br>(.62) | -0.08<br>(.65) |
| *Population* | 4.15***<br>(.72) | 2.76***<br>(.70) | 2.13***<br>(.61) | 1.78***<br>(.63) |
| *Economic Growth* | .09***<br>(.01) | .08***<br>(.01) | .08***<br>(.01) | .08***<br>(.01) |
| *Political Regime* | .05**<br>(.02) | .03*<br>(.01) | .006<br>(.01) | .005<br>(.01) |
| Countries | 125 | 125 | 125 | 125 |
| Observations | 4316 | 4272 | 4272 | 4272 |
| F-stat | 12.43*** | 16.22*** | 35.76*** | 37.78*** |
| R-squared | .09 | .09 | .10 | .10 |

*Note: *p< 0.1, **p< 0.05, ***p< 0.01; Driscoll-Kraay standard errors in parentheses; all independent variables are lagged by one year*

As an example, China is a posterchild for how it signaled foreign investors through greater engagement with the global community – both politically and socially – since 1979, after having remained self-isolated during the period 1949–79 (Hayter and Han 1998). By the late 1980's, China had established diplomatic relations with 133 nations, the most since its founding as the People's Republic of China in 1949 ("Foreign Relations"). By the year 2000, China had cumulatively received $347 billion in FDI and was averaging over $40 billion annually, which represented almost 20 percent of the FDI flows to developing countries (Broadman 2002).

In Eastern Europe, Lithuania in the 1990s serves as an illustrative example of international engagement resulting in inward foreign investment flows. Greater engagement with the International Monetary Fund and the World Bank during its post-communist years in the early 1990s not only helped Lithuania secure million-dollar loans from these institutions but it also attracted multi-million dollar private foreign investments in Lithuanian factories and plants (Kimbell 1994). Lithuania's turn around in this context is particularly illustrative since, according to the OECD, "one reason for the initially slow development of FDI in Lithuania was the generally low profile of the country internationally" (OECD 2000: 30).

Descriptive examples of China, Lithuania, and other countries politically and socially globalizing themselves and attracting FDI flows abound in the recent global political economy. However, of further interest to this research is whether the positive influence of *political globalization* and *social globalization* on FDI inflows work through the intentional

signaling channel or the unintentional one, or both. This examination is important to distinguish between the effects of strategic signaling (intentional) versus non-strategic signaling (unintentional) so developing and transition countries can prioritize their political and social globalization maneuvers. For this stage of the analysis, we exploit the bifurcation of the KOF indices of political and social globalization into *de facto* and *de jure* globalizations to account for different dimensions and characteristics of globalization (Gygli, Haelg, and Sturm 2018). "While *de facto* measures of globalization include variables that represent flows and activities, *de jure* measures include variables that represent policies that, in principle, enable flows and activities" (Gygli, Haelg, and Sturm 2018: 2). In other words, by virtue of being policies strategically undertaken by governments, *de jure* globalization approximates to intentional signaling, according to our theoretical framework. By the same argument, *de facto* globalization represents unintentional signaling as these signals are not strategically produced but released unintentionally in the normal course of a country's engagement with the global community.

**Table 2**: Fixed Effects Models of FDI Inflows – Intentional and Unintentional Signaling

| Variable | Intentional Signaling | | Unintentional Signaling | Full Model | |
|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 |
| *Political Globalization (De Jure)* | .05*** (.01) | | | | .03*** (.01) |
| *Social Globalization (De Jure)* | | .12*** (.02) | | | .09*** (.02) |
| *Political Globalization (De Facto)* | | | .009 (.01) | | -0.009 (.009) |
| *Social Globalization (De Facto)* | | | | .07*** (.02) | -0.002 (.02) |
| *Market Size* | | | | | |
| *GDP per Capita* | .82 (.59) | -0.05 (.64) | 1.59*** (.48) | 0.94 (.56) | -0.12 (.68) |
| *Population* | 2.26*** (.78) | 1.69*** (.50) | 4.08*** (.66) | 3.39*** (.76) | .99* (.56) |
| *Economic Growth* | .08*** (.01) | .08*** (.01) | .09*** (.01) | .08*** (.01) | .08*** (.01) |
| *Political Regime* | .03 (.01) | -0.006* (.01) | .04** (.01) | .03* (.02) | -0.003 (.01) |
| Countries | 125 | 125 | 125 | 124 | 124 |
| Observations | 4272 | 4272 | 4272 | 4221 | 4221 |
| F-stat | 25.05*** | 29.47*** | 10.71*** | 31.45*** | 34.46*** |
| R-squared | .09 | .10 | .09 | .09 | .10 |

*Note: *p< 0.1, **p< 0.05, ***p< 0.01; Driscoll-Kraay standard errors in parentheses; all independent variables are lagged by one year*

Table 2 contains results of the analyses conducted to examine the separate effects of intentional and unintentional signaling on FDI inflows. Both *political globalization* and *social globalization* are deconstructed into *de jure* and *de facto* indices by the KOF Index of Globalization. Models 5 and 6 report *de jure* results while *de facto* results are presented in models 7 and 8. Each of these four reduced models contains only one of the four *de facto* or *de jure* variable, apart from the control variables. Model 9 is the full model with all the variables. Taken together, the results from models 5 and 6 demonstrate that both *de jure* political and social globalization are statistically significant and take the expected positive sign. The results from model 7 show that *de facto* political globalization has a positive coefficient but is not significant in a statistical sense while model 8 results indicate that *de facto* social globalization is both positive and statistically significant. In the full model, only the *de jure* sub-variables for both political and social globalization are statistically significant with the expected positive signs.

We can interpret these results as evidence that only *de jure* political globalization has an impact on FDI glows, with *de facto* globalization not displaying any statistically significant effects. However, social globalization appears to influence FDI inflows through both the *de jure* and *de facto* channels. In terms of intentional versus unintentional signaling, we can, therefore, conclude that the impact of *political globalization* on FDI inflows works only through the intentional route. For *social globalization*, this effect on FDI is observed through both the intentional and unintentional channels, although the unintentional mode of impact is not robust to the inclusion of additional variables.

As part of robustness checks, I ran the same reduced and full models for both sets of analyses with lags of two, three, and five years for the right-hand side variables. All the results, which are unreported, were robust to the change in lags. Moreover, for the reduced model with the three-year lag, *de facto* political globalization was found to be positive and statistically significant.

To account for experiential differences of a historical nature between developing and transition countries, a final set of analyses was performed on separate sub-samples of developing countries and transition countries. All formerly-communist central and eastern European countries formed part of the transition group of 24 countries while the rest of the 101 countries were grouped as developing countries. The analyses were conducted for models with one, two, three, and five year lags of the independent variables. The results, which are unreported, largely show that *political globalization* and *social globalization* are statistically significant variables for both groups of countries to attract FDI, although for transition countries the impact of *political globalization* occurs with a lag of at least three years. Moreover, for full models, only *social globalization* returned any statistical significance across the four different time-lags for both groups. The results for intentional and unintentional signaling mirrored the results from the main analysis – the reduced models indicate statistically significant effects of *de jure* political and social globalization and *de facto* social globalization but not of *de facto* political globalization. For the full models, the *de jure* variables – or intentional signaling – for the developing country group for both political and social globalization were the only factors that sustained their statistical significant across the four different year-lags. For transition countries, this consistency was absent, possibly due to low data points. The overall understanding from

this final set of differentiated analyses is that political globalization of the intentional type and social globalization of both the intentional and unintentional varieties are significant determinants, in a statistical sense, of FDI inflows into developing countries as well as transition countries.

## VI. Conclusions

This study allows us to draw various conclusions concerning the relationship between political and social globalization and FDI inflows. First and foremost, these two non-economic forms of globalization matter for FDI in developing and transition countries as they lower the country risk perceptions, which past research had documented as having a negative effect on FDI inflows. Second, in the case of political globalization, strategic signaling has better prospects of attracting FDI than nonstrategic signaling. Foreign investors are more impressed by a country's policy moves, such as participation in international organizations and investment treaties, than in its mundane activities of hosting foreign embassies and international NGOs. Third, for the most part, social globalization exerts positive influence on FDI inflows through both the strategic and non-strategic channels. However, for this variable too, foreign investors are more positively influenced by public policies and social systems that promote social development, encourage international engagement, and ensure social freedoms than by the presence of international agents and activities. Finally, though there exist historical differences between developing countries and transition countries, both political and social globalization influence FDI inflows to these two groups of countries, although in the case of the transition countries the influence of political globalization appears to take place with a longer lag.

An immediate implication of the findings of this study is that developing and transition countries that need to signal their investment-worthiness can economically benefit from their political and social engagement with the outside world. The further implication is that there are economic returns to political and social globalization through both strategic and non-strategic signaling. This is a novel understanding since, in discussions on globalization, economic returns are generally associated with economic globalization and not political or social globalization.

In advocating for greater political and social engagement with the global community as a means to attract FDI, this study does not imply that all FDI is beneficial to the recipient countries. There are serious and valid arguments raised by scholars concerning the possible negative impacts of FDI. But exploring them are outside the scope and direct interest of this study, although it is imperative to note that developing and transition countries be cognizant of the quality of the incoming investments. The findings and conclusions of this particular study indicate the fact that international economics is so intricately intertwined with the political and social dimensions of the global community that they have to be studied in unison to obtain a deeper and clearer understanding of the workings of the global political economy.

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## Contact address

**Raju Parakkal, Ph.D.**, Associate Professor of International Relations
College of Humanities and Sciences, Thomas Jefferson University, 4201 Henry Avenue, Philadelphia, PA 19144, USA
(raju.parakkal@jefferson.edu)

## APPENDIX: KOF Index of Globalization 2018: Structure, Variables, and Weights

| **Social Globalization, de facto** | **Weight (%)** | **Social Globalization, de jure** | **Weight (%)** |
|---|---|---|---|
| *Interpersonal Globalization, de facto* | *33.3* | *Interpersonal Globalization, de jure* | *33.3* |
| International voice traffic | 22.9 | Telephone subscriptions | 38.2 |
| Transfers | 27.6 | Freedom to visit | 31.2 |
| International tourism | 28.1 | International airports | 30.6 |
| Migration | 21.4 | | |
| *Informational Globalization, de facto* | *33.3* | *Informational Globalization, de jure* | *33.3* |
| Patent applications | 35.1 | Television | 25.2 |
| International students | 31.2 | Internet user | 31.9 |
| High technology exports | 33.7 | Press freedom | 13.2 |
| | | Internet bandwidth | 29.7 |
| *Cultural Globalization, de facto* | *33.3* | *Cultural Globalization, de jure* | *33.3* |
| Trade in cultural goods | 22.6 | Gender parity | 31.1 |
| Trademark applications | 13.3 | Expenditure on education | 30.9 |
| Trade in personal services | 25.6 | Civil freedom | 38.0 |
| McDonald's restaurant | 23.2 | | |
| IKEA stores | 15.3 | | |
| **Political Globalization, de facto** | **Weight (%)** | **Political Globalization, de jure** | **Weight (%)** |
| Embassies | 35.7 | International organizations | 37.0 |
| UN peace keeping missions | 27.3 | International treaties | 33.0 |
| International NGOs | 37.0 | Number of partners in investment treaties | 30.0 |

# *Entrepreneurship Support Agencies (ESA) and Development of Small and Medium Enterprises (SMEs) in Nigeria*

## *Agentury na podporu podnikání (ESA) a rozvoj malých a středních podniků (MSP) v Nigérii*

**OLUFEMI AMOS AKINBOLA**
**SEKINAT ARIKE SANNI**
**OMOLOLA SARIAT AKINBOLA**

**Abstract**
Small and medium scale enterprises (SMEs) are lifeblood of most economies. On the average SMEs represent over 90% of the enterprises and account for 50 to 60% of employment in most African countries. This study appraised the developmental efforts of Enterprise Supporting Agencies (ESAs) and their Contribution to Small and Medium Scale Enterprise (SMEs) Growth in Nigeria. The study adopted survey technique of which about one hundred and eighty-five (185) questionnaire were administered to selected small businesses in Lagos State, Nigeria through purposeful random sampling to get primary data that treated appropriate research questions and two hypotheses were tested accordingly. The study found that the ESAs need to advance on their primary functions of advisory and informational support and that there is a relationship between training and development of ESAs to SMEs Growth in Nigeria. The study recommends that Government should work relentlessly towards providing infrastructural support, reduction of bottlenecks of business registration and mitigate the high costs of doing business and ESAs should be properly be regulated and the role of business support should not be duplicated by other agencies to enhance efficiency.

**Keywords**
enterprise support agencies (ESAs), small and medium enterprises (SMEs), business support services, entrepreneurship

**JEL Codes**
L25, L26, M1, M19

**Abstrakt**
Malé a středně velké podniky (MSP) jsou živnou bází většiny ekonomik. V průměru představují malé a střední podniky více než 90 % podniků a ve většině afrických zemí tvoří 50 až 60 % zaměstnanosti. Předložená studie hodnotí rozvojové úsilí agentur podporujících podnikání (ESA) a jejich příspěvek k růstu malých a středních podniků (MSP) v Nigérii. Studie aplikuje průzkumnou techniku, která vychází ze sto osmdesáti pěti (185) dotazníků vybraných malých podniků ve státě Lagos v Nigérii pomocí účelného náhodného výběru, aby se získala primární data, která odpovídají na otázky výzkumu. Podle toho byly

testovány dvě hypotézy. Studie zjistila, že ESA musí pokročit v jejich primárních funkcích poradenské a informační podpory a že existuje vztah mezi výcvikem a vývojem ESA pro růst malých a středních podniků v Nigérii. Studie doporučuje, aby se vláda vytrvale snažila poskytovat podporu infrastruktury, snižovat překážky pro registraci podnikatelských subjektů a zmírňovat vysoké náklady na podnikání. Ke zvýšení efektivnosti by orgány dohledu měly mít řádně upravený status a jejich role podpory podnikání by neměla být nahrazována jinými orgány.

**Klíčová slova**
agentury pro podporu podnikání (ESA), malé a střední podniky (MSP), služby pro podporu podnikání, podnikání

## Introduction

Enterprise support agencies (ESA) are adjudged to be a basis for existence, regulation and sustainability of small and medium enterprises, they help in ensuring the successful existence of small and medium sized businesses and provide platform for their growth by organizing certain developmental program to encourage the posterity of the SMEs. (Odeh & Okoye, 2014).

According to the small and medium enterprises development agency of Nigeria (SMEDAN, 2010) 80% of SMEs goes into extinction before their 5th anniversary. Among the factors responsible for these untimely close-ups are business advisory and know how issues, inadequate training and development, tax related issues, ranging from multiple taxations to enormous tax burdens etc. In many government policies, small and medium enterprises are usually viewed and treated in the same light as large corporations. However, their size and nature makes them unique. The importance of ESAs effects on Small businesses as a mechanism of economic growth and development is often ignored. They are perceived as minute establishments that have minimal effect on the state of the economy. However, when a conducive environment is created for these small businesses to grow through proper regulation, the SME sector has the highest propensity to transform our economy. In the same light, enterprise support agencies are important for the government as they are the major source of control for government monitoring and would also assist the government to generate income in form of tax when businesses perform well which in turn are used to run government as well as provide infrastructure such as good roads, water supply and electricity which are essential for the smooth running of these businesses that are mainly manufacturing companies and at such rely on these commodities to survive.

Lawal, Raimi, & Moshood, (2014) suggested that one of the major concerns of leaders and development practitioners in developing countries of the world is that economies in recent years has not only been the promoting SMEs but also the provision of a formidable institutional framework for establishing, developing and sustaining viable small and medium scale enterprises (SMEs). An important feature among SME sector is its ability to create jobs. Vibrant SMEs sector are considered crucial in solving multivariate socio economic problems in developing economies including unemployment, low growth and poverty.

## Statement of research problems

The realization of the developmental roles of ESAs in developing MSMEs has been an age long phenomenon in Nigeria but the wrong policies and incentives coupled with business environment have continue to hamper the pivotal roles of SMEs in addressing economic problems. Also some SMEs fail to achieve sustainability due to constraints by factors such as huge operating cost and provision of non-financial services, legal constraints and subsidized interest rates among others. It is in the light of these that the concerns that ESAs strategies have now become a universal issue especially among developing mixed economies. In addition, the development of SMEs has been described as an important mechanism of enhancing economic growth and employment creation (Hamid and Bello, 2008). In similar vein, Oni and Daniya (2012) opined that government over the years have formulated several policies with a view to developing SMEs in Nigeria as they have been recognized as organs for achieving self-independence, employment creation, import substitution, effective and efficient utilization of local raw materials, and contribution to economic development of the country.

Osinde et al (2013) evidently pointed that most SMEs are mostly affected by inadequate capital base and low managerial and technical skills mainly caused by their inability to access training and advisory services of enterprise support agencies as most of SMEs are informal. However the extents to which the ESAs business advisory services have assisted the SMEs to garner training enhancing their efficiencies remain subject of contention. Also most SMEs believed that most ESAs exist for mere reasons that are not developmental to the business objectives of SMEs. (Odeh and Okoye, 2014). In view of these, the study comes up with the following hypotheses to evaluate whether;

$Ho_1$: ESAs advisory and informational support services has significant effect on the performance SMEs

$Ho_2$: There is a relationship between training and development of ESAs and SMEs growth

## Conceptual Overview

## Enterprise Support Agencies and Propositions

Businesses have been proven to survive and perform better in locations where laws and regulations guiding the affairs of businesses are favourable. Also institutions of government and private are set up for the purpose of providing support and regulating businesses. In Nigeria institutions such as small and medium enterprises development agency of Nigeria (SMEDAN), Manufacturers Association of Nigeria, (MAN), Bank of Industry (BOI) are created to encourage business creation and sustainability, however great disparities exist among nations and even among sub-societies in nations, in terms of entrepreneurial emergence and performance. (Baba 2013) Consequently, entrepreneurial development and growth has been related to environmental factors. Indeed, the quest for the causal factors for the emergence of entrepreneurs have been at the front burner of entrepreneurial and business leadership thoughts and theories, in recent time, as entrepreneurship

continued to gain popularity as a means of wealth creation and economic growth and development. Bennett (2012) highlighted that entrepreneurial emergence has been linked to environmental influence and impact. The disparities among nations in developing entrepreneurial societies through entrepreneurship support agencies have also been attributed to advisory support services, training, financial assistance and infrastructural development differences between societies both in priorities and policy implementation. It is against this background that this paper that its necessary to demystify the concept of entrepreneurship support agencies and its effects on the development of SMEs in Nigeria.

**Table 1**: Selected Entrepreneurship Support Agencies in Nigeria

| S/N | Enterprise Support Agencies | Acronym | Categorization | Purpose/Objective |
|---|---|---|---|---|
| 1 | Bank of Industry | BOI | Federal | To provide business support services and loan for SMEs. |
| 2 | Small and Medium Enterprises Development Agency of Nigeria | SMEDAN | Federal | To promote the development of micro, small and medium Enterprises (MSMEs) |
| 3 | Ministries of Commerce and Industries | MCI | State | To facilitate business activities and build capacities for the purpose of development |
| 4 | State Cooperative Division and Units. | SCDU | State | To encourage savings and reserve for credit rating and access for business. |
| 5 | Manufacturer Association of Nigeria | MAN | Industrial Org | To encourage high standard of quality for member's products through policy initiatives. |
| 6 | National Association of Small and Medium Enterprises | NASME | Industrial Org | For networking, capacity building, policy advocacy and business promotions. |

*Source: Akinbola etal, 2017*

## Conceptual clarification of SME Classifications

Small and Medium Enterprises (SMEs) has been variously defined by scholars. So there are as many definitions as there are authors depending on the purpose, objective and use of definition. The Small and Medium Enterprises Credit Guarantee Scheme (SMECGS, 2013) defined SMEs as enterprises with a total capital employed not less than N1.5 million, but not exceeding N200 million, including working capital, but excluding cost of land and/or

with a staff strength of not less than 10 and not more than 300. This paper will not adopt in a global context, a general definition of SMEs using size and scale of operation, but within the fixed co-ordinates of national boundaries, it might be relatively easier.

Small and Medium Enterprises (SMEs) as defined by the National Council of Industries (2010) refer to business enterprises whose total costs excluding land is not more than two hundred million naira (N200, 000,000.00) only. Small and medium enterprises are assumed to be steps for entrepreneurship, development and innovation. Most emerging economies (as Nigeria) have embraced the initiatives of promoting SMEs as a strategy for industrialization through entrepreneurship support organizations. This has been demonstrated by several administrations over the years, that employed monetary, fiscal and industrial measures at the macro and micro levels to assist the development of SMEs but policy inconsistencies has always barred the SMEs in the economy from consistent progress. (Oyelaran-Oyeyinka et al, 2007). The table below gives a better description of the representation of small and medium enterprises

**Table 2**: Definitions of SMEs by number of employees, turnover and asset value

| S/N | Agency | Year | Number of Employees | | | Asset Value | | |
|---|---|---|---|---|---|---|---|---|
| | | | Micro | Small | Medium | Micro | Small | Medium |
| 1 | Small and Medium Enterprises Development Agency (SMEDAN) | 2004 | <10 | 10-49 | 50-199 | N<5M | N5-<N50 | N50-<500 |
| 2 | Micro, Small and Medium Enterprises Development Fund (CBN) | 2013 | <10 | 11 | 200 | <N5m | N5M | <N500M |
| 3 | Small and Medium Enterprises Guarantee Scheme (CBN) | 2010 | NA | 11 | 300 | NA | NA | <N500M |
| 4 | Companies and Allied Matters Act | 2014 | NA | NA | NA | NA | <N1M | <N500M |
| 5 | Small and Medium Industries Equity Investment Scheme | 2003 | NA | 10 | < 300 | NA | NA | <N200M |

| S/N | Agency | Year | Number of Employees | | | Asset Value | | |
|---|---|---|---|---|---|---|---|---|
| | | | Micro | Small | Medium | Micro | Small | Medium |
| 6 | National Council on Industry | 2001 | <10 | 11-100 | 101-300 | <N1.5 | <N50M | N50M<N200M |
| 7 | Small and Medium Enterprises Development Agency (SMEDAN) | 2015 | <10 | 10-49 | 50-199 | <N10M | N10M-<N100M | N100M-<N1B |
| 8 | Central Bank of Nigeria | 2005 | <10 | 11-100 | 101-300 | <N1.5M | <N50M | <N200M |
| 9 | Central Bank of Nigeria | 2006 | NA | NA | NA | NA | NA | <N1.5B |

*Source: Akinbola etal, 2017*

## Challenges of SMEs in relation to Enterprise Support Agencies

Baba, (2013) acknowledged that most enterprise support agencies do not put continuous training, Informative learning, technological knowledge acquisition and transfer as priority and veritable source of entrepreneurship development and efficient management. Other challenges of small and medium enterprises include non-updating of SME businesses by enterprise support agencies on current industry developments and requisite tools of integrating with formal structure to make them competitive resulting to lack of the wherewithal. Again, Olajide 2010 earlier pointed that some organizations are forced to prune or right size their market force due to harsh economic conditions occasioned by poor global economy which adversely affected economy and business activities. In addition, the incessant epileptic power supply across the country and inadequate infrastructure such as roads, storage facilities, telecommunication, access to market etc. pose great challenges to these nascent enterprises. Closely related to the problem of inadequate power supply and social infrastructure is the problem of certain policies implemented through enterprise support agencies designed by government which are inimical to the growth of small and medium enterprises. An example of this can be seen in the removal of subsidies implemented by government thus aggravating the problems of small and medium enterprises without consultation and engagement of enterprise support agencies.

## Application of Oliver Hart Contract Theory to enterprise support agencies and small and medium enterprises

This work hold its footings on **Oliver Hart** contract theory (1987), in contract theory, asymmetric information arises when one of two parties engaged in a business transaction happens to have more or different information than the other. In such a situation, one party often does not know enough about the other party and fails to make an accurate decision. This circumstance leads to a potential adverse selection and moral hazard problems in business dealings. Adverse selection is a problem arising from asymmetric information which occurs before a transaction is entered into. A lender may decide not to lend money although the borrower is worthy of the loan and has the potential to make loan repayments as expected. Moral hazard is a problem of asymmetric information that arises after transition has occurred. The borrower might engage in activities that are undesirable from the lender's point of view, and this makes it less likely that the loan will be paid back. Akinbola etal (2014) have pointed out that information asymmetry is one major cause of business failure of small businesses and enterprises. According to the authors, capital and information does not always flow to small firms because of adverse selection and moral hazard, two factors that are known to have a devastating negative impact on small enterprises.

## Empirical Analysis

Miller, Godfrey, Levesque & Stark (2009) used the U.S. National Longitudinal Study of selected businesses to examine the effects of various personal characteristics among entrepreneurs and supporting agencies. They found that business advisory services appear to be more important for enterprises, while training and capacity building are more important for small and medium enterprises. They also argued that continuous access to business advisory services by Small business associations assist firm to generate higher incomes for investors in the firm. Smith, McArdle and Willis (2010) found that entrepreneurs with intermediate levels of risk tolerance survive longer than entrepreneurs with very high or very low levels of tolerance.

Likewise, in a study to investigate the effect of business development services of entrepreneurship support agencies on the performance of Small Scale enterprises, Osinde et al (2013) found out that the entrepreneurs who received business development services recorded an improvement in the growth of sales and growth in market shares on the various businesses they were operating. The study further established that those who attended the training services recorded an improvement in their businesses in terms of growth in sales and profits with 83.3% of the respondents who always attended training reporting to have good growth in profits as opposed to only 41.2% of those who never attended training.

Last, the evidence on the effects of business training on entrepreneurial outcomes is also scarce; (Kotze & Smit, 2008; Karlan & Valdivia, 2010) advocate that in many cases, basic business skill training should accompany the provision of micro and large scale

loans to improve the capacity of the businesses to utilize funds. SMEs investment training mainly addresses capital investment decisions, general business management and risk management. Therefore, a wrong decision can have long lasting effect not only on the profits but on very survival of the enterprise. Bay, Catasus & Johed (2012) researched on Management of business challenges among small and micro enterprises in Nairobi Kenya. The findings of the research indicated that over 50% of SMEs continue to have a deteriorating performance with 3 in every 5 SMEs failing within months of establishment. Only 2.5% respondents saying their businesses were very successful. The results also showed that 49.5% of those who had received training in their areas of business reported that their businesses were doing well hence the conclusion that relevant training or education is positively related to business success.

## Methodology

The research methodology adopted for the study is qualitative and was essentially driven by epistemology philosophy. Exploratory research is conducted in order to gain understanding and uncover new patterns of behavior within Nigeria framework so that conceptual theories can be developed to give detailed explanation of the nature of the data collected. For this study, 185 respondents consisting of owners and managers of selected manufacturing and import & export trading SMEs in Lagos state were purposeful and randomly sampled. Of the 185 respondents that were reached, 136 managers returned and dully filled the questionnaire, which was 73% of the total number of the respondents. A response rate of 73% is considered adequate because a survey response rate of 50% or higher is considered sufficient for analysis. (Rubin & Babbie, 2011). All the questionnaire data were given numerical inference with the aid of SPSS. In consideration of the nature of the data and the research questions, a descriptive statistical method that includes frequencies and inferential statistics was considered.

## Results, Findings and Discussion

**Table 3.1:** Distribution of respondents and response rate on Entrepreneurship Support Agencies (ESA) and Small and Medium Enterprises Development

| **Organization** | **Questionnaire administered (sampled)** | **Percentage of total response (%)** |
|---|---|---|
| Manufacturing | 95 | 54 |
| Import/Export | 90 | 46 |
| Total | 185 | 100 |
| **Managerial Category** | **Questionnaire administered (sampled)** | **Percentage of total response (%)** |
| Owners | 80 | 57 |

| | | |
|---|---|---|
| Managers | 56 | 44 |
| No of Returned | 136 | 73 |
| No of Not Returned | 49 | 17 |
| Total no of Questionnaire | 185 | 100 |

| **Variable (Advisory and Support Services)** | **Total (N)** | **Mean of Response Rate** |
|---|---|---|
| The agencies have made us known that business advisory services exist. | 136 | 2.35 |
| Business advisory services are inaccessible thereby hindering SME performance. | 136 | 3.67 |
| **Training and SME Growth** | **Total (N)** | **Mean of Response Rate** |
| ESA training for SMEs has been consistent | 136 | 2.23 |
| ESA training has the capacity to enhance SME growth if properly coordinated. | 136 | 3.68 |
| My organization has benefitted maximally from Entrepreneurship Support Agencies | 136 | 2.45 |

*Source: Field Survey 2017*

Item 1 report the mean of respondents as whether agencies have made them known that business advisory services exist. The mean score 2.35 is a suggestion of disagreement with the fact that only few amongst the respondents are aware of the services rendered by ESAs.

Item 2 report the findings in relation to accessibility of business advisory services and hindrance to SME performance. The mean score of 3.67 is subject to agreed.

Item 3 reports the findings connected to ESA training for SMEs being consistent. In the case also, the mean score of 2.23 is an indication of disagreed responses.

Item 4 report that training has the capacity to enhance SME growth if properly coordinated. The mean score 3.68 is subject to agreed.

Item 5 review responses whether SME organization has benefitted maximally from Entrepreneurship Support Agencies. The mean score 2.45 is an indication of agreed.

**Hypothesis One:**

$Ho_1$: ESAs advisory and informational support services has significant effect on the performance SMEs.

**Table 4.1:** Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .328(a) | .108 | .102 | .44359 |

*a Predictors: (Constant), ESAs advisory and informational support services*

Table 1.1 is the model summary. It shows how much of the variance in the dependent variable (performance SMEs) is explained by the model (ESAs advisory and informational support services). The R square is .108 expressed by a 10.8% of the variance in ESAs advisory and informational support services would lead to enhance SME performance.

**Table 4.2:** ANOVA(b)

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 4.082 | 1 | 4.082 | 20.747 | .000(a) |
| | Residual | 33.844 | 172 | .197 | | |
| | Total | 37.927 | 173 | | | |

*a Predictors: (Constant), ESAs advisory and informational support services*

*b Dependent Variable: enhanced SME performance*

Table 1.2 shows the assessment of the statistical significance of the result. The ANOVA table tests the null hypothesis to determine if it is statistically significant. From the results, the model in this table is statistically significant (sig = .000) and hence the null hypothesis should be rejected.

**Table 4.3:** Coefficients(a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | B | Std. Error |
| 1 | (Constant) | 3.144 | .270 | | 11.634 | .000 |
| | ESAs advisory and informational support services | .281 | .062 | .328 | 4.555 | .000 |

*a Dependent Variable: enhanced SME performance*

*Source: Field Survey 2017*

This table seeks to ascertain the variables that contributed significantly to the prediction of the dependent variable. The beta value is used to ascertain this. The beta value (.502)

indicates that SAs advisory and informational support services would lead to enhanced SME performance.

## Interpretation

From the above tables and analysis, it is valid to contribute that ESAs advisory and informational support services would lead to enhanced SME performance. This is because "p" <0.05 as indicated in the ANOVA table above. Furthermore, it is valid to conclude that enhanced SME performance is essential given the **Beta Value (.328)**

**Decision Rule**
Reject the null hypothesis ($H_{01}$) and accept the alternative hypothesis ($H_{a1}$). Therefore SAs advisory and informational support services would lead to enhanced SME performance.

**Hypothesis Two:**
$Ho_2$: There is a relationship between training and development of ESAs and SMEs growth

**Table 4.4:** Correlations

| | | Training and development of ESAs | SMEs growth |
|---|---|---|---|
| Training and development of ESAs | Pearson Correlation | 1 | 1.000(**) |
| | Sig. (2-tailed) | | .000 |
| | N | 136 | 136 |
| SMEs growth | Pearson Correlation | 1.000(**) | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 136 | 136 |

*Source: Field Survey (2017) ** Correlation is significant at the 0.01 level (2-tailed).*

**Coefficient of Determination (C.O.D)**
The coefficient of determination is obtained using the formula $C.O.D = r^2 \times 100\%$
Where r=Pearson Correlation
Thus; $C.O.D = (1.000)^2 \times 100\%$
$C.O.D = 1 \times 100\%$ i.e C.O.D = 100%

**Interpretation of results**: The Pearson correlation of r=1.000 therefore implies 100% shared variance between training and development of ESAs and SMEs growth.

The relationship between the variables (training and development of ESAs and SMEs growth) was investigated using Pearson correlation coefficient. The results from the table

above show that there is a significant correlation of (1.000) between both variables at a 0.0001 level of significance. Thus, as obtained from the table {r=1.000, p<0.0001, n=136}

**Decision**

Haven found out that there is a significant relationship between training and development of ESAs and SMEs growth, we therefore reject the null hypothesis (H0), and accept the alternative hypothesis (H1).

**Discussion of Findings**

Freiling and Laudien (2013) in his study of the effect of business advisory and informational support services on the financial performance of small scale enterprises using a sample of 113 small scale enterprises and using a survey design established that majority of the small business owners or managers had just basic education and over 57% of these business operators hardly attend any business training programmes despite the establishment that over 60% of them had little or no knowledge in business management hence were void of management skills vital in the running of their enterprises. The study also established that the performance of small scale enterprises was on average low as its corroborated our findings for hypothesis one.

In line with hypothesis two, Audretsch and Mahmood (1995) in their study of the effect of provision of micro finance and training to boost the growth of youth micro enterprises under Kenya Rural Enterprise Program (KREP) in Kisii County using a sample of 86 youth micro enterprises established that training in micro enterprise investment had a significant positive impact on the performance of the microenterprises with a standardized beta coefficient of 0.281 which indicated that a unit increase in the provision of training to SMEs resulted to a 28.1% increase in performance. The study by Ortega (2010) in Bosnia further established that majority of the respondents were very satisfied with the provision of capital investment and basic business skills training in micro enterprise investment. This suggests that the business skill training accompanying the provision of micro loans most likely improves the capacity of the entrepreneurs to use funds and hence impacts on business performance. In terms of business risk management, the results showed that respondents were moderately satisfied in terms of achievement of business risk management skills. With the implication that the SMEs were inadequately equipped with knowledge and skills of business risk management hence are unable to adequately deal with business risks and therefore in the event that such risks occur, their micro enterprises are significantly affected.

It can be encapsulated and inferred from this paper that the following applies to ESAs and SMEs in Nigeria:

i. There is a low level of awareness ESAs functions among SMEs in Nigeria.
ii. The ESAs have a great impact on developing SMEs to perform better in the economy.
iii. Training and advisory functions of ESAs for SMEs are highly beneficial for SME growth and development.

**Conclusion and Recommendations**

In this research, it has been proven that entrepreneurship support agencies have a lot of influences on the development of small and medium enterprises in Nigeria. The first element is the business advisory that indicates mainly a supportive role for the SMEs

further showing that if ESAs provides adequate business advisory services for SMEs, there are chances that performance would be influenced and failure rate would reduce for SMEs. This outcome validates the key function of ESAS in the development of SMEs. With regard to this current study, it can be inferred that SME development can be enhanced through the entrepreneurship support agencies activities in Nigeria.

The second element which also appears as significant is the training aspect of ESAs. Trainings are significant for SMEs. Since most SME organizations are more interested in the growth and advancement of their firms for global relevance.

Based on the findings of the study, the following recommendations were made:

**Entrepreneurship Support Agencies**
Entrepreneurship Support Agencies are advised to;

i. To create a more broad and accessible avenue for SMEs to know more about their operational functions as regards business advisory services and informational support they offer.
ii. An interactive web portal should also be created where SMEs can have access to training schedules of the ESAs in relation to other consulting services.
iii. Develop SME programs that would attract organizations to see the Entrepreneurship Support Agencies as supportive organizations that have the capacity to enhance SME business performance.

**Small and Medium Enterprises**
Small and Medium Enterprises should endeavour to engage the entrepreneurship support agencies in terms of communication for the ESAs to understand their needs and if possible engage the ESAs in ways of collaboration for better relevance.

**Government**
This study further recommends that government should provide necessary parameters for measuring performance of entrepreneurship support agencies in Nigeria well as to ensure that their basis and purpose of establishment are in line with best practices.

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## Contact address

**Olufemi Amos Akinbola**
Department of Business Administration, College of Management Sciences, Federal University of Agriculture, Abeokuta
(akinbolaoa@funaab.edu.ng)

**Sekinat Arike Sanni**
Department of Digital and Data Driven Marketing, University of Southampton, United Kingdom
(sekinatsanni@yahoo.com)

**Omolola Sariat Akinbola**
Department of Business and Entrepreneurship, Kwara State University, Malete
(s_omolola@yahoo.com)

# *The Effect of Financial Ratios on the Stock Prices: Evidence from the Polish Stock Exchange*

## *Vliv finančních ukazatelů na ceny akcií: aplikace na polskou burzu cenných papírů*

**MARIE LIGOCKÁ**

**Abstract**

Stock prices can be influenced by many factors; the macroeconomic factors, industrial specifics and company characteristics are three main categories. The object of this paper is to analyze relationship between selected financial ratios and stock prices of the food, energy, metallurgical and chemical companies listed on the Polish Stock Exchange (Giełda Papierów Wartościowych w Warszawie, GPW) over the 2006–2015 period. The Johansen test that investigates long-term equilibrium between stock prices and financial ratios is used. The short-run dynamics of the long-term equilibrium relationship will be examined using the Vector Error Correction Model (VECM). The panel regression method that analyze relationships between data set in two-dimensional space follows. The findings indicate the impact of the rentability, the liquidity and the financial leverage to the selected stock prices of companies listed on the GPW.

**Keywords**

financial ratios, cointegration, Poland, industry, stock exchange, panel regression

**JEL Codes**

L60, M21, O52

**Abstrakt**

Ceny akcií mohou být ovlivněny mnoha faktory, přičemž lze klasifikovat tři základní kategorie proměnných, a to makroekonomické proměnné, odvětvová specifika a charakteristiky společnosti. Cílem je analyzovat vazbu mezi vybranými finančními ukazateli a cenami akcií potravinářských, energetických, hutnických a chemických společností obchodovaných na polské burze cenných papírů (Giełda Papierów Wartościowych w Warszawie, GPW) v období 2006–2015. Johansenův kointegrační test je využit ke zkoumání dlouhodobé vazby mezi cenami akcií a finančními ukazateli. Následuje zkoumání krátkodobé dynamiky dlouhodobého rovnovážného vztahu prostřednictvím modelu korekce chyb (VECM). Využito je také metody panelové regrese, která analyzuje data ve dvourozměrném prostoru. Výsledky naznačují převažující vliv rentability, likvidity a finanční páky na ceny akcií vybraných společností obchodovaných na GPW.

**Klíčová slova**

finanční ukazatele, kointegrace, Polsko, průmysl, burza cenných papírů, panelová regrese

## Introduction

Development of stock prices and identification of the variables that can affected them is long time problematics. There are many fundamental factors that can effect stock prices. Three main categories can be defined; macroeconomic factors, industrial specifics and company characteristics. This study is oriented on company characteristics and their impact on stock prices. The importance of information in financial statements and their influence on stock prices can be found in the studies of Ball and Brown (1968) and Beaver (1968), who emphasized them as the first.

At the beginning the modern portfolio theory and model CAPM were used methodologically. But the research was extended to the Efficient Market Hypothesis (Fama, 1970). According to the theory the efficient market, all the relevant information about changes in variables are fully reflected in the current stock prices preventing investors from earning abnormal profits.

This study is focused on relationship between financial ratios and stock prices of companies listed on the GPW. The GPW is the biggest stock exchange in Central and Eastern Europe with market capitalisation 1 340 bil. PLN in March 2018. The GPW is typical by high liquidity and by many new IPOs. The 32 food, energy, metallurgical and chemical companies are analyzed. The food, energy, metallurgical and chemical industry present basic parts of every national economy. The importance of food industry is related to the provision of food to the population by the production and sale of quality and safe food. The chemical production is considered as a basic element of the production in many branches of the manufacturing industry. The metallurgical industry is the basis for the production of semi-finished products and finished products made of metal for production especially in mechanical engineering and metalworking. The energy industry generates electricity that is necessary to production in other industries and this distributed among the population. The selected industries had a share of approximately 9% of the GDP in period 2006–2015. Financial ratios include the return on assets (ROA), the return on equity (ROE), the financial leverage (FL), the debt ratio (DR), the equity ratio (ER) and the acid test (L2).

The contribution is divided into several sections: A Review of the Literature follows the Introduction. Then, the section Data and Methodology is presented, the part Findings follows, and the final section is the Conclusion.

## 1 Review of the Literature

Many studies examine the relationship between stock prices or stock returns and financial ratios, but a lot of them are focused on the developed stock markets such as markets of the USA and Asia. We can find studies oriented on Central European countries despite marginal position of their stock markets. These studies are presented in this section.

Asteriou and Dimitropoulos (2009) investigated specific ratios and their effect on stock returns of 101 non-financial firms listed at the Athens Stock Exchange from 1995 to 2004.

The results show that the ratios of working capital to total assets and net profit to sales (ROS) have a negative impact on stock returns, while the ratios of net profit to total assets (ROA) and sales to total assets affect returns positively.

Atanasov and Nitschka (2017) examined the relationship between firm size, economic risks, and stock returns. They found that the value premium in small stocks is consistently priced in the cross-section of international returns, whereas the value premium in big stocks is not. The results hold true for regional and global stock markets.

Bessler et al. (2007) analyzed the impact of fundamental variables of individual banks on stock market returns using data from a panel of 235 European banks from 1991 to 2005. The most important finding is a positive impact of the ratio of loans to total assets, the ratio of non-interest income to total income, and the ratio of off-balance sheet items to total assets on subsequent bank stock returns.

Casterén et al. (2006) examined the driving forces of the stock returns of EU banks. They used 53 EU banks and data from 1991 to 2004. They found that although short-term expected returns are mainly driven by the momentum of past returns and past leverage, over the longer term, returns showed some mean reversion to shocks.

Drummen and Zimmermann (1992) analyzed the importance of various market and sector factors to stock price volatility. They used 11 European countries over the 1986–1989. The results showed that country factors can explain 19% of the average stock variance, the impact of the world stock market is 11%, European market trends explain 8% and industrial trends 9%. Their analysis showed the importance of various market and sector factors to European stock price volatility.

Isakov and Sonney (2003) investigated the influences of industrial and country factors in international stock returns. They used data of 20 developed countries over the period 1997–2000. The findings showed the rapidly increasing impact of industry effects. The authors interpreted this result as an evidence of the increasing globalization of international stock markets.

Muradoglu and Sivaprasad (2009) explored the impact of a firm´s leverage on stock returns. They used 788 non financial companies listed on the London Stock Exchange for the period 1980–2008. Data were classified into 9 main industries: oil & gas, basic material, industries, consumer goods, healthcare, consumer services, telecommunications, utilities and technology. The results showed that leverage has a negative relation to stock returns.

## 2 Data and Methodology

The 32 food, energy, chemical and metallurgical companies listed on the GPW are used. In particular, there are 10 food firms, 6 energy companies, 5 chemical firms and 11 metallurgical companies. The list of analyzed companies are demonstrated in Table 1.

**Table 1**: Analyzed companies

| Energy companies | Food companies | Metallurgical companies | Chemical companies |
|---|---|---|---|
| Polenergia | Ambra | Drozapol | Ciech |
| Zespół Elektrociepłowni | Atlanta Poland | Stalprofil | Grupa Azoty Zakłady Azotowe Puławy |
| Grupa Lotos | Colian | Alchemia | Grupa Azoty Zakłady Chemiczne Police |
| Polski Koncern Naftowy Orlen | Gobarto | Boryszew | Synthos |
| Polskie Górnictwo Naftowe i Gazownicto | Grupa Zywiec | Cognor holding | Bioton |
| Skotan | Indykpol | Ferrum | |
| | Kruszwica | Grupy Kęty | |
| | Pepees | Impexmetal | |
| | Wawel | Mennica Polska | |
| | Wilbo | Odlewnie Polskie | |
| | | Stalprodukt | |

*Source: Authors´calculations*
*(https://www.gpw.pl/en-home)*

The market capitalisation of selected companies present 10.11% of the market capitalisation of GPW, as Table 2 shows. It means, the significant share of market capitalisation of selected companies is detected. Data with an annual frequency will be used for the period 2006–2015. Data on stock prices are from Yahoo Finance and web portal Stooq. Stock prices are measured by the average of daily values for each year. The reason is the volatility changes are not ignore.

**Table 2**: Market capitalisation of selected companies

| | |
|---|---|
| **Capitalisation of GPW** | 1, 340 bil. PLN |
| **Capitalisation of seleted companies:** | |
| Energy companies | 101.216 bil. PLN |
| Food companies | 10.059 bil. PLN |
| Metallurgical companies | 11.681 bil. PLN |
| Chemical companies | 12.569 bil. PLN |
| **Share of the selected companies** | 10.11% |

*Source: Authors´calculations*
*(https://www.gpw.pl/en-home, https://stooq.com/)*

The financial ratios of rentability, liquidity and indebtedness are used. The rentability is an important factor for investors, because the rentability reflects possibility of generating new resources and achieving the profit with using invested capital. The liquidity is important for the financial stability of the company. The ability of paying of companies liabilities is related to the enough of the financial means. But too high liquidity causes inadequately using of the capital in making profit. The indebtedness show the share of using own capital and debt financing. The acceptable high of debt financing can be positive to the rentability and that can influence stock prices.

The financial ratios included are as follows:

- the return on assets (ROA) calculated as

$$ROA = \frac{operation\ profit}{total\ assets} \tag{1}$$

- the return on equity (ROE) calculated as

$$ROE = \frac{operation\ profit}{equity\ capital} \tag{2}$$

- the financial leverage (FL) calculated as

$$FL = \frac{total\ assets}{shareholders'\ equity} \tag{3}$$

- the debt ratio (DR) calculated as

$$DR = \frac{liabilities}{total\ assets} \tag{4}$$

- the equity ratio (ER) calculated as

$$ER = \frac{own\ capital}{total\ assets} \tag{5}$$

- the acid test (L2) calculated as

$$L2 = \frac{(currents\ assets - inventory)}{short - term\ liabilities} \tag{6}$$

The ROA is related to the total effectivity of the companies and ability to generate the profit. The ROA reflects profitability of all capital resources. The ROE gives information about the profitability of the shareholders´capital. And the FL is related to the ROE. The FL present the degree of change of the ROE when the capital structure is changed. The L2 is a strong indicator of whether a company has sufficient short-term assets to cover its immediate liabilities, which can influence the financial stability of the firm. The DR provides creditors and investors with a general idea what the share of the debt financing is using by the company. And the ER shows what the share of total assets is financed by the shareholders´capital. These time series are calculated using the financial statements of the companies and database Amadeus.

Before the empirical estimations the descriptive statistics is presented in Table 3. It specifies the mean, median, maximum, minimum and standard deviation. The table shows that the maximum value of the stock prices is 86.35 PLN for chemical companies, and the minimum value is 0.57 PLN for food firms. The chemical companies are typical by the highest standard deviation, that shows the market risk.

**Table 3**: Descriptive statistics of stock prices

| Variables | Energy industry | Food industry | Metallurgical industry | Chemical industry |
|---|---|---|---|---|
| Mean | 16.6375 | 1.9100 | 14.2079 | 37.2691 |
| Median | 16.9700 | 1.6800 | 9.7365 | 28.8778 |
| Maximum | 18.0025 | 2.9600 | 51.1721 | 86.3485 |
| Minimum | 14.4730 | 0.5676 | 2.6969 | 17.2593 |
| Std. Dev. | 1.2042 | 0.5308 | 13.9856 | 21.4494 |

*Source: Authors´calculations*

Following the descriptive statistics, the methodology is presented. First, the stationarity of the time series was tested by the Levin-Lin-Chu unit root test. Then, the data were subjected to correlation analyses to determine a linear relationship between stock prices and selected financial ratios.

Then, the long-term equilibrium relationships were analyzed by the Johansen test, determining the presence of cointegrating vectors as a VAR; the equation for the considered VAR model is as follows (Johansen and Juselius, 1990):

$$\Delta Y_{it} = C_0 + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{i,t-1} + \Pi Y_{i,t-1} + \eta_{it} \quad (7)$$

where $Y_t$ is a vector of non-stationary variables, $C_0$ is a constant and $\eta_t$ is the white noise term. $\Delta Y_t$ means rate of growth or changes. The panel data set consists of N cross-sections observed over T time periods, where i presents the index for the cross-section, *t* is the index for the time dimension and *j=1,…, p* denote the number of factors in each cross-section. The variables $\Pi$ and $\Gamma$ in the matrix contain the value of the cointegrating vectors. The information in the coefficient matrix between the levels of $\Pi$ is decomposed as $\Pi=\alpha\beta'$, where the relevant elements of the $\alpha$ matrix are adjustment coefficients, and the $\beta$ matrix contains the cointegrating vectors. The first likelihood ratio for the null hypothesis of the precise *r* cointegrating vectors against the alternative *r + 1* vector is known as the maximum eigenvalue statistic. The second statistic for the hypothesis of at most r cointegrating vectors against the alternative is known as the trace statistic.

Further, the Vector Error Correction Model (VECM) that is the method to investigate the issue of causation. The method explores short-term deviations that are necessary to the achivement of the long-term equilibrium relationship between selected factors. The following VECM specification is applied:

$$\Delta y_{it} = \Pi y_{i,t-k} + \Gamma_1 \Delta y_{i,t-1} + \Gamma_2 \Delta y_{i,t-2} + \ldots + \Gamma_{k-1} \Delta y_{i,t-(k-1)} + u_{it} \quad (8)$$

where $\Delta y_t$ means rate of growth or changes, ut denotes a $n \times 1$ vector of unobservable error terms. The variables $\Pi$ and $\Gamma$ in the matrix contain the value of the cointegrating vectors.

Then, the panel regression method that analyze relationships between data set in two-dimensional space is applied, the general mathematical equation is in accordance with Brooks (2002):

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \ldots + \beta_k X_{k,it} + \varepsilon_{it} \quad (9)$$

where $Y_t$ is endogenous variable, specifically stock prices in a time *t*. $X_{it}$ present an exogenous factors, respectively trading volume in the time *i*. The coefficients $\beta 0, \ldots, \beta k$ are parameters of regression function, and ε is uncorrelated stationary random variable.

# 3 Findings

At the beginning the correlation coefficients between the stock prices and financial ratios are demonstrated in Table 4. The correlation coefficients between stock prices and the ROE are statistically significant in all cases. The stock prices of metallurgical and chemical companies demonstrate statistically significant coefficients with the ROA. The stock prices of energy, food and chemical firms present statistically significant coefficients with the FL. Then, the correlation coefficients between stock prices of energy companies, metallurgical firms, chemistry firms and the DR and the ER are statistically significant. The stock prices of food companies, metallurgical firms, chemistry companies and the L2 show statistically significant correlation coefficients. The negative correlation coefficient means, when the value of financial ratio increases, the value of stock prices fell down and vice versa. The positive correlation coefficient denotes, when the value of financial ratios increases, the value of stock prices increases and vice versa.

**Table 4**: Correlation coefficients

| Variables | Energy industry | Food industry | Metallurgical industry | Chemistry industry |
|---|---|---|---|---|
| ROA | 0.1693 | -0.0755 | -0.7566* | 0.6350* |
| ROE | -0.2440*** | 0.2570* | 0.2875* | 0.6694* |
| FL | -0.3480* | 0.0180 | -0.4207* | 0.5066* |
| DR | 0.3854* | 0.0180 | 0.6676* | -0.3424** |
| ER | 0.2606** | 0.0231 | 0.7708* | -0.3953* |
| L2 | 0.2121 | 0.4969* | -0.4538* | 0.3003** |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

Further the results of the Johansen cointegration test are shown. The Trace statistics and Max-Eigen Statistics were used. There was detected two cointegrating vectors between the stock prices of energy companies and the ROE, the FL, the DR and the ER as Table 5 shows. The results indicate that stock prices of energy companies were influenced by the ROE, the FL, the DR and the ER in the long-term.

**Table 5**: Results of the Johansen test – Energy companies

| | r=0 | r ≤1 |
|---|---|---|
| **Stock prices/ROA** | | |
| Trace Statistics | 16.03 | 6.426 |
| Max-Eigen Statistics | 18.06 | 6.426 |
| **Stock prices/ROE** | | |
| Trace Statistics | 68.90* | 44.28* |
| Max-Eigen Statistics | 43.02* | 44.28* |
| **Stock prices/FL** | | |
| Trace Statistics | 62.81* | 41.51* |
| Max-Eigen Statistics | 39.17* | 41.51* |
| **Stock prices/DR** | | |
| Trace Statistics | 137.9* | 24.13** |
| Max-Eigen Statistics | 134.7* | 24.13** |
| **Stock prices/ER** | | |
| Trace Statistics | 27.11* | 20.66*** |
| Max-Eigen Statistics | 18.97*** | 20.66*** |
| **Stock prices/L2** | | |
| Trace Statistics | 29.92* | 9.310 |
| Max-Eigen Statistics | 31.88* | 9.310 |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The existence of the short-term deviation between the stock prices and the FL and the ER was confirmed by VECM. The significance of each model is computed using the F-statistics coefficient and the coefficient R-squared (R2). According to the results the correction to the long-run equilibrium should be occurred with probability 61% (FL) and 23% (ER) as Table 6 shows. The sign of the coefficient is, negative in all cases; this indicates that an increase in financial ratios has a negative impact on stock prices of selected companies.

**Table 6**: Results of the VECM – Energy companies

| | | | |
|---|---|---|---|
| **CointEq1** | -0.6161<br>(0.03549)<br>[-17.3617] | **CointEq1** | -0.2323<br>(0.0196)<br>[-11.8262] |
| **PRICE (-1)** | 0.0821<br>(0.0557)<br>[1.4741] | **PRICE (-1)** | -0.4442<br>(0.0724)<br>[-6.1369] |
| **FL (-1)** | 0.1148<br>(0.0071)<br>[15.9938] | **ER (-1)** | -90.1190<br>(8.3384)<br>[-10.8076] |
| **Constant** | -8.7219<br>(0.8129)<br>[-10.7284] | **Constant** | -1.0960<br>(0.1375)<br>[-7.9670] |
| **R2** | 0.9071 | **R2** | 0.8009 |
| **Adj. R2** | 0.9030 | **Adj. R2** | 0.7874 |
| **F-statistic** | 219.8485 | **F-statistic** | 59.0240 |

*Source: Authors´calculations*

*Note: Standard errors are in ( ) and t-statistics is in [ ].*

Two cointegrating vectors were revealed for two models and one cointegrating vector was detected for one model in the case of food companies. According to the result it is possible to confirm that food stock prices were influenced by the ROA and the ROE in the long-term, as results in Table 7 show. Other of the selected financial ratios do not have any impact on stock prices of analyzed food companies in the long-term.

**Table 7**: Results of the Johansen test – Food companies

| | r=0 | r ≤1 |
|---|---|---|
| **Stock prices/ROA** | | |
| Trace Statistics | 166.2* | 41.56* |
| Max-Eigen Statistics | 155.5* | 41.56* |
| **Stock prices/ROE** | | |
| Trace Statistics | 184.2* | 88.48* |
| Max-Eigen Statistics | 184.2* | 88.48* |
| **Stock prices/FL** | | |
| Trace Statistics | 184.2* | 7.661 |
| Max-Eigen Statistics | 184.2* | 7.661 |
| **Stock prices/DR** | | |
| Trace Statistics | 184.2* | 7.661 |
| Max-Eigen Statistics | 184.2* | 7.661 |

| | | |
|---|---|---|
| **Stock prices/ER** | | |
| Trace Statistics | 184.2* | 7.043 |
| Max-Eigen Statistics | 184.2* | 7.043 |
| **Stock prices/L2** | | |
| Trace Statistics | 74.80* | 23.14 |
| Max-Eigen Statistics | 74.12* | 23.14 |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The short-term deviations are detected between the stock prices and the ROA and the ROE. The results of the VECM show that the correction to the long-run equilibrium should be occurred with probability 44% (ROA) and 53% (ROE) as Table 8 shows. The sign of the coefficient is, negative in the case of the ROA and the ROE; this indicates that an increase in financial ratios has a negative impact on stock prices of analyzed food companies.

**Table 8**: Results of the VECM – Food companies

| | | | |
|---|---|---|---|
| **CointEq1** | -1.4412<br>-0.0786<br>[-18.3290] | **CointEq1** | -1.5334<br>-0.0833<br>[-18.4077] |
| **PRICE (-1)** | 0.5559<br>-0.0546<br>[10.1744] | **PRICE (-1)** | 0.7252<br>-0.061<br>[11.8758] |
| **ROA (-1)** | -14.3526<br>-1.4999<br>[-9.5690] | **ROE (-1)** | -12.6233<br>-1.296<br>[-9.7401] |
| **Constant** | -1.2511<br>-0.0439<br>[-28.4898] | **Constant** | -1.0228<br>-0.0302<br>[-33.7808] |
| **R2** | 0.7969 | **R2** | 0.8024 |
| **Adj. R2** | 0.7923 | **Adj. R2** | 0.7978 |
| **F-statistics** | 170.7549 | **F-statistics** | 176.6455 |

*Source: Authors´calculations*

*Note: Standard errors are in ( ) and t-statistics is in [ ].*

Then, for three models, two cointegrating vectors were revealed. The results in Table 9 present that stock prices of the metallurgical companies were affected by the ROA, the ROE and the ER. The influence of the FL is very weak. According to the results it is possible to confirm that the ROA, the ROE, the ER and the FL have an impact on stock prices of the metallurgical companies in the long-term.

**Table 9**: Results of the Johansen test – Metallurgical companies

| | r=0 | r ≤1 |
|---|---|---|
| Stock prices/ROA | | |
| Trace Statistics | 377.4* | 57.45* |
| Max-Eigen Statistics | 360.9* | 57.45* |
| Stock prices/ROE | | |
| Trace Statistics | 207.1* | 63.27* |
| Max-Eigen Statistics | 179.2* | 63.27* |
| Stock prices/FL | | |
| Trace Statistics | 205.5* | 31.30*** |
| Max-Eigen Statistics | 210.4* | 31.30*** |
| Stock prices/DR | | |
| Trace Statistics | 173.4* | 17.02 |
| Max-Eigen Statistics | 191.9* | 17.02 |
| Stock prices/ER | | |
| Trace Statistics | 202.6* | 40.85* |
| Max-Eigen Statistics | 191.8* | 40.85* |
| Stock prices/L2 | | |
| Trace Statistics | 214.2* | 20.29 |
| Max-Eigen Statistics | 231.9* | 20.29 |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

According to the VECM there are short-term deviations between the stock prices and the ROA and the ROE. The correction of short-term deviations should be occurred with probability 34% (ROA), 72% (ROE) and 83% (ER). The sign of the coefficient is, negative; this indicates that an increase in financial ratios has a negative impact on stock prices of selected metallurgical companies how the results in Table 10 determine.

**Table 10**: Results of the VECM – Metallurgical companies

| | | | | | |
|---|---|---|---|---|---|
| **CointEq1** | -0.3489<br>(0.0123)<br>[-28.3357] | **CointEq1** | -0.7254<br>(0.0198)<br>[-36.6463] | **CointEq1** | -0.8373<br>(0.0186)<br>[-44.8288] |
| **PRICE (-1)** | -0.1916<br>(0.0384)<br>[-4.9793] | **PRICE (-1)** | 0.0125<br>(0.0205)<br>[ 0.6117] | **PRICE (-1)** | 0.0776<br>(0.0156)<br>[ 4.9782] |
| **ROA (-1)** | -16.9163<br>(3.3799)<br>[-5.0049] | **ROE (-1)** | -3.1035<br>(0.3693)<br>[-8.4033] | **ER (-1)** | -2.9330<br>(0.3768)<br>[-7.7838] |

| | | | | | |
|---|---|---|---|---|---|
| **Constant** | -6.7344<br>(0.1809)<br>[-37.2281] | **Constant** | -8.8650<br>(0.3329)<br>[-26.6272] | **Constant** | -6.5843<br>(0.2089)<br>[-31.5192] |
| **R2** | 0.9094 | **R2** | 0.9307 | **R2** | 0.9716 |
| **Adj. R2** | 0.9073 | **Adj. R2** | 0.9290 | **Adj. R2** | 0.9706 |
| **F-statistic** | 427.0231 | **F-statistic** | 570.9875 | **F-statistic** | 958.7451 |

*Source: Authors´calculations*
*Note: Standard errors are in ( ) and t-statistics is in [ ].*

The findings for the chemical companies prove that it is not possible to confirm that the selected financial ratios belong to the economic fundamentals that affect the stock prices of chemical companies in the long-term, as Table 11 shows.

**Table 11**: Results of the Johansen test – Chemical companies

| | r=0 | r ≤1 |
|---|---|---|
| **Stock prices/ROA** | | |
| Trace Statistics | 170.0* | 10.22 |
| Max-Eigen Statistics | 173.5* | 10.22 |
| **Stock prices/ROE** | | |
| Trace Statistics | 85.49* | 3.710 |
| Max-Eigen Statistics | 99.89* | 3.710 |
| **Stock prices/FL** | | |
| Trace Statistics | 46.81* | 11.16 |
| Max-Eigen Statistics | 48.07* | 11.16 |
| **Stock prices/DR** | | |
| Trace Statistics | 17.91*** | 14.21 |
| Max-Eigen Statistics | 13.07 | 14.21 |
| **Stock prices/ER** | | |
| Trace Statistics | 32.48* | 8.054 |
| Max-Eigen Statistics | 35.02* | 8.054 |
| **Stock prices/L2** | | |
| Trace Statistics | 45.72* | 14.23 |
| Max-Eigen Statistics | 43.73* | 14.23 |

*Source: Authors´calculations*
*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The panel regression is next method to examine which of selected financial ratios can affect stock prices of selected companies. The results for energy companies Table 12 shows. The coefficients of the ROE, the FL, the ER and the ER are statistically significant,

that means these financial ratios can have an impact on the stock prices of the energy companies. The influence of the ROE, the FL and the ER is, negative and the impact of the DR is positive. This means, the increase of the ROE, the FL and the ER should cause an decease of stock prices of energy companies and vice versa. The increase of the DR should cause an incease of the stock of energy companies and vice versa. The positive influence of the DR is in accordance with the theory, because debt financing can be cheaper then using of the own capital. The equation can be defined as:

Stock prices = 22.1051 + 19.0352 ROA – 0.3562 ROE – 0.1178 FL + 0.9653 L2 + 2.0523 DR
(0.0000) (0.0003) (0.2016) (0.0026) (0.0190) (0.2740)
– 81.0783 ER
(0.0006)

**Table 12**: The panel regression – Energy companies

| Variables | Coefficients | Probability |
|---|---|---|
| **Constant** | 22.1051* | 0.0000 |
| **ROA** | 19.0352 | 0.0003 |
| **ROE** | -0.3562* | 0.2016 |
| **FL** | -0.1178** | 0.0026 |
| **L2** | 0.9653 | 0.0190 |
| **DR** | 2.0523* | 0.2740 |
| **ER** | -81.0783* | 0.0006 |
| **Durbin-Watson statistics** | 2.1 | |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The findings for food firms Table 13 show. The coefficients of the ROA, the ROE, the FL, the L2 are statistically significant, that means these financial ratios can have an influence on the stock prices of the food companies. The impact of the ROA and the FL is, negative and the impact of the ROE and L2 is positive. This means, the increase of the ROE and the L2 should cause an incease of stock prices of food companies and vice versa. The increase of the ROA and the FL should cause an decrease of the stock of energy companies and vice versa. The positive influence of the ROE and L2 is consistent with the theory, and the negative impact of the FL is in accordance with the empricial literature. The equation can be defined as:

Stock prices = 0.4092 – 30.7909 ROA + 36.7686 ROE + 8.0002 FL + 0.3500 L2 + 0.1298 DR
(0.0130) (0.0000) (0.0000) (0.0001) (0.0012) (0.5337)
– 20.1706 ER
(0.0002)

**Table 13**: The panel regression – Food companies

| Variable | Coefficients | Probability |
|---|---|---|
| **Constant** | 0.4092** | 0.0130 |
| **ROA** | -30.7909* | 0.0000 |
| **ROE** | 36.7686* | 0.0000 |
| **FL** | 8.0002* | 0.0001 |
| **L2** | 0.3500* | 0.0012 |
| **DR** | 0.1298 | 0.5337 |
| **ER** | -20.1706* | 0.0002 |
| **Durbin-Watson statistics** | 2.04 | |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The results of the panel regression for metallurgical companies Table 14 shows. The coefficients of the ROA, the ROE, the FL, the L2 and the ER are statistically significant, that indicate these financial ratios can have an influence on the stock prices of the metallurgical firms. The impact of the ROA and the L2 is negative that indicate that an increase in this financial ratios can caused the decrease of stock prices and vice versa. And the influence of the ROE, the FL and the ER is positive that means increase of this financial ratios should cause an increase of the stock prices and vice versa. The equation of the panel regression can be defined as:

Stock prices = 13.3335 – 64.6899 ROA + 11.2304 ROE + 1.3022 FL – 2.9477 L2 –
(0.1758) (0.0000) (0.0000) (0.0000) (0.0349)
42.2584 DR + 16.8773 ER
(0.1175) (0.0000)

**Table 14**: The panel regression – Metallurgical companies

| Variable | Coefficients | Probability |
|---|---|---|
| **Constant** | 13.3335 | 0.1758 |
| **ROA** | -64.6899* | 0.0000 |
| **ROE** | 11.2304* | 0.0000 |
| **FL** | 1.3022* | 0.0000 |
| **L2** | -2.9477** | 0.0349 |
| **DR** | -42.2584 | 0.1175 |
| **ER** | 16.8773* | 0.0000 |
| **Durbin-Watson statistics** | 1.9 | |

*Source: Authors´calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

The outcomes of the panel regression for chemical companies in Table 15 show that all coefficients are statistically insignificat. These results confirm there is not influence

of selected fiancial ratios to the stock prices of chemical companies. The findings are consistent with results of the Johansen cointegration test in Table 11. The equation of the panel regression can be defined as:

Stock prices = – 613.5333 + 612.9169 ROA – 12.5411 ROE + 27.4729 FL +99.7919 L2 +
(0.4442) (0.2755) (0.8711) (0.7245) (0.5218)
49.5414 DR + 1, 716.241 ER
(0.8168) (0.3975)

**Table 15**: The panel regression – Chemical companies

| Variable | Coefficients | Probability |
|---|---|---|
| **Constant** | -613.5333 | 0.4442 |
| **ROA** | 612.9169 | 0.2755 |
| **ROE** | -12.5411 | 0.8711 |
| **FL** | 27.4729 | 0.7245 |
| **L2** | 99.7919 | 0.5218 |
| **DR** | 49.5414 | 0.8168 |
| **ER** | 1,716.241 | 0.3975 |
| **Durbin-Watson statistics** | 1.97 | |

*Source: Authors' calculations*

*Note: *, ** and *** denote significance at the 1%, 5% and 10% levels.*

## Conclusion

The objective of the paper was to analyze relationship between stock prices of food, energy, metallurgical, chemical companies and selected financial ratios. The Johansen cointegration test and the panel regression were used to examine long-term equilibrium relationship between the stock prices of the selected companies and the ROA, the ROE, the L2, the ER, the DR and the FL. The short-run dynamics of the long-term equilibrium relationship was examined using the Vector Error Correction Model (VECM). The results show statistically significant links that is consistent with Drummen and Zimmermann (1992) who confirm the importance of various market and sector factors to the stock prices.

According to the Johansen cointegration test the stock prices of energy firms were affected by the ROE and the FL, the stock prices of food companies and the stock prices of metallurgical firms were influenced by the ROA and the ROE. None of selected financial ratios had an impact on stock prices of chemical companies. The positive relationship was revailed between stock prices, the ROA and the ROE, that is consistent with Asteriou and Dimitropoulos (2009) who confirmed the positive effect of rentability to stock returns. The negative link can be detected with energy companies and metallurgical companies. These

results can be caused by the findings of negative value of the ROA and the ROE; or by their decreases in some years. The results are consistent with theory.

The influence of the FL to the stock prices is mainly negative, that is in the accordance with Muradoglu and Sivaprasad (2009) who showed the negative impact of the financial leverage to the stock returns. The positive effect is detected in some cases. These findings are caused by prevailing influence of positive leverage effect or negative leverage effect to the stock prices. Moreover the method of the panel regression confirmes the influence of the FL and the L2 on stock prices of food companies and the influence of the L2 on stock prices of metallurgical companies. Some of linkages were validated differently by the Johansen test and by the panel regression, specifically for energy companies. The difference of results can be related to the using of different methods, this fact is confirmed by empirical studies; e.g. Petcharabul and Romprasert (2014).

The results of the long-run equilibrium relationship were supplemented by using VECM estimations to analyze short-term dynamics. The results confirm the existence of the short-term deviations between the stock prices of the food and metallurgical firms, the ROA and the ROE and the stock prices of the energy companies and the FL.

According to the results it is not possible to make general conclusion. But the findings indicate mainly the impact of the rentability, the liquidity and the financial leverage to the selected stock prices of companies listed on the GPW.

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## Contact address

**Ing. Marie Ligocká**
Silesian University in Opava, School of Business Administration in Karviná,
Univerzitní náměstí 1934/3, 733 40 Karviná, Czechia
(ligocka@opf.slu.cz)

# *The Key Factors in the Textile Industry*
## *Klíčové faktory v textilním průmyslu*

DAVID MAREŠ

**Abstract**
The author has concerned himself with the key factors of the textile industry. From the point of view of the branch specifics of the textile industry, these factors are considered to be the number of units, the number of employed individuals, the gross value added, work productivity, exports, imports and the balance. The development of these key factors has been investigated on the basis of their year-on-year growth, the average growth coefficient and their mutual dependency as designated by the Pearson correlation coefficient. Given the specific characteristics of the textile industry which faces a high degree of competition and has a pro-export focus, the key factors have been analysed from several points of view, such as the point of view of the employees, i.e. the number of units and the number of employed individuals, the sustainability of these key factors in the past (using the average growth coefficient) and the stability shown by these units in a year-on-year comparison. This is followed by the area of performance, i.e. an investigation into the gross value added and work productivity and the sustainability and stability of these performance factors in the past. The factors involved with the openness of the textile industry in relation to imports and exports, i.e. not only how stable and sustainable these factors are, but also what influence they have on the performance indicators, have also been subsequently investigated. The following conclusions have been reached on the basis of the aforementioned indicators; all of the investigated variables have displayed growth with the exception of the number of employed individuals, so it is therefore possible to consider them to be sustainable, while exports and imports have a fundamental influence on the performance of the branch which is measurable by means of the value added and the work productivity.

**Keywords**
textile industry, performance, gross value added, exports, imports, balance

**JEL codes**
F10, F17, J01

**Abstrakt**
Příspěvek se zabývá klíčovými faktory textilního průmyslu. Z hlediska odvětvových specifik textilního průmyslu se za tyto faktory považuje počet jednotek, počet zaměstnaných osob, hrubá přidaná hodnota, produktivita práce, vývoz, dovoz a saldo. Vývoj těchto klíčových faktorů byl zkoumán na základě jejich meziročního růstu, průměrného růstového koeficientu a jejich vzájemné závislosti, jak je stanoveno korelačním koeficientem Pearson. Vzhledem ke specifickým charakteristikám textilního průmyslu, který čelí vysokému stupni konkurence a má proexportní zaměření, byly klíčové faktory analyzovány z několika hledisek, například z pohledu zaměstnanců, tj. počtu jednotek a počtu zaměstnaných osob, udržitelnosti těchto klíčových faktorů v minulosti

(s použitím průměrného růstového koeficientu) a stability těchto jednotek v meziročním srovnání. Následuje oblast výkonu, tj. šetření hrubé přidané hodnoty, produktivity práce, udržitelnosti a stability těchto výkonnostních faktorů v minulosti. Následně byly zkoumány také faktory spojené s otevřeností textilního průmyslu ve vztahu k dovozu a vývozu, tj. nejen to, jak jsou tyto faktory stabilní a udržitelné, ale také vliv, který mají na ukazatele výkonnosti. Na základě výše uvedených ukazatelů bylo dosaženo těchto závěrů: Všechny zkoumané proměnné vykazovaly růst s výjimkou počtu zaměstnaných osob, takže je lze považovat za udržitelné. Vývoz a dovoz mají zásadní vliv na výkonnost odvětví, která je měřitelná pomocí přidané hodnoty a produktivity práce.

**Klíčová slova**
textilní průmysl, výkonnost, hrubá přidaná hodnota, vývoz, dovoz, saldo

## Introduction

Every branch is specific due to its production, its pro-export orientation and its dependency on other branches within the framework of supplier and/or customer relations. In the case of an open branch of industry, i.e. where there are no entrance and exit barriers within the framework of international trade, we can ask how the performance indicators, such as the gross value added and work productivity, are influenced by exports and imports in the given branch. At the same time, it is also not possible to omit other key factors which concern each branch and influence its stability (measured in accordance with the year-on-year change) and sustainability (measured using the average growth coefficient). These key factors can be divided into the employee perspective (measured on the basis of the number of units and the number of employees) and the international trade perspective (measured on the basis of exports, imports and the balance of trade).

We can characterise the specific nature of textile production as follows "Textile production (CZ-NACE13, author's note), which is then further divided into cotton, silk, linen and woollen production depending on the used raw material. The production of the majority of textile products involves several technological levels. It includes the fields of spinning, weaving and finishing and the production of other textiles. The textile industry belongs to those sensitive branches which face a great deal of competition in the global market, especially on the part of third countries. For all that, however, the textile industry in the Czech Republic has a pro-export focus. From an overall point of view, it can be said that the competitive influences of imports from abroad are substantially projected into the economic earnings and that the branch is subject to fashion trends."[1]

As far as the selection of the suitable performance indicators is concerned, we can pay special attention to the stage which the company (branch) finds itself in. "The authors of the paper have analysed the dependence of the following ratios on the growth rate of growing companies: the ratios of profitability, liquidity, current assets and solvency, the

1 *The Ministry of Industry and Trade of the CR (2017) p. 73.*

break-even point, the revenue per employee, average costs, labour costs, capital costs, capacity utilisation and productivity."[2]

The authors have also further developed the given dependency between the indicators of financial and non-financial performance and company growth (we can apply this to the branch) and have reached the following conclusions: "The result of our analysis clearly indicates that there is a relationship between various financial and non-financial ratios and the growth of a particular company. A relationship has been found between the measure of a company's profitability, liquidity, "current assets", average revenue per employee, costs, price of capital and productivity and the growth of a growing Slovenian company in the manufacturing industry. These results have allowed us to conclude that, when comparing the values of those measures of business performance, managers and entrepreneurs also have to take into account the company's growth. On the other hand, no such relationship has been found in the case of the rate of return on equity, solvency, the price of a company´s debt, the relative break-even point and the price of labour."[3]

The given issue also concerns the fact that "It is very clear that there are many substantive differences between young and old companies. Many differences are both statistically significant and large in magnitude. Young companies tend to be overrepresented in the three high growth performance groups: Star, Growth Focus and High Growth. Young companies are underrepresented in all other performance groups and are the least likely to be Low Growth (only 6.5%). Young companies also tend to exhibit a "U" shaped profit relationship. In other words, young companies have a tendency to be *either* high *or* low in terms of profitability, but are less likely to have mid-range profitability."[4]

The issue of evaluating the overall performance of the branch using benchmarks in the specific market also involves the fact that "Even though it is very important in a company´s overall performance, the indebtedness of a company is not important in itself, if the funds are used well (the profitability issue) and the debt repayments are regular (the liquidity issue). The case of the market leader in the Slovenian dairy processing industry presented in this paper has showed that the debt reduction was significant in both absolute and relative terms. It also had an impact on the profitability measured by the ROA and ROE indicators. This indicated that the borrowed money was used properly in the service of the core business and that debt reduction and credit crunch created problems in the Slovenian diary industry, as represented here by the market leader. So, both the hypotheses of this research have been confirmed. Of course, debt reduction cannot take all the blame for any bad results: profitability increased in the last observed year (2014). There are numerous factors which could be analysed, such as prices, competition, milk quotas in the past, capacity usage (which is approximately up to 70% – IMAD, 2008), productivity and efficiency. This could be explored in further research."[5]

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*2 PONIKVAR, N., M. TAJNIKAR and K. PUŠKIN (2009), p. 1.*

*3 PONIKVAR, N., M. TAJNIKAR and K. PUŠKIN (2009), p. 12.*

*4 STEFFENS, P. DAVIDSSON and J. FITZSIMMONS, J (2009), p. 14.*

*5 MUMINOVIĆ, S. (2016), p. 29.*

The following information exists with regard to the sales level benchmark: "The overall objective of a business enterprise is to earn at least a reasonable return on the funds invested, which is consistent with maintaining a sound financial position. The present research paper aims at focusing the objectives to appraise the profitability performance from the point view of the sales levels and to analyse the profitability performance from the point view of investments. The gross margin reported the ups and downs over the study period."[6]

When talking about export oriented companies, it is also necessary to take the influence of the exports on working capital[7] into account.

If we summarise the aforementioned information and take into account the basic economic theory, we become aware of the fact that the goal of a company's efforts is to maximise its profits. We can define this maximisation of profits as the achievement of the greatest possible revenue with the lowest possible costs. If we break the given assumption down using company economics, we arrive at the following conclusion that, if a company has fixed costs and variable costs, the growth in revenues (through sales) must also be accompanied by growth (under regular conditions) in the total variable costs (more products also mean higher total variable costs). We can also consider the above-proportional growth of costs (especially fixed costs as represented by production capacity). The efficiency of the maximisation of profit is then mainly achieved on the basis of savings in fixed costs (the same level of fixed costs at a bigger volume of production) and/or by the difference between the product price in costs (or purchases) and the sales price. Nevertheless, if we analyse company reports and the availability of the statistical data on the given branch, we discover that the gross value added indicator comes closest to the aforementioned concept of company efforts. Nevertheless, it is also necessary to take other factors such as price rises into account. In the case of new branches, their life cycle or the cycles of the companies contained within them, the types of companies (production, sales) and the typology of the companies particularly have an impact on the activity indicators which may lead to a distortion of the indicators, for example with regard to the turnover of the total assets and fixed assets in sales companies, so that these indicators no longer make sense, because they do not include the assets designated for production and as such these indicators may look better than those for a production company.

With regard to the characteristics of the textile branch, it is absolutely necessary to analyse the stability of the key factors of the given branch using a statistical apparatus and at the same time to diagnose the performance "drivers" and the sustainability of the given branch.

*6 KUMAR, P. and M. REDDY (2013), p. 12.*

*7 OLBRECHT, V. and J. POLÁK (2015).*

**Table 1**: The division of CZ-NACE 13 according to the individual groups

| | |
|---|---|
| 13.1 | The treatment and spinning of textile fibres and yarn |
| 13.2 | Weaving textiles |
| 13.3 | Textile finishing |
| 13.91 | The production of miscellaneous textiles |

*Source:* [8]

# 1 The methodology

The author of the research used statistical methods when analysing the statistical data, specifically the average growth coefficient, the year-on-year growth rate and the Pearson correlation coefficient. These methods were applied to the individual variables of the textile industry, whereby the average growth coefficient was intended to evaluate the positive or negative developments in 2009–2016. Similarly, the year-on-year change should indicate the stability on a year-on-year basis. The Pearson correlation coefficient then reveals the main drivers of the key factors in the textile industry and their influences.

## 1.1 The average growth coefficient

The average growth coefficient expresses the time series dynamic. "If this coefficient is multiplied by one hundred, it shows by how many percent of the value in time t-1 the value in time t has grown."[9]

**The average growth coefficient:**

$$\bar{k} = \sqrt[r-1]{\frac{y_2}{y_1} * \frac{y_3}{y_2} * \ldots * \frac{y_r}{y_{r-1}}} = \sqrt[r-1]{\frac{y_r}{y_1}} \quad (1)$$

*Source:* [10]

Where:
y = is the given investigated variable in the given year
r = the number of the growth coefficient

8 *The Ministry of Industry and Trade of the CR (2017), p. 73.*

9 *ARTL, J., M. ARTLOVÁ and E. RUBLÍKOVÁ (2002), p.15.*

10 *ARTL, J., M. ARTLOVÁ and E. RUBLÍKOVÁ (2002), p.15.*

## 1.2 The year-on-year growth rate

We can express the year-on-year growth rate both as a percentage (see the growth rate below) and in absolute terms. The year-on-year growth rate tells us how the given variable has changed as a percentage in comparison with the previous year. On the other hand, the absolute increase quantifies the given change in absolute terms.

**The growth rate:**

$$\text{The growth rate} = \frac{(y_t - y_{t-1})}{y_t} \tag{2}$$

*Source:* [11]

**The absolute increase:**

$$\text{The absolute increase} = y_t - y_{t-1} \tag{3}$$

Source:[12]

Where:
$y_t$ = the variable in a given year
$y_{t-1}$ = the variable in the previous year.

The absolute increase and the growth rate are dynamic functions; see "The dynamic function will be created by means of the dynamic characteristics of the absolute increase, the growth rate or the change coefficient and their relations".[13]

## 1.3 The Pearson correlation coefficient

When analysing the statistical data, the research used the Pearson correlation coefficient which is used in causal relations. "Any dependency of the variables gives rise to the natural question as to whether this is substantial or not, i.e. how strong the given relationship is. However, a correlation is most frequently understood in statistics as a mutual and linear relationship between the variables."[14]

**The Pearson correlation coefficient**

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}} \tag{4}$$

*Source:*[15]

*11 ARTL, J., M. ARTLOVÁ and E. RUBLÍKOVÁ (2002), p.14.*

*12 ARTL, J., M. ARTLOVÁ and E. RUBLÍKOVÁ (2002), p.15.*

*13 MIHOLA, J., P. WAWROSZ and J. KOTĚŠOVCOVÁ (2017,) p. 10.*

*14 PECÁKOVÁ, I. (2008), p. 177.*

*15 ŠKALOUDOVÁ, A. (2016).*

"The correlation coefficient ends up with values ranging from -1 to 1. A zero value means the linear (i.e. not any) dependence of the monitored pair of variables, while the correlation coefficient is in the range of plus ± 1, if there is a functional dependency, where the value of one is unequivocally derived from the value of the second variable on the basis of the line equation. The sign expresses a direct or indirect linear dependency and the size of the coefficient in the stated interval can therefore be interpreted as the greater or lesser intensity of this dependency."[16]

# 2 Data

## 2.1 Research into growth

**Table 2**: The number of units

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Number of units | 2,123 | 2,601 | 2,828 | 3,151 |
| Growth rate | | 22.52% | 8.73% | 11.42% |
| Growth coefficient | | 1.225 | 1.087 | 1.114 |

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Number of units | 2,715 | 2,520 | 2,424 | 2,293 |
| Growth rate | -13.84% | -7.18% | -3.81% | -5.40% |
| Growth coefficient | 0.862 | 0.928 | 0.962 | 0.946 |

*Source: own calculations based on the data*[17]

The number of units measured by the growth rate did not fall beneath the minimum value which was achieved in 2009. The greatest change occurred in 2010, when the growth in comparison with 2009 was 22.52%.

**Table 3**: The number of employed individuals

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Number of employed individuals | 27,343 | 25,449 | 25,641 | 25,537 |
| Growth rate | | -6.93% | 0.75% | -0.41% |
| Growth coefficient | | 0.931 | 1.008 | 0.996 |

16 *PECÁKOVÁ, I. (2008), p. 178.*

17 *The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Number of employed individuals | 25,012 | 24,744 | 25,395 | 25,845 |
| Growth rate | -2.06% | -1.07% | 2.63% | 1.77% |
| Growth coefficient | 0.979 | 0.989 | 1.026 | 1.018 |

*Source: own calculations based on the data [18]*

The number of employed individuals in the given branch reached its lowest value in 2013, which does not correspond to the lowest value in the number of units. As far as the stability in the number of employed individuals is concerned, we can speak about a branch which has not experienced significant changes in excess of 7%.

**Table 4**: Gross value added

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Gross value added in millions of CZK | 11,463 | 11,804 | 12,409 | 12 44 |
| Growth rate | | 2.97% | 5.13% | -2.94% |
| Growth coefficient | | 1.030 | 1.051 | 0.971 |

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Gross value added in millions of CZK | 12 829 | 14 282 | 13 817 | 14 280 |
| Growth rate | 6.52% | 11.33% | -3.26% | 3.35% |
| Growth coefficient | 1.065 | 1.113 | 0.967 | 1.034 |

*Source: own calculations based on the data [19]*

As a performance indicator, the gross value added has developed at a stable level, whereby it only experienced a fall in the 2012/2011 and 2015/2014 periods (with a fall to its maximum value of -3.26%), but it experienced growth in the other years.

**Table 5**: Work productivity

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Work productivity in millions of CZK (Gross value added/number of employed individuals) | 0.419230 | 0.463830 | 0.483951 | 0.471629 |
| Growth rate | | 10.64% | 4.34% | -2.55% |
| Growth coefficient | | 1.106 | 1.043 | 0.975 |

18 *The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

19 *The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Work productivity in millions of CZK (Gross value added/number of employed individuals) | 0.512914 | 0.577190 | 0.544083 | 0.552525 |
| Growth rate | 8.75% | 12.53% | -5.74% | 1.55% |
| Growth coefficient | 1.088 | 1.125 | 0.943 | 1.016 |

*Source: own calculations based on the data [20]*

The work productivity copied the development of the value added and the number of employed individuals, whereby the negative year-on-year development did not exceed 6%. In this regard, we can speak of stable development in the year-on-year comparison.

**Table 6**: The balance

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Balance in millions of CZK | 6,505 | 5,967 | 7,864 | 8,591 |
| Growth rate | | -8.27% | 31.79% | 9.24% |
| Growth coefficient | | 0.917 | 1.318 | 1.092 |

*Source: own calculations based on the data [21]*

We can consider the stability of the development of the textile industry to be very good, not only with regard to the positive balances in the individual years, but also with regard to the fact that no strongly negative developments occurred in relation to the previous year during the investigated period.

**Table 7**: Exports

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Exports in millions of CZK | 39,571 | 42,654 | 48,508 | 49,363 |
| Growth rate | | 7.7911% | 13.7244% | 1.7626% |
| Growth coefficient | | 1.0780 | 1.1370 | 1.0180 |

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Exports in millions of CZK | 51,450 | 58,231 | 60,9756 | 64,152 |
| Growth rate | 4.2279% | 13.1798% | 4.7123% | 5.2103% |
| Growth coefficient | 1.0420 | 1.1320 | 1.0470 | 1.0520 |

*Source: own calculations based on the data [22]*

*20 The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

*21 The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

*22 The Ministry of Industry and Trade of the CR (2017), p. 73–78.*

We can consider the rate of export development to be positive in all the given years on the basis of the year-on-year changes. Every year saw an increase in comparison with the previous year. We can therefore speak of stable positive development.

**Table 8**: Imports

| Year | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Imports in millions of CZK | 33,066 | 36,687 | 40,644 | 40,772 |
| Growth rate | | 10.9508% | 10.7858% | 0.3149% |
| Growth coefficient | | 1.11 | 1.1080 | 1.0030 |

| Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Imports in millions of CZK | 43,280 | 49,495 | 50,948 | 53,658 |
| Growth rate | 6.1513% | 14.36% | 2.9357% | 5.3191% |
| Growth coefficient | 1.0620 | 1.1440 | 1.0290 | 1.0530 |

*Source: own calculations based on the data*[23]

The import situation copied that of exports. As such, this involved permanent imports which increased their growth rate every year without a single fall in any year.

## 2.2 The dependency research

### 2.2.1 Exports and gross value added

**The Pearson correlation coefficient (exports and gross value added):**

$$r = \frac{\sum_{i=1}^{n} (VA_i - \overline{VA})(E_i - \overline{E})}{\sqrt{\sum_{i=1}^{n} (VA_i - \overline{VA})^2 \sum_{i=1}^{n} (E_i - \overline{E})^2}} \quad (5)$$

*Source: own calculations based on* [24]

Where:
r = the Pearson correlation coefficient (exports, value added)
E = exports
VA = value added

After calculating the result, we arrive at a Pearson correlation coefficient (exports and value added) of 0.9585

*23 The Ministry of Industry and Trade of the CR (2017), p. 73–78.*
*24 ŠKALOUDOVÁ, A. (2016).*

### 2.2.2 Exports and work productivity

**The Pearson correlation coefficient (exports and work productivity):**

$$r = \frac{\sum_{i=1}^{n} (PL_i - \overline{PL})(E_i - \overline{E})}{\sqrt{\sum_{i=1}^{n} (PL_i - \overline{PL})^2 \sum_{i=1}^{n} (E_i - \overline{E})^2}} \quad (6)$$

*Source: own calculations based on*[25]

Where:
r = the Pearson correlation coefficient (exports, work productivity)
E = exports
PL = work productivity

After calculating the result, we arrive at a Pearson correlation coefficient (exports and productivity) of 0.9264.

### 2.2.3 Imports and value added

**The Pearson correlation coefficient (imports and gross value added):**

$$r = \frac{\sum_{i=1}^{n} (VA_i - \overline{VA})(I_i - \overline{I})}{\sqrt{\sum_{i=1}^{n} (VA_i - \overline{VA})^2 \sum_{i=1}^{n} (I_i - \overline{I})^2}} \quad (7)$$

*Source: own calculations based on*[26]

Where:
r = the Pearson correlation coefficient (exports, imports)
I = imports
VA = gross value added

After calculating the result, we arrive at a Pearson correlation coefficient (imports and gross value added) of 0.9712.

*25 ŠKALOUDOVÁ, A. (2016).*

*26 ŠKALOUDOVÁ, A. (2016).*

### 2.2.4 Imports and work productivity

**The Pearson correlation coefficient (imports and work productivity):**

$$r = \frac{\sum_{i=1}^{n} (PL_i - \overline{PL})(I_i - \bar{I})}{\sqrt{\sum_{i=1}^{n} (PL_i - \overline{PL})^2 \sum_{i=1}^{n} (I_i - \bar{I})^2}} \quad (8)$$

*Source: own calculations based on*[27]

Where:
r = the Pearson correlation coefficient (exports, the number of units)
I = imports
PL= work productivity

After calculating the results, we arrive at a Pearson correlation coefficient (imports and work productivity) of 0.9451

# 3 The results

## 3.1 The growth coefficients for the individual factors

**The average growth coefficient (the number of units)** is: 1.011038 which we can interpret by stating that the indicator of the number of units in the monitored period increased on average by 1.011038 times every year or that the number of units in the monitored period increased by an average of 1.1038%.

**The average growth coefficient (the number of employed individuals)** is 0.991988. This shows that the given indicator fell by 0.991988 times every year in the monitored period. The second possible interpretation is that the number of employed individuals fell every year on average by 0.8012%.

**The average growth coefficient (gross value added)** is 1.031896, which we can interpret as showing that the value added indicator increased on average by 1.031896 times every year in the monitored period or that the number of units in the monitored period increased on average by 3.1896%.

**The average growth coefficient (work productivity)** is 1.040341, which we can interpret as showing that the value added indicator increased on average by 1.040341 times every year in the monitored period or that the number of units in the monitored period increased on average by 4.0341%.

*27 ŠKALOUDOVÁ, A. (2016).*

**The average growth coefficient (balance)** is 1.070658, which we can interpret as showing that the balance indicator increased on average by 1.070658 times every year in the monitored period or that the balance in the monitored period increased on average by 7.0658%.

**The average growth coefficient for exports** is 1.07145, which we can interpret as showing that the balance indicator increased on average by 1.07145 times every year in the monitored period or that the balance in the monitored period increased on average by 7.145%.

**The average growth coefficient for imports** is 1.071716, which we can interpret as showing that the balance increased on average by 1.071716 times every year in the monitored period or that the balance in the monitored period increased on average by 7.1716%.

## 3.2 The strength of the dependency of the selected factors

The result of the Pearson correlation coefficient (exports and gross value added) is 0.9585. We can therefore interpret this as showing that a strong linear dependency exists between the value added and exports, whose development is strongly projected into revenues from sales of own products, goods and services and therefore strengthens the performance in relation to the market.

The result of the Pearson correlation coefficient (exports and productivity) is 0.9264. We can therefore interpret this as showing that productivity is strongly influenced by exports.

The result of the Pearson correlation coefficient (imports and gross value added) is 0.9712. We can therefore interpret this as showing that imports strengthen the performance of the measured gross value added.

The result of the Pearson correlation coefficient (imports and work productivity) is 0.9451. This therefore involves a strong dependency between performance and productivity.

## The conclusions

The textile branch has been investigated from the point of view of several key factors: the number of units, the number of employed individuals, the value added, the work productivity, the balance, the exports and imports.

The textile branch has been selected for the reason that it is one of those sensitive branches which face a high degree of competition and which underline this fact through their pro-export orientation. The key factors have been investigated on the basis of statistical methods, i.e. the year-on-year growth rate, the average growth coefficient and

the Pearson correlation coefficient. The key factors were investigated in the time period of 2009–2016.

From the point of view of the year-on-year growth, the number of units (number of business entities) did not report any significant changes, with the exception of the 2010/2009 comparison, and we can characterise the key textile branch factor pertaining to the number of business units as being stable (with regard to growth) within the context of the overall growth coefficient for the period (2009–2016): see the table below.

The key factor of the number of employed individuals did not display any significant fluctuations in the given period within the general context of the overall growth coefficient (2009–2016), but it does have a falling value: see the table below.

The value added reported falls and growth which did not exceed the value of 11%, but for all that its overall value grew within the context of the overall period.

Work productivity showed a higher value of positive growth than falls within the year-on-year comparisons. In general, work productivity grew the most out of all the investigated indicators, i.e. the number of units, the number of employed individuals and the gross value added.

**Table 9**: Growth coefficients

| Variable | Average percentage growth |
|---|---|
| Number of units (growth) | 1.1038% |
| Number of employed individuals (fall) | 0.8012% |
| Gross value added (growth) | 3.1896% |
| Work productivity (growth) | 4.0341% |
| Balance (gross) | 7.0658% |
| Exports | 7.145% |
| Imports | 7.1716% |

*Source: own calculations*

We can also reach the conclusion that the development of the number of employed individuals has not copied the growth in the number of units in the textile industry. The gross value added has not achieved the same degree of growth as work productivity. Work productivity has grown more quickly than value-added. Exports and imports have shown the greatest growth of all the investigated variables, which indicates the strong export and import orientation of the textile industry. The development in the growth of the balance has further confirmed this.

On the basis of the investigated factors (2009–2016), we can speak of a positive development of the balance (the balance was positive in all the years).

**Table 10**: The strength of the dependency in relation to exports

| Variables | Correlation coefficient |
|---|---|
| Exports and gross value added | 0.9585 |
| Exports and work productivity | 0.9264 |

*Source: own calculations*

The strength of the dependency of the gross value added key performance indicator on exports is born out by the result of the correlation coefficient (exports and value added). The result of 0.9585 shows a strong dependency between value added and exports, i.e. gross value added is strongly influenced by exports.

Nevertheless, the growth rate for exports is higher than the growth rate for gross value added and, if we take into account the fall in the number of employees, we can also ponder whether the textile branch is sufficiently profitable with regard to its export rate (whether it is capable of selling export goods for a sufficiently high price).

**Table 11**: The strength of the dependency in relation to imports

| Variables | Correlation coefficient |
|---|---|
| Imports and gross value added | 0.9712 |
| Imports and work productivity | 0.9451 |

*Source: own calculations*

The aforementioned values clearly show the strong dependency of the value added on imports and we can therefore state that value added is strongly influenced by imports. This is subsequently projected into revenues for sold goods when accounting for this sales margin. Imports therefore influence value added and work productivity.

**Table 12**: The overall characteristics of the textile branch from the point of view of its individual variables

| Variable | Characteristic |
|---|---|
| Number of units | Minimal growth in the last 8 years, large fluctuations in growth in year-on-year changes: given the ability of specific companies to absorb the fluctuations in the growth of the year-on-year changes, we can consider the given branch to be stable and sustainable from the point of view of the prospects for the number of units. |

| Variable | Characteristic |
|---|---|
| Number of employed individuals | The number of employed individuals has seen a fall in the last 8 years: given the number of units (growth), it is possible to assume that this has involved a fall caused by the implementation of more modern technology which has substituted the labour force. |
| Gross value added | The performance of the given branch is increasing, mainly with regard to the increase in the number of units: we can therefore speak of growth in the performance of the given branch in the long term period of 2009–2016, despite the slight increase in competition. |
| Work productivity | Work productivity is increasing at a faster rate than the performance measured by the gross value added, which inclines us to assume that human work has probably been substituted with technology (the growth in the number of units, the growth in the gross value and the fall in the employed individuals) |
| Balance | The balance is positive and it has developed with 7% growth per annum. We can consider this characteristic to be positive from the point of view of the national economy. |
| Exports and gross value added | On the basis of the results, we can state that there is a strong dependency between exports and performance which indicates that exports are a significant driver for performance. |
| Exports and work productivity | Exports contribute to work productivity to a significant extent: given the strong dependency between performance and exports and the fall in the workforce, we can state that performance (gross value added), strongly influenced by exports, is a significant driver for productivity. |

| Variable | Characteristic |
|---|---|
| Imports and gross value added | Imports contribute to the performance of the given branch to a significant extent: given the fact that the majority of imports are realised without any local production capacities (imports occur), we can therefore assume that imports are admittedly a significant driver of performance in the branch, but at the expense of employment in the given branch. |
| Imports and work productivity | Imports contribute to the performance of the given branch to a significant extent and given the development in employment we can postulate that greater work productivity has been achieved, albeit at the expense of "employment": this means simply the strengthening of work productivity by increasing gross value added influenced by imports. |

*Source: own calculations*

In general, we can characterise the textile branch as being stable for companies which are already functioning in the given market and have done so since the beginning of the measurement of the key factors for the given branch, i.e. from 2009, on the basis of the data from 2009 to 2016. The textile branch is growing from the point of view of the number of companies, albeit with large year-on-year fluctuations, especially in the increases in the number of companies. From the point of view of the national economy, the number of employed individuals is falling with slight year-on-year fluctuations, which we can take to mean, for example, the greater participation of technological advances or the substitution of employees with technology. The performance of the branch is increasing and it has achieved significant growth in relation to the previous investigated variables (employment, the number of units), which we can characterise as being generally positive for company owners. Work productivity is increasing more quickly than the gross value added (the performance indicator) and it can be assumed that this involves the substitution of the workforce with technology, both with regard to the increase in the number of companies and the falling employment and to the increase in performance. Exports and imports have maintained more or less the same tempo, which indicates that commercial and production activities are not being substituted in individual companies or in the given branch, from which we can postulate that the ratio of production (export) and sales (import) activities in the given branch is stable and that there is no fall in employment as a result of a reduction of production companies at the expense of sales companies. Given that the balance of trade is positive (and stable), we can consider the given branch to have good prospects, to be a branch which is not threatened by foreign trade and likewise to be a branch which is not influenced by customs barriers during

exports or which would not be in need "protection" against imports from the point of view of the national economy. On the basis of the aforementioned information, we can characterise the given branch as a stable and competitive branch on the basis of the data investigated within that branch. In the author's opinion, further investigation could concern yourself with the predictability and outlook for the given branch.

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## Contact address


**Ing. David Mareš, M.B.A., Ph.D.**
University of Finance and Administration, Faculty of Economic Studies, Department of Finance / Vysoká škola finanční a správní, Fakulta ekonomických studií, Katedra financí (28352@mail.vsfs.cz)

# *Bargaining Power: Significance, Structure and Development*

## *Vyjednávací síla: Význam, struktura a vývoj*

JAN ČERVENKA

**Abstract**

In game theory, the bargaining problem is defined as an exchange of utilities between negotiators. Assumptions used in game theoretical solutions are often partially or fully not applicable in real situations. The outcome of the bargaining also depends on the parameter called bargaining power. This parameter, although usually neglected or perceived only as static, determines to a large extent on which negotiator will succeed with his idea of the distribution of utilities. Paper focuses on the identification of the elements of bargaining power, the possibilities of their exploration and development. Bargaining power is described as a combination of facts and abilities that can be variable during bargaining. The paper analyses these facts and abilities, divides them into individual parts and suggests, how to influence them both immediately and in the long run.

**Keywords**

game theory, bargaining problem, bargaining solution, bargaining power

**JEL Codes**

C70, C71, C79

**Abstrakt**

V teorii her je vyjednávací problém definován jako výměna užitků mezi vyjednávajícími. V řešeních nabízených teorií her nacházíme celou řadu předpokladů, které aplikaci těchto řešení v reálných situacích zcela nebo částečně neumožňují. Výsledek vyjednávání závisí také na parametru nazvaném vyjednávací síla. Tento parametr, ač obvykle opomíjený nebo vnímaný jen jako statický, v podstatné míře rozhoduje o tom, kdo z vyjednávajících prosadí svoji představu o rozdělení užitků. Identifikaci elementů vyjednávací síly, možnostem jejich zkoumání a rozvoje se věnuje tento příspěvek. Vyjednávací síla je popsána jako kombinace faktů a schopností, která může být proměnlivá v průběhu vyjednávání. Příspěvek analyzuje tyto fakta a schopnosti, rozčleňuje je na jednotlivé části a navrhuje, jakým způsobem je ovlivnit jak okamžitě, tak v dlouhodobém horizontu.

**Klíčová slova**

teorie her, vyjednávací problém, vyjednávací řešení, vyjednávací síla

## Introduction

Bargaining is a complex activity that can be analysed from many different angles and disciplines. The outcome of the bargaining depends on the mutual interaction of two or more subjects with their own will and usually different ideas about the outcome of the bargaining. The result of bargaining cannot be easily deduced and depends on both the starting point, the negotiator's ability and the bargaining process. The game theory system, which deals with the analysis of conflict situations and the search for appropriate strategies, is therefore a suitable tool for analysing the bargaining situation. In terms of a complex theory, it is possible to analyse the bargaining situations and, according to the chosen conditions, to identify the appropriate strategies and the optimal solution.

The combination of bargaining and game theory has been evident since the beginning of this field of study. Virtually all conflict situations require some form of bargaining. Formally, within the game theory, this issue was defined by J. Nash in his paper "The Bargaining Problem" (1950). Bargaining is understood as a way of distributing utility among bargaining parties. There is a set of all possible bargaining results *(S)* within which the problem is sought. Bargaining begin at the point of disagreement *d*, on which players are able to agree without bargaining. If there is still space for utility increase, there is bargaining on its division. To find a solution, it is necessary to determine the criteria to meet this solution. One of these criteria introduced by Nash is an axiom of symmetry, which can be interpreted as equality of bargaining power. Kalai (1977) then generalized this solution also for cases of inequality of bargaining power, but it is still based on the assumption of their known proportions.

There are a number of definitions of bargaining power – according to the Merriam-Webster Encyclopedia, bargaining power is defined as: "the relative capacity of each of the parties to a negotiation or dispute to compel or secure agreement on its own terms"[1] .

Most authors in the field of game theory focus primarily on the mathematical side of the problem and therefore simplify and formalize the problem in order for it to be processed mathematically and to allow the creation of a model of the bargaining situation. This, however, undermines the importance of bargaining power as a significant and often decisive influence. The reason is that bargaining power is a combination of given and variable factors that together create a dynamic power complex. Determining the distribution of bargaining power or some bargaining power value is virtually impossible due to the complexity and mutual interaction of individual factors. We can get a certain idea only in retrospect, based on the results of concrete bargaining, or simply by selecting a factor that is known and that can be expected to have a major influence on the bargaining, such as market share, capital resources, etc.

The actual bargaining is, in reality, a dynamic process where the position of the parties can change substantially during the bargaining. Compared to model situations, the parties do not have perfect information, they may evaluate known facts differently and the way they use them depends not only on their skills and knowledge, but also on motivation,

*1 https://www.merriam-webster.com/dictionary/bargaining%20power*

opinions, emotions and determination. It is therefore somewhat meaningless from this perspective to talk about the mathematical solution to the bargaining problem. For a successful bargaining it is all the more important to understand the meaning of the term "bargaining power" and how it can be influenced both for oneself and for other parties.

The paper aims to identify the factors that make up the bargaining power, their description and the proposal of methods to influence them in favour of the bargaining party. It is based on the expectation that, based on this analysis, it will be possible to propose recommendations for the development of bargaining power over the long term as well as immediately during the bargaining.

## 1 Literature review

In the literature, bargaining power is interpreted in various ways and rather marginally in many publications.

In the article that defined the bargaining problem, its conditions, and solutions corresponding to these conditions, John Nash assumes equality of bargaining power as one of the conditions for its solution (Nash, 1950, p. 159).

In their book "Theory of Games and Economic Behavior", which is the basic literature for the study of game theory, the authors take into account the different bargaining powers, see for example (Neumann a Morgenstern, 2007, p. 18242). However, they treat the differences in bargaining power as a task parameter, rather than a specific subject of investigation, and as such they do not further specify bargaining power. The authors of the generalized Nash solution approach the distribution of bargaining power similarly (Harsanyi a Selten, 1972), taking into account the asymmetry in the bargaining.

In the paper General Theory of Bargaining (Pen, 1952, p. 27), the author promisingly states: "What are the factors that determine the results of the bargain? The answer to this question should not be a bare summing up of these factors, but the interplay between the factors and the way they influence the final result should also be made clear. The factors should be systematized in a scheme of reference that can serve as a tool in analyzing concrete bargaining processes." Unfortunately, the author continues by focusing on constructing a form of profitable function of parties based on the risk taken by bargaining parties. On each factor, the author states the following: "The determining factors of the ophelimity[2] functions may be very complicated. " Despite that, there are at least three factors following from the author's considerations that affect negotiation, namely the date by which the bargaining must be concluded, the elasticity of demand and the possibility of substitution.

The bargaining power related to the price of disagreement is developed further also by other authors. In their book Collective Bargaining, Chamberlain and Kuhn (1965, p. 170) define the bargaining power of trade unions as "management's willingness to agree to the

*2 Usefulness– https://en.oxforddictionaries.com/definition/ophelimity*

union's terms" and, according to the authors, "management's willingness in turn depends upon the cost of disagreeing with the union terms, relative to the cost of agreeing to them." Svejnar (1986) extends the idea even further, stating: "the bargaining outcome in our model can be described for each party in terms of its disagreement utility, bargaining power, and fear of disagreement" His concept of bargaining power, however, also does not analyse its individual aspects and does not address the possibilities of direct influence.

A number of other works on bargaining theory are virtually ignorant of bargaining power, such as (Stevens, 1958), which deals in particular with the subjective interpretation of facts by the bargaining parties and the impact of this subjectivity on the bargaining.

In other sources, which even have the term "bargaining power" in the title, such as (Roson a Hubert, 2015), or (Sarkar, 2013), this power is only taken as a given attribute used for further calculations and is not further studied. It is also the case of Dlouhý and Fiala (2015), and, to a large extent, also in "Bargaining in dynamic markets"(Manea, 2017), which deals with another interesting aspect of bargaining power, namely its evolution over time, based on the results of previous bargaining. Assuming different bargaining results, the bargaining power distribution may change in the following rounds of bargaining!

Lecraw (1984) is more specific. As a source of bargaining power of international corporations compared to local firms, he shows the possibility of cost optimization in international structures, ownership of better technology, sufficient capital for investment and lower cost of capital, existing distribution channels abroad, and usually also management experience in leadership and investment. Another view in terms of the need to provide trade credit is provided by Fabbri and Klapper (2016). In their paper "Bargaining power and trade credit", they derive bargaining power of suppliers versus customers from the relative share of the customer in the supplier's turnover, information advantage, the quality of the product supported by guarantees and certificates.

Perhaps the most detailed discussion of bargaining power can be found in Spaniel (2014, p. 7). In the chapter "What Is Bargaining Power?" he lists its five sources: "(1) control over proposals, (2) patience, (3) the attractiveness of alternatives should bargaining break down, (4) knowledge of the opposition's preferences, and (5) the credibility of one's threats and promises." Even this division, however, does not affect all aspects of the bargaining power, and thus it does not allow it to be monitored and managed.

The problem of the difference in research in social and natural sciences is comprehensively discussed for example by (Ochrana, 2013). Hayek (1995, p. 28) has also dedicated a whole book, which argues in detail the differences between facts in the natural and social sciences: "Most of what social or human activity focuses on are not really 'objective facts' in that special, narrower sense of the word, in which this term is used in science, as opposed to 'opinion', and cannot be defined at all in physical terms. In terms of human activity, things are what the acting person thinks they are." The fact that the assessment and perception of reality of people is not perfect, and is usually distorted, is described by behavioral economics, for example (Kahneman, 2012).

# 2 Bargaining in game theory and alternative approaches

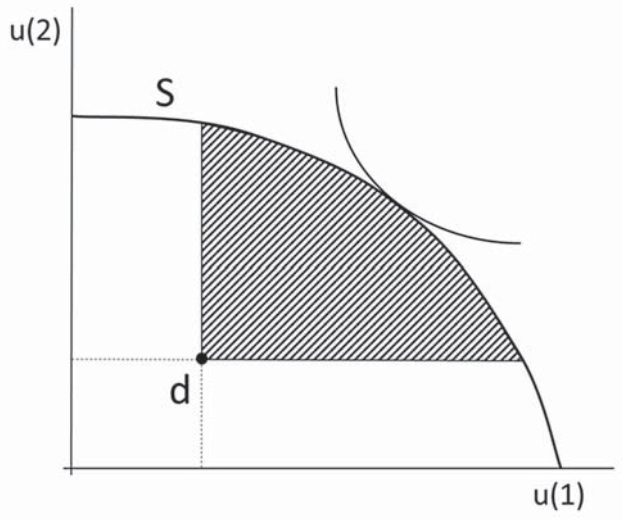
Bargaining is a complex activity present in human life in many different forms from birth to death. According to J. F. Nash (1950), bargaining is a way of exchanging utility, and from this point of view, a great deal of interpersonal interaction is a type of bargaining. There are different ways of exploring it, emphasizing various aspects of the bargaining process. The representative ones include:

## 2.1 Game Theory and Bargaining Problem

In game theory, which deals with the relations of independent parties with the possibility of independent decision-making and with own actions that affect other parties, bargaining is mainly the focus of the so-called "cooperative game theory". It examines how parties can achieve additional utility, income or another advantage by mutual cooperation, and how they can then divide this additional utility.

The basis for cooperative games can be found in John F. Nash's article "The Bargaining Problem" (1950). Here, Nash defines the bargaining problem a set S of all possible distributions of additional utility that can be gained through mutual cooperation. It also determines the point of disagreement d, from which the actual bargaining takes place – it comes from a point where there is disagreement with the way utility is distributed, or it can be placed at a zero point.

**Figure 1**: Nash's bargaining problem




*Source: Author, based on Nash (1950)*

The utility obtained for the first party is marked *u(1)* and *u(2)* for the second party. Nash also defines axioms that must be met by the solution to the problem. These are: Pareto efficiency and individual rationality, symmetry, independence of scale, and independence of irrelevant alternatives. Nash proposes a solution to a bargaining problem (the so-called Nash solution) that meets these axioms as a maximum product of the additional utilities:

$$max[u(1^*) - u(1^0)][u(2^*) - u(2^0)] \quad (1)$$

where *u(1*)* and *u(2*)* represent the utilities of the parties at the bargaining solution point, $u(1^0)$ and $u(2^0)$ represent utilities at zero point or at a point of disagreement if they agree on it.

Other authors subsequently suggested further solutions with more or less altered axioms. The most well-known ones are the so-called equilibrium solution, in which the parties share the utility equally:

$$[u(1^*) - u(1^0)] = [u(2^*) - u(2^0)] \quad (2)$$

utilitarian solution that maximizes the combined utility:

$$max\{[u(1^*) - u(1^0)] + [u(2^*) - u(2^0)]\} \quad (3)$$

and Kalai-Smorodinsky solution, which maintains the maximal benefits ratio:

$$[u(1^*) - u(1^0)]/[u(2^*) - u(2^0)] = [\max u(1^*) - u(1^0)]/[\max u(2^*) - u(2^0)] \quad (4)$$

All these solutions, which bring different results, are based on the principle of symmetry, which can be interpreted as equal bargaining conditions and powers.

The existence of different bargaining powers is reflected in the dictator solution, where one party gains maximum utility at the expense of the other, and therefore assumes the ability of the party to enforce such a solution. However, such a form of asymmetry is quite extreme.

The different conditions of parties are also addressed by the authors of the "generalized Nash's solution" (Harsanyi a Selten, 1972), which takes into account the ration of bargaining powers:

$$max[u(1^*) - u(1^0)]^{\alpha}[u(2^*) - u(2^0)]^{\beta} \quad (5)$$

where $\alpha$ and $\beta$ are real numbers are greater than zero and their relative ratio determines the ratio of bargaining powers. Still, however, the ratio of these powers, which can fundamentally affect the distribution of the commonly obtained utility, is understood to be a fixed given quantity.

Another important factor that can fundamentally affect the final distribution is the point of disagreement *d*. All solutions are based on this point and it is therefore advisable not to underestimate its settings during bargaining. A better informed and prepared negotiator can use the setting of the point of disagreement to gain an advantageous bargaining position.

In terms of exact calculations, even the assumption of the same perception of facts is contentious. Human beings are not identical – they assess facts based on many influences such as knowledge, experiences, opinions, etc., which are created and changed throughout one's life. So the same facts for one negotiator can be an attractive opportunity, the other one will see a risky situation with an uncertain result. Subjectivity of perception is discussed by authors of the Austrian economic school as (Hayek, 1995, p. 28), or (Mises, 2006, p. 18). Through the bargaining process, it is possible to reconcile these views, at least to a certain extent, but it is completely unrealistic to eliminate the differences in perception.

For practical use, the way of expressing utility is also somewhat problematic, as it that depends on individual preferences. Utility as such is difficult to quantify. For this reason, in economic applications utility is usually replaced it by another variable, such as by yield, which can be better measured and used further. This simplification is possible, but one should be aware of it all the time. For example, an explanation of many seemingly irrational decisions can be found in the emotional impact of alternatives on the utility of the parties.

## 2.2 Program on Negotiation at Harvard Law School

Another approach to bargaining is represented by the Program on Negotiation at Harvard Law School. Since 1983 they have been working on the bargaining theory and its practical application. The basic principles on which the research is based are described in the book "Getting to Yes" (Fisher a Ury, 1987) – it is focusing on solutions as opposed to positional bargaining and on key principles: Separate the people from the problem, Focus on interests, not positions, Invent options for mutual gain and Insist on objective criteria. The fundamental idea Fisher and Ura introduced is the role of the BATNA (Best Alternative To a Negotiated Agreement). BATNA is related to preparation for meetings and means clarifying what alternative options the bargaining party has, i.e. what is the minimum outcome for which it is worth to bargain. Thus, BATNA largely corresponds to the point of disagreement known from cooperative games, both in importance and in the way of use.

This creates the theoretical framework and further papers and authors elaborate on these principles and develop techniques for different bargaining situations and conditions.

The principles of the Harvard Program on Negotiation are based more on the bargaining reality, where information is limited, its meaning has different interpretations, and bargaining is a way of seeking or even creating benefit for negotiators. This benefit is subjective, corresponds to economic utility, and the bargaining process aims to find creative possibilities to meet the needs of the bargaining parties.

## 2.3 Practical bargaining according to the FBI

Even though the Harvard Program on Negotiation is focused on practical application, it lacks in approaching subjectivity and in particular the emotional aspect of bargaining.

After becoming thoroughly acquainted with the program, Chris Voss, the former FBI chief negotiator, whose negotiating skills were developed in often extreme practical situations, says: "... no matter how we dress up our negotiations in mathematical theories, we are always an animal, always acting and reacting first and foremost from our deeply held but mostly invisible and inchoate fears, needs, perceptions, and desires. That's not how these folks at Harvard leamed it, though. Their theories and techniques all had to do with intellectual power, logic... They had a script to follow, a predetermined sequence of actions, offers, and counteroffers designed in a specific order to bring about a particular outcome. It was as if they were dealing with a robot..." (Voss a Raz, 2016)

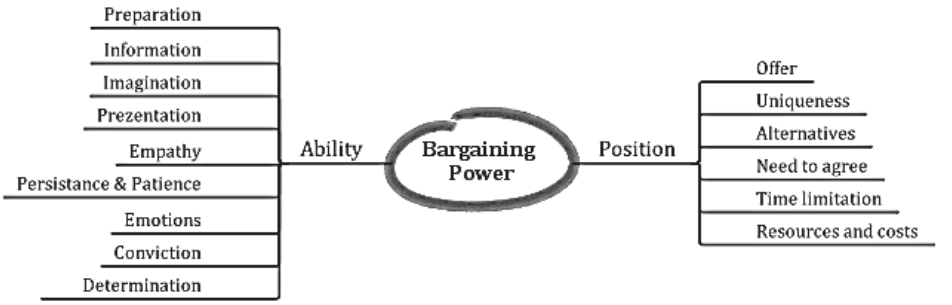
In his book "Never Split the Difference: Negotiating As If Your Life Depended On It" (2016), Voss describes practice-proven methods of working in tense situations with facts and emotions of both others and one's own. The theoretical model developed by the FBI, BCSM (Behavioral Change Starway Model), is based on the psychology of Carl Rogers and includes five phases: active listening, empathy, rapport, influence and behavioral change. Within this model, Voss describes various practice-proven techniques such as silence, mirroring, naming emotions, paraphrasing, and others contributing to a deep understanding of the situation of the other, and subsequently influencing the perception of the other side in a desirable way. At the same time, he deals with the actual emotions that affect the way a negotiator can cope with the unpleasant moments when the partner is aggressive when a lot is at stake, or when he must be unyielding and insist on achieving the best conditions.

## 3 Bargaining power

It follows from the above that even the best theoretical model of bargaining, based on perfect information, will be limited in practice. The outcome of bargaining depends most on the complex of facts, information and their interpretation, abilities and decisions, which can be summed up under the term "bargaining power".

To study bargaining power and to identify how bargaining power can be developed, it is first necessary to describe it and identify its essential parts. One of the possible divisions is shown in the following picture:

**Figure 2**: Components of bargaining power



The basic proposed division is to bargaining position, i.e. facts that are more or less given, and to bargaining ability, which can, to a large extent, influence the perception of the bargaining position and which can be substantially influenced and developed over the long term.

## 3.1 Bargaining position

Bargaining positions include factors describing what the party can offer and other circumstances related to this offer. These include, for example, the uniqueness of the offer, whether it is substitutable either directly or by substitutes, and whether there is interest in the offer among other parties. An important factor influencing the bargaining position is the need to agree and any time constraints. A party that needs to reach an agreement for a variety of reasons, such as a lack of funds, is much more open to concessions, as well as a person who has to conclude the bargaining by a certain point, either due to the departure of a plane or end of a period for which certain objectives are set.

A separate issue conditioning the bargaining position concerns resources available to the party and the costs incurred by the bargaining. These directly affect the need to agree, the ability to extend the bargaining and other parameters.

Although the bargaining position is seemingly objectively given, it is always a question what meaning the facts for the bargaining parties have.

## 3.2 Bargaining ability

The bargaining ability includes a set of abilities that fundamentally influence what can be achieved with the original bargaining position. Also important is the possibility to develop the bargaining ability both during the bargaining and in the long term. Specifically, the bargaining ability can be divided into the following components:

**Preparation** – includes the activities before the start of bargaining, in particular the question: "What game are we playing?", defining tasks for the preparation of bargaining, and especially clarifying one's BATNA (Best Alternative To A Negotiated Agreement), which contributes significantly to the advantageous setting of the point of disagreement in the bargaining problem.

**Information** – it is a substantial power that can lead both to strengthening and to substantially weakening one's own positions. Getting the maximum information and providing only desirable information about oneself is therefore an important negotiator's job. It is information about the bargaining position of the parties, as well as about their strategy, personalities, opinions, emotions, relationships in teams, etc. In particular, information about the needs and motivation of the counterparty is a necessary starting point for formulating a suitable offer.

**Imagination** – a very important ability of the negotiator. The ability to introduce possible scenarios and strategies, alternatives to the required one, which would meet the needs of the counterparty, etc., improves the negotiator's options.

**Presentation** – one thing is the facts, another thing is their interpretation. The ability to present facts in a desirable way and to persuade the counterparty about the truthfulness of this presentation is certainly desirable.

**Empathy** – understanding the counterparty – no real agreement can be reached without understanding. It is necessary to understand the other side and on the basis of this understanding can one then build a strategy for gaining the maximum utility.

**Persistence** – Many negotiations are decided mainly because of persistence or patience. It is not just about using the time constraint of the counterparty, but also about gaining time for further bargaining and convincing the counterparty, and often also about using the counterparty's loss of concentration or its fatigue, etc.

**Emotion** – The ability to work with emotions, both with one's own and with the counterparty's emotions, is a significant part of the bargaining power. Bargaining is a complex process that is necessarily influenced by emotions, and whoever underestimates this dimension of bargaining can be very surprised by the unexpected reactions of both the counterparty and his own.

**Conviction** – includes a wide range of opinions, prejudices and attitudes acquired by upbringing, experience and other ways we often are not aware of, but which can substantially influence our judgment, decision-making and behavior.

**Determination** – is an important aspect of bargaining, which is usually not taken into account during bargaining. It is the motivation to achieve the best or desired result. Strong determination augments all other abilities. Interestingly, for the counterparty, the negotiator's determination need not be only negative. For example, if the negotiator is convinced of the correctness of a mutually advantageous agreement, then his determination will lead to the search for ways to reach such an agreement.

These aspects of the bargaining power can be further divided, for example, what information needs to be found, what the uniqueness of the offer depends on, etc. If we have identified the key components of the bargaining power, we can express them for example as follows:

**Figure 3**: Complex bargaining power


## 3.3 Possibility to influence bargaining power

To predict and influence the outcomes of bargaining situations, the question of how much bargaining power can be influenced both during the actual bargaining and by long-term cultivation of the negotiator's bargaining power is essential. It was for this purpose that the bargaining power had to be divided into individual, definable and measurable parts. What cannot be tracked and measured is difficult to influence.

The possibility to influence results already from the actual division. The facts about the bargaining position at a given time can be influenced only minimally, but with the help of bargaining ability it is possible to influence their perceptions, by extending the bargaining we can achieve a change of situation, or by understanding the counterparty we can change the bargaining conditions so that they better suit the negotiator and at the same time satisfy the counterparty. The main part of influencing the bargaining power leads through bargaining abilities, both through their use in bargaining and by their long-term development.

The possibilities of long-term development of one's own bargaining powers are obvious. Like all abilities, it is possible to develop these as well. The breakdown of bargaining abilities

allows both a specific development for individual areas and a general overview allowing to prevent deficiencies in one of the areas, which could lead to failures. For example, a negotiator who does not manage his own emotions can, at one moment of anger, waste weeks of work and bargaining he has done so far. The ways of developing abilities will vary in different areas. From simple education for understanding the bargaining process, through practical training with feedback to profound psychological work with emotions, beliefs, etc.

To immediately influence the bargaining power, it is necessary to realize that the ratio of bargaining powers is not a static variable but a dynamic one. Any further information can bring about change, each further bargaining is an opportunity for a better understanding of the other party and its motivations. A committed negotiator usually has a variety of tools to tilt the odds to his advantage. From this point of view, persistence is associated with a firm belief that an advantageous agreement can be reached is a rational assumption that contributes to improving the negotiator's results.

At the same time, attention to the bargaining power and its individual parts is likely to lead the negotiator to being better able to identify, what bargaining situations are worth entering, and thus reduce the risk of unsuccessful attempts.

To a certain extent, shortcomings in the bargaining abilities can be compensated. One option is to set up a negotiating team involving members with different strengths, complementing each other appropriately. In such a case, it is necessary to lay down clear rules and thus work as a team. With poor coordination, mutual rivalry, and lack of communication in the team, this strategy may further weaken the bargaining position.

Another option is procedural – based on an analysis of best practices, one can develop for each bargaining area a description of best practices and appropriate questions, which can partly offset the experience and ensure that some important steps are not omitted. They can take the form of simple lists or forms, so they will be practically usable. It is not possible to completely influence all areas in this way, for example emotional stability, but in others such as preparation or presentation it can ensure that the required procedures and a suitable structure are maintained.

## Conclusions

The work using different bargaining approaches explores bargaining power, the possibility to monitor, measure and manage it. It is based on the game theory, it points to some aspects that are limiting for practical use and compares it with other approaches. In game theory, the bargaining problem and its solution was defined by J. Nash (1950). Other scientists subsequently identified other possible solutions for different conditions. These are mathematical models with different assumptions, the adherence to which is unrealistic in real bargaining. The usefulness of these models is to illustrate aspects of bargaining and understanding the effects of some tendencies, but they are not usually appropriate for predicting and influencing the outcome of bargaining. The Program on Negotiation

at Harvard Law School is another scientific approach, which identifies key aspects and bargaining strategies. It is a practical approach which, however, is excessively based on rational evaluation and negotiation and omits subjective, emotional and unconscious aspects. These aspects were studied by Chris Voss, a former FBI negotiator and owner of a negotiation consultancy firm.

After comparing these approaches, we can conclude that the key factor in bargaining is a complex of facts and abilities referred to as bargaining power. Ultimately, it decides who will be more successful with his idea of the distribution of utility, revenues or other bargaining items. In the literature, bargaining power is usually neglected or a constant balance of bargaining power is considered.

The paper presents an identification of the key aspects of bargaining power. It allows measurement and development of these aspects. Analysis of the bargaining power provides an important understanding of its effect. The division of bargaining power into bargaining position and bargaining ability together with a deeper look into the possibility of influencing the seemingly invariant bargaining position provides a tool for creative bargaining even in a seemingly clear or resolved situation. The effect of bargaining power is dynamic and hence the power dynamics of the bargaining parties can change rapidly. Bargaining power can be understood primarily as a comprehensive competence.

Further research will involve the determination of benchmarks for individual areas and the specification of the possibilities to develop individual aspects of bargaining power. Technological developments can be expected to allow for better measurement of the different behavioral aspects and thus provide better feedback.

The paper has achieved its objectives. It presents an analysis of the factors that make up bargaining power, their description and the proposal of methods to influence them in favour of the bargaining party.

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## Contact address

**Ing. Jan Červenka**
University of Finance and Administration / Vysoká škola finanční a správní, doktorské studium
(jan.cervenka@hotmail.com)

# Discussion

## *Game Modeling of the Organization's Management Strategy and Training in Strategic Thinking Based on Game Analogies*

## *Modelování her ve strategii řízení organizace a vzdělávání v oblasti strategického myšlení založené na herních analogiích*

**EVGENY V. GENKIN**
**LIUBOV G. MAKSIMOVA**
**MAXIM I. MAKSIMOV**
**VLADIMIR V. VELIKOROSSOV**

**Abstract**
The article examines the problems arising in modern economic conditions in organizations of various sectors of the national economy in the implementation of strategically-oriented management systems. Despite the prevalence of such systems, there are great difficulties in their modeling and development of strategic thinking among managers and entrepreneurs.

**Keywords**
strategy, modeling, organization, chess, game, management

**Abstrakt**
Článek zkoumá problémy vzniklé v moderních ekonomických podmínkách v organizacích různých sektorů národního hospodářství při zavádění strategicky orientovaných systémů řízení. Navzdory převaze takových systémů existují velké obtíže při modelování a rozvoji strategického myšlení mezi manažery a podnikateli.

**Klíčová slova**
strategie, modelování, organizace, šachy, hra, řízení

The problem of modeling an organization's management strategy, as well as training entrepreneurs and managers in strategic thinking has been quite acute for at least fifty years. The corresponding query in Google, for example, gives about 530,000 unique results only in Russian (580,000,000 results for a query in English). It is assumed that one of the oldest strategic games – chess – can be of great help here. The lessons she offers to a novice entrepreneur and an experienced strategist are often more important and practical than from any commercial game of those that constantly appear on the market and develop. According to the 13th world champion Garry Kasparov, "chess is

a battlefield... and they cannot be played otherwise. Business also... can be considered a struggle to the end."

Chess is a difficult game, modeled, as well as business, on the basis of military art. Immediately, we note that there is a fundamental difference between chess and business. Chess (like boxing, for example) is a zero-sum game, but in a business both rivals can win. For example, the two leaders of the market of sweet sparkling water are the drivers for other players in this market.

In developed countries, chess receives a lot of support, including state support, in recognition of the enormous benefits that people receive from the game. So, in the world there are huge studies on the effect of chess on Alzheimer's disease, on the influence of chess on the development of children and many others. There is no way to exaggerate the role of chess in the development of artificial intelligence. This article will show how chess can be used as a tool to improve business skills.

In business, as a rule, in the markets there are competitors who plan to seize or increase their share. Many strategies and tactics used in chess are applicable to business situations.

*Ruben Anlacan* [7] identifies ten skills of a successful businessman that a person acquires with an understanding of strategy in chess:

1. The ability to look forward. Only those who can foresee the future a few steps ahead can, on the one hand, show good results in chess, and on the other, show stability and growth in business. "Inaccurate demand forecasting can cost retailers significant amounts of lost profits," said Anders Richter, a leading expert in the retail competence center for SAS, one of the recognized leaders in high-performance analytics and Big Data, in an interview. In addition, given the increasing relevance of innovative technologies for doing business and public administration [5], [6], it is necessary to state a clear connection between chess theory and practice and modern approaches to management.
2. The ability to sacrifice. In chess, there are situations when you can give up a piece in order to gain an advantage later. This is similar, for example, to making investment decisions in a business where a businessman risks in the hope of receiving returns in the future [1].
3. Good memory. To be able to look to the future while playing chess, you must learn to memorize a large number of potential moves and possible options. Since memory is an important element of thinking [3], it should help improve business decision making.
4. Understanding the value of training. Good thorough preparation is the key to success in chess and in business. In chess, it is primarily about analyzing the games of the future opponent. In business, however, preparation can include both market research and business planning as a whole. An increasing role in the success now plays all sorts of staff training.
5. Self-organization. In chess tournaments there is a rule "touch – move". This means that when a chess player touches a figure, he must make a move for her. If a move is made, it cannot be changed. Even in major tournaments, there were cases when a chess player changed course in the absence of witnesses, however, such chess

players quickly gained a well-known reputation, which ultimately destroys or greatly affects their authority. This also applies to business: when a businessman deceives his clients with false or exaggerated promises, he can get tactical gains and sales growth, but in the future it will be difficult to save his reputation and restore his image. As the founder of the Matsushita group and the PHP Institute, Inc., Konosuke Matsushita [2], wrote, "trust is gained not quickly and not simply. It is created gradually due to selfless efforts and unlimited care. But no matter how long a trust is created, it can be lost in an instant. That is why trust must not be forgotten for a moment."

6. Understanding the value of patience. In chess, you need time to place your pieces in the correct position before you can effectively attack; a premature attack will backlash. This is very similar to a business, you must patiently restrain yourself from reckless action until everything is established. First, you need to conduct market research and feasibility studies, and only then risk your capital.
7. Anticipation of moves rivals (competitors). When choosing a move, a good chess player calculates possible (probable) answers from his opponent. As Garry Kasparov writes in his book "Chess as a model of life" [8], "the majority of the strongest grandmasters, regardless of time control, base their calculations on strategic planning. When there is a basic strategy, position analysis can be both quick and highly effective. If you play without a plan, then your decisions will be spontaneous. Jumping over the course from one position to other, instead of moving to the main goal, you only solve current tasks. " In essence, this idea of a thinking competitor (opponent) acting against you should be included in the preparation of business plans. In the real world, competitors will respond to your actions, with the interests of stakeholders (stakeholders) varied from full acceptance and cooperation to rejection and sharp opposition.
8. Skill to think "off the board". Although chess has strict rules, an experienced player knows how to use his creativity to come up with unexpected moves to defeat an enemy. Chess legend Bobby Fisher shocked everyone with the choice of debut in the match against the world champion Boris Spassky, abandoning the usual move for himself, which for many years brought him success at the highest level matches. The entrepreneur must come up with an innovative strategy, choose unexpected solutions in the field of marketing. Much has been written about this in the famous book by Trout and Rice [4].
9. The ability to play by the rules. Chess has rules to follow. Business also has its own rules, the violation of which can lead to severe punishments or even imprisonment.
10. The ability to concentrate. Since chess requires hours of full concentration, it is an excellent learning to concentrate your mind. This is an excellent therapy, especially for those whose minds tend to "wander" or get tired too quickly.

Chess has a long history. They have existed for at least a thousand years in its current form. And not for nothing. This is also a game full of rich symbolism. Our ancestors managed to reproduce castles, knights, bishops, kings and queens on the board. Symbolism is something that successful companies actively use today.

Shane [9] draws parallels between chess pieces and displays in business. So, he associates a rook, a fairly powerful figure in chess with military might, as well as the size and strength of a company. Size is not only the number of employees and similar structural indicators, but

also market share, if we are talking about business. Knight (knight; in Russian terminology – steed). Even today, owning horses is a sure sign of rich person. A thousand years ago, having a good horse meant great wealth. A knight or a steed symbolizes financial strength. Bishop (bishop; in Russian terminology – elephant) symbolizes the art of negotiation. An elephant, moving only diagonally in one color, shows strength and weakness at the same time. Politics, negotiation and influence all fall under the kingdom of the bishop.

Summarizing Shane, we can conclude that in business, by analogy with chess, you can use: size and strength, capital and connections. Turning to the systems of strategic management of the organization, we can distinguish:

- the need to maintain pressure. Successful companies direct significant efforts to attack and maintain pressure. And vice versa, the book contains many examples when pure defense did not allow companies to achieve success in business. The defending companies, in fact, act more predictably, in the mode of reactive adaptation, without having a real opportunity to execute their own strategy;
- the need to analyze before making strategic decisions. Moreover, as in chess, it is not the "quantity" of analysis that is fundamental, but its quality.
- the need for accounting and control. By analogy with grandmaster chess, where not being able to take a turn back can cost you a game, strategic miscalculations in business can lead to the destruction of a company. Here we can remember a famous example of Lehman Brothers Holdings, Inc. – The largest US investment bank, which was one of the world's leading financial conglomerates, existed for more than 150 years, but was destroyed in 2008 under the influence of catastrophic strategic management miscalculations. Another example is the Britannica Encyclopedia (Britannica), which was actually destroyed during approximately 2 percent of its life cycle, mainly due to the underestimation of the importance of the emergence of new technologies of informatization of society. In Russia, a good example of an incorrect distribution of resources is Transaero aircompany, which in 2014 took the honorable 17$^{th}$ place in the rating of safe airlines of the world of the German research center JACDEC (Aeroflot took the 35$^{th}$), and in 2017 was declared bankrupt. One of the main reasons for this was erroneous strategic assessments and decisions made by the company's management, which resulted in the company debts being assessed 144 times as high as all its assets at the time of bankruptcy.

One of the founders of the PayPal payment system, Peter Thiel, who performed the national chess master at a rather early age and was one of the strongest US chess players under the age of 21, speaks about the need to understand the value of things in business: "Every subject in a chess game has specific value. Knowing the value makes it easier to make decisions about game strategy and placement. Similarly, knowing the value of employees and other partners, it may be easier to make business decisions regarding job responsibilities and much more. "

As the experience of holding strategic courses and sessions, entrepreneurs often have great difficulty with scenario planning and scenario thinking, in general. A successful chess player must always pay attention not only to the first few moves, but also have a system of plans to counter the actions of opponents. In other words, he should keep in mind various scenarios of events. Similarly, good businessmen should have Plan A, Plan B, and consistent plans according to their situations. So, when launching their cars in the world, Japan faced tough

competition from the United States. They realized that it was only the use of revolutionary innovations that could allow them to win in the competitive struggle in the context of more expensive gasoline, refusing immediate benefits in favor of gaining a share in the US market.

Thus, chess is taught to make decisions in difficult situations under conditions of strong pressure, which can help not to make fatal strategic mistakes in business.

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## Contact address


**Evgeny V. Genkin, Ph.D.**, Associate Professor
Department of Organizational and Management Innovations, PLEKHANOV Russian University of Economics

**Liubov G. Maksimova**, Graduate student
The Russian Presedential Academy of National Economy and Public Administration

**Doc. Ing. Maxim I. Maksimov, Ph.D.**, Associate Professor
Department of Organizational and Management Innovations, PLEKHANOV Russian University of Economics

**Prof. Ing. Vladimir V. Velikorossov, DSc.**
Head of Department of Organizational and Management Innovations, PLEKHANOV Russian University of Economics

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