

# **ENTERPRISES IN UNSTABLE ECONOMY**

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## INTRODUCTION

The twenty-first century has brought new challenges to the firms as well to the entrepreneurs. On the one hand, business activity is getting easier because of: internationalization and globalization make more sales markets available for companies, flow of goods and capital is faster and cheaper and contemporary means of communication enable to establish business relations much quicker. On the other hand, the armed conflicts accumulation, fast flood of information, computerization and globalization caused those business conditions to change rapidly and are unstable. As a consequence some firms are not able to cope with new challenges and exit the market.

In this book, the selected problems of the contemporary economy including issues referring to business operation in an uncertain environment were presented. A major advantage of this publication is that it unveils very important matters related to different regions of Europe and the scientists from various universities took part in this enterprise.

The book was divided into three parts.

In the first part, the selected problems applying to financial management as well as to accountancy were shown. Especially with more attention to: internal and external financial resources that can be accessed to reduce flood risk and its consequences in the Romanian region, risk management in the commodity markets as well as in the tourism sector and accountancy harmonization.

The second part of the book is devoted to the searches of success factors in business management, with special regard to innovation aspects. Among others the ways to increase the firms and regions competitiveness were portrayed.

Incredibly interesting is the third part of elaboration, presenting business activity in Poland. It was enriched by a few readable case studies, what can be particularly thought-provoking both for scientists and practitioners.

I hope that presented in this book studies and considerations will constitute an introduction to further research.

I would like to thank the Authors of the chapters for their contribution and I am inviting for the cooperation in the scope of research included in the book.

*Błażej Prusak*





**PART 1**

**FINANCIAL MANAGEMENT  
AND ACCOUNTING**



## CHAPTER 1

### FINANCING OF FLOODS EFFECTS REMOVAL IN DANUBE'S OLTENIAN SECTOR

#### 1.1. Introduction

Among the natural disasters affecting severely the development of the regions in the European Union, the floods have been the most harmful. These may cause human victims, may lead to relocation of the population, can negatively affect the agriculture, the environment and the regional economic development.

In Romania the protection against floods along the Danube is ensured by a system of dams along the river which represents the main line of defense for the localities situated in the floodplain. The damming system was built in the early 70s, and during time, because of the weather and climate changes from the past decade, it has significantly reduced the function for which it was designed, the degree of insurance has fallen below 1%, the value for which this system has been designed in the first place.

The floods from 2006 caused serious damage on the lower sector of the Danube, which is why flood protection became highly necessary, and the restoration of the damming system is a major problem that needs urgent investigations. Thus, according to the A.N. Report Romanian Waters<sup>1</sup> regarding the floods from April 2006, in the district Dolj there were evacuated 7440 people, 340 houses were completely destroyed, 197 homes affected, 1113 households were flooded, 3 km from the district road was severely affected, and 4,500 ha agricultural land has been compromised.

#### 1.2. Material and method

The **material** on which the research is based is represented by the statistical data related to the phenomenon of floods in Europe and also in Romania, financial

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<sup>1</sup> “*Redevelopment of the floodplain of the Danube Valley in Romania*” – review regarding the development sceneries of the floodplain between Ghidici and Zăval, Romania-Netherlands project, Eurodite, HKV Consultants, 2012.

data and technical information regarding how to restore defense structure of the investigated area, internal and external financial resources that can be accessed to reduce flood risk and its mitigation. The **research method** combines fundamental research with applied research as well as with the development, all of which contribute to achieve the goal.

### 1.3. Presentation of the researched area

The Danube River, on the sector Cetate-Dăbuleni, is under the administration of AN Romanian Waters and Administration of the Water Basin Jiu and represents 147 km of river. The area investigated for this study is represented by the floodplain, the area bordering the river and corresponding to “The Green Corridor of the Danube”, the area considered to be the most vulnerable to flooding. Administration of the Water Basin Jiu is located in the South West of Romania, has an area 16,734 sq Jiu-Danube (10.080 kmp, BH Jiu), 1,461,661 inhabitants (density of 77 inhabitants / square km), 56% of people in urban areas. 54% of the total area is the agricultural land and 29 % forests. ABA Jiu manages integrally Dolj and Gorj districts and partially the district Hunedoara (Figure 1.1).



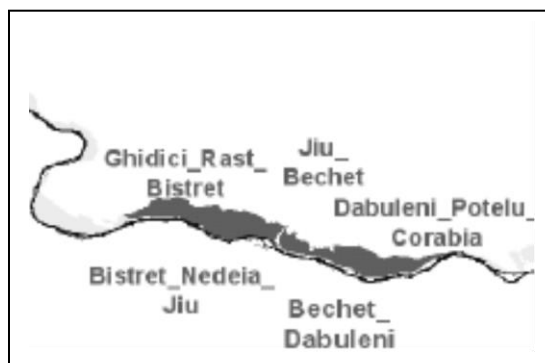
**Figure 1.1. Administration of the Water Basin Jiu – general presentation**

Source: ABA Jiu.

ABA Jiu administers the following infrastructure: 698.292 km damming system, 446.868 km regularization, 9 dams (two of them are non-perennial reservoirs, used only when the flood diminishes. (Source [www.abajiu.ro](http://www.abajiu.ro)). Some of the infrastructure is administrated by other organizations, such as Hidroelectrica, ANIF (district offices). The most important permanent accumulations are PFI and PFII (on the Danube), Tg. Jiu Vădeni, Turceni (on river Jiu) Tismana, (on Tismana River), Great Valley (on river Motru) Vâja, Clocotis (on Bistrita river).



The most important dams in the researched area are: Cetate-Basarabi, Ghidici-confluence Balasan, Bistretu Nou-confluence Desnățui, Desnățui – Nedeia, Lișteava (Jiu- confluence Jiet), Bechet-Dăbuleni. The dammed length is 168.22 km, including also the subdivision dams that contribute to polders, having a role in the defense against the floods (Figure 1.3).



**Figure 1.3. The main polders with a role against floods on the sector Cetate-Dăbuleni**

**The Section Basarabi-Rast** is a natural, free of dams area, where the unspoiled wetlands are connected to the European network Natura 2000. This sector did not have serious problems during the floods, because the villages are outside the areas with a high risk to this phenomenon, and a large part of the territory is considered as special area: ROSCI0039 Ciuperceni-Desa and ROSPA0013 Ciuperceni-Calafat-Danube. In the researched sector there are 24 natural lakes and ponds, which form the Danube River floodplain and create unique ecosystems, similar to wetlands.

#### **1.4. The current situation of funding the defense activity against floods**

Currently, there is no special financial system to recover the money from the expenses used for the protection against floods. The National Water Management Authority approved the budget and set the prices for water users and for the drainage of the wastewaters in reservoirs (the polluter pays for exceeding pollutant limits established by the current law). For the investment projects, the Romanian government allocates an annual budget from different sources. After being constructed, the works are transferred to the Romanian Waters – the national water management authority – for operation and maintenance.

The investments from the past years in the infrastructure for protection against the floods are transmitted through water administrations and financed from different sources: state budget (21.36%), EBRD loans (grant + budget), co-grants (47.24%), Fund for the Environment (19.77%), Solidarity Fund (1.76%) and European funds (9.87%). The main part of these funds was directed to creating the flood risk maps (grant from SOP Environment, Priority Axe 5, about 25 millions of Euros) and rehabilitation of the large dams.

### **1.5. Development of instruments responsible for the flood protection system in the Danube Valley**

The study conducted in the researched area showed that flood defense problems can be solved by ascension and/or strengthening of the existing dams, but this assumption is not generally valid. Protection against the floods is highly necessary and the level of protection is still an urgent problem that needs investment. Given the nature of the service, flood protection is considered primarily a governmental task (responsibility) embedded in an extensive legal framework (security, water, environment), which was strongly affected by the European legislation (especially the Framework water Directive).

The problem of the floods could be also solved by decreasing the critical water levels which can be achieved by extending the river and increasing the flow discharge capacity in extreme conditions, as such. In other words, we shall give to the Danube and to other rivers more space. This concept has been successfully applied in the Netherlands and elsewhere in Europe. The concept *More space for rivers* the focus is moved from the dams (seen as investments), towards the river.

Creating additional “rooms” for the streams can be achieved by creating a series of side channels in the floodplain (similar to passages), deepening or extending the river bed, reducing the major floodplain, removing some barriers and relocating dams (changing the land configuration). All these options for increasing the level of flood protection involve very high costs and expenses.

#### **1.5.1. Rearranging the floodplain through wetlands extension**

The Dutch companies *Eurodite*, *HKV Consultants*, in collaboration with the Romanian Waters reviewed the possibility of restoration of the floodplain in this area. The project was a study of pre-feasibility, after which there were two solutions that promote the naturing of the investigated areas, as follows:

Solution 1 – building a side channel to reduce flood risk and conservation of the sites Natura 2000 in the area Ghidici-Zaval, with a total value of 195 million Euros;

Solution 2 – renaturing the floodplain of the Danube River by applying the principle “more room for the river” with a total cost of 91 million Euros.

Because the costs proposed by the Dutch companies for a relatively small area were very high and unbearable to the local administration, the implementation of the two solutions is still in question, because the Danube River should have an integrated approach along all its lower sector.

### 1.5.2. Restoring the damming system in the Danube Valley, sector Cetate-Dăbuleni

The research conducted on the sector Cetate-Dăbuleni, led to the conclusion that the best option for defense against floods, taking into consideration the cost-effectiveness analysis is heightening the existing dams, which will increase the safety level and protect the area against floods. In the Danube Valley, on the sector Cetate-Dăbuleni, researches were made by Dutch experts in flooding defense with the purpose of rehabilitating the area affected by floods on the Danube River in 2006. Based on this model, for the sector Cetate-Dăbuleni, the research made went towards rehabilitation of the existing dams, bringing them back to the level of importance and level of insurance similar to that for which they were designed and built in the 70s.

The research has led to the fact that for the length of 168,22 km of dams, it is necessary a volume of 3.93 million m<sup>3</sup> of material (clay), that can be taken right from the area, without the need of its transportation from long distances. Table 2.2 shows the total costs in case the necessary material is taken right from the neighboring area of the dams, because the local soil is suitable for strengthening it.

**Table 1.2. Costs for rehabilitating the dams on the sector Cetate-Dăbuleni, on the Danube River**

Costs	Unit prices			Necessary material (clay)	Costs (Mil Euro)
	RON	Euro*	Unit	Unit	
Strengthening the Danube dams	4.40	1.00	/m <sup>3</sup>	3.93 Mil m <sup>3</sup>	3.93
Excavation of land in the area where dams are built	11.40	2.59	/m <sup>3</sup>	3.93 Mil m <sup>3</sup>	10.17
Transporting the soil (inside)	7.95	1.80	/m <sup>3</sup>	3.93 Mil m <sup>3</sup>	7.07
Sub-total					21.17
Additional risks, execution costs etc. (10%)					2.11
Total					23.28

\* exchange rate : 1,00 Euro = RON 4.40 (09.09.2014)



The total value of implementing the project is of 23.28 million of Euros and provides flood protection by restoring the dams and increasing the insurance level at 1%. This amount can have as a source a public-private partnership, or different external grant sources, such as SOP Mediu, or the European Regional Development Fund.

## **1.6. Conclusions and recommendations for recovering the expenses**

The issue of financing flood protection activity is an old problem for this sector because financial resources were never sufficient. Proposals for solving this problem have been made by researchers and specialists from AN Romanian Waters, ABA Jiu Danube Delta Research Institute, National Institute of Hydrology and Water Management (2006-2014). Researchers from NKV Eurodite Consultants; Witteveen + Bos have made inquiries in Danube meadow (2010-2011) and made important contributions in solving these problems. The research made by the author of this article is relatively new (2012-2014) and the results are very useful, water management activity can be used successfully in other areas of the Danube basin.

The approach is new, and research results are original and can bring significant benefits to companies such as Romanian Waters; ICPDR; ABA Jiu towards their implementation. The investigated theme represents a novelty because it moves towards cost recovery of flood defense work of Danube Valley, very important in the current financial environment. Similar studies very recent (2014), were made by specialists of institutions in the Netherlands (Van Dijk Water Management, Ecorys, VNG International), through projects funded in the field of water management bodies.

The issue of recovery of expenses that was made to reduce the flood risk is one thorny and future research looks at how local authorities and the political class would help solve this problem. In order to increase and ensure the necessary budgets for the measures of protection against the floods, on a medium and long term, there are three basic ways of financing:

1. Resizing the state budgets and extending them.
2. Introducing a tax for protection against the floods.
3. Introducing a paid contribution by direct users.

An important aspect is the fact that flood protection is linked to other complex problems for the calculation of risk. Taxation, as a source of money for the budget, should be based on the principles of the rule of law. We need a public awareness campaign to inform the public and stakeholders regarding the need to start paying for flood protection.

The EU support period for investment in flood protection category is guaranteed until 2020. It is important that financial resources are available in a long term. If possible, the flow of funding (money) for water management and for flood protection should be isolated from political interference. In the current system it is indicated that the management of government institutions should be political. In the process of flood defense, prioritizing the interventions is made according to infrastructure exposure to flood risk. Firstly, the population is protected, then their homes and households. Afterwards, it is made the inventory and constant monitoring of the critical sports that appear after the flood has passed.

## **CHAPTER 2**

### **HEDGING STRATEGIES OF DERIVATIVES INSTRUMENTS FOR COMMODITY TRADING ENTITIES**

#### **2.1. Introduction**

The aim of this chapter is to focus on the main hedging strategies applied to the commodity market. Each strategy was enriched by the real example illustrating the specific case. It can be useful not only to the companies producing or trading the commodities but to market investors as well.

One can risk the hypotheses that knowledge of different hedging strategies of derivatives instruments on the commodity market needs widespread literature improvement with practical examples.

For companies especially those associated with commodities, hedging is facing a number of possible strategies. The strategies give various contexts:

1. No hedging.
2. Hedging with a guarantee of future costs of the unit.
3. Time mismatch between cost of raw material and income of final product.
4. Active hedging based on directional views of the market.

Ad. 1. Decision not to hedge is usually driven when there is a common opinion of little fluctuation of grains price, what will have a minute impact on potential margin. Producer may actually pass some increase in price of underlying grains on manufacturer of grains without affecting its own margins. In case the underlying price were to decline, producer may finish with cutting the final price, with concern of proportional correlation between price reduction and price fall- the higher the fall the bigger price reduction may be.

Ad. 2. Future cost of unit can be hedged by locking in a lot of production cost with undergoing a significant proportion of commodity price exposures. Such strategy enable to fix price and secure adequate margin of final product.

Simultaneously it will have beneficial influence on customers, due to resistance to high price volatility.

Ad. 3. Situation takes place when manufacturer has long in time production process and the final product is bond partly with commodity price. Shall the manufacturer combine payment for raw material regularly with sales of final production, then the timing mismatch may not be a significant issue; otherwise companies are forced to hedge against irregular deliveries that combined with comprised fluctuations of commodity price account for risk.

Ad. 4. When many producers and manufacturers unaware of commodity price movements are willing to hedge against risk, then they should whatsoever implement hedge basing on production levels. Meanwhile, some of commodity producers and manufacturers are taking advantage of easing favorable conditions of market in order to introduce hedging practices basing of foresees of future needs, as they anticipate certain need for a commodity (Wilson et al., 2003).

Besides these aspects, the strategy should be selected is size of hedge. Transactions may be situated of foreseen buy of commodity. Whether actual commodity is not bought then manufacturer may be facing a hedge for which there is no underlying exposure. Thus, in result some number of companies participates in hedging only proportion of their exposure. Significant part of hedgers prefer financial settlement of transactions, though there is a chance to venture with a particular supplier that offer commodity of specific and expected quality and grade.

Hedging as an outcome of risk management arises to account several questions before establishing entire “big picture”. Mentioned aspect of size of the hedging is one of them. Further questioning refers to whether producer of manufacturer are willing to secure entire exposure, when the hedging should start, now or later in the future, what is the vision on market like direction of market, time of interest, magnitude of exposure, what would be the preferred instruments of security, and whether entity is ready to pay for the protection.

In theory, analyzing the literature, there are many items treat on the investing strategies, especially on the financial markets but commodity markets seem to be undervalued. It should be mentioned the impact such authors like: T.M. Saltvedt, B. Andersen, J. Hull, N.C. Schofield or W.W. Wilson, R. Wagner, W. Nganje. Unfortunately there is no chance to expose the whole knowledge on the hedging strategies but it is a try to attract an attention on the importance the subject of this research. The meaning of agricultural commodity hedging strategies affects the countries, like Poland for example, where this area of activity has to be improved. Luck of mother language literature and inexperience in the commodity hedging strategies forces investors and agricultural commodity producers to analyze foreign patterns and to copy this in the Polish commodity market by analogy.

In practice many hedgers tend to express their opinion about the future movement of the market, however sometimes with accentuation that they are not qualified to do make their own judgments. Meanwhile when relied on third-party companies they are concerned of potential outcome of the hedging strategy. Their anxiety and fears can be shattered in a very simple manner that is creation of scenarios. Scenarios analysis shall give a feedback of how the hedged transactions would affect earlier assumptions and plans (Boczkowski, 2011).

As for methods of analyzing the core of hedging strategies applied by derivatives instruments, it was decided to describe each of them separately adding extra practical example.

## **2.2. Spot contracts**

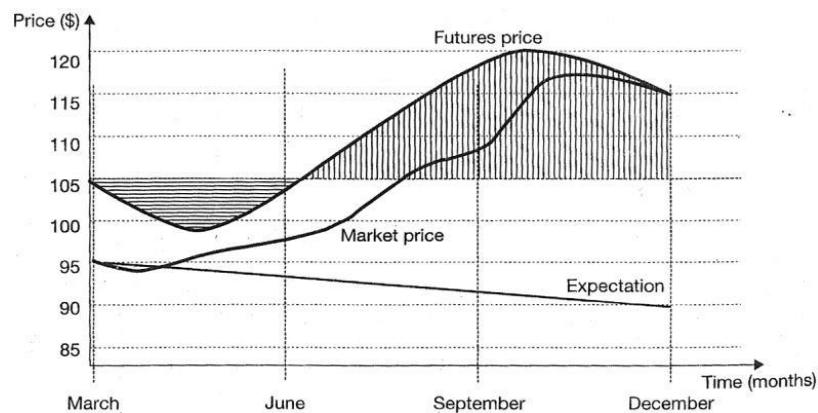
Commodity companies before trying another derivative instrument usually decide to take an overall view on the movement of an asset. An outright transaction is a solely buy or sell strategy rather than some complex combination of transactions. For instance when the unaware trader is trying to assume the value of commodity in 6 month time, and has no clue whether to buy or sell. Decision is questionable and tough, though if investor expects the price to rise then one should buy, otherwise when expectation are of price to decline then investor should sell. The decision is a function of the investment horizon and how the trader thinks that spot prices will evolve relative to forward prices. Situation is that wheat grain is traded at present 368 USD per bushel at spot market while the 6-month forward is priced at 412 USD. The forward price is not a predictor of the future spot prices but should be used as a breakeven value against which every investment decision should be judged, because a spot purchase, that is kept for specified time, in the end will have a value equal to the forward price. In result there are three possibilities for a trader given.

These are:

1. When the assumed spot price in 6 month' time would be greater than the current forward price, the trader should buy wheat, borrow money to finance its purchase and lend out the wheat to earn the lease rate. If that finds it results, one would be able to sell wheat at the end of the period at a price that is going to be greater than the cost of carrying the grains for the period.
2. In case the trader forecasts actual spot price in 6 month as lesser than the current forward rate, then one should consider short (selling) welcomed. One shall sell the wheat and place the proceeds on deposit to earn interest for 6 months. So as to ensure selling position being covered, bank would be to

borrow the wheat and pay leasing fee. Finally at end of 6 month period, wheat is being re-bought at the prevailing spot price and delivered to the lender of the grain. As a net result cash flow receives exceed the cash flows paid.

3. If it it predetermined actual spot price in 6 months was going to be equal to the current forward rate, then one would be indifferent to buying or selling the wheat. Interestingly, latter second scenario would establish possibility for a trader to believe that price of wheat would increase, however, to a level less than the current forward rate, this could indifferently suggest a selling strategy. Therefore, meaning of spot strategy is, no matter spot price will rise or fall but where it will be in relation to the forward rate.



**Figure 2.1. Relation of spot contract and futures**

Source: Saltvedt, Andersen (2010).

### 2.3. Commodity options

Banks alike commodity producers and manufactures when using options as hedging instrument are facing some various market risks, that are finally manageable when these information are known:

- strike price,
- time to maturity,
- underlying price,
- cost of carrying an underlying hedge,
- the implied volatility of underlying asset.

Help is delivered by Black-Scholes model that introduce Greek letters as variables to equation and allow to measure and manage sensitivity of derivative

market- particular exposure to risk. All calculated through calculus factors Delta, Theta, Vega, Rho, and Gamma calculate all sensitivity measures. So far, they are used to price an option contract for investors, though there are trials to create hedging strategies basic on “neutral” value of each of option pricing factors; no official publication reason about this method, thus it will be treated as insignificant for real commodities investors for the time being, and therefore for this evaluation either (Cohen, 2005).

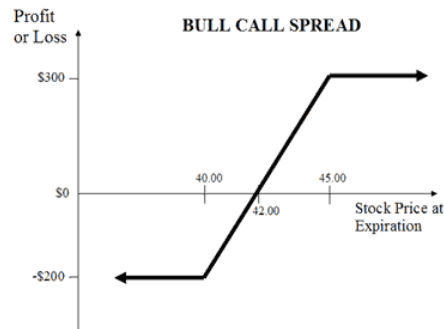
Just before discussing the use of double option strategies for hedging purposes there appear a necessity to introduce professional language for various types of hedging strategies. A bullish option strategy is based on the expectation of an increase in the price of the underlying asset. Conversely, a bearish option strategy assumes a decrease In the price of the underlying asset. In a vertical option strategy, the option contracts have the same expiration dates but different strike prices. Conversely, in a horizontal option strategy (often called a calendar spread) the option contracts have the same strike price but different expiration dates where the option trader tries to take advantage of the development in the option’s time value.

Present market payoff strategies include mainly such complex combinations:

- Vertical bull spread,
- Vertical bear spread,
- Straddle,
- Strangle,
- Box spread,
- Butterfly spread with call or put,
- Condor with call or put,
- Ratio call and put spread.

Vertical bull spread can be established to hedge a short position in the underlying asset. It is usually facilitated in moderately bull market where investors are trying to capitalize incline in price of underlying commodity (asset). In the single option strategy, a short exposure can be hedged by buying a call option. If an increase in the price of the underlying asset is expected (a bullish market), the likelihood that a put with a lower strike price will be exercised is relatively low. Thus the hedger may concurrently write a put option contract against receipt of the option premium. Both purchasing and writing side of this spread strategy has the same expiration date and the number of contract are equal. The profit and loss profile of a vertical bull spread combines the profiles of the put option and the call options. What is understood by doubly hedged strategy in bull spread is that any premiums cost of purchased call options are offset by sold (written) call options (Lidbark, 2008).

Profitability of this strategy exists if the underlying commodity (asset) price increases. Alternatively, the max loss for the bull spread occurs in situation of declining underlying asset price below option's strike price. Shall the options finish out-of-the-money with no value, then the complete net debit paid will be lost.



**Figure 2.2. Profit from bull spread using call options**

Source: Taleb (2010).

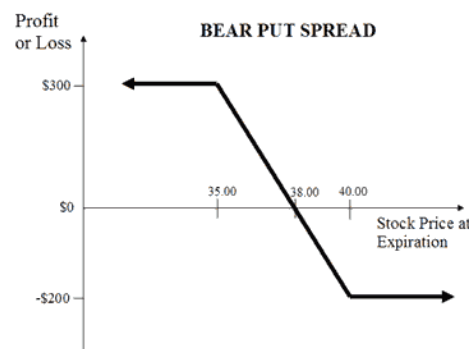
Vertical bear spread can be established to hedge a long exposure of the underlying asset. It is usually facilitated in mildly bearish market in which investors are willing to capitalize decline in price of the underlying commodity (asset). Vertical spread is used as a name more and more broadly because of contracts on the same commodity (asset) and equal expiration date but various strike prices. In the single option strategy, a long exposure is hedged by buying a put option.

However since expectations point to a decrease in the price of the underlying asset (a bearish market), the likelihood that a call option with a higher strike price will be exercised is limited. So, the hedger may concurrently write a call option against receipt of the option premium. Together buying and selling side are equal in number of contracts. The profit and loss profile of a vertical bear spread can be illustrated graphically by combining the profit and loss profiles of the put and call options. Likewise doubly hedged bull spread strategy, bear spread purchased put option cost is completely or partially offset by written put option with lower strike price, therefore then risk of losing paid premium is reduced or hedged. Profitability scenario present rising income when the price of underlying commodity (asset) is decreasing down to zero value, though is limited, whereas maximum loss occurs as underlying commodity (asset) price inclines over higher strike price.

A straddle strategy consists of a call and a put option with the same exercise price and the same expiration date on the same underlying commodity (asset). The buyer of a straddle buys the call and put, while the seller of a straddle sells the same two options; depending on the market side position there is long or short

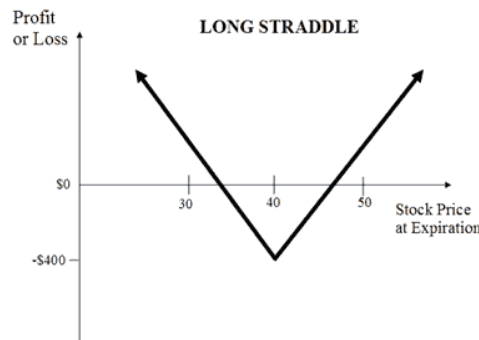


straddle. In case of such combination long straddle is obtained by investor expecting high volatility from the market whereas short straddle is found useful by those who assume minimal activity in price from the market. Value of the premium inclines along the rising volatility and maturity of underlying commodity (asset). Due to fact of acquiring long call and put for long straddle, investor shall acquaint with risk and awards of long puts and calls options. Strategy proved to be very beneficial when investors foreseen considerate movement in price, no matter up or down; if upside profits are potentially unlimited, downside though are limited to zero value of underlying asset on stock. When, however, volatility and price of underlying commodity (asset) remain breakeven point range sense of facilitating strategy is doubtful due to maximum loss of two premiums.



**Figure 2.3. Profit from bear spread using put options**

Source: Taleb (2010).



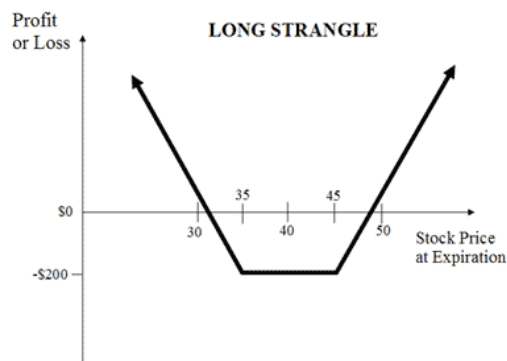
**Figure 2.4. Long straddle payoff**

Source: *Option Strategy Finder*.

Another strategy alike to straddle in concept bases in two option contracts combination of same expiration dates and same underlying commodity (asset) The

differentiation are strike prices of contracts. By the contracts in long strangle one mean buying call and put options whereas in short strangle selling these same contracts. The two option contracts would be bought at out-of-the-money strike prices to reduce the double premium cost, so the strike price of the put option will be less than the strike price of the call option.

Realization of the options profits is correlated with volatility of market that gives profit unlimited with upside and limited to zero value of underlying commodity (asset) downside movements. Nevertheless, strategy is worthless when the underlying commodity (asset) price is at or within the range of the contracts strike prices at expiration dates. Strangle is due to different strike prices, which influence option price estimation via Greek variables, is cheaper than straddle adequate options.



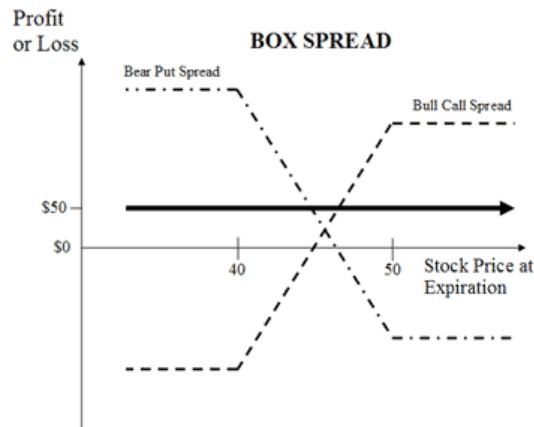
**Figure 2.5. Profit & Loss Long Strangle payoff**

Source: *Option Strategy Finder*.

Box Spread strategy is an example of zero risk strategy where profit loss situation are minimized only to present value of strategy payoff. Such combination of transactions when put into a diagram, it demonstrates a rectangular box, thus the name of strategy. In order to avoid potential arbitrage opportunities, the price of the box spread must be the present value of the certain payoff. Box spread consists of a bull and bear spread together, consecutively with calls and puts and both having the same pair of exercise prices. Investor may decide whether to follow bear spread with a bull spread or vice versa so as to establish expected balance between payoffs and premium.

There are two different variations of this strategy – the long and short box spread. Basically same combinations of call and put options are used; long box spread utilizes 4 options of same exercise date and underlying commodity (asset), while short one usually consists of two options. Strategy is dependable on several

factors that make it feasible for the investor. The environment is placing arbitrages as most important role, for the reason to remain the balance of the results directly impacted. The success is basing also on proper execution of puts and calls options; making for instance wrong call is bound to miss the entire equation out of line, what lead to imbalance between present value and net premium of the strategy.

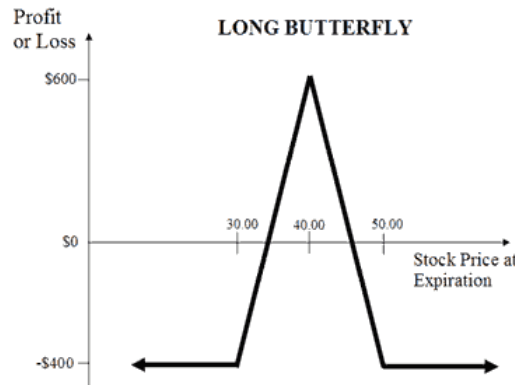


**Figure 2.6. Box spread payoff**

Source: *Option Strategy Finder*.

Butterfly spread can be executed by using three calls with the same expiration date on the same underlying stock. The long trader buys one call with a low exercise price, buys one call with a high exercise price, and sells two calls with an intermediate exercise price. For such calls using strategy short trader takes exactly the opposite position, selling one call with a low exercise price, selling one call with a high exercise price, and buying two calls with an intermediate exercise price.

For a long trader the spread profits most when the stock price at expiration is at the intermediate exercise price. In essence the butterfly spread gives a payoff pattern similar to a straddle. Compared to a straddle, however, a butterfly spread offers lower risk at the expense of reduced profit potential. Butterfly spread can also be initiated with a combination of put options. For a long position in a butterfly spread, the trader buys a put with a low exercise price, buys a put with a high exercise price, and sells two puts with an intermediate exercise price. The short trader sells a put with a low exercise price, sells a put with a high exercise price, and buys two puts with an intermediate exercise price. The long and short butterfly trades with puts give a profit pattern just like the butterfly trade with calls, as illustrated in Figure 2.7. below.



**Figure 2.7. Butterfly spread**

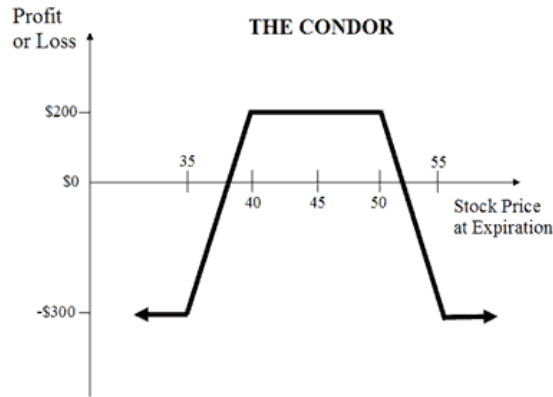
Source: *Option Strategy Finder*.

Condor strategy belonging to complex neutral family of option strategies is a specialized position that involves four options on the same underlying good and with the same expiration date. Similar to butterfly spread results in far wider profitable range and with the cost of lower maximum profit; it shall be used when the investor assumes little or amplitude within traded range of condor strategy.

The four options have different exercise prices. For a long condor entered with call options, a trader buys a call with a low exercise price, sells a call with a somewhat higher exercise price, sells a call with a yet higher exercise price, and buys a call with highest exercise price. Notice that this is like a butterfly, in that the long trader buys two calls with extreme exercise prices, and sells two calls with intermediate exercise price. In a butterfly, the intermediate exercise price is the same for two calls, while a condor uses two different intermediate exercise prices (Cohen, 2005).

As with other strategies considered, it is also possible to initiate a condor with puts as well as with calls. Again, all options have the same underlying stock and the same expiration date. For a long condor with puts, the trader buys a put with the lowest exercise price, sells a put with a higher exercise price, sells a put with a yet higher exercise price, and buys a put with the highest exercise price. The short condor trader takes the opposite side of the long position, selling a put with the lowest exercise price, and selling a put with the highest exercise price. Meanwhile there is a difference between call and put option built condor depending on the market whether it is more bullish or bearish options will have the different price, thus before introducing hedging condor strategy costs should be recalculated (Augen, 2008).

In general condor spread is inferior to other complex neutral strategies by two means: the lowest maximum profit and highest maximum loss potentials.



**Figure 2.8. Long condor payoff**

Source: *Option Strategy Finder*.

Ratio spread is a spread transaction in which two or more related options are traded in a specified proportion. For example, a trader might buy a call with a lower exercise price and sell three calls with a higher exercise price. As the ratio of one instrument to the other can be varied without limit, there are infinitely many different ratio spreads that are possible. Consequently, we will consider just one fairly simple ratio spread as a guide to the variety of ratio spreads available. In a ratio spread, the number of contracts bought differs from the number of contracts sold to form the spread. For instance, purchasing two options and selling one gives a 2:1 ratio spread.

The spread can be varied infinitely by changing the ratio between the options that are bought and sold. Thus, it is impossible to provide a complete catalog of ratio spreads. Consequently, we illustrate the idea behind ratio spreads by considering a 2:1 ratio spread (Taleb, 2010). There are two types of ratio spreads: call and put ratio spreads. Within 2:1 ratio in case of call spread there is a purchase of one call option and simultaneous sale of two call options at a higher strike price, whereas in put ratio spread it is established by buying a put option and selling two put options at a lower strike price. Call spread option is relevant for hedgers with a view that while asset prices may rise they will not increase to extreme heights in the near term, while ratio put spread is more convenient for institutions that expect falling asset prices but not immediately and not by a large amount. Figure presents the profits and losses for the profits and losses for the bull spread with call options, repeating the information of bull spread, and it shows profits and losses from the

ratio spread considered. Comparing these two profit and loss patterns, one can see that ratio spread cost more to undertake, but that it also offers higher profits if the stock price rises sufficiently.

Ratio spread payoff can be illustrated by the following example.

Example:

Feed factory needs to cover annual demand for soybean seed in amount of total 1 mln bushels from one of the Polish seaports. For them any fluctuation from present price is dangerous- if higher their product will not be attractive in price, if lower their purchase will not be economically correct. That is why they are introducing option strategy called straddle in this case long version paying two premiums. As the spot price is 13.81 USD/bushel, strike price for options is 13.80 USD. Premium paid is 2.736 USD/bushel. When price are 1.3 USD from the 13.81 feed factory is secured- within the range they are eligible to obtain the product on spot.

## 2.4. Forward contracts

Commodity forwards are the most basic instruments of securing risk. Type of hedging strategy relies only on whether the contract is bought or sold, consecutively it is long or short position; strategies theory described in futures section.

Concept of hedging itself in case of forward contracts is relating ultimately to one contract strategy; mentioned earlier. More and more producers and other entities associated with commodity markets are heading towards brokers or banks in order to additionally acquire forwards which are to lock the price until contracts expire.

When investors assumptions are about to make them feel unstable and wobbling of underlying asset price to incline in future, one purchases a previously calculated amount of contracts, depending of volume of commodity necessary to be hedged. Each contract are commonly regulated is set to 100 thousand of instrument units (Galant, Dolan, 2010).

Should alternatively investors be finding forecasts that in future prices of interest underlying assets are to decrease considerably, then a hedging strategy for investors appears as sell of forwards contracts at calculated amount.

Forwards in practical terms are these instruments which do not involve more requisite deposit on account to proceed with transaction than in case of other instruments. It is an advantage for investors, only balance at the end is solved.

Example:

Trader for the feeding mill expects some major increase in price of soybean meal in next two months. As one today's price sees as very attractive one decides

to buy two month stock. Value of contract is 983 000 EUR, start 1st June and finish 1st August the same year. Present price is 246 EUR and the price possible to be secured is 245.5 EUR.

## **2.5. Futures contracts**

Commodity futures contracts are worth mentioning because they were the second official instrument on futures markets that were introduced, and were initially to reduce the impact of price fluctuations on agricultural produce the availability of which often can be seasonal. However, the futures contracts cover a wide range of commodities that constitute important ingredients and raw materials in commercial activities (Wilson et al., 2003).

Hedging with futures contracts can be characterized by the scope of the underlying risks subject to the hedge. The term micro-hedge describes the case in which a futures position is matched against a specific asset or liability item on the balance sheet. An example of micro-hedge would be a bank hedging rates on one-year certificates of deposit from the liability side of its balance sheet. The term macro-hedge describes the case in which the hedge is structured to offset the net risk associated with the hedger's overall asset/liability mix. An example of a macro-hedge would be a bank that uses interest rate futures to equate the interest rate exposure of its assets with the interest rate exposure of its liabilities.

In some situations there is requirement to hedge of cash flow over extended periods. A hedge for this type of long-term risk can be implemented in two different ways. First, futures positions can be established in a series of futures contracts of successively longer expirations. This is called a strip hedge. Second, the entire futures position can be stacked in the front month and then rolled forward (less the portion of the hedge that is no longer needed) into the next front month contract. Such type is called a stack hedge.

For the reasoning of hedging strategies there are 3 types of futures contracts strategies:

- Long hedging,
- Short hedging,
- Cross-hedging.

Long hedge is the answer for investors' fear that commodity price will rise unexpectedly and they wish to lock the price on affordable level in the future.

The idea that commodity investor may reduce risk without actually owning a commodity. One forecasts that price may increase in several next months. With today's price one analyses situation and set the highest price acceptable. It is

calculated whether storage of the commodity is more expensive than purchasing it for a higher price. If the price is overrating the profitability, investors decide to enter the futures market to hedge against the possibility of the future unexpected increase in prices and prevent serious loss of profitability (Wilson et al., 2003).

Short hedge is a hedge in which the hedger sells a futures contracts. By this one eliminates or minimizes the possible decrease in value of approximately equal amount of commodity.

As an example, assuming that wheat price is at risk of decline to forecasted much greater harvest due to good weather, profit from sales may be diminished. If producer is not satisfied with assumed price within 3 months (harvest time), one shall enter wheat futures market. For this reason one sells contracts for specified amount of wheat. Assuming that there is an actual decline in price of wheat, any profit from sold contracts with balance loss from sales of physical wheat.

Cross hedge is the ideal case when futures market is trading the same goods traded on underlying market, the cash amounts matched the futures contract amounts, and the hedging horizons of the mine owner and film manufacturer matched the delivery date for the futures contracts. In actual hedging applications, it will be rare for all factors to match so well. In most cases the hedged and hedging positions will differ in:

- the time span covered,
- the amount of the commodity,
- the particular characteristics of the goods.

In such cases, the hedge will be a cross-hedge-a hedge in which the characteristics of the spot and futures positions do not match perfectly. For instance in agricultural industry, some business entities require deliveries of grains on quite regular basis, though each delivery should be hedged in order to prevent variations of the price. Secondly this same entity may order various amounts of grains and finally may choose from any class of grains or whether it can be GMO or not (Schofield, 2007).

When the characteristics of the position to be hedged do not perfectly match the characteristics of the futures contract used for the hedging, the hedger, must be sure to trade the right number any kind of futures contract to control the risk in the hedged position as much as possible. In general, one cannot expect a cross-hedge to be as effective in reducing risk as a direct hedge.

Futures contracts in contradiction to forwards require initial required margin, the value set by clearing house of the market- usually from 1250 EUR recently for wheat contract (50 tons) to 1750 EUR for rapeseed contract (50 tons).

Example:

Client forecasts significant drop in price of rapeseed in new harvest this year  
– so far indications are at the level 473 EUR/mt on the November 11 Matiff



contract. As one sees the price decline below 400 EUR/mt in a few future months he is opening short position on Matiff market; he is willing to secure the value of the crop till the 2012 new crop. His product in amount of 3000 tons of rapeseed needs initial required margin in the value of 1750 EUR a contract. 3000 tons gives 60 contracts. So the initial deposit is calculated for 105 000 EUR. For now future contract for new crop 2012 is valued for 433 EUR thus our price that is secured is 433 EUR. Missed 40 euros of premium shall be covered by another instruments or another time (Schofield, 2007).

## **2.6. Swap contracts**

Swap contracts are delivered by commodity markets like Paris/London Euronext via legitimated brokers. They are not that popular derivatives in commodity field and thus volatility is low, however they may introduce some good solution for hedging strategies to agricultural companies. Strategies are quite obvious, the most convenient are called strip where partial amount of contracted product is swapped each fixed period of time. They can be exercised in physical and cash manner (Kolb, Overdahl, 2007).

Example:

Mill needs 12000 tons of wheat at a specified allowable price. Such amount is to be delivered in each month by 1000 tons. For this reason the mill takes swap contract with 12 strips in order to secure the price of the wheat. The only cost is forward points that discount the further strip wheat price.

## **2.7. Conclusions**

Derivatives on Polish market have been present broadly since 2002, however initial indexation and presence on GPW was in 1999. No matter the dates, however, they were input into financial system quite recently. From this point general conclusion is that the knowledge of mechanisms driving the system is insignificant. There is a conviction of great deal of risk exposure when utilizing them. Such outcome is a result of weak orientation on forward markets, missing completely the truth of derivative instruments. The truth is that they are exclusive instruments of minimizing the risk. Nevertheless, the effective utilization is strictly bond with manager's portion of adequate knowledge and experience. Therefore essential solution leads to increase of knowledge describing advantages of derivative instruments for companies with various exposure to risk.

As mentioned, comprising transactions on derivative market in Poland is observed as relatively very risky. The key reasons are media that are apt to confirm myth every time there is a drastic change on financial markets that utilized derivative instruments. Nonetheless, reality is quite an opposite; approved reason is faulty, inappropriate and unskillful application of securities with overrated speculations with derivatives. Alternatively problematic may be the lack of control of transaction administrators; as an instance of Barrings bank's employee that solely led to bankruptcy after a series of faulty transactions (Winiecki, 2011)

One can conclude that lack of financial knowledge of managers make most business entities and within even more agricultural producers mostly unprepared and unaware of derivative instrument. Hopefully, developing financial consciousness of derivative market tempers positively for the future.

## CHAPTER 3

### RISK ASSESSMENT IN TOURISM ENTERPRISES<sup>2</sup>

#### 3.1. Introduction

The objective of this chapter is to present the terminology of risk assessment of tourism enterprises: what risk is, what risk management is, what risk administration is, what risk pilotage is, what are the differences between risks and risk management in industry and risks and risk management in tourism enterprises, what are the specific risks for tourism enterprises and what are the differences between risk management and crises management.

Also, we want to present our innovative method of risk assessment for tourism businesses because we have found many methods for risk assessment but, in our opinion, these are not fit for tourism enterprises, and also they are based on results, not on perception. We want to ground this method on specific risk for tourism enterprises and on perception of these risks at top management level, before risks are materialized. This methodology helps us identify and hierarchy the main specific risks in tourism enterprises from Romania and to quantify these risks. In order to realize that, we want to disseminate the questionnaire at top management. By the results gathered – questioning top management from Romanian tourism enterprises – we hope to validate our methodology for risk assessment because we would like to help increase our tourism field being an important field for our country.

#### 3.2. Risk assessment in tourism enterprises

First, we want to clarify what risk is as there are many opinions on this subject in the literature. The authors traditionalists, such as Matthew and George M. Lenz Betterly, consider risk as being a concept with a negative connotation,

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<sup>2</sup> This chapter was supported from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007 – 2013, project number POSDRU/159/1.5/S/142115, project title “Performance and Excellence in Postdoctoral Research in Romanian Economics Science Domain”.

meaning a loss. But in our opinion, risk means both, chance of loss and it is threat, and chance to get good results if we take it and it is an opportunity. The concept of risk includes both threats to business objectives and opportunities for improving the results. This view is supported by Encyclopedic Dictionary definition of Managerial and found the source said: "As the disparity between the various possible outcomes, more or less favorable or unfavorable to a future action" (Ciocoiu, 2008).

Thus, we believe that the risks from the not expect a potential gain can have only negative consequences, are pure risks, and these require their insurance. All other risks, those that have positive connotations, should be viewed in terms of management, meaning that a future event or activity may cause damage, but it can make a profit, otherwise risk management covers only such risks.

Addressed both in terms of risk of loss and gain is specific risk management processes and is called managerial or speculative. This risk has two manifestations: "entrepreneur risk that is assumed by the entrepreneur – manager during his business management, which can result in a gain or loss; and risk randomly determined brutal, unforeseen events that can complete loss". (Bibu, 2008).

So we can say that the risk itself is not a purely negative element. The risk is essential for progress and failure is often a part of the innovation process. Risk is an event whose consequences we do not know. And in our research we work with two concepts, the two facets of risk, namely:

- the concept of opportunity, when the consequences of an event are positive;
- the concept of threat, when the consequences are negative.

We also want to clarify what is risk management. The term risk management appeared in 1950, but it was recognized and implemented in a company only after a decade. The American Management Association has played an important role in the development of this concept. In the 1970`s companies began to take risks multiplied and wanted to take other defensive measures except insurance policies. Thus, they used methods of prevention and loss control and risk management concept implemented (Ciocoiu, 2008).

We believe that a company's business requires a risk management because it enables better coping with its negative influences and is able to capitalize on the positive. In any organization this is necessary because risk management acts both inside and in the environment where there is uncertainty, as threats or opportunities. Enterprise Risk Management is a comprehensive risk management program that addresses pure risks of the company, hedge risks, strategic and operational ones.

Risk management is a central part of the management of a company. The main purpose of risk management is to identify and treat risk in a company. This

increases the likelihood of success and reduces the probability of loss and uncertainty global objectives. Risk management should be a continuous process to be developed in accordance with the company's strategy and its implementation and be integrated into the company culture with an effective policy and a program led by senior management. Risk management translates business strategy into tactical and strategic objectives (Ciocoiu, 2008).

In our opinion, we consider to be very important to distinguish between risk management and risk assessment. Risk assessment is part of the risk management process and is generally defined in the literature as a process of measuring the likely outcomes of events and significant consequences of these results on businesses exposed to these events (Pop, 2003).

In literature we find a multitude of approaches to risk management steps, we consider the following:

1. Risk identification.
2. Risk assessment.
3. Develop plan for monitoring and control.
4. Implement plan and assess situation.

We believe that risk management is an essential component of risk management, although not covered by the definitions of this concept. To cope with changes in Romania as well as the global and competitive environment and respond effectively to the current turbulences, romanian companies should be piloted by performance.

A new concept used in risk management is piloting risk. Thus, we want to shape an image of this concept. As stated Barbulescu, pilotage is "all activities of a company's management to achieve its mission, based on appropriate strategies, well defined and the use of methods and techniques to ensure the production of goods, works or service to certain well-defined limits, the required volume of customers in certain conditions of quality and cost, and use enterprise resource optimization so as to ensure its permanence, development and competitiveness" (Bărbulescu, 2000).

From our point of view, an enterprise pilotage and pilotage involves risk and risk management being a component of strategic management, we believe that pilotage risk is part of the strategic piloting of an undertaking. And an affirmation to support this opinion is "strategic pilotage carefully studying opportunities or threats that may arise and how, through appropriate measures, opportunities and threats can be exploited, turned into strengths" (Bărbulescu, 2000).

The differences between risks and risk management in industry and risks and risk management in tourism enterprises derives from specificity of tourism to industry. In industry is about production of goods, about products and in tourism

about services. As the industry faces the risk called production risk, opinion that there should be a risk of services. The services are very different from products services by their nature (examples can not be stored, the interaction between the provider and the consumer is more evident than between producer and consumer, stronger seasonality) and they depend on the specific factors (natural factors such as weather that has a decisive role in tourism infrastructure, on access to the provision of services of tourism , the existence of tourist areas), so have specific risks.

Thus, in our view the risks specific to tourism enterprises are:

- occupancy risk, which is measured by the indicator Occupancy and can have numerous causes to materialize with negative consequences for the company (economic situation, natural causes, reasons on the structure's accommodation);
- qualification of human resources risk refers to the possibility of not having qualified personnel in tourism;
- risk relating to the employment of staff: refers to the ability to motivate staff in extraseason and how to retain qualified staff throughout the year;
- the risk of dependence on one market segment: shall be calculated by dividing the total population segment customers, either by reporting the number of customers in the segment to the total number of customers; examples of tourism with a high degree of dependence is assisted tourism and luxury tourism; it is preferable that this level of support to be as small as in the event of the collapse of the concerned segment, the company is not affected very much;
- the image risk: it is the consumer's point of view because it reflects disappointment to the provider of travel services; it is important that this would not develop due to poor promotion that being caused by the enterprise and the likelihood and frequency are much higher.

Lately, because of many changes crisis management has become a very important component in business management. It may interfere with risk management, but both have different puproses. That's why we want to sketch the main differences between risk management and crises management.

In opinion of Ribaric, crisis management can be defined like “the process by which an organization deals with a major unpredictable event that threatens to harm the organization, its stakeholders, or the general public” (Ribaric, 2010).

The most important differences between these two types of management is that the crisis management involves dealing with threats after they have occurred while risk management involves assessing potential threats and finding the best ways to avoid it.

### 3.3. The proposed methodology for risk assessment in tourism enterprises

Also in this chapter we want to present our methodology of risk assessment in tourism enterprises because we have found many methods for risk assessment but, in our opinion, these are not fit for tourism enterprises and also they are based on results, not on perception. We want to ground this method on specific risk for tourism enterprises and on perception of these risks at top management level, before that risk are materialized.

The risk assessment method proposed by us has the following distinctive characteristics from those studied in the literature (Armean, 2014):

- risk assessment is carried out before production of risks;
- risk assessment is based on perception, not on results;
- specific risk assessment is performed for tourism businesses.

This method is applied by the tourism enterprise risk management or general management where the specific missing and consists of:

- specific risk hierarchy, with an importance coefficient ( $K_i$ ) from 1 to 5, 1 being insignificant and 5 significantly (Tab. 3.1.)

**Table 3.1. Coefficient of importance for risk**

Risk	$K_i$
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- measurement of these risks threatening notes from 1 to 5, 1 being that very few factors that may lead to that risk, and 5 when there are many factors that can lead to the materialization of the risk (Tab. 3.2.)

**Table 3.2. Threat grade**

Risk	Threat grade
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- measurement of vulnerability to these risks with notes from 1 to 5, 1 being that tourism enterprises are not vulnerable to these risks, and 5 being very vulnerable (Tab. 3.3.)

**Table 3.3. Vulnerability grade**

Risk	Vulnerability grade
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- measuring the level of countermeasures to these risks with notes from 1 to 5, 1 equals that the organization has the necessary countermeasures tourism, and 5 does not have any countermeasures (Tab. 3.4.).

**Table 3.4. Countermeasures grade**

Risk	Countermeasures grade
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- measuring the level of risk impact with notes from 1 to 5, 1 when impact is insignificant, and 5 when significant (Tab. 3.5.).

**Table 3.5. Impact grade**

Risk	Impact grade
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- measuring the probability of materialization of the risk with notes from 1 to 5, 1 it is almost impossible and 5 almost certainly (Tab. 3.6.).



**Table 3.6. Probability grade**

Risk	Probability grade
occupancy risk	
qualification of human resources risk	
risk relating to the employment of staff	
the risk of dependence on one market segment	
the risk of image	

Source: own elaboration.

- centralizing data above (Tab. 3.7.)

**Table 3.7. Risk variable grades**

Risk	T	V	C	I	P
occupancy risk					
qualification of human resources risk					
risk relating to the employment of staff					
the risk of dependence on one market segment					
the risk of image					

Source: own elaboration.

- assessment of company-specific risk perception of tourism: from fundamental equation of risk (Băileşteanu, 2010) –  $R = T * \frac{V}{C} * I * P$ , each risk is calculated separately using the following formula:

$$R_i = \sqrt[4]{T_{ri} * \frac{V_{ri}}{C_{ri}} * I_{ri} * P_{ri}}$$

- specific risk assessment overall perception of tourism enterprise: is calculated using the results above, multiplied by the coefficient of importance of each risk individually:

$$R_g = \frac{\sum R_i x K_i}{\sum K_i},$$

- placing tourism enterprise based on the overall level of specific risk (Figure 3.1.):

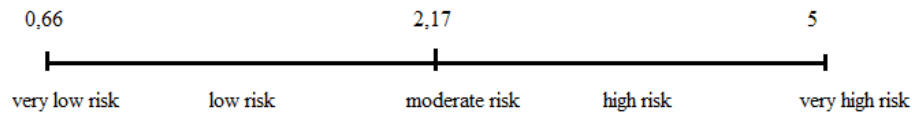
$R_g = 0,66$  – very low risk,

$0,66 < R_g < 2,17$  – low risk,

$R_g = 2,17$  – moderate risk,

$2,17 < R_g < 5$  – high risk,

$R_g = 5$  – very high risk.



**Figure 3.1. Global representation of specific risk**

Source: own elaboration.

### 3.4. Case study: risk assessment in Romanian tourism enterprises

The first part of this methodology is based on a research from some center-pieces from Romania but we made it specific for tourism, and the second part is based on perception of risk variable. With this questionnaire we want to identify the respondents by some characteristics, to identify the level of risk management in this enterprises, to assess risk at the level of sample and measure the perception of risks.

This methodology helps us identify and rank the main specific risks in tourism enterprises from Romania and quantify these risks. In order to realize that we want to disseminate the questionnaire at top management level.

The method of analysis of questionnaire responses is SPSS. The questionnaire has 25 questions structured as:

Part A: Identification of the respondent questions that aim to differentiate responses and their interpretation by category of respondents, such as:

- 1) the area in which is the structure of accommodation: city, resort or in transit areas;
- 2) the type of accommodation: cottage, villa, hostel, hotel or resort;
- 3) classification of accommodation: no/1 star/daisy, 2-3 stars/daisies or 4-5 stars/daisies;
- 4) the relationship between management and ownership: owner is the manager or the manager is different from the ownership;
- 5) ownership structure of accommodation: mixed, private or public;
- 6) legal form of accommodation: Ltd., JSC or individual enterprise;
- 7) the size of accommodation: micro, small/medium or large enterprise;
- 8) type of business structure accommodation depending on working time during a calendar year: seasonal enterprise or organization working throughout the year;
- 9) active in business: under 10 years, between 10-25 years and more than 25 years;

Part B: Questions on the assessment of risk perception and its variables aimed at prioritizing risks and variables measuring risk (threat, vulnerability, countermeasures, impact, probability):

- 10) specific risk hierarchy, with an importance coefficient ( $K_i$ ) from 1 to 5 (1 being insignificant and 5 significantly): Tab. 3.1;
- 11) assessment of perception of threats depending on its size related with each risk (grade 5 – very significant threat and grade 1 – threat very insignificant): Tab. 3.2;
- 12) assessment of perception of vulnerability depending on its size related with each risk (grade 5 – very vulnerable, and note 1 – slightly vulnerable): Tab. 3.3;
- 13) assessment of perception of countermeasure depending on its size correlated with each risk (grade 5 – very small possibility of countermeasure and grade 1 – very high possibility of countermeasure): Tab. 3.4;
- 14) assessment of perception of impact depending on its size related to each risk (grade 5 – the greatest impact and grade 1 – lowest impact lowest): Tab. 3.5;
- 15) assessment of perception of probability of materialization depending on its size related to each risk (grade 5 – probability close to 100 % and grade 1 – probability almost to 0 %): Tab. 3.6;

Part C: Questions on the concept of risk and risk management aimed to find out the perception and attitude towards risk managers in tourism from Romania, in so far as it is considered a risk and linked to the performance of the enterprise, risk management methodology, such as:

- 16) the perception of risk: is a phenomena only with a negative connotation or it is a phenomena with both negative- and a positive connotation;
- 17) attitudes towards risk : risk appetite, indifference to risk or risk aversion;
- 18) opinion about risk being a key determinant of performance;
- 19) turnover of accommodation structure averaged over the last 5 years: under 10,000 EUR, between 10,000 to 50,000 EUR or more 50,000 EUR;
- 20) the general state of the business environment in Romanian tourism: relatively stable, unstable or highly risky;
- 21) extent affected by the enterprise risk: very long, long, fit, small or very small;
- 22) the extent to which risk is subject to management approach: very long, long, fit, small or very small;
- 23) internal departments focused on managing risks: general management, risk management or other/s management department/s;

- 24) if the dashboard contains information on risk thresholds signaling;
- 25) what are the risk management tools used for risk supervision.

### **3.5. Conclusions**

We believe that this study can contribute to the specific literature because we tried to clarify some concepts in our opinion much discussed in literature such as risk, risk management, risk pilotage; and to customize these concepts for tourism enterprises, poorly explored area in our opinion. We tried to show the differences between risk and risk management in industry and tourism, and briefly present risks that we consider to be specific tourism enterprise .

Also, we wish this chapter to have an important contribution in the field of risk management in tourism enterprises as presenting an innovative risk evaluation method, different from existing ones. This method differs from those in the literature because it is based on perception not on results; is about custom specific risks in tourism enterprises applied prior to the contingency, finding a method of prediction.

Future research directions are: the questionnaire of the top management of tourism enterprises from Romania, centralization of responses to the questionnaire and the validation or invalidation of research hypotheses.

## **CHAPTER 4**

### **HARMONIZATION OF ACCOUNTING SYSTEMS, A NEED FOR THE FOREIGN INVESTORS IN ROMANIA**

#### **4.1. Introduction**

Every country is governed by principles and rules forming a system which every economic operator must respect in order to be able to conduct its business in that country.

The system generally means a set of elements (principles, rules) dependent on each other to form an organized whole that puts order in a field of theoretical thinking, regulates the classification of a field of human knowledge, or is it a practical activity who operate according to the aim pursued (DEX, 1966).

From an accounting perspective, the system can be defined as „an organized ensemble of theories, concepts, principles, processes, methods and techniques through which occurs obtaining, processing and storage of information about the economic heritage” (Mateş et al., 2005).

Nowadays borders are no longer a impediment in the flow of monetary capital, of goods and services and technology. It is a common situation when subsidiaries and branches of multinational companies that operate in foreign countries, are subject to the accounting regulations of the respective countries.

If the global economy grows, economic entities are faces with the issue of reporting information in the financial statements according to different accounting systems of the countries in which they operate. Since accounting provides information for making economic decisions in the economic environment of the countries in which they operate, multinationals are in a position to restate its financial statements in accordance with a particular set of accounting rules usually that set of rules in the country of origin of the parent entity.

Taking these aspects into account, we can see the need of multinational companies for harmonized accounting systems of world countries in order to obtain comparable data worldwide.

## **4.2. Conceptual framework for harmonization**

### **4.2.1. The factors that influence the global financial reporting systems**

Literature has approached the issue of harmonization in an effort to reduce and finally to eliminate the differences between existing accounting systems, for starters, have been identified the factors that influence the global financial reporting systems in order to obtain a set of accounting rules that ensure a uniform reporting of information at a global scale.

Roberts (Roberts et al., 1998) presents five major environmental factors acting on cultural values and influences the accounting system of each country:

1. The economic system.
2. Socio-political.
3. The legal system.
4. The education system.
5. Religion.

According to Professor Neculai Tabara (Tabara, Horomnea, 2010), the economic, political and legal systems are interdependent and may be influenced by education and religion. The extent to which religion has an impact on socio-economic and political environment varies from country to country, with the example of Muslim countries where religion is the most important factor influencing the economic environment.

It can be said that the five factors mentioned play a key role in formation of cultural values which, in turn, affect, among other things, the values of the accounting profession, with direct impact on the accounting system. Information provided by the accounting system in turn influence the economic, political, legal and educational systems.

Nobes (Nobes, Parker, 2004), on the other hand, identifies eight factors that may lead to differences in national accounting systems, namely:

1. The external environment and culture.
2. The legal system.
3. Sources of funding.
4. The relationship between accounting and taxation.
5. Accounting profession.
6. Inflation.
7. Accounting theory.
8. Externe – influences other factors.

Choi (Choi, Meek, 2005) classifies such influence factors:

1. Sources of funding.

2. The legal system.
3. The relationship between accounting and taxation.
4. Economic-political boundaries.
5. Inflation.
6. Level of economic development.
7. Level of education development.
8. Culture.

As can be seen from the above, there is consensus in the thinking of specialists regarding the factors that determine the different ways of reporting the information globally. We can say that the main factors are: the political, legislative and fiscal systems, the financing method, the accounting profession and other external factors.

We present in the following the main factors mentioned above.

### **1. The influence of political-economic environment**

Political stability and economic vision of the government influence the society's working environment. If they are not set, there is no money on the market from the state budget or from investors because no one invests in an area of political insecurity in which no one can forecast the development on a longer interval of time.

If there are no regulations, the market develops chaotic. The absence of regulations can generate abuses, bottlenecks and inability to collect money to the state budget. Economic stability is an absolute prerequisite for the development and improvement of a solid accounting system, where it can be deduced that the progress of an accounting system is facilitated when the country has a stable political system. This means that developing a solid accounting system is very difficult in conditions of bureaucracy, corruption or political instability.

Allocation and effective use of public financial resources are two of the most important concerns of the public authorities.

Social cultural expenditures are allocated on the basis of the government social programs according to the objectives set by the state and designed for the entire community. It is estimated that from an economic point of view they have a positive effects because, by increasing education standards, improving health and living conditions it will create a long-term national product that will generate indirect benefits for the entire society.

One can say that, in a symbolic way, that the economic system can be likened to a circular chain that may break at the weakest link. It is therefore essential to support the economic activity, by generating new jobs and by developing horizontally, leading to increasing the number of taxpayers and also

increasing the salaries. We can support private economic sector that has demonstrated over time the ability to absorb workforce and generate income to the budget. It goes without saying that the state should participate also by paying on time their commitments negotiated with operators so that they, in their turn, to be able to pay at maturity fees and contributions.

## **2. The influence of the external environment and culture**

One of the determining factors in the evolution of the accounting system of a society is the environment in which it operates. Western mentality is inclined towards culture and desire for improvement and broadening of knowledge. Always a cult man will have the consciousness of the work well done and desire to advance in the social hierarchy.

## **3. The influence of the legal environment and economic development level**

Worldwide, legal systems fall into two broad categories, namely:

- Roman-German legal system and
- common law system.

Roman-German legal system is based on Roman law, civil jus developed by Justinian in the sixth century, according to which accounting rules are related to the idea of justice and morality, becoming true doctrine. In countries where the legal system is applied, such as in France, Germany, Spain, Belgium, Portugal and Greece, accounting regulation is a social contract which reflects a compromise between the parties.

Regulatory mechanism in countries with such a system are defined by the nature of the rules to be observed. In France, for example, there is the General Plan of Accounts which is mandatory for all entities operating in France and sets a number of precise rules for evaluating and presentation of the financial statements. Also, accounting regulation is imposed on all entities that perform an economic activity, irrespective of legal form.

The system is more permissive in Germany, for example, entities have an interpretation of legal texts generally accepted and the accounting rules are applied differently depending on the shape and size of the company.

The common law, specific for the British Isles, is characterized by a greater freedom given to companies in the development and presentation of financial statements under the condition of reflecting true and fair view of the work undertaken at the establishment. In countries like the US, Ireland, India, Australia where applies the common law system, there is a self-regulatory accounting point of view which is achieved by the normalizing act of liberal accounting profession, rather than with a general accounting plan.



#### **4. The influence of funding sources**

The role of financial statements is to provide relevant, reliable and comparable informations to those interested for the accurate picture of the economic situation of an entity. The financial and accounting information reflected by the financial statement is determined by the structure of the stakeholders of that entity, aspect that leads to differentiation in rules and accounting practices.

In most cases, entities provide their funding sources either through bank loans or by increasing equity. The level of economic development of the country in which the company operates determines, to a large extent, its mode of financing and accounting system. For example, in Anglo-Saxon countries, funding entities is done mostly by increasing equity. In this context, accounting rules provide first of all to investors, all necessary information in order for them to make the best business decisions, such as the right time to buy or sell shares.

In countries where entities resort to financing through bank loans, accounting practices are oriented to protect banking investment through the application of rules of evaluation and measurement in a more cautious manner.

If the state is the major funder of economic entities, the financial statements are designed to meet their needs, thus creating a strong link between the accounting and tax systems.

The way in which an entity obtains funding presents a real interest in financial reporting because, in them, the difference between financing carried out with the support of financial institutions or through capital is essential. Both individuals and institutions that fund companies through loans are actually interested by ability to pay at maturity interest rates and borrowing contracted. On the opposite side are those who participate in company financing through capital, because they are primarily interested by increasing net asset after paying obligations.

As we have seen there are many factors that determine the ways of reporting the information globally. We can say that companies and their stakeholders are the most affected by the differences in accounting practices globally. For example, multinational companies owning subsidiaries in a foreign country have to prepare consolidated financial statements, which requires to elaborate two sets of financial statements: one in accordance with the principles of the country where are the subsidiary and the other using the principles of the country of origin of the parent company, aspect that generates additional costs.

#### 4.2.2. Foreign investors in the Romanian market

To reflect the need for the Romanian accounting harmonization with EU directives and International accounting standards, we made the following case study. Based on data provided by NTRO we identified the companies with foreign capital from Romania because of our desire to reflect their share and their number in the total number of the open societies in Romania. In August 2014 all over the country were registered 195,386 companies with foreign capital, which represents 49.47% of all companies registered at the National Trade Register Office. A company with foreign equity participation represents a company in which the shareholders, persons or legal persons, have the residence or registered office outside Romania.

In the table below it is presented, in detail, the ranking of the countries of origin of investors in companies with foreign participation in the share capital on 31 August 2014 (Tab. 4.1).

As can be seen from this table, most investors on the Romanian market are from Italy, Germany and Turkey and as we can see these three countries represent 37.35% from total of foreign participation and the remaining 47 countries reach the value of 62.65% from the total of foreign participation in the Romanian market.

**Table 4.1. Ranking by residence countries of investors in companies with foreign participation in the share capital on 31 August 2014**

		No.	%
No.	Total Romania	196,560	50.53
1	Italy	38,716	19.82
2	Germany	20,473	10.48
3	Turkey	13,776	7.05
4	Hungary	12,528	6.41
5	China	11,277	5.77
6	France	7,872	4.03
7	U.S.A.	6,878	3.52
8	Austria	6,811	3.49
9	Israel	6,685	3.42
10	Greece	5,939	3.04
11	Irak	5,868	3.00
12	Syria	5,803	2.97
13	Ciprus	5,530	2.83
14	Spain	5,250	2.69
15	U.K.	4,937	2.53
16	Holland	4,556	2.33
17	Moldavia	4,374	2.24
18	Lebanon	3,915	2.00

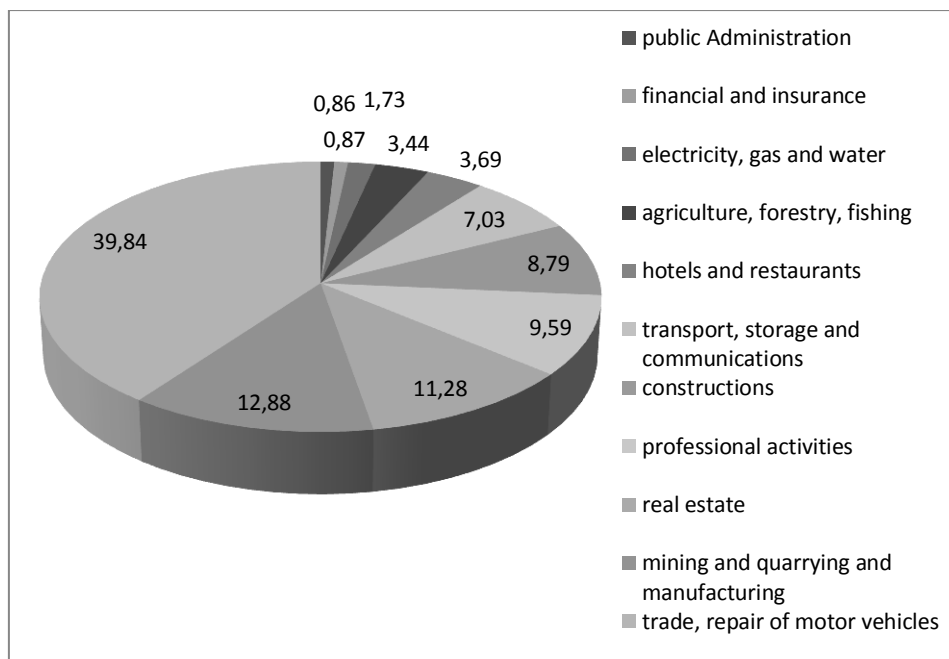
19	Jordan	3,276	1.68
20	Belgium	3,165	1.62
21	Switzerland	2,534	1.30
22	Bulgary	1,931	0.99
23	Canada	1,751	0.90
24	Egypt	1,648	0.84
25	Sweden	1,337	0.68
26	Czech	832	0.43
27	Ireland	830	0.42
28	Denmark	805	0.41
29	Luxembourg	793	0.41
30	Poland	762	0.39
31	Australia	716	0.37
32	Slovakia	565	0.29
33	Portugal	516	0.26
34	British Virgin Islands	379	0.19
35	Norway	338	0.17
36	Japan	259	0.13
37	Panama	226	0.12
38	South Korea	223	0.11
39	Liechtenstein	212	0.11
40	Bermuda	200	0.10
41	Slovenia	198	0.10
42	Virgin Islands	187	0.10
43	Finland	162	0.08
44	Malta	117	0.06
45	Gibraltar	66	0.03
46	Singapore	62	0.03
47	Belize	43	0.02
48	Without Citizenship	25	0.01
49	Ins. Marshall	25	0.01
50	Netherlands Antilles	15	***

Source: own interpretation after the statistics.

If we look after the structure on activity fields in the number of companies with foreign participation in the share in August 2014, the situation is as follows (Figure 4.1).

As can be seen from this figure, most foreign investors have invested their money in hotels and restaurants, namely 39.84% of the total. In the second place we find the mining and quarrying and manufacturing domain but at a significant difference of the first place. The construction sector ranks 5th from the top, with 8.79%. The construction sector contributes significantly to the prosperity and competitiveness of the national economy because is well known that a modern and efficient infrastructure is the key to productivity. People and the companies are

dependent on the performance of infrastructure: homes rehabilitated and refurbished thermal for the population, better roads, rehabilitation of water and sewerage networks, modern buildings and several shopping areas, hospitals built and equipped according to European standards, modern railway, represent local investment projects for the community and also represent jobs for the builders that operate in the market. While many investments in infrastructure are needed, companies operating in the construction sector faced difficulties in meeting obligations because of the lack of financial resources, aspect which led to a need for foreign investors.



**Figure 4.1. The structure on activity fields**

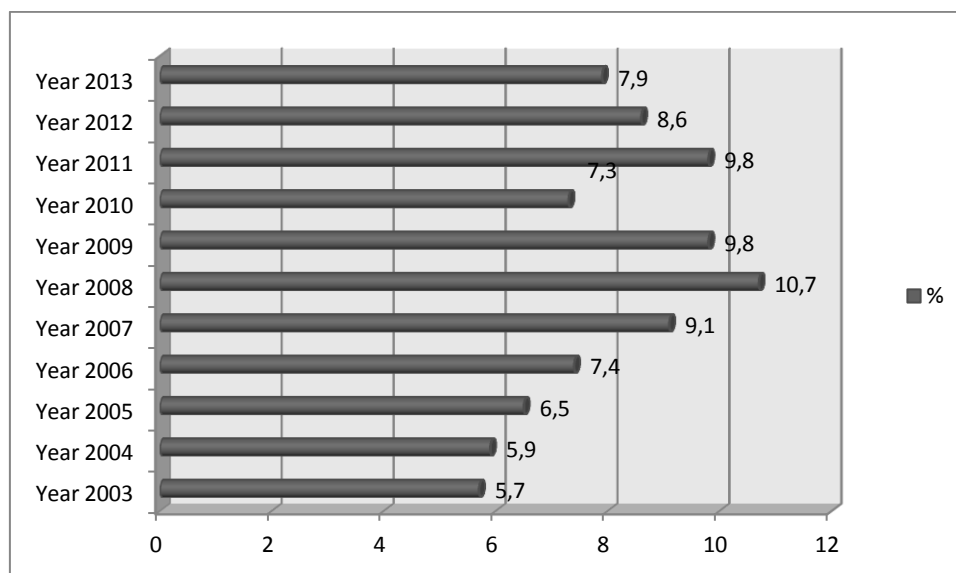
Source: own interpretation after the statistics.

The year 2008 was for the construction sector in Romania a year of economic boom. In the next chart you can see the dynamics of the construction sector's share in GDP of our country in the period 2003-2013.

As can be seen from the graph, since 2003 until 2008 the share of the construction sector in GDP had an upward trend in Romania. The global economic crisis had affected this sector, so, in the next two years, namely in 2009 and 2010 there was a decrease rather sharply to the value of 7.3% in GDP. In 2011 there is a slight increase to 9.8%. In the following two years, in the construction sector we

can observe a decline, the share of this sector in GDP was falling both in 2012 and 2013, up to the value of 7.9% in 2013.

If we look in terms of the amount of subscribed capital, the situation is as follows (Tab. 4.2).



**Figure 4.2. The share of the construction sector in GDP in Romania**

Source: own interpretation after the statistics.

**Table 4.2. The amount of subscribed capital**

No.	Country	Total	
		LEI	EURO
1.	Romania	136.645.623,00	39.300.802,53
2.	Foreign invest	135.758.876,70	35.377.531,50

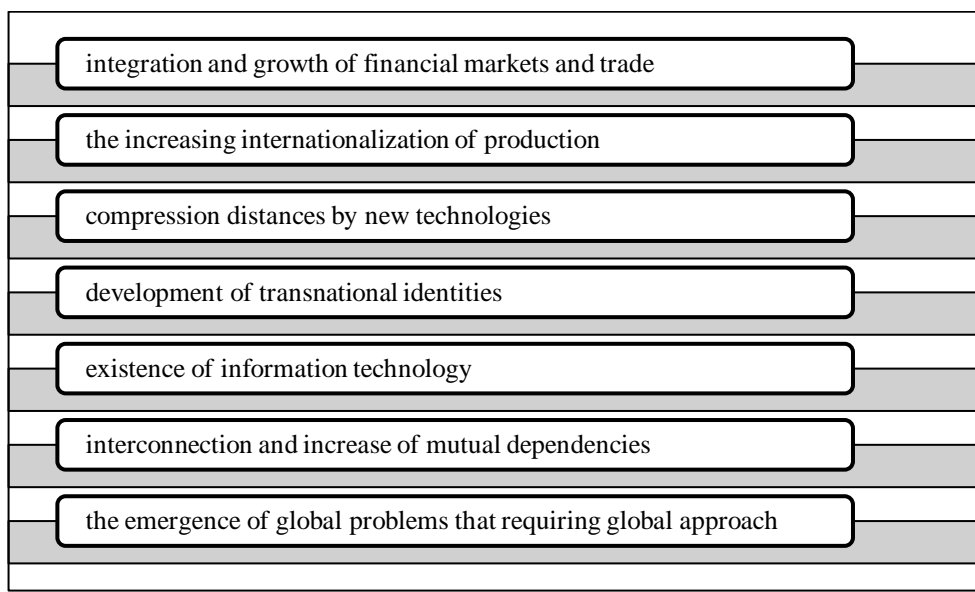
Source: own interpretation after the statistics.

As it can be seen from this table, the value of subscribed share capital by Romanian investors is approximately equal with the one made by the foreign investors. Considering these aspects, the steps made in order to achieve a compatibility of the Romanian accounting system with the worldwide systems are determined by the new configuration of international economic relations that are in a globalizing process generated by the international movements of capital. From the data presented we could notice that Romania is a country where many foreign investors want to place their financial resources.

Standardization of accounting rules worldwide would mean for foreign investors a reduced cost for obtaining information and for making the necessary adjustment in order to make the information comparable.

Globalization does not change only the boundary elements between states but also presents how the economic policies are adopted and implemented. Globalization tends to become a tool for management, for universal values and global economic processes, a generalization tool of democracy, prosperity and security.

The concept of „globalization” of Anglo-Saxon origin, is characterized by the following significant features (Figure 4.3)



**Figure 4.3. The characteristics of globalization**

Source: own interpretation after the statistics.

The promoter of globalization is considered to be trade, globalization starting with the first interstate economic relations, primarily commercial. Globalization designate an emphasis on cultural relations, social, political and economic across national borders, involving more than geographical extension of a range of events and issues. Globalisation also means intensifying global connections and awareness of this intensification, while diminishing the importance of territorial borders.

Accounting harmonization process conducted within the European Union provides for the improvement of standards, methods, rules and national accounting

terminology to make them comparable and compatible in order to give the same interpretation of events and transactions, developing standards and EU directives incorporated in the accounting legislation of each country.

### **4.3. Conclusions**

The accounting system of a nation is strongly influenced by its level of economic development, being in a directly proportional relationship. Therefore, an accounting system of a developed country is and will always be focused on the lack of bureaucracy, the economic reality, unambiguous legislation that will not provide loopholes to circumvent accounting regulations. An accounting system designed to be a real support for taxpayer may generate economic progress for the society and awareness the fact that the by paying taxes and contributions to the state budget our society is developing more and more, should be a goal and not a utopia.

The accounting harmonization at European level is achieved through convergence with International Accounting Standards IAS / IFRS developed by the IASB, which are a powerful tool for achieving the objectives undertaken: to protect investors and the financial resources to improve the functioning of capital markets.

In this process are frequently used, as could be seen from the foregoing, the terms of harmonization, convergence and compliance. Accounting harmonization aims to limit variations of accounting systems by agreeing to accounting regulations in all EU countries via European directives. Convergence of Accounting aims to remove differences between accounting systems based on convergence project between US GAAP (General Accepted Accounting Principles United States) and IFRS (International Financial Reporting Standards) and Compliance is consistency of accounting rules with a default. At EU level, conformity is achieved by applying IFRSs in all Member States for listed companies that prepare consolidated financial statements.

The evolution of the globalization of financial markets has increased the need for information from investors claiming the need for uniform accounting rules, shared internationally. Given these wishes, accounting harmonization process in Europe has made significant progress in recent years, finding practical application in important economic areas using adopting international standards IAS / IFRS by the Member States.





**PART 2**

**COMPETITIVENESS,  
INNOVATION  
AND DEVELOPMENT**



## **CHAPTER 5**

### **INTUITIVE AXIOMATICS AND SEMIOTICS IN ECONOMICS – CEMENT FACTORY CASE<sup>3</sup>**

#### **5.1. Introduction**

This topic was chosen because of the unsatisfactory state of research in the area of applying formalism and semiotics in economy. Through this chapter I wish to pave the way for future research in this area. My aim is the creation and application of a simplified model used as the basis for future axiomatisations. Therefore, this chapter is divided into 4 parts. The first part represents the theoretical background concerning semiotics, the study of signs and the way in which they relate to other areas of study, ex. medicine. In the second part a brief summary of other research articles pertaining to my area of study was prepared. In the third part, a theoretical model was elaborated, for the semiotic analysis of an economic unit. In the last part my conclusions can be found, my future research avenues will be presented, also my research limitations are outlined alongside a comparison with other similar models of semiotic analysis.

##### **5.1.1. Character and role**

In the Course of General Linguistics, published for the first time in 1916, Saussure postulated the existence of a general science of signs, semiology, in which linguistics is only a part. Therefore, semiology aims to capture every system of signs, indifferent to its content or limits, images, gestures, musical sounds, objects and the complex associations between them, these being a part of the ritual's content, of conventions or public entertainment: all of these constituting, if not

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<sup>3</sup> Această lucrare a fost realizată în cadrul proiectului POSDRU/159/1.5/S/142115 cu titlul “Performanță și excelență în cercetarea doctorală și postdoctorală în domeniul științelor economice din România”, cofinanțat din Fondul Social European prin intermediul Programului Operațional Sectorial Dezvoltarea Resurselor Umane 2007-2013.

specific languages, at least systems for signifying something. There is nowadays a demand for the field of semiotics, this stemming not from the fancy of some researchers but from the practical and theoretical necessity of modern world history (Hill & Wang, 1968).

Semiotics began to be a useful tool for the cultural studies from the late 60's as a result of the research done by Roland Barthes. While currently semiotics does not have a central role, through cultural and media studies, it remains useful for the discerning researcher.

Semiotics is not institutionalised as an academic discipline, it is only a research and study are which involves many theoretical positions and methodological tools. It is commonly used in textual analysis, here we must note the fact that a text can exist in any medium and can be verbal, non-verbal, or both, contrary to the logocentric character of this distinction. A text representing an amalgamation of signs, constructed and interpreted with an emphasis on the accepted conventions of a domain or a particular way of communication.

In this case, the term "way" is used in a variety of different modes by different academics, it is possible to include large category like discourse and writing, or printing, or it can refer to several specific technical forms from mass-media or the interpersonal communication modes that are used. Some researchers even made a classification of these modes of communication: visual, audio or tactile. Human experience is in essence multisensory, any representation of experience being a subject of the constraints typical to the used communication mode. For example, in the case on language, we sometimes do not have words to describe a experience and also we do not have any way to represent smell or touch, using the existing communication modes. Different modes and types of communication offer different ways to represent experience, facilitating some forms of expressions and blocking others.

The everyday use of a communication mode by someone that knows how to use it, doesn't appear as a problem, this fact not being very surprising, because these communication modes evolved as a way to fulfil goals that are usually viewed as incidental. How often and how fluently a communication mode is used, usually it becomes more transparent or invisible for it's users. Usually, in that moment, the primary function for that communication mode is perfectly satisfied.

There are 2 divergent traditions in semiotics, these coming from the works of Saussure and Pierce. The only semiotician which tried to unite these two approaches was Umberto Eco.

In the last decade, semiotics began to evolve from the classification of sign systems to an exploration of the different modes of producing the signs and their

meaning, the way in which systems and codes are used, or transformed, in practice. While before this, the emphasis was placed on studying the sign systems as mechanisms that generate messages, now the process itself is being examined. The transformation and the creation of codes, the transformations suffered by the individuals which use them, individuals being usually the subjects concerning semiotics.

Therefore, semiotics is important because it helps us to not take reality for granted, by having a purely objective existence, independent from human interpretation. It teaches us that reality is a system of signs.

### **5.1.2. Definition**

**Semiotics** is the field that studies the way in which communication and signifying works, the relations between code and message, between sign and discourse. The fundamental unit of semiotics is the sign. Semiotics represents also the study of signs and codes, signs that are not used in the process of producing and interpreting the messages, and the codes which govern the use of these signs.

### **5.1.3. Principal components**

Semiotics is composed out of:

1. Semantics – relation between signs and the things to which they refer; their denotata, or meaning.
2. Syntactics – relations among signs in formal structures.
3. Pragmatics – relation between signs and the effects they have on the people who use them.

#### **Sign**

A sign represents something that can be interpreted as having a meaning, different from itself, through this it is capable of communicating an information to the person who decodifies or interprets that sign. The 2 dominant models on which constitutes a sign are those of the linguist Ferdinand de Saussure and the one by Charles Sanders Pierce:

- Saussure's Diadic model: He defines the sign as being composed of:
  - a Significant: the sign's form;
  - a Signifier: the concept that is being represented.

The sign being the whole that results from the association of the significant with the signifier. The relationship between the signifier and signified is called signification, being represented in Saussure's diagram with arrows.

- Pierce's Triadic model:
  - A sign: a sign's form;
  - It's object: one that the sign is about;

- It's interpreter: doesn't really interprets, but indicates the sense interpreted by the sign.

Pierce's triad can be applied to cases that do not have a human point of origin with the condition that the end-point is human.

### **Symbol**

Pierce and Saussure use the term symbol differently. Nowadays, most researchers refer to a language like a symbolic system of signs. Saussure avoided to refer to lingvistical signs as symbols, because the everyday use of this term refers to examples like the scales (signifying justice), he insisted that these kind of signs are never arbitrary. They indicate a vestige of a natural connection between significant and signifier, a link that he later named as being "rational". While Saussure oriented himself upon the arbitrary nature of a lingvistic sign, a more conclusive example or arbitrary symbolism is the one of mathematics. Mathematics do not require a link to the exterior world, its significant's being indisputable concepts, mathematics being a system of relations.

For Pierce, a symbol is a sign which refers to the object it describes thanks to a law, usually an association of general ideas, which is made in such a way that the symbol is interpreted alongside it's object.

### **Signs classification**

In the following paragraphs, i will illustrate Pierce's classification, I consider this one to be the most important, because it shows the relations between the signs and it's object:

- Symbol: the significant is not like the signifier, the segnificant being fundamentally different or purely conventional, the relations between them needs to be learned: morse code, punctuation signs, numbers, flags;
- Icon: the significant is perceived to be like or to imitate the signifier, being similar through it's possession of one of its qualities: a portrait, a cartoon, etc.;
- Index: the significant isn't differente, but in a close connection with the signifier, the link can be possibly observed: medical symptoms, natural signs, signals, etc.

### **Code**

The specific semiotic systems will be called codes. These codes are:

- Social Codes (in the broadest sense, all semiotic codes are social):
  - Verbal language (phonetic, sintactic, lexical and paralingvistic codes),
  - Body codes (contact, proximaty, facial expressions),
  - Commodity codes (fashions, cars),
  - Heuristic codes (protocols, rituals, role-playing, games);

- Textual codes (Representative):
  - Scientific codes;
  - Esthetics codes (classicism, romanticism, etc.),
  - Rhetoric, stylistic and gender codes (narrative, subject, characters, actions, exposition, argument, etc.),
  - Mass-media codes (self-explaining);
- Interpretative codes:
  - Perceptual codes: visual perception,
  - Ideologic codes: text coding (dominant, negotiated or opposite) as well as individualism, feminism etc.

#### **5.1.4. Semiotics in other fields**

1. Biosemiotics – a relatively new field which studies the production, action and interpretation of signs and codes in biology.
2. Cognitive semiotics – it concerns the study of meaning-making, this study being achieved through the use of methods and theories developed in cognitive sciences and human ones.
3. Computational semiotics – this branch attempts to engineer the semiosis process in order to study, perfect and improve Human-Computer Interaction, it hopes to achieve this through the mimicking of human cognition in artificial intelligence.
4. Cultural semiotics
5. Design semiotics
6. Product semiotics – uses semiotics in order to improve the use of signs in the design of physical products.
7. Law and semiotics
8. Literary semiotics – this represents the original branch of semiotics, as pioneered by Ferdinand de Saussure, this field being influential in the development of literary theory.
9. Music semiology – “There are strong arguments that music inhabits a semiological realm which, on both ontogenetic and phylogenetic levels, has developmental priority over verbal language”. (Middleton, 1990, p. 172; Nattiez 1976, 1987, 1989; Stefani 1973, 1986; Baroni 1983; Semiotica, 1987).
10. Organisational semiotics – this studies the role of information and how it can be better used in firms, businesses and organised activities. The main characteristic of this field is the fact that it treats organisations as information systems.

- 11.Semiotic engineering – helps the designer in figuring out the wants and needs of the users inside an informatic system.
- 12.Semiotic information theory – examines the information content carried by signs and expressions as it is conceived in the framework developed by Pierce.
- 13.Social semiotics – expands the interpretable semiotic landscape to include all cultural codes, such as in slang, fashion, and advertising. It considers social connotations, including meanings related to ideology and power structures, in addition to denotative meanings of signs.
- 14.Urban semiotics – studies the meaning of urban forms, this being generated by signs, symbols as well as their specific social connotation. Its areas of focus are the material objects (like buildings, parks, etc.) as well as popular discourse concerning the urban landscape (like architectural criticism).
- 15.Theatre semiotics – uses semiotics in the analysis of theatre plays and production for the purpose of improving these forms of entertainment.
- 16.Visual semiotics – a branch closely related to visual rhetoric, it analyses visual signs.
- 17.Zoosemiotics – a branch created by Umberto Eco, it studies mostly the communication and meaning-making of animals.

## 5.2. Literature review

The area of semiotics is a relatively new research area, economic semiotics being even more new. Thanks to this fact, there are not many researchers who have chosen to analyse this particular domain, therefore I do not have a large knowledge base from which to start. As a consequence I have examined several articles from some academic journals that are similar to my field of study, and who also use similar methods in researching economy through the use of signs.

**Money talks but what are they really saying?** Carl Wennerlind.

In this article (Wennerlind, 2001), Wennerlind poses the question, what do we really understand through money? He starts his research from the premise that although we use them constantly in economic calculations, in analysis and predictions, no one has tried to decipher their semiotic character, alongside their useful nature. He also identifies money as a mediator for inter-human relationships. In essence, he tries to explore their character and their social, cultural and politic context.

**Marketing and Semiotics: New Directions in the Study of Signs for Sale**

Jean Umiker-Sebeok.



This book is a collection of articles pertaining to the applications of semiotics in marketing. Some articles were useful in my research thanks to the models and methodology they contain (Jean Umiker-Sebeok, 1987; Corporate Imagery and Communication, Mythology in Organizations and Marketing, The Semiotic Diagnosis of Marketing Culture, A Semiotic Approach to the Design Process and Advertising as a Cultural System).

**The Concept of Total Brand Based on Semiotics** Wang Liansen.

This article examines the diverse opinions relating to the brand concept, that are already existing in management and marketing (Liansen, 2004). Wang explains and solves the two enigmas that appear upon his analysis of Pierce's triadic model. On that basis, he offers a new definition of brand in semiotics and constructs a conceptual model, called a total brand.

**Semiotics: The Basics** Daniel Chandler.

This book wishes to be a sort of a syllabus or entry-point in the world of semiotics. Through the use of a simple language and contemporary examples, the book analyses this interdisciplinary area, asking questions like: What is the sign?, Which codes do we take as granted?, What is a text? How can we use semiotics in a textual analysis? etc. (Chandler, 2007).

**Tourism and the Semiotics of Nostalgia** John Frow.

J.Frow analyses the influence of nostalgia and memories upon touristic demand (Frow, 1991), alongside the role of semiotics in creating those experiences.

**Economic Theory as an Art Form** Alan W. Dyer: This article (Dyer, 1998) explores and infirms McCloskey's analysis on economy, its similarity to a form of rhetoric, this situation (in the author's vision) raising clear problems concerning the economic scientific community identity.

**Semiotics, Economic Development, and the Deconstruction of Economic Man** Alan W. Dyer: This article (Dyer, 1988), also by A.W. Dyer supports Veblen's theory about the role of tradition in institutionalist theory, this theory having a profound effect upon economic development.

### **5.3. Method for a semiotic analysis of a economic unit**

My objective for this article represents the creation of a simple model for the semiotic analysis of a company's efficiency in producing cement.

Hypotheses:

H1: What are the specific indicators for calculating a companies efficiency?

H2: How can we use these indicators to obtain more information about the firm?

H3: What are the rules or limits for these indicators?

H4: How can we interpret the results and its dynamic?

Research instrument:

For the purpose of this article, the research instrument used is a variation of a semiotic analysis from literature, being built from the start not for use in literature but in economics.

The following model is composed out of five successive stages:

1. Definitions: in which I establish the initial state of the firm, and I symbolise the primary indicators.
2. Axioms: the primary indicators are used to define five axioms, these axioms establishing the second level indicators.
3. Rules: in here the first and second level indicators are combined to create specific results pertaining to an economic analysis.
4. Theorems: where the results obtained from the combination of the first and second level indicators are used to create three theorems.
5. Interpretation: where we calculate the indicators of efficiency and offer an explanation for each result type.

#### **Cement factory case**

1. Definitions
  - a) An industrial firm, producing cement cannot function without consuming electrical power. ( $E_{el}$ ),
  - b) The economy requires cement ( $q$ ),
  - c) Electrical power costs money ( $p_{re}$ ),
  - d) The cement produced will be purchased with money ( $p_{rp}$ ),
  - e) A workday has 24 hours.
2. Axioms
  - a) Every ton of cement produced requires a certain quantity of electrical power ( $c_{se}$ ),
  - b) In an hour, there is a certain quantity of cement produced ( $\eta q$ ),
  - c) In each ton of cement there exists a certain quantity of labor, or productivity ( $w_m$ ),
  - d) With the required electrical power, money and materials, the need for cement will be completely satisfied ( $N_q$ ),
  - e) The normal costs for 1000 lei production are ( $C_n$ ).
3. Rules
  - a)  $E_{el} = q \times c_{se}$  (total production needs),
  - b)  $Q_n = q \times w_m$  (it shows production),

- c)  $C_{el} = q \times c_{se} \times p_{re}$  (the cost of electrical power),
- d)  $Q_m = q \times p_{rp}$  (commodity production value),
- e)  $24 \times n_q \times n_z \times I \geq N_q$  (the correlation between cement production and the need for cement),
  - $n_z$  = the number of working days in a month,
  - $I$  = the number of working months in a year,
- f)  $q = 24 \times n_q \times n_z \times I$  (equality between production and the factors that determine it),
- g)  $P = Q_n(1 - \frac{c_n}{1000})$  (financial results).

#### 4. Theorems

- a)  $w_d = \frac{Q_m}{C_{el}}$  (the productivity of electricity consumption),
- b)  $\tau_{el} = \frac{P}{C_{el}}$  (the rentability of electricity consumption),
- c)  $C_{sel} = \frac{C_{el}}{Q_{m,P}}$  (specific consumption/consumption of electrical energy).

#### 5. Interpretation:

- The (e) rule is analysed, which needs to be permanent  $\geq$ , otherwise the social need for cement is not satisfied:
  - Because of  $\eta_q$ ,
  - Because of  $\eta_z$ ,
  - Because of  $l$ ,
  - Because the duration of a workday isn't used (24 hours),
- $w_{el}$  is calculated considering the normed value  $w_n$ , encountering the following situations:
  - $w_n > w_{el}$  (unacceptable situation),
  - $w_n = w_{el}$  (a limit situation and an alarm),
  - $w_n < w_{el}$  (a very good situation, the ideal),
- $\gamma_{el}$  is calculated comparatively considering the normed value  $r_n$ , encountering the following situations:
  - $r_n > \gamma_{el}$  (a bad situation),
  - $r_n = \gamma_{el}$  (a good situations, but under questions),
  - $r_n < \gamma_{el}$  (a very good situation),
- In the same way we analyse  $c_n$  and  $c_{sel}$ :
  - $c_n > c_{sel}$  (a good situation),
  - $c_n = c_{sel}$  (equilibrium, but under questions),
  - $c_n < c_{sel}$  (a bad situation),

- We compare the dynamics of the following efficiency indicators and their generating measures, resulting:
  - $\tilde{w}_{el} > \tilde{Q}_m$ ,
  - $\tilde{w}\tilde{\gamma}_{el} > \tilde{R}_f$ ,
  - $\tilde{c}_{sel} > C_{el}$ .

These being adequate situations, if the inequality is opposite then the state of the firm isn't good, the causes need to be discovered and adequate measures need to be taken.

As you can see, this method is useful in creating a bridgehead between semiotic theory and economic analysis, all further methods will go from this direction forward. In my research this represents my first foray in this area, semiotics, from here on out i will try to increase the degree of complexity and find more applications for sermiotics in economy.

## 5.4. Conclusions

As you can see, on little space, with little means, we can do a logical calculation of the efficiency of using electrical energy and a correct, fast and systematic interpretation, which helps us create a good environment for a diagnostic of the system's state and adopting the necessary measures to ensure its functionality. This model was used as a small part of a larger model, the DIAG model, the larger model being very similar in structure but vastly different in scope or complexity. The interpretations are correct but they are done with the help of the larger model, therefore, future models must increase in size and complexity in order to offer a more detailed view of economic processes and efficiency. As this is a work in progress, there will be more research added in time, my main goal in this chapter being only to pave the way for that future research.

Research limitations:

This being a simple model it is somewhat limited in scope, currently being just effective in analysing a small part of economic indicators. In future articles i will try to increase the scope and the number of indicator analysed in order to offer a more thorough and strong analysis. In essence the model is flawed, its main purpose being just that of a proof of concept.

Future directions in research:

1. Sign interpretation: this will be composed of an inventory of signs, a syntax (the relationships between the signs), and a semantics (searching for the reports between the signs, and the objects that they refer to).

2. Intuitive axiomatics: the second direction will refer to the creation of an intuitive axiomatic, composed of an inventory of signs, the relations between these signs, a hermeneutics for interpreting the signs and finally a pragmatic perception of these signs.
3. Formal axiomatics: this is my last avenue of research, consisting of a symbolic language, the axioms of efficiency and the axioms of performance.

## **CHAPTER 6**

### **TECHNOLOGICAL OPPORTUNISM, ANTECEDENT OF E-MARKETING CAPABILITIES**

#### **6.1. Introduction**

Today we are living in a very dynamic environment. It is mandatory for managers to develop new capabilities and strategies in order to obtain competitive advantage and high performance. In order to obtain a high competitive advantage firms have to adapt their business model on the basis of new technologies. The adoption of radical technologies is linked to their marketing strategies in the area of product design, distribution and pricing (Gapon & Glazer, 1987). We can consider e-marketing capabilities development and e-business adoption as a radical technological change because they are transforming the business model and processes, resulting in the disruption of old industries and the creation of new ones. We structured the chapter in two main subchapters, in the first subchapter we talk about the technological opportunism and its importance for today's market, in the second subchapter we have presented the E-business adoption and e-marketing capabilities and we created a theoretical link between technological opportunism and e-marketing. At the end we succeed to refine the e-marketing construct and of understand the drivers that may lead a firm to develop e-marketing capabilities and the relationship between e-marketing capability and technological opportunism.

#### **6.2. Technological opportunism**

Technological opportunism is a sense-and-respond capability of firms with respect to new technologies, and an important driver of radical technology adoption. (Srinivansan et al., 2002). The reasons why the ability to sense and respond to new technology developments is critical are: technological change is a principal driver of competition, destroying monopolies, creating new industries and rendering

products and markets obsolete (Srinivansan et al, 2002); in-house technology developments is increasingly being complemented by additional sources, within and outside an industry (Pisano, 1990); difficulty for firms to predict which of several technology options under development will eventually succeed commercially, and therefore it may be expedient for firms to hedge their positions with alternative new technologies (Schilling, 1998). According to Resource-Based View (RBV), firms can build competitive advantage by developing resources and capabilities. Capabilities are complex bundles of skills and accumulated knowledge, exercised through organizational processes, which enable firms to coordinate activities and make use of their assets (Day, 1994). To generate sustainable competitive advantage, capabilities must have several critical properties: being valuable, rare, imperfect imitable, and nonsubstitutable.

Srinivansan et al. (2002) found that technological opportunism has two components: technology sensing capability and technology-response capability. Technology-sensing capability is an organization's ability to acquire knowledge about and understand new technology developments, technologies that can be developed inside or outside the company. The organization with high technology sensing capability will continually search after information's about new technologies opportunities and for threats. Firms that have a strong sensing capability keep close contact across the business functions as well as with external stakeholders. The company will also identify, sense and evaluate the internally created innovations and scan for external innovations through meetings with vendors, debriefings from salespeople, and discussions with competitors.

Technology response capability represents the organization willingness and ability to respond to the new technologies that it senses and that may influence the business. An organization that senses new technologies may not be willing or able to respond to these new technologies, because such technologies can cannibalize existing products, markets, and organizational relationships, and result in switching costs (Chandy & Tellis, 1998). The firms with this capability are also capable of remodelling their business process in order to take advantage of environment opportunities or avoiding the potential threats represented by the new technologies. There are multiple ways in which a firm can deal with radical technologies, they can ignore it, monitor it, form alliances in order to exploit the new technology, they can do limited experimentation, and adopt the technology within the firm.

### **Technological opportunism and performance**

Firms are continuously searching after how to obtain advantage in the market, whether it is a complex process or a capability that creates this advantage. Sensing and responding to the technological change is one of the way that firms

can gain competitive advantage (Srinivansan et al, 2002). Firms that have technological opportunistic culture are using their resources to actively scan the market, beyond those in which their products compete, for discoveries that will change the way firms do business (Srinivansan et al, 2002). Managers in these firms actively seek indicators that can create market advantages. Strong sensing capability firms are usually the first who notice technological developments that may potentially affect their business.

Technological opportunism is distinct from both organizational innovativeness and technological orientation in an important way. As they are conceptualized and measured both refer to the capability of an organization to develop new technologies, products and processes. On the other hand technological opportunism is the capability to sense and respond to new technologies whether those technologies are developed internally or externally or are used in developing new products. If a organization is willingness to invest in a in-house research facility to develop a radical new production process, the organization is both innovative and technologically orientated but not necessarily technological opportunistic (Srinivansan et al, 2002).

Today's technological changes is at a high level, the firms should extend their view beyond the traditional sources, like stakeholders, venture partners, suppliers or customer to the computer mediated environments/ online environment. However, it is not enough for firms to just sense the technological changes, they should also act on the knowledge. This require proactivity and investments in firm's processes. As a sense and response capability, technological opportunism is conceptually similar with market orientation (Jaworski & Kohli, 1993) define market orientation as organization-wide gathering of marketing intelligence pertaining to customer's needs, dissemination of intelligence among the departments and organization wide responsiveness to it. The researchers have focused on sense-and-response capability of firms with respect to their markets environment of customers and competitors (Srinivansan et al., 2002). However, technological opportunism differs in two important ways: First while market orientation is focused on customer and market intelligence, the new technologies can appear from many other sources, outside the market environment, sources like: suppliers, universities and other industries. Other research suggest that some market oriented firms are not able to adopt new technologies because their current customers do not find them useful (Christensen, 1997). Second, adopting such a change is risky and it's not clear if it will be successful or not to the firm (Srinivansan et al, 2002).



### **6.3. E-business adoption and e-marketing capabilities**

E-business is defined as “the use of electronic networks and associated technologies to enable, improve, enhance, transform or invent a business process or business system to create superior value for current or potential customers” (Sawhney & Zabin, 2001, p. 15). This definition is consistent with the “the use of internet technologies to link customers, suppliers, business partners and employees using at least one of the following: e-commerce websites that offer sales transactions; customers-services websites; intranets and enterprise information portals; extranets and supply chains; and IP electronic data interchange” (Information Week, 1999). Both definitions recognize that e-business is helping the firm in developing its process and become a networked entity. E-business also have equal impact to all the organization structure and across a range of its business processes. The definition have at their core the use of computer/technology for mediating different environments. For us the concept of marketing in computer-mediated environments it’s interesting. Computer mediated environments is characterized as a dynamic distributed network, potentially global in scope, together with associated hardware and software. Technology can include a broad range of communication technologies, devices and infrastructure pertaining to internet. In computer mediated environments can be identified four corresponding interactions: consumer-firm interactions with focus on consumer behaviour in context of consumer’s interactions with firms; firm–consumer interactions with focus on firms’ strategies and tactics in context of firms’ interactions with consumers; consumer–consumer interactions with focus on consumer behaviour in the context of consumer interactions with other consumers; and firm–firm interactions with focus of firms’ strategies and tactics in context of firms’ interactions with other firms (Yadav & Pavlou, 2014).

The integration of it and marketing is usually known as e-Marketing, and includes a broad set of interaction-enabling technologies that are frequently used in business to business. Technologies like customer relationship management software’s (CRM), sales force automation (SFA), e-commerce websites and extranets. These rich interactions provide customers with access to firm resources and information’s while simultaneously is providing the firm information about its customers (Trainor, 2011). Consistent with (Brodie et al, 2007) e-Marketing technologies extend beyond Internet-based advertising and communications and includes new technologies that are supporting several marketing functions including sales activity, marketing research and planning, customer relationship management, customer support.

The e-Marketing can create value in two ways. First is by providing a close bi-directional connection to a company's business processes, providing customers with direct access to firm resources. A good example of e-Marketing that connects customer to the firm's business process can be found when the firm is providing customized support extranets for its customers. Usually these extranets provide access to relevant support knowledge bases, product documentation and electronic communications with engineers. In this way customers become tightly integrated with the company's product development lifecycle leading to much greater customer-firm information's sharing and interaction. Those extranets not only provide customers with direct connection to firms resources, it also provide to product management a set of rich information regarding customer expectations, demands and usage. This kind of information sharing plays a critical role in developing and maintain strong customer relationships.

Second, the e-Marketing capability also creates value by enabling employees to increase their focus on the customers. This can be done through synchronizing activities and information throughout the organization. Outside-in information can be integrated with other customer records to improve overall sales productivity and organizational efficiency (Kim & Jae, 2007).

(Shaltoni, 2011) notes that adoption of e-marketing has two main benefits. The first is related to raising profitability through increasing revenues or cutting costs and second is related to improving marketing functions. E-marketing occurs as a result of new devices or systems and it causes changes in most marketing functions. The information companies receive from rich interactions can be used by marketers to better understand their customer expressed and latent needs. (Bharadwaj, 2000) finds out that a firm IT capability includes the IT infrastructure, human IT resources include the technical and managerial IT skills and IT-enable intangibles such as knowledge assets, customer orientation and synergy. Also IT resources have also shown to contribute to improve performance only when used together with e-marketing culture.

Based on the existing literature we conceptualize e-marketing capability as a multidimensional construct which include e-marketing technological capabilities and e-marketing value creating capability.

E-marketing technological capabilities refer to development and deployment of technology infrastructure that support e-marketing activities and initiatives. E-marketing value creating capability represents the managerial support for e-marketing technological capabilities and also the organizational culture that embraces these initiatives.

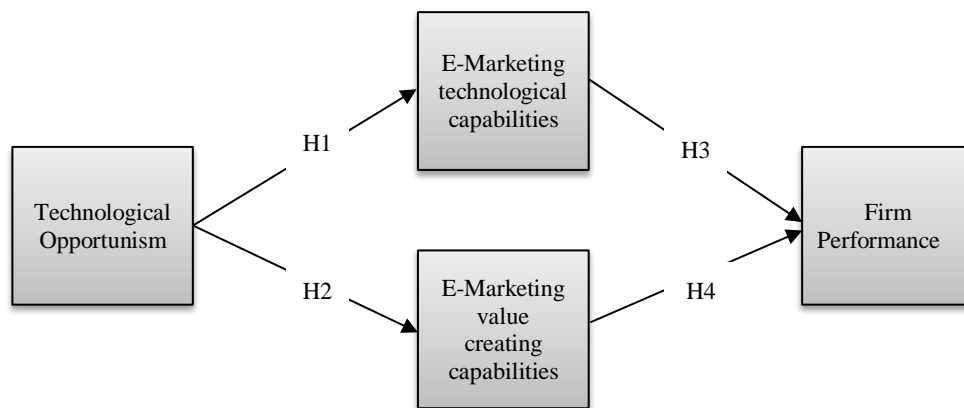
The first dimension, e-marketing technological capabilities represents the firm's investments in the development, implementation and usage of e-Marketing

technologies that can facilitate rich interactions between the firm and its customers. This set of technologies can include: e-customer websites that offer sales transactions, extranets, customer relationship management systems, sales force automations (Wu et al, 2003) described e-business adoption as the firm implementation of these types of technologies and that has a positive influence on the performance outcomes of customer satisfaction, relationship development and sales performance. E-business adoption also improves the communication processes, enabling higher intensity and quality interactions and also by increasing information sharing. Information technology resources also play an important role in establishing durable relationships with customers directly and indirectly. Directly by establishing direct interfaces with customers (websites) and Indirectly by enhancing the performance of the various boundary-spanning roles found throughout the organization (via CRM and SFA).

The second dimension e-marketing value creating capability, plays a significant role in the firm's ability to generate value from the implementation of information technology (Wu et al, 2003; Srinivansan et al, 2002). According to (Henderson & Venkatraman, 1993) successful technology implementation needs the support of top executives who opened to the new technology and they can provide leadership and display the need for the technology across the organization. A important role in this dimension is the flexible organizational culture that can embraces the new technology and support the integration through the organization (Wu et al, 2003). Further research shows that innovative companies have employees that are not only open to new processes implementation but are also proactive, they are finding out how the process are running and making the necessary modification in order to improve them. (Lawson & Samson, 2001) also suggest that an appropriate culture within the organization is very important in order to be successful in innovation. Additionally, having an flexible culture leads to increased e-commerce performance (Saini & Johnson, 2005).

The following discussion outlines the conceptual model for this research. Technological opportunism of the firm is hypothesized as antecedent of e-marketing capabilities. As presented above technological opportunism has two components technology-sensing capability which represents the firm's ability to understand and acquire knowledge about the new technology developments and technology response which represents the organization's willingness and ability to respond to the new technologies it senses in its environment.(Srinivansan et al, 2002) suggest that a firms capability of sensing and responding to new technology and technology adoption are positively related, as stated earlier our model suggest that top management team committed is a complementary human resource and it is a necessary element of e-marketing development, therefore our hypothesis are:

- H1. Technological opportunism have a positive influence on e-marketing technological capabilities.
- H2. Technological opportunism have a positive influence on e-marketing value creating capability.
- H3. E-marketing technological capabilities have a positive effect on firm performance.
- H4. E-marketing value creating capabilities have a positive effect on firm performance.



**Figure 6.1. Conceptual model of empirical research**

Source: own elaboration.

#### 6.4. Conclusions

In this chapter we contribute to development of understanding the drivers that may lead a firm to develop e-marketing capabilities and the relationship between e-marketing capability and technological opportunism. We argued the importance of technological opportunism in developing and integrating e-marketing capabilities within the firm's processes, and we were trying to refine the e-marketing capabilities construct in order to have an appropriate operationalization and a reliable scale to measure it. Technological opportunism is a strong driver of adopting new technologies. It seems that technologically opportunistic firms can not only sense the market, but also can respond effectively. Managers may feel more comfortable investing in e-marketing if they know that their firm will outpace the competition. Through the lens of senior marketing executives, the value of technological opportunism is a key driver of organizational success.

## **CHAPTER 7**

### **MODERN CONCEPTS OF RELATIONSHIP MANAGEMENT IN THE SUPPLY CHAIN**

#### **7.1. Introduction**

Forming relationships with suppliers is a complex issue with many interesting points, especially in times of economic turmoil. Subject appears to be important mainly due to the fact that the current relationship skills with clients is a factor in the smooth functioning of the organizations who are elements of global supply chains. Building relationships with customers and suppliers is a prerequisite at improving the organization and its processes implementation, not only with the use of quality management standards, the environment and safety, but also other tools such as the Toyota Production System (TPS), Six Sigma and Lean Management (Urbaniak, 2010, p. 395).

It may be noted that modern companies sympathize to the days that characterized peaceful external environment. Ability to plan and achievement of the objectives was then much easier. The current need for continuous adaptation to changing conditions, often called agility in businesses action often poses problems. Progressive rate of change makes that organizations increasingly seek for stability and order in some areas. In the enterprise market, this trend occurs in the context of relations with cooperators. For any organization an important sphere of action is the relationship between suppliers and customers.

As already mentioned, they have connect with condition of the undisturbed flow of goods and services in the supply chain. This, in turn, is in itself a value-added and is available for each element in such a chain, regardless of its size. It is well known that the enterprise market is dominated by a tendency to long-term cooperation. Maintaining good relations is an extremely difficult task especially now, when the gain is often a determinant of the company. Effective communication with the whole range of other activities helps to build relationships. However,

it seems that companies market also called business to business market (B2B) use in collaboration many methods, techniques and tools. Particularly important place is occupied by the so-called operational improvement tools, those that improve the functioning of the organization at all levels, from those in the lowest.

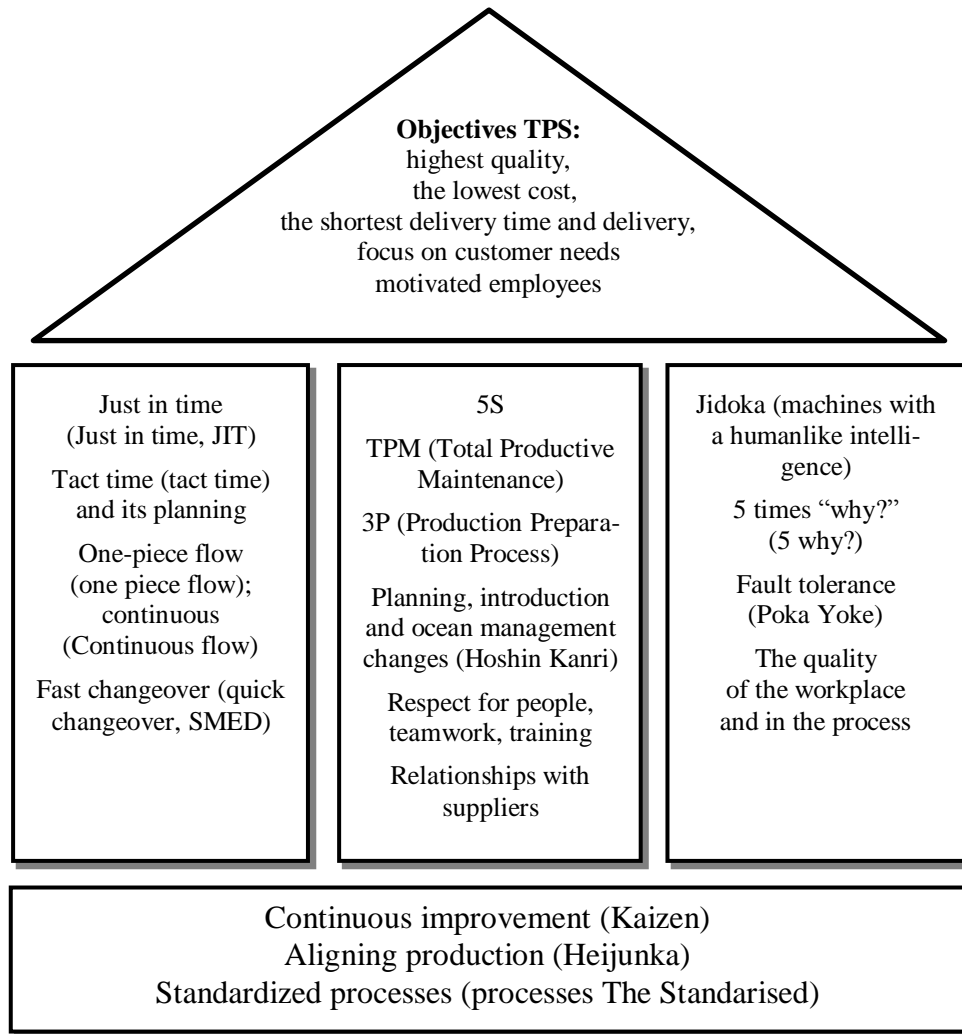
The aim of the study is to identify the impact of operational improvement tools to build relationships with suppliers on the business to business market. It cites the relevant facts reported in the literature and the results of research carried out in the form of direct interview realized in various industries.

## **7.2. Tools supporting improvement**

Improvement activities in modern enterprises has different faces. Currently available to management remains a number of solutions aimed at improving processes. However, it should be noted, that three important concepts to improve prevail today in developed companies. They are Lean Management, Six Sigma methods and techniques related to the Toyota Production System.

Prizes worth the Toyota Production System is linked to quality enhancement technology, increasing security and decreasing the time of processes. TPS is a collection of many practical methods and techniques, the use of which is determined by the elimination of three elements: the waste and loss (jap. Muda), variability of processes (jap. Mura) and overload (jap. Muri) both humans and machines (Wieteska, 2011, p. 128). This dating back to the early twentieth century concept promotes balance in the organization. Implemented in small steps brings significant results. Taichi Ohno and Eiji Toyoda announced the Toyota Production System assumptions and methods and techniques for achieving the goals of this concept through the so-called “TPS house” shown in Figure 7.1. Each of the pillars contains the instructions which, when combined with the creativity of a workforce to give the results set out as “the roof of the house”. Continuing work to improve operational processes in the imagination of authors, is based on a solid foundation, which is the standardization of processes, leveling production and Kaizen. Today, more and more companies are putting into their business elements from the Toyota Production System directly or transforming them a little of their own. 5S, which refers to the standardization of the place and the organization of work, also identified with the order and neatness position seems to be as common as quality management, environmental and security standards. Similarly, if we are talking about for Total Productive Maintenance – to zero accidents and zero defects resulting from the operation of machinery. Companies presents increasingly more responsible approach to this issue by developing the skills and qualifications of maintenance technicians. Schedules and plans for renovations, repairs and maintenance of

today are not only good practice, but also a requirement. It is also worth noting that among the improving techniques placed in TPS House in the central pillar were entered relationships with suppliers. They support the smooth functioning and effective fulfillment of the objectives described concept.



**Figure 7.1. TPS House**

Source: Own calculations based on J.K. Liker (2004, p. 73).

The second concept is the Lean Management. It is based on a “slimming” processes in the organization, which is to minimize the use of resources and reducing

losses. Lean Management focuses on the implementation of the four interrelated operational objectives aimed at improving cooperation with suppliers (Urbaniak, 2010, p. 85). Belonging these shortening process cycle, time of delivery, minimizing inventory and the maximum utilization of capacity (See more, Lichtarski, 2005). This concept directs attention to companies in the improvement of processes and monitoring provide added value the product. All manifestations of such waste. Those associated with the occurrence of bottlenecks, duration of cycles and capacity of the system must be kept to identify and promptly liquidate. The implementation of Lean Management is a complex and requires organizations (Alukal, 2006, pp. 67-69):

- conscious approach to the planning and implementation processes, solve all the problems encountered, and no single issue,
- provide the necessary resources,
- appoint leaders (ang. Lean champions),
- to work together to mobilize and involve collaboration of all employees,
- effective communication management with employees based on feedback,
- creating an atmosphere that encourages improvement action,
- establishment of performance evaluation systems strengthening programs for workers and their involvement,
- make sure that we all understand the reasons for the changes and benefits of “lean” placed in the enterprise,
- adjust the company's strategy to personal goals of employees (as much as possible),
- create a vision of the organization after the change,
- the introduction of a performance measurement system based on the company's goals,
- analysis and sharing of both costs and benefits,
- emphasis on responsibility.

“Slimming” is therefore a challenging task and multi-stage. Especially important when you work on the implementation, seems to have motivated and highly committed executives who knowingly communicating with the crew of the company, will take care for the smooth running.

Six Sigma is another example of the concept of organizational improvement. It's primary purpose is to reduce costs by increasing efficiency of processes and minimize the number of non-compliance reported both in processes and in the products themselves. 6 Sigma concept involves, inter alia, to identify areas of high-risk and implement preventive measures in the field of emerging unacceptable variations in the processes that cause errors in articles lowering their quality (Harry



& Schroeder, 2001, pp. 22-23). In this concept, all activities of the organization should be focused on meeting the needs of customer, for which it is necessary to define them on eg. market research. This concept uses a statistical method, which is especially important in statistical process control and continuous measurement of its effectiveness. The literature for the most commonly used methods in this concept presents DMAIC (Define, Measure, Analyse, Improve, Control) and DMADV (Define, Measure, Analyse, Define, Verify) (Dedhia, 2005, pp. 567-574). Both the first and the second methodology is based on the assumptions described in the continuous improvement Deming wheel. Important difference is the fact that DMAIC is used to improve the existing products and processes, and DMADV refers to those processes and products that are in the design phase. Six Sigma focuses on employee engagement, which is seen as a stimulating troubleshooting.

The possibility of using the above Lean Management, Six Sigma and the Toyota Production System is wide. They are specifically designed for the improvement of whole units. However, the rest of the work is indicated their role in building strong relationships with suppliers.

### **7.3. Building relationships supplier – recipient in the enterprise market**

Shaping the relationship between the supplier and the recipient in the enterprise market is gaining importance in particular growing conditions the intensity of competition, which is characterized by the current economy. The change in strategy towards the suppliers is likely to be caused by the pressure of not only the turbulent environment, but also more and more aware of the desire to continuously improve the organization's activities. Functioning to reduce costs and improve the quality of customer service is a priority today many companies. Worth emphasizing is the fact that most organizations operating in the B2B market, being aware of the benefits of improving cooperation willingly turns on efforts to improve relations. Frequently, therefore, can be observed that over the duration of the cooperation relationship becomes more strengthened and individualized, which may consist in (Romanowska & Trocki, 2002):

- treating the client as a specific and unique from the point of view of the supplier,
- elimination of errors (complaints, corrections supply) in collaboration sales,
- adaptation of maximum production or purchase to the needs of the recipient,
- creating a friendly relationship to the recipient,
- adapting solutions to the customer, even though they are not always convenient for the company,

- impersonated to a client,
- issuing information signals with a strong personal character (displaying the characteristics of the individual terms of the sale, the convenience in terms of the availability of the location, or complexity assortment).

Partner relationships in the B2B market as a result of long-term cooperation conducive to greater openness. Thanks to work under relationships business partners better understand their expectations and needs. What is more they cooperate in conditions of trust, loyalty and free communication.

Efforts to improve the quality of cooperation require each part of big commitment. Making changes to the more operative use the occasion occurred (which include the implementation of the objectives of the organization by improving collaboration with suppliers) is very desirable and very common phenomenon. With high probability it can be stated that the improvement potential of the organization through the implementation of innovations in operational processes is a guarantee of achieving satisfactory results. In addition, the partnership is related to security, and it can be described by the following features (Cheverton, 2001):

- R & D providers and recipients are carried out jointly,
- know all the costs and margins,
- innovation play an important role,
- buyer's market as the market becomes the supplier; Together they take active measures aimed at developing consumer market,
- both parts will jointly develop a business plan,
- marketing strategies are created together,
- operates a system of information,
- held joint training,
- buyer and seller use the same resources, including human,
- exit barriers from the compound, make it difficult to break,
- the composition of the teams assigned to specific measures include the employees of both companies; managers of these teams may be selected for both the manufacturer personnel and the customer.

Opportunities and possibilities of reaching for the implementation of modern management methods and techniques used in more and more organizations. Forming relationships with suppliers in the purchasing process can be described in four phases. These are (Urbaniak, 2010):

- defining the requirements for the purchase of sources in terms of technical quality and service, size and frequency of orders, potential suppliers, financial conditions;
- choice of supplier, which precedes the identification of potential suppliers, the qualification of suppliers and negotiate the terms;

- performance of the contract (including the transmission of orders, deliveries and monitor purchasing process documentation);
- evaluation of cooperation and the development of partnerships, which includes periodic evaluation of suppliers (point or indicator), assessing the impact of cooperation with the supplier to improve the efficiency of processes in the supply chain (design, purchasing, warehousing, manufacturing, maintenance, environmental management).

The interviews carried out in June 2013 at Poznan International Fair “Innovations, Technologies, Machines,” with several companies involved in the meeting that the issue of building relationships with suppliers is still perceived as complicated. Once you manage to find the right cooperator based on market analysis and preliminary assessment phase begins suppliers of hard work “Break-up” companies. Before they define their goals both cooperation and establish rules of functioning, often comes to problem situations.

It seems that having implemented and effective functioning of the operational improvement tools both as a supplier and the recipient company, can minimize the barriers encountered during bond formation. Standardized procedures are based on clear rules facilitate the sharing of information and knowledge, which allows for faster access to the partnership and attitudes for successful, long-term cooperation.

Without a doubt, often repeated in the studies was to have answers by both parts cooperate implemented, documented and certified management systems conforming to the requirements of ISO standards. This gives an indication of no doubt that today's businesses are looking to work for an organization seeking continuous improvement.

It should be noted, however, that the ruling of the last several years of fashion for a system of management, contributed to its universality, thereby depriving him of elitism features. Companies looking for new solutions, but also a distinguishing factor among numerous competitors, implement more and more new ideas aimed at improving the efficiency of processes and enhancing the quality of our products.

Both the small and medium-sized enterprises as well as large, multinational corporations, are focused on how to survive a difficult moment came today on the Polish market. For some time in a number of strategies, officially or unofficially, the most important point was to maximize profits. Companies, regardless of size, are thus looking for savings. When asked corresponded organizations that are important to both save money on supplies as and those arising from the relationship with suppliers. Companies indicated that they want to reduce the costs associated with the supply by limiting errors, inconsistencies or gaps provided by suppliers of goods and by keeping watch timeliness, completeness and flexibility of delivery. In

terms of the relationship pointed to the significant role of effective communication and rapid exchange of information about problems. These activities support they had, according to the respondents, competent staff who knows how to solve problems with the principle of “win-win”.

The basic condition for the functioning of the rules of conduct is a long-term partnership-oriented relationship sites (Światowiec, 2006, pp. 94-95). No one wants to expose the current search costs further, good enough suppliers and related costs of building a common strategy of cooperation. This task is time consuming and extremely expensive.

Over time, however, built ties are exposed to second hand drop expressed interest, eg. through lack of initiatives related to the common development. The problem is sometimes often lose sight of the joint, connecting business goals. The consequence of this is a departure from the robustness, flexibility and continuous exchange of information for the economic results, taken in the short term. This lack of attention the relationship may lead to their degradation. To avoid these negative phenomena and feel a long association as a “stable relationship” and not “routine”, should be involved in this area of perfecting the methods and techniques. Companies surveyed during the fair clearly showed that the consistency of our IT systems and implemented the concept facilitates interaction. In addition, companies can exchange experiences in the field of their application and regulate issues identified by using their assumptions. It is not uncommon to also recommend that customers at home provider to introduce some solutions from these techniques, in order to more efficiently shape the resulting bond.

#### **7.4. Recapitulation**

Supplier Relationship Management (SRM) is an activity that allows for efficient interaction on the line supplier – recipient. Its main objective is reduced to maximize the value of relationships, as a result of proper planning, organizing and controlling activities in this area. Management of the cooperation with contractors should also be characterized by continued motivation of employees of the supplier and the recipient to be active in the process. Persistence and proper conduct of the relationship provides continuous assessment efforts of suppliers, as well as the continuous improvement of the relationship, which refers to the collaboration. Coordinate joint actions concerning eg. production and supply so as to determine the purpose of joining the company, it is not an easy task. The starting point here seems to be the assumption of maintaining mutual loyalty while independence and creativity in action.

Development of young science, which allows management is currently operating on the market entrepreneurs reach for different concepts, methods, tools and philosophies. Direction selection and the determination of rules of conduct in the areas of management, will be linked with certainty to the nature of the activity and specificity of the industry. Because there is no doubt that the planning and organize so as to motivate employees and control activities do not take place in the same way everywhere. At the same time, it seems that a fair assessment, and firmly rooted in reality, the analysis of their abilities is key to the effective implementation of the most matched to the enterprise concept.

The relationship between the supplier and the consumer market constantly subjected to the means of production are analyzed and discussed in the world and Polish literature. It is no wonder that entrepreneurs are of great interest. This is a positive development, which in the coming years certainly bring a lot of interesting solutions for the entire economy. It should be emphasized that enterprise B2B market reach for improvement tools, in order to obtain further benefits from long-term cooperation. Cooperation in the field of their use in order to achieve common goals becomes more frequent. It involves solving problems using the concept of assumptions and accompanying methods and management techniques. Systematic approach to the issue of relations connected with the involvement of competent employees translates into stability so sought after today. Confidence and trust, so rare in today's world, are possible and even necessary to be able to keep up with the changes taking place today in the markets and to be able to adapt to the needs of the supply chain.

## **CHAPTER 8**

### **GAINING COMPETITIVE ADVANTAGE WITHIN CLUSTER BUSINESS INFRASTRUCTURES<sup>4</sup>**

#### **8.1. Introduction**

Over time there has been a large degree of confusion surrounding the concept of clusters. It is fair to declare that cluster means different things to different institutions and different researchers. The main reason for this is the fact that there is no real consolidated theoretical framework for this kind of spatial agglomeration (Brown, 2000). Even if Stewart, Skinner and Edwards (2008) sustained that “a cluster of linked businesses can generate commercial synergies and strengths that enable it to achieve a global presence even when it is geographically distant from major world markets” through the lens of Porter’s cluster theory of comparative advantage (Porter, 1998), Feser (1998) argues that there is no cluster theory clearly establish, rather a broad range of theories and ideas that constitute the logic of clusters. Though, the important role of organizing the business activities into clusters, as innovative forms of spatial organization, in order to ensure a more efficient and effective business by using the synergy between organizations, stirs the interest of researchers in management.

#### **8.2. Conceptual framework for clusters**

Even if the term cluster is relatively new, in the literature there are several approaches to this concept. In Czamanski and Ablas (1979) perspective, cluster means “a subset of industries of the economy connected by flows of goods and

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<sup>4</sup> This work was supported by the European Social Fund through Sectorial Operational Programme Human Resources Development 2007–2013, project number POSDRU/159/1.5/S/142115, project title “Performance and Excellence in Postdoctoral Research in Romanian Economics Science Domain”.

services stronger than those linking them to the other sectors of the national economy. The concept is thus devoid of any spatial connotation”, while Krugman (1991) illustrates that clusters “are not seen as fixed flows of goods and services, but rather as dynamic arrangements based on knowledge creation, increasing returns and innovation in a broad sense”. According to Porter (1998), identified as the father of the modern strategy field, traditional clusters may be defined as “geographic concentrations of inter-connected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies or common inputs. Finally, many clusters include governmental and other institutions – such as universities”.

According to Rosenfeld (1995) a cluster is “a loose, geographically bounded agglomeration of similar, related firms that together are able to produce synergy” and after two years he identified that in clusters should be active channels for business transactions. Swann and Prevezer (1996) refer to clusters as “groups of firms within one industry based in one geographic area”. According to Hill and Brennan (2000) a competitive industrial cluster is “a geographic concentration of competitive firms or establishments in the same industry that either have close buy-sell relationships with other industries in the region, use common technologies, or share a specialized labor pool that provides firms with a competitive advantage over the same industry in other places”. Bresnahan, Gambardella and Saxenian (2001) describe regional clusters as “a spatial and sectoral concentration of firms; and we measure success by the ability of the cluster as a whole to grow, typically through the expansion of entrepreneurial start-ups”. Even if Feser and Bergman (2000) were using the concept industrial cluster with the same meaning as Czamanski and Ables, after just two years, this time Feser and Lugar (2002) have shown the cluster concept as: “concentrations of businesses that co-locate because of trading relationships and/or to share common factor markets (including infrastructure, knowledge resources, and labor) and/or common goods markets”.

Regarding the relationships between cluster members, Ketels (2003) wrote about the companies co-located in a specific region and linked by interdependencies. Brenner (2004) considers clusters as “an industrial agglomeration that is caused by local self-augmenting processes”. In the same year, Morosini (2004) defines clusters as “socio-economic entity characterized by a social community of people and a population of economic agents localized in close proximity in a specific

geographic region”. Maskell (2005) suggests that the cluster “exists because of locational economies that are largely independent of the internal degree of interaction”. Vom Hofe and Chen (2006) sustained that “while all the concepts about cluster appear to have their roots to a more or lesser extent in agglomeration theory, the fact that there is no unique and coherent theory of agglomeration economies is also mirrored in the variety of concepts and definitions of industrial clusters”.

### **8.2.1. Clusters development and evolution**

Clusters progress from the Marshall’s industry districts, to the Perroux’s theory of growth poles, to the theory of industrial location of Weber and Hoover, and path dependence theory which had an influence on a cluster concept development. All this definitions tried to accentuate the concept of cluster around some key concepts which we can identify in all of Porter definition from the 90s until 2000: vertical and horizontal links, companies interconnected in a particular field, cooperation and competition, competitive advantage, special skills and knowledge (Brown et al., 2007). They stimulate competitive pressure even among indirectly competing or non-competing participants (Porter, 2008) and enable to stimulate economic development of national economies (Pavelková et.al., 2009).

Regarding to the development of clusters, some of them develop from networks of small and medium size enterprises, others from links between enterprises and universities (from here the cluster may have recruitment opportunities) or research institutes. Some clusters appear around the successful companies, which act like magnets for the others enterprises in the same field, the last ones wondering to obtain the competitive advantage through collaboration.

Some sources of cluster development are the aspects regarding to location, business environment conditions and the impact of entrepreneurial decisions by leaders from private or public sector (Ketels & Memedovic, 2008).

There are a lot of life cycle cluster theories where is explained the birth, the growth, the maturity, the decline or the reorganization and restructuring of a cluster against the background of industry life cycle.

In the first stage, emerging clusters have just a few entities, with a low potential for obtaining the competitive advantage in the market. This is called embryonic stage, which can be generated by innovations. When the cluster grows, are created links and the potential for interaction is growing as same as the performance of the cluster. This is the moment when the cluster can be seen as an anchor for the rest of the companies around it, and it may start to attract new enterprises, universities or research centers. The growth stage is where markets have developed sufficiently to spin off and attract competitors to stimulate entrepreneurship. At the



mature level, the cluster has to keep its competitive advantage and use all its potentials to convert this in a sustainable competitive advantage. The cluster should not permit its decline and should reconfigure in the moment in which it accumulation of resources is slow and the connectedness is not at a high level.

### 8.2.2 High performing clusters characteristics

Clusters are no longer perceived as isolated organizations but as eco-systems with ambitions to become high performing clusters. According to the “White Paper” (Europa InterCluster, 2010) there are 15 criteria divided into three categories describing clusters.

**Table 8.1. Categories and criteria for a high performing cluster**

Categories	Criteria
1. Framework conditions – surrounding the cluster’s main actors	<ul style="list-style-type: none"> <li>– quality of cluster sector relevant R&amp;D,</li> <li>– quality of the education in relevant fields,</li> <li>– dynamics of creating new and innovative companies in the region,</li> <li>– attractiveness of the region for high potentials,</li> <li>– existence of innovation stimulating regulation and public sector demand.</li> </ul>
2. Cluster actors – competitiveness of main actors	<ul style="list-style-type: none"> <li>– critical mass of market and technology leaders developing or manufacturing high tech products,</li> <li>– international visibility and reputation of the cluster and its actors,</li> <li>– commitment and active involvement of key actors,</li> <li>– involvement of competitors,</li> <li>– involvement of cluster actors in international co-operations.</li> </ul>
3. Cluster organization /management	<ul style="list-style-type: none"> <li>– cluster strategy and its implementation,</li> <li>– professionalization of cluster management services,</li> <li>– sustainability of financing and appropriate staffing of the cluster organization,</li> <li>– good coherence between triple helix,</li> <li>– added value.</li> </ul>

Source: adapted Bialic-Davendra (2011).

These criteria can be seen as determinants of clusters competitive advantage, along with the four factors incorporated into the Porter diamond:

- demand conditions,
- factors conditions,
- related and supporting industries,

- firm strategy, structure, and rivalry.

### **8.3. Obtaining competitive advantage through innovation**

According to Porter (1990) “the home nation takes on growing significance because it is the source of the skills and technology that underpin competitive advantage” and “differences in national economies structures, values, cultures, institutions and histories contribute profoundly to competitive success”.

Companies achieve competitive advantage through innovation. Innovation may appear from a new company, into an existing one, or from another nation. In clusters it can be the same: innovation may come from a new member or appear inside of an existent one. Based on a specific set of indicators, Innovation Union Scoreboard (2014) places European Union countries in four different innovative performance groups, namely:

- Innovation Leaders: Sweden, Denmark, Germany and Finland, and these scores well above the European Union average;
- Innovation followers: Cyprus, Estonia, Slovenia, France, Austria, Ireland, UK, Belgium, Netherlands, Luxembourg with scores close to the European Union average;
- Moderate innovators: Poland, Lithuania, Croatia, Malta, Slovakia, Hungary, Greece, Portugal, Spain, Czech Republic, Italy with scores below the European Union average;
- Modest innovators: Bulgaria, Latvia and Romania significantly below the European Union average.

In this chapter we have identified and selected the most innovative and less innovative European Union countries, a sample of extremes for this geographical area in terms of innovation to identify existing gaps and possible ways of softening them the most innovative countries are: Sweden, Denmark, Germany and Finland (the Innovation Leaders) and the less innovative ones are: Bulgaria, Latvia and Romania (the Modest Innovators). Speaking in terms of east and west, one can observe how the innovation levels of East European regions are far below Western Europe and in the European media. West Nordic countries have been marked by a high index of innovation.

Although in the recent years the European Union has improved its innovation performance through numerous policies and programs in this regard, are preserved significant differences between Member States, differences that decrease the European average.

Regarding to Table 8.2, Bulgaria is one of the countries showing a modest innovation with a performance well below the EU average, occupying last place. Relative strengths are found in human resources (which leaves behind four other countries), intellectual assets (which leaves behind six countries) and weak points are Finance and support and Innovators (which occupies the last place), Linkages & entrepreneurship and economic effects. Good place occupied in human resources is due only indicator located above the EU average, namely Youth with a level of secondary education and lowest scores is registered for venture capital and non-EU doctoral students.

**Table 8.2. Places occupied (from 1 to 28) by countries in the different innovation dimensions across and within performance groups**

Country \ Performance indicator	Human resources	Open, excellent and effective research systems	Finance and support	Firm investments	Linkages & entrepreneurship	Intellectual assets	Innovators	Economic effects
Romania	23	27	26	27	28	28	24	20
Latvia	19	28	18	28	25	23	27	26
Bulgaria	24	25	28	26	27	22	28	27
Sweden	1	3	3	1	4	4	3	7
Finland	2	9	2	3	9	5	7	5
Denmark	10	1	4	6	1	1	5	4
Germany	11	12	8	2	7	3	1	2

Source: adapted Innovation Union Scoreboard 2014.

Latvia strengths are human resources (leaving behind not only the two countries in the same category and the other six of the moderate innovators and one (Luxembourg) which is part of the innovation followers), finance and support which ranked 18, just 8 positions against average and 11 to the nearest innovation leader. Weaknesses are in open, excellent and effective research systems, firm investments and innovators. The performance is above average in human resources, namely in the population with university education.

Romania is found on the upper position of the group to which it belongs, namely modest innovators, with strengths in human resources, innovators and economic effects, for the latter indicator being located at a distance of 5 places by Latvia and 6 places by Bulgaria. Weaknesses are linkages & entrepreneurship, which occupies the last position, intellectual assets and open, excellent and effective research systems where occupies the last place. Sweden is one of the leaders in

innovation, with a significant performance above average. This maintains the position of the top of the list, with the best system performance innovation in the EU, followed by Denmark, Finland and Germany, the countries with the highest investment in innovation.

Even if many oscillations can be observed upward and downward within each group of innovative performance, numerous studies have been developed by Feldman in 1994, Audretsch and Feldman in 1996 to demonstrate that firms within clusters are more innovative than those that are geographically distanced from each other, the reason being the rapid transfer of knowledge. "Firms' current technological efforts strongly depend and build upon previous scientific advances and technical achievements. Innovation is a highly cumulative activity. This implies that firms located in region which have accumulated high levels of innovative success and possess a relevant stock of knowledge will be relatively advantaged in the next round of innovations compared to other firms." (Beaudry & Breschi, 2000).

Clusters have the potential to provide a network of skills that enable the implementation of ideas in the form of innovations. Clustering of the technology industry is beneficial to the industry itself and moreover is also beneficial to the development of innovative practices in the industry(...) Innovation is an important factor crucial to the establishment of industrial clusters (Hsieh-Sheng Chen, 2011).

At the European level, clusters are formed from a bottom-up or a top-down approach and are supported by own funds or by regional, national or European funds. Some countries operate a top-down approach, when economic development agencies might wish to start up a cluster, while in the so-called bottom-up approach the private sector players might wish to create a cluster or to get involved in one. The countries from the East part of Europe have fewer clusters and less resource, fewer skilled employees and less public and private sources of funds. In the same time, the Western European countries have a broad representation of the sectors with possible competitive advantage and larger sources of funds.

#### **8.4. Conclusions**

The empirical data that has become accessible in recent years has certified the strong link between clusters, innovation and economic performance. At European level (COM614/27.10.2010) clusters are considered the "engine" of economic development and innovation, because they are a framework for business development, collaboration between companies, universities, research institutions and other stakeholders in the same geographical area.

Competitive advantage does not only result from firm specific competencies, but also from the ability to organise the whole value creation process within the cluster. Porter's original definitions revolve around the ability of industry sectors to use location to garner competitive advantage (Brown, 2007).

In Western Europe, traditional industries are in general higher placed on the technological ladder compared to the corresponding Eastern ones (Pencea, 2010).

There is no a perfect approach for the cluster appearance and development, a gold recipe to obtain the competitive advantage into the innovative spatial agglomeration. Clusters have a positive contribution to the industry performance because of the innovation potential inside the cluster or the region. The Eastern European countries are confronted with significant problems regarding to the public authorities implication into de cluster appearance starting with the cluster policies that are not clearly formulated. The clusters developed inside the West Europe are an example for the other ones regarding the methods to obtain the competitive advantage. The models should not be taken and implement exactly as it is in the initial cluster, it can be processed and adapted in terms of cultural model of the new cluster or of the distinctive competences existed inside of it.

In all Europe exist a high desire to form clusters and are created numerous programmes to sustain this form of innovative spatial agglomeration. The success stories from the developed countries inside European Union appear to be interesting perspective for all those countries from the Eastern Europe where even if the public politics are not well advanced, the enterprises tend to cooperate with universities and research centers to develop strong competitive advantage.

## CHAPTER 9

### RESHORING AS A FORM OF RELOCATION OF ECONOMIC ACTIVITY – US FIRMS CASE STUDY GAINING

#### 9.1. Introduction

Ever-changing business environment affects manufacturing location decisions. As a result production is outsourced to an external branch or companies located outside the home region. Lately, *offshoring* has been primarily motivated by cost factors, hence, manufacturing activities tended to be shifted to low-labour cost China. Currently, this trend is decreasing or is being reversed as manufacturing activities are being brought back to the regions or even home countries. One of the reasons for this situation is an increase in costs of running business which cuts profit margins of relocating companies. The United States is one of the countries concerned by the *reshoring* phenomenon e.g. it withdraws its manufacturing from *offshore* countries in order to bring it back to the region or home country. It is therefore useful to take a closer look at this phenomenon and analyse its consequences.

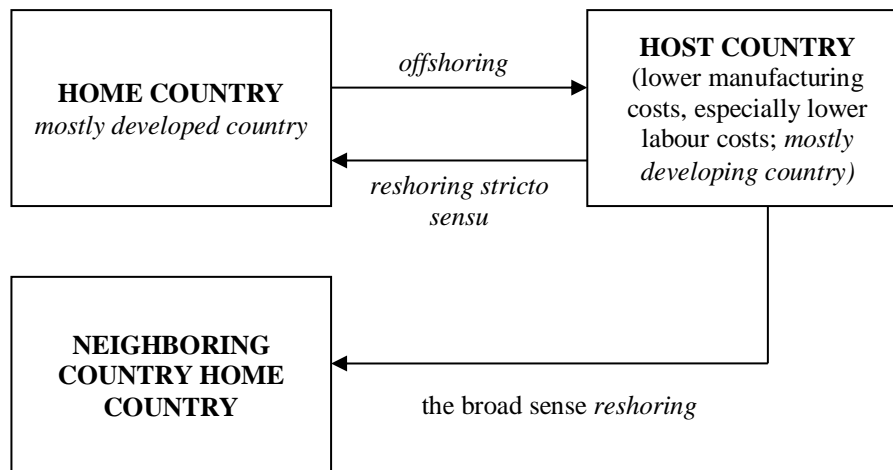
For that purpose, the first part of this chapter defines *reshoring* and enumerates its forms. The consequences of *reshoring*, on the other hand, are discussed in the second part and are based on the case study database of The Reshoring Initiative. The cases discussed concern two companies that have decided to *offshore* their manufacturing to low-cost locations (mainly China) and then to *reshore* it their home country. Finally, the chapter ends with conclusions which are referred to the analysed companies.

#### 9.2. Reshoring as a form of business relocation

##### 9.2.1. The concept of reshoring

In the literature on the subject, the concept of *reshoring* denotes the phenomenon of bringing back to the home country a part of or entire production which

has been previously *offshored*<sup>5</sup> usually from the developed to the developing countries which are characterized by lower production costs. This means that *reshoring* is not possible without prior *offshoring* and at the same time that the direction of relocation is reversed with respect to the original one. Thus, relocation involves, to a large extent, a transfer from a developing to a developed<sup>6</sup> country. For this reason, the term *reshoring* is used interchangeably with *reverse offshoring* or *backshoring* (Needham, 2014, p. 1; Fernandes, 2013; see also Hahn, 2010, p. 2; cf. Zhuplev, 2014, p. 87). Bringing business back to the original location may be understood in two ways. Hence, in the broad sense *reshoring* denotes relocation in the home region, such as Europe, illustrated by *nearshoring* which indicates location in the proximity of the home country<sup>7</sup>. The proximity should, however, be understood in a broad sense, not just as a foreign country but also as countries geographically close to each other (e.g. the European market). *Reshoring stricto sensu* means shifting production back *strictly* to the home country (Figure 9.1).



**Figure 9.1. The concept of *Reshoring***

Source: own study.

Different approach is adopted by other authors, for whom the term *reshoring* is a general concept that does not indicate the direction of back relocation. Gray, Skowronski, Esenduran, Rungtusanatham (2013, p. 28) stress that the terms such as *reshoring* and *backshoring* emphasise where production activities are to be undertaken

<sup>5</sup> Both international *offshore insourcing* and *international outsourcing*.

<sup>6</sup> According to Hahn (2010) *reverse offshoring* denotes relocation from developing to developed countries and other developing countries. See more: Hahn (2010).

<sup>7</sup> *Nearshoring* is a production relocation process in the proximity of the home country, usually in the neighbourhood thereof. This process, unlike *reshoring*, does not require *offshoring* or *offshore outsourcing*. In other words, it may occur irrespective of *offshoring*.

rather than who is to perform them. This thread is further developed by Fratocchi, Nassimbeni, Zanoni, Barbieri, Di Mauro (2014, pp. 54-56) who note that *reshoring* refers to the general changes in location with respect to the previous *offshore*<sup>8</sup> country. In order to denote those changes in a more exact manner complementary words, such as *back* or *near*, are to be used. As a result, *back-reshoring* refers to the reverse decision with respect to the previously implemented strategy of [international – UP] *outsourcing* or [international – UP] *insourcing* (Zhuplev, 2014, p. 87). It is a partial or total repatriation of production to the home country followed by incorporation of the previously offshored manufacturing into the structures of the firm or by its transfer to external suppliers in the home country. *Near-reshoring* occurs when production is brought back from the offshore to the home country (Fratocchi et al., 2014, p. 56).

It appears that both concepts mentioned above may be regarded as useful. The previous concept, in which back relocation directions may be presumed from the point of view of narrow and broad understanding of reshoring, simplifies and generalizes the discussed process. It is, first and foremost, a result of the previous use of the term reshoring in the academic papers or the press. Fratocchi, Nassimbeni, Zanoni, Barbieri and Di Mauro (2014) concept provides additional details and systematizes the terms used so far.

### 9.2.2. The types of reshoring

Regarded solely as a choice of an adequate location, reshoring may be divided into four types:

- a) *in-house reshoring* in which a firm fulfills local demand by *reshoring* wholly owned production. After back relocation a full ownership of production inputs is maintained;
- b) *reshoring for outsourcing*, in which a firm fulfills local demand by *reshoring* wholly owned production. After back relocation, the production activities are commissioned to home – [home country or home region] based external suppliers;
- c) *reshoring for insourcing*, in which a firm fulfills local demand by *reshoring* production performed by offshore suppliers. After back relocation, the production will be incorporated into the structures of the firm;
- d) *outsourced reshoring*, in which a firm fulfills local demand by *reshoring* production performed by offshore suppliers. After back relocation the production activities are commissioned to home – [or region-UP] based external suppliers (Figure 9.2) (Gray et al., 2013, p. 28).

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<sup>8</sup> In this chapter the term offshore country is used to denote the country, usually with cheap labour, where manufacturing has been relocated. It should not be considered equivalent to tax havens.



		<i>To: Onshore</i>	
		<i>In-House</i>	<i>Outsourced</i>
<i>From: Offshore</i>	<i>In-House</i>	In-House Reshoring	Reshoring for Outsourcing
	<i>Outsourced</i>	Reshoring for Insourcing	Outsourced Reshoring

**Figure 9.2. Types of reshoring**

Source: Gray, Skowronski, Esenduran, Rungtusanatham (2013, p. 28).

		<i>To: Nearshore</i>	
		<i>In-House</i>	<i>Outsourced</i>
<i>From: Off-nearshore</i>	<i>In-House</i>	In-House Near-reshoring	Near-reshoring for Outsourcing
	<i>Outsourced</i>	Near-reshoring for Insourcing	Outsourced Near-reshoring

**Figure 9.3. Types of near-reshoring**

Source: own study.

By developing the above approach with comments by Fratocchi, Nassimbeni, Zanoni, Barbieri and Di Mauro (2014) and at the same time by using suggested terms of *back-reshoring* or *near-reshoring* more types of manufacturing back relocation may be identified. In addition to the types outlined above (in: Gray et al., 2013, p. 28), which refer solely to *back-reshoring*, the types which refer to back relocation to a *nearshore* country, should also be listed (Figure 9.3):

- in-house near-reshoring* – after back relocation a full ownership of production inputs is maintained;
- near-reshoring for outsourcing* – after back relocation manufacturing performed in the offshore facility is commissioned to the external suppliers in the *nearshore* country;

- c) *near-reshoring for insourcing* – manufacturing activities previously performed by offshore suppliers in the *offshore* country are incorporated into the firm's structures after relocation;
- d) *outsourced near-reshoring* – manufacturing activities previously performed by offshore suppliers in the *offshore* country are commissioned to external suppliers in the *nearshore* country.

### 9.3. The consequences of reshoring

#### 9.3.1 Reshoring in the United States – background

Reallocation of production to the home country (*reshoring stricto sensu* or *backshoring*) seems to be a popular trend in the United States<sup>9</sup>. The conditions which are conducive to this process include, first and foremost, changing circumstances in the *offshore* countries such as China, Mexico, Vietnam, Bangladesh or India. So far, foreign investments were attracted to these countries mainly due to an inexhaustible supply of low-cost labour, a huge and booming domestic market, government incentives as well as Chinese currency depreciation (Sirkin et al., 2011, p. 2). Current total cost of production is minimally lower in the host countries or comparable to production costs in the home countries (cf. Needham, 2014, p. 1). The reason being not only wage increase but also regulation of the labour market and transportation costs in the host countries (see more: Needham 2014, p. 4)<sup>10</sup>. *Reshoring* of U.S. manufacturing is also determined by limited access to skilled workers in the *offshore* countries e.g. in China or in India as well as a relatively mild law on protection of intellectual property in the host countries. The U.S. economy in comparison with the *offshore* countries is characterized by lowest energy costs (according to the International Energy Agency), or relatively low costs of natural gas and diesel oil (Tate, 2014)<sup>11</sup>.

Non-market factors include actions taken by the U.S. government such as SelectUSA programme, ACE tool (Assess Cost Everywhere) or individual information campaigns. The aim of those actions is, above all, to encourage U.S. companies to reallocate their production in the United States and attract new foreign

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<sup>9</sup> In the U.S. relocation back to the home country is most often described by the term *reshoring*. In this part of the chapter the term 'reshoring' is used within the context mentioned above.

<sup>10</sup> One example is China which introduced Employment Promotion Plan, setting an objective that minimum wages should rise up to 2015 not less than 13 per cent per year and that at the same time a minimum wage should not be lower than 40 per cent from an average wage in a given province. As a result, average increase in wages in China in the years (2008-2012) amounted to 12.6 per cent (Palonka, 2014; BBC, 2013).

<sup>11</sup> Motivations for reshoring qv. e.g. Needham (2014, p. 3); Van Den Bossche et al. (2014).

investments. ACE is a tool for calculating and comparing costs in the offshore countries with the costs in the U.S., allowing to reconsider a previously taken decision to offshore manufacturing activities. It is estimated that 25% of *offshored* jobs would be brought back to the U.S. if the total cost were calculated. Rising wages in the *offshore* countries and the so called hidden costs that diminish expected savings are deciding factors (The Reshoring Initiative Blog 2013). ACE and SelectUSA comprise a database of case studies of companies that were reshored to the U.S. (see more: ACE, SelectUSA, cf. The White House, 2012)<sup>12</sup>.

The Reshoring Initiative is a non-governmental organisation founded by Moser. Its aim is to bring back jobs to the U.S. through *reshoring*. As is already the case with ACE, the Reshoring Initiative enables the companies to assess the profitability of *offshoring* and compare results with the costs of manufacturing business already performed in the U.S. by means of a TCO Estimator tool (Total Cost of Ownership Estimator). Furthermore, the organisation attempts to get community involved in the initiative in several ways. These are mainly information and promotion measures to provide The Initiative Reshoring with links to articles on *reshoring* in order to supply a library on the organisation's website, submit *reshoring* case studies, add relevant comments to articles on the U.S. manufacturing, share information about the TCO Estimator tool with local economic groups or talk to your local political leaders (congressmen, senators) about the benefits derived from reshoring.

### **9.3.2 The reshoring of American businesses against the case study database of The Reshoring Initiative**

Data analysis of the so called case studies from The Reshoring Initiative database allows to draw several conclusions which may only be referred to the companies describing reshoring cases in the aforementioned database. This is due to several reasons, among them, the most important ones being a small number of case studies and incomplete data<sup>13</sup>. The database contains merely seventeen examples of businesses *reshored* back to the U.S. during 2009-2014. However, according to the information published on The Reshoring Initiative blog, there are many

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<sup>12</sup> Local initiatives that promote bringing jobs back to the U.S. are as follows: declaring March 2013 Reshoring Month by Ohio State Senator. West Virginia Senator, on the other hand, was one of the co-sponsors of a bill that encouraged American businesses to refrain from outsourcing their production to foreign companies and at the same time to bring jobs back home and hire American workers. Senator Rockefeller called for keeping tax codes simple and reducing corporate tax rates in different areas to incentivize manufacturers to keep their businesses in the U.S. (The Reshoring Initiative Blog, 2013; *Rockefeller co-sponsored bill...*, 2012).

<sup>13</sup> At the same time it is difficult to assess whether these data are representative without the exact number of reshored businesses.

more cases of businesses *reshored* to the United States (362 cases recorded in December 2014)<sup>14</sup>.

An additional deficit has been the fact that it is impossible to compare the number of jobs that have been *offshored* with the ones that have been subsequently *reshored*. It is thus difficult to measure whether, among surveyed companies, all jobs have been reallocated and at the same time to assess whether *reshoring* has been successful for employment<sup>15</sup>.

The most important conclusions regarding reshoring back to the United States which might be drawn based on the analysis of The Reshoring Initiative's database are as follows:

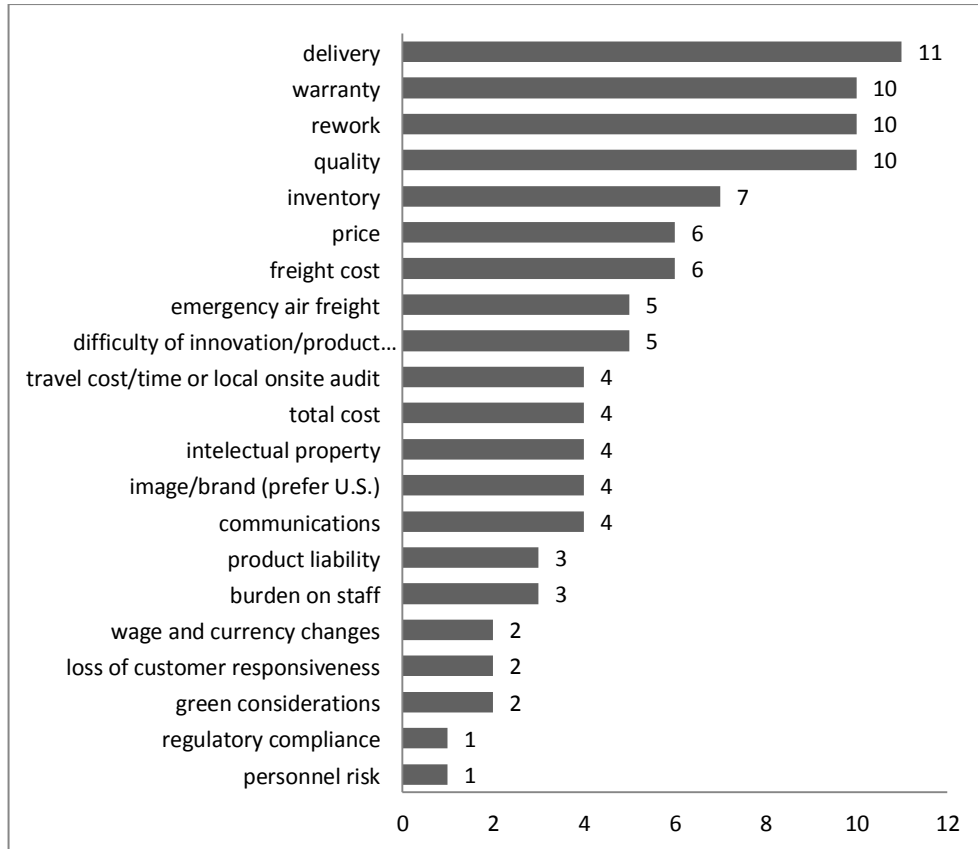
1. Satisfaction survey regarding reshoring carried out by companies using a three-grade scale (low, medium, high) in 14 out of 17 cases is high. In three cases no answer was provided.
2. Reshoring concerned manufacturing business located in China (13 cases). In two cases business was reshored simultaneously from China and Taiwan. Business was reshored to the U.S. from other offshore countries – Italy and India (2 cases each).
3. In 2009 and 2010 production was reshored from Italy. In 2012 and in the years thereafter manufacturing activities were reshored exclusively from the Asian countries.
4. Reasons to reshore listed by most of the companies are as follows: delivery, warranty, rework and quality (cf. Chart 1). One company was not able to justify the reason to reshore (answer: not sure).
5. In 15 out of 17 cases reshored business was kept or incorporated into the structure of the parent company. It was decided in only two cases to commission production to external suppliers. It was not possible to identify in all cases whether offshored business was conducted in-house or commissioned externally.
6. The number of jobs created in the U.S. thanks to reshoring, according to data gathered from some companies, ranged from 1 up to 68 jobs per one firm. Ten firms that reshored their jobs to the U.S. created altogether 188 new

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<sup>14</sup> It should be noted that The Reshoring Initiative's case studies are submitted by the companies. Perhaps direct survey would increase the number of reshoring cases studied.

<sup>15</sup> It is partly due to the questionnaire's structure. A question about employment concerns the number of jobs created in the U.S. as a result of reshoring. However, there is no question about the number of jobs which have been offshored, which would allow for the comparison of these pieces of information. Another question asks what happens to the jobs after reshoring, and there are two possible answers: reshored and work was kept from being offshored. However, the answer does not specify whether they were totally or only partially reshored. Results of the questionnaires are often influenced by respondents themselves who often do not provide answers to questions asked.

jobs. Remaining firms did not state the number of reshored jobs clearly. Some companies pointed out that they offshored their production but they kept the work from being offshored.



**Figure 9.4. Reasons to reshore according to the U.S. companies**

Source: own study based on The Reshoring Initiative's case study.

### **9.3.3. Master Lock and General Electric – reshoring case study**

Reshoring decision is influenced by many factors which, among others, depend on external conditions such as delivery, warranty or quality. Internal conditions are also of significance since every company has its own vision and development strategy. It is thus worth to analyse the process of reshoring at the company-specific level. Such an analysis allows to grasp development directions of individual companies at a given time as well as to capture the process of current changes.

Cases discussed below are a random selection of companies which have reshored their manufacturing back to the U.S.<sup>16</sup>.

#### **Master Lock case study**

Master Lock was founded in 1921 by Harry Soref. Having invented laminated padlocks in 1924 Master Lock launched its production in Milwaukee, Wisconsin, U.S.A. At first, Master Lock began its production in a small room of a commercial building with just five employees, only to develop within 15 years and move into current manufacturing facilities in the same city.

After Soref died in 1957, Master Lock continued to invest in innovation. It also supported various charities e.g. American Red Cross. In 1970 American Brands (presently known as Fortune Brands) bought Master Lock. Over consecutive years, Master Lock appeared in many commercials, TV programmes and newspapers. The company sponsored many events e.g. car races. It also continued to support charity and promote environmental protection.

In 1990 Master Lock employed 1,300 workers in Milwaukee area. In 1993 the company offshored manufacturing jobs to Mexico and China. At the same time production in Milwaukee plant was automated and subsequent manual operations were shifted to the lower cost countries. It was a response to the onslaught of cheap counterfeit locks that flooded the U.S. market.

In 2011 the conditions in China changed – Chinese workers demanded pay rise as they saw an opportunity to raise their standard of living. Chinese currency policy which favoured its own economy started to give in to pressures exerted by the U.S. and other countries.

As a result American export to China became cheaper, whereas Chinese products sold on American market became more expensive. This strongly influenced the cost of freight, which was quadrupled within a year.

Reshoring begun for Master Lock when the company employed ca. 36 workers in order to restore the number of workers in Milwaukee plant up to 379 workers. Conditions in Milwaukee plant were different from the plants in the off-shore countries. The automated production was the biggest difference and its consequence was lower demand for labour in the plant in Milwaukee.

It should be stressed that reshoring did not mean that all jobs were brought back to the U.S. as part of Master Lock's production remained in China. It was, however, destined exclusively to the Chinese domestic market. Similarly, manufacturing activities which had been previously offshored to Mexico, were not later reshored to the home country.

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<sup>16</sup> Case study is based on Hutzler, Lippert (2014) and data gathered from the discussed companies' websites.

With reference to the discussed business' motivation to reshore, economic advantages resulting solely from market factors, need to be stressed. This is because Master Lock has received neither support nor encouragement from local or federal administration to reallocate its jobs to the U.S. Reshoring which initially assumed an increase in employment by 36 workers in its home plant eventually led to an increase to over 100 workers in Milwaukee facilities. Although this figure appeared insignificant when compared to national employment, it set a new direction and signalled that market conditions might augment reshoring among American companies in the near future.

For business, offshoring meant primarily the change of manufacturing system in the home region. Master Lock was able to gain momentum resulting in automated manufacturing and change of employment structure which moved towards high-skilled positions. Consequently, American production became economically attractive. The changes discussed influenced not only the employment structure but also the number of jobs. Since manufacturing became automated only one worker was required to operate various machines for most of the time. Thus, it became clear that the number of returning jobs will be lower than the number of jobs offshored to labour-intensive factories in China.

Since the beginning of its business, Master Lock's image was shaped by its activities for the U.S. and local community. The company supported charity, environmental protection and participated in many national sporting events. It appears that both product quality related to the American brand and patriotism play a prominent role in the company's strategy which is demonstrated by the caption „Made in America with pride” visible in Master Lock's logo.

#### **General Electric case study**

In 1951 General Electric (GE) built an impressive manufacturing facility, the so called Appliance Park, located in Louisville, Kentucky, where 'white goods' were manufactured. The park comprised six enormous factory buildings, independent fire department, its own power generating plant and a huge parking lot with traffic lights. As a result, the industrial park managed to support the US housing market which became economically buoyant for the first time since the Second World War. By 1955, Appliance Park employed 16,000 workers, in 1973 the number of workers reached 23,000. Thereafter production dwindled which resulted in a huge drop in employment – in 2011 GE's employment fell to a staggering low of 1,863 workers.

Labour conflicts constantly interrupted production, especially in the 1970s and 1980s. Then, with an aim to cut the costs and maximize the stock price, GE decided to shift production to China, where it started to manufacture water heaters.

Despite lower production costs, decreasing profits forced GE to try to sell appliance business in 2008. This attempt failed, however, because there was no demand on the market for business appliance due to the ongoing economic crisis.

In 2012 the company's new management decided to reintroduce production to Kentucky. The decision was prompted by lowering the total labour costs and decreasing demand for workers resulting from technical improvement in Louisville and rising wages in China. GE received \$17 million worth of government subsidies which allowed to cover some expenditure related to bringing production back in the U.S. Reallocated business included production of such appliances as: hot water heater, stainless steel dishwasher, front loading clothes washers and dryers.

Changes in GE were linked to newly introduced efficient production management resulting in shorter manufacturing time of hot water heaters. It took 10 hours to assemble a water heater in China while in Louisville it took only two. In addition, the quality of products was improved, the sale price was lowered and productivity in 2012 was three times higher than it had been in the 1960s. Furthermore, a two-tiered wage scale was introduced. This meant that new workers received a substantially lower hourly wage than the remaining veterans. All these factors allowed GE to regain its market position in a relatively short period of time.

#### **9.4. Results**

Reshoring, which needs to be defined as bringing manufacturing back to the original location, is a popular process in academic, political and media discussions. In the U.S. the highest expectation as far as reshoring is concerned is to bring business back home which in turn is to restore the level of employment in the companies that had previously outsourced their production. However, the analysed case studies, clearly show that this issue is disputable as it is difficult to expect that all previously offshored jobs could be repatriated. Additionally, conditions in the US-based facilities differ from those located in low-cost countries e.g. China. The main difference is the degree of technological advance which is related to the company's demand for workers. Consequently, the demand for labour in the off-shore locations was usually higher than in the U.S. as far as analysed case studies are concerned. Furthermore, bringing production back to the home country is often a result of offshoring-related costs. For this reason the financial situation of reshored companies in the U.S. has not always been/is sound. It is thus difficult to expect an immediate and substantial growth of employment after business is reshored (cf. GE). Even though the position is later stabilized, employment is not



always restored to its initial level. This in turn is a result of the capital intensity of production in the U.S.

It should be noted that expectations related to offshoring mainly concern an improvement in the financial structure of the company. The U.S. companies are primarily motivated to reshore by costs of freight, inventory and rework. Quality, company image and patriotism are also of significance. None of the analysed companies claimed that they were driven to reshore in order to bring jobs back to the U.S.

The aim of the future research in the field of reshoring should be to establish the intensity of reshoring as well as to identify the manufacturing sectors in which the phenomenon of reshoring is most popular and what conditions must be met for it to happen. In addition it is worth to attempt to carry out broader comparative analyses of employment consequences in both relocation directions: offshoring and reshoring. Moreover, one problem which remains unresolved is the question of reshoring process from the point of view of the host country.



**PART 3**

**BUSINESS ACTIVITY**  
**– EXPERIENCE FROM POLAND**



## CHAPTER 10

# THE ECONOMIC SITUATION IN POLAND THROUGH THE PRISM OF THE SITUATION IN THE ENTERPRISES ON THE BASIS OF THE BUSINESS TENDENCY SURVEY

### 10.1. Introduction

Nowadays every highly-developed country has its own methods of estimation of the economic situation. In the long history of business tendency survey in Poland, see (Adamowicz et al., 2013) there were many theoretical studies in this area (Matkowski, 1993; Hübner et al., 1994; Barczyk, 1997; Adamowicz, 2003; Lubiński, 2004). Predicting the direction of fluctuations in the economy allows to countering the anticipated bad effects or to emphasize those good for the country. For this purpose usually some kind of economic indicators are used. There is a wide range of indicators and methods of calculating them. In general they are based on two categories of data: qualitative and quantitative. They serve as an input to analytic methods starting from simple averaging and ending in complex econometric models. A comprehensive knowledge and recommendations for methodology of designing questionnaires and the construction of indicators can be found in a handbook published by the OECD in 2003.

There are respected and well-known institutions involved in research on the economic situation in Poland. Besides the Organisation for Economic Co-operation and Development (OECD) it is worth to mention the key institution in Poland conducting the research in that area using business tendency surveys like the Central Statistical Office of Poland (GUS)<sup>17</sup>, Narodowy Bank Polski (NBP)<sup>18</sup>, Instytut Badań nad Gospodarką Rynkową (IBnGR)<sup>19</sup> and the Research Institute for

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<sup>17</sup> <http://stat.gov.pl/obszary-tematyczne/koniunktura/> (10 May, 2015).

<sup>18</sup> [http://www.nbp.pl/home.aspx?c=/ascx/koniunktura\\_prezentacja.ascx](http://www.nbp.pl/home.aspx?c=/ascx/koniunktura_prezentacja.ascx) (10 May, 2015).

<sup>19</sup> <http://www.ibngr.pl/Obszary-badawcze/Badania-Koniunkturalne-i-Sektorowe> (10 May, 2015).

Economic Development in Warsaw School of Economics (RIED)<sup>20</sup>. The more detailed list of the research institutions in Poland in years 1980-2012 (including division into surveyed sectors) is available in (Adamowicz et al., 2013, p. 237).

In this chapter we concentrate on the part of the business tendency survey that concerns the manufacturing. The methodology used by various institutions differs not only because of the method of analysis, but also because of the size of the sample or its selection. For example research sample taken by the Central Statistical Office of Poland consists of enterprises employing 10 or more persons, whereas the survey of the Research Institute for Economic Development is addressed also to microenterprises. Some of the surveys (or their parts) are conducted monthly (RIED, GUS), some quarterly (GUS) and some weekly (IBnGR). Also different variables and questions are used and finally many various methods of analysis are implemented: weighted averaging (RIED<sup>21</sup>), seasonal adjustment (TRAMO-SEATS<sup>22</sup>; Burman, 1980), time series decomposition (ARIMA, see for example (Ladiray & Quenneville, 2001) or (Monsell et al., 2013)), Bayesian averaging (Białowolski et al., 2013) or frequency filtering (Addo et al., 2012). All of those procedures belong to a class of econometric methods and have strict assumptions, which are necessary for the legitimate use of them. In this chapter we chose an alternative approach, which can be considered in category of automatic pattern recognition. Namely we explored the use of the hidden Markov method for study of the dependence of the respondents' opinion about the current and future situation in the enterprise versus the global economic situation in the country. It is worth to emphasize that analysis of the business cycle or turning points in it, is not an easy task. A large variety of data and rapidly changing on many levels situation causes problems not only in predicting but even in determining the historical or current state of the economy in the country. As an example, we may use the fact that historical dating of turning points given by the OECD are sometimes changed over time.

This chapter is based on the results of the business tendency survey conducted by Research Institute for Economic Development in Warsaw School of Economics. We limited ourselves to one part of this survey that concerns the manufacturing production. The survey consists of questions about the current and the future situation in the industrial enterprise. More information about the questions from the survey as well as the choosing the respondents' sample are given in the following

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<sup>20</sup> <http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Strony/metody.aspx> (10 May, 2015).

<sup>21</sup> Details of the research method can be found on [http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Documents/metoda\\_badawcza.pdf](http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Documents/metoda_badawcza.pdf) (10 May, 2015).

<sup>22</sup> Two linked programs TRAMO ("Time Series Regression with ARIMA Noise, Missing Observations, and Outliers") and SEATS ("Signal Extraction in ARIMA Time Series") recommended by Eurostat.

sections of the paper. The RIED surveys are used to calculate each month the indicator of business activity in industry for Poland<sup>23</sup>, so usefulness of the respondents' opinion is proven by existence of such an indicator, which is regularly published in the RIED bulletins. Data from the survey conducted by the RIED are used mainly to calculate indicators. Arbitrary system of weights used in the RIED method is subject to criticism. There were of course some alternative weighting schemes proposed (Kowalczyk & Tomczyk, 2009). Nevertheless REID method uses mainly the data about the assessment of the current situation.

The hidden Markov model (HMM) was presented by (Bernardelli & Dędyś, 2012) as an effective method of the business cycle turning points identification with small requirements in terms of the assumptions. The aim of this study was to confront the opinions of the respondents of the business tendency survey in manufacturing production conducted by the RIED about the current and the future economic situation in the enterprise with the official indications of the economic situation in the country. Validation of the relationship between the prediction and current assessments of the respondents may benefit in additional information useful in constructing better methods to analyze the business tendency. Nowcasting and forecasting calculations combine with the time series of the responds from the survey could be used from the researchers' and decision-makers' point of view to build the enterprises' profile and from the enterprises' point of view to make the more reasonable plans related to the production.

Respondents' answers to some questions could be correlated with the official assessment of the economic situation and some of them could be completely inaccurate. Even if there is a statistically significant correlation between the opinion of the respondents about the economic situation in the country and the real economic situation, then the open question is to determine, what is a reason and what is a result. Maybe it is like so called self-fulfilling prophesy: respondent thinks that the situation is good/bad just because he heard some news about it. Or maybe the better/worse situation in many enterprises is the reflection of the real situation in the country. Answer to this problem is more difficult due to the possibility of the time delay between the change of the situation in the enterprise and the reaction to this change of the global market.

To get the reliable results it is necessary to compare them with commonly acceptable sources. As a main reference time series the OECD dating of the turning points for Poland<sup>24</sup> was used. It is worth to notice that there are other sources, with are not consistent with the OECD dating. As an example can be mentioned the

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<sup>23</sup> <http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Strony/przemysl.aspx> (10 May, 2015).

<sup>24</sup> <http://www.oecd.org/std/leading-indicators/oecdcompositeleadingindicatorsreferenceturningpointsandcomponentseries.htm> (10 May, 2015).

turning points identified by M. Drozdowicz-Bieć (Drozdowicz, 2008). The advantages of using the OECD dating are the monthly time granulation (quarterly in case of Drozdowicz-Bieć dating) as well as the long history of turning points identification. It is worth to add that the time series given by the OECD is the composite leading indicator. For the more accurate analysis of the results of the survey also hard economic data, that is sold production in industry (constant prices), were used. This reference time series is provided by the Central Statistical Office of Poland.

This chapter is composed of five sections. After introduction, in the second section the methodology and the description of proposed model and its parameters estimation algorithm. The third section contains information about input and output data used in the research, whereas in the fourth section the results of computer simulations exploring the presented method are described. Paper ends with the summary.

## **10.2. Models and the method of estimation**

The assessment of the current and future economic situation plays a key role in the strategy planning of every enterprise. Financial condition of the enterprise is usually strictly connected with the global economic condition of the country (or to be more exact countries, including for example neighbor countries or countries, which participate in an import/export with the enterprise). Therefore it is vital for the policy makers to know in advance, that the situation becomes worse, to take some steps to counter this. It is also important for the enterprise to predict the general direction of change in the economy to adapt on time. Knowing leading factors of turning points of the business cycle or to develop own indicators of the business cycle could be the advantage over the competition and in the result maybe the necessary condition to survive in difficult time of economic crisis.

Certainly, the future level of economic development depends on many factors. Thus, even indisputable identification of turning points in economy is a challenging task. Exemplary data used by many researchers are the gross domestic product, export, rate of employment or level of production. Using them as a basis of a construction of econometric models, however, is problematic due to the potential presence of unspecified variables in created models or simply restrictive assumptions about the model and input data. Among often used econometric models there should be mentioned those relying on ARIMA (Bell, 1984; Wildi & Schips, 2005) or logistic regression (Birchenhall et al., 1999, Sensier et al. 2004).



There are however alternative approaches to the econometric modelling. One of them is based on Markov models (see Bhar & Hamori, 2004; Mamon & Elliott, 2007). To the main advantages of this class of methods should be counted a non-deterministic character and weak assumptions (comparing to the econometric approach). Markov models proved to be an effective tool in many fields and they evolved in time. One of the most useful generalizations is the hidden Markov model (Hamilton, 1994; Cappé et al., 2005).

#### **10.2.1. Hidden Markov models**

Hidden Markov models (HMM) are widely used as a key part of algorithms of analysis of processes and patterns. The idea behind HMM is based on distinguishing two layers:

- visible, representing as observed sequence of emissions,
- hidden, consisting of the sequence of states (symbols), which are not known, but we want to discover them.

The most known application of HMM is connected with pattern (speech, handwriting, gesture) recognition (Jelinek, 1997), as well as the various data analysis, like DNA sequencing in bioinformatics (Durbin et al., 1998) or financial and macroeconomic time series analysis in econometrics (Cappé et al., 2005; Mamon & Elliott, 2007). Theory and practice of hidden Markov models are also well-established in business cycles analysis. They are mainly limited to two states only (Decewicz et al., 2008; Abberger & Nierhaus, 2010), but there are studies (Bernardelli, 2013, 2014) showing that generalization to multistate gives a result in the form of more flexible and efficient models.

A formal definition of a hidden Markov model could be given on the basis of stochastic process theory (Cappé et al., 2005) or dynamic Bayesian network scope (Ghahramani, 2001). Simpler in terms of assumptions and notation is a definition, which uses the terminology from the field of finite-state probabilistic automaton (Rabin, 1963). This definition will be briefly presented in the following part of the section.

Let  $S_X$  be a non-empty, finite set of  $k$  states. Let  $S_I$  be a symbol of an initial state. Furthermore let

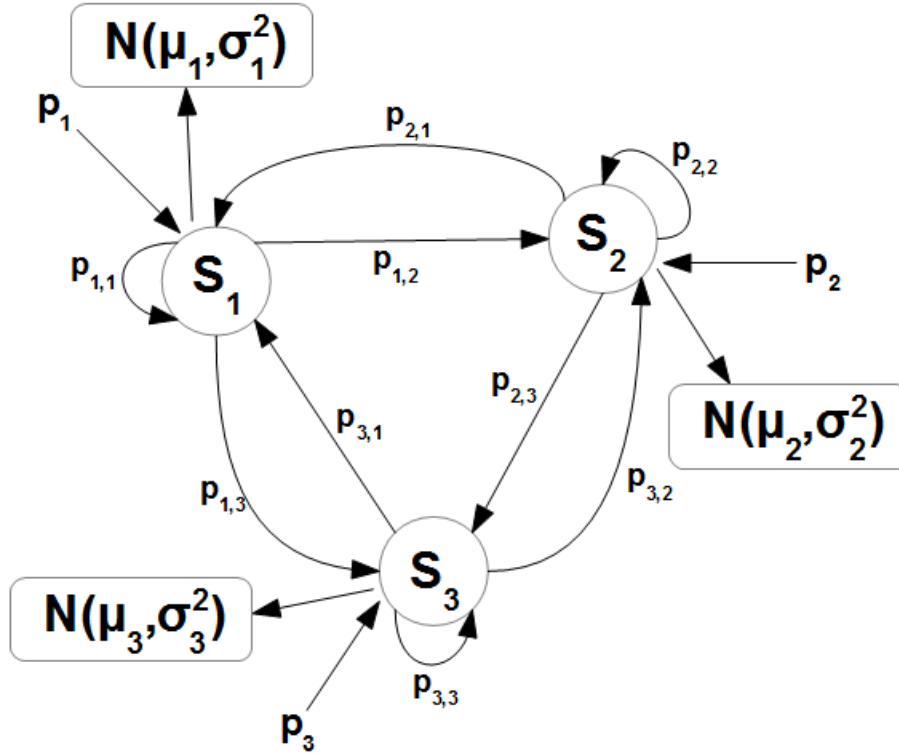
$$P = [p_{i,j}]_{i,j=1}^k \quad (10.1)$$

be a matrix of probabilities of transitions, where  $p_{i,j}$  is the probability of transition from the state  $i$  to the state  $j$ . It is assumed, that the transition matrix has a stochastic property, that is for every  $I$

$$\sum_{j=1}^k p_{i,j} = 1. \quad (10.2)$$

Markov chain is an ordered triple  $(S_X, S_I, P)$ . The characteristic feature of Markov chain is so called lack of memory. It means that the next state depends only on the current state and the history of getting to this state is not important.

Hidden Markov models are an extension of the Markov chain by adding an additional alphabet  $\Sigma$ . Symbols of this alphabet are emitted in the specific state with the given probability distribution. It is assumed that in every state some symbol is emitted. The HMM in the state  $i \in S_X$  is emitting the symbol  $x \in \Sigma$  with the given probability  $e_i(x)$  and next it changes the state to  $j$  with the probability  $p_{i,j}$ . In the case of continuous probabilities (and therefore infinite alphabet) by  $e_i(x)$  a probability distribution is meant. For the Gaussian distribution with the expected value  $\mu$  and the variance  $\sigma^2$  the exemplary schema is presented in Figure 10.1.



**Figure 10.1. A schema of a three-state hidden Markov model with normal probability distributions of emitting symbols**

Source: own elaboration.

The notation of  $k$ -state HMM, defined as a hidden Markov chains with a  $k$ -element set of states, is used. In this paper two-, three- and four-state models with a normal distribution probability of emitting symbols in every state are considered. Each hidden Markov model thus is defined by the following parameters (compare Bernardelli, 2014):

- $k$  – number of states,
- set of symbols (alphabet)  $\Sigma$  where  $n$  is a number of symbols,
- initial probabilities for every state ( $k$  parameters),
- transition matrix  $P$ , that is matrix of probabilities of transitions between two states ( $k^2$  parameters),
- parameters of normal distribution defining probability of emission of symbol in each state ( $2kn$  parameters).

### **10.2.2. Model parameters estimation**

Given an input data (visible layer) to the hidden Markov model one need to estimate the model parameters and determine the states (symbols) of the model (hidden layer). There is the well-known Baum-Welch algorithm (Baum et al., 1970), which allows finding the nearly optimal values of the parameters of the HMM. The Baum-Welch algorithm is an iterative method that calculates maximum likelihood. This algorithm should be considered as a greedy algorithm and thus obtained solutions may be far from optimal – there is no guarantee that the result found by the Baum-Welch algorithm is really a global optimum. Starting from different initial values of the parameters algorithm could find various solutions that are only local maxima. To increase the chance of finding better approximation of the optimal solution, the algorithm could be used repeatedly for the same input data, but different initial parameters. Unfortunately it is impossible to perform the calculations for every combination of values of initial parameters – there are infinitely many of them. Therefore for the computational purpose all intervals which contain values of possible parameters must be discretized. Number of nodes is increasing exponentially<sup>25</sup> with increasing number of states and the computation time of the Baum-Welch algorithm is proportional to the size of the discretization grid, so even then checking all eventualities is not possible. Often used in this situation solution is to add randomness to the procedure, that is to choose initial points in the random way. This approach is in fact a Monte Carlo simulation (Glasserman, 2003). The more points are chosen, the higher probability of finding the global maximum, not only a local one.

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<sup>25</sup> For the reasonable value of the step of the grid (at least 100 values of every parameter) computational time of the Baum-Welch algorithm on any existing computer, would take more time then the estimated age of the universe. For more detail information see Bernardelli (2014).

There is also an issue with deciding which model should be considered as the best. To be more precise, some optimization criteria need to be specified, to choose the set of parameters of HMM, which is assumed to be the best (according to the accepted criteria) approximation of the global optimum. The choice could be made based on various optimization criteria as well as on comparison with the reference time series. The most common criteria are:

- Akaike information criterion (AIC),
- Bayesian information criterion (BIC),
- value of likelihood function,
- frequency of obtaining a given set of parameters in the Baum-Welch algorithm.

The precise description of the procedure of finding the best approximation of the global maximum (considering various criteria of optimization) is presented by Bernardelli (2013, 2014). Having the proper HMM chosen, still it is necessary to establish the correct order of states (based on the model and values of conditional distribution). There are several methods used in practice. Historically the oldest are connected with so-called filtered and smoothed probabilities. In those methods the states are defined so to say for each moment of time separately. There is however another, more complex approach: instead of dealing with moments of time one by one, we can search the most likely path of states in the whole considered period. That kind of path could be found by exploring the algorithm proposed by Andrew Viterbi (1967). The Viterbi algorithm is an example of dynamic programming. The output data is the most likely sequence of hidden states which are commonly called the Viterbi path.

It should be emphasize that although the hidden Markov models were known and used in the research on business cycles, the approach combining multistate HMM with Viterbi algorithm and its use for macroeconomic time series is relatively new. It was first presented in the article (Bernardelli & Dędyś, 2012), with some improvements in (Bernardelli, 2014). In this paper this procedure is used to determine the relationship between the respondents' assessments of the current and projected economic situation in the enterprise.

### **10.3. Description of the data**

#### **10.3.1. Input data**

As an input data answers of the respondents to the questions of business tendency surveys in industry were used. The business tendency surveys are conducted monthly by the Research Institute for Economic Development in Warsaw School

of Economics. One part of this survey concerns the manufacturing production and consists of eight questions about the current and eight questions about the future situation in Poland (due to a respondent's knowledge and prediction based on the data from their enterprise). Respondents are chosen from the set of all enterprises, including microenterprises. It is definitely different approach then in case of the business tendency surveys of the Central Statistical Office of Poland, where respondents are chosen only from the enterprises, which employ 10 or more persons (see website of the Central Statistical Office of Poland for more details). According to the report<sup>26</sup> of GUS concerning microenterprises in Poland in 2013, the average year number of microenterprises in 2009-2013 were equal to 1 676.6 thousands, which gives approximately 95.6% of all business entities. It means that theoretically the RIED survey should be more representative than this conducted by GUS.

Each month the RIED survey in industry is sent to 1500 periodically randomly chosen entities. The number of correctly questionnaire ranges between 350 and 400. Each time the survey is sent to the same recipients, but due to the different fates of the enterprises the sample is getting smaller in time. This is the reason, for which every second year, new respondents are drawn to maintain the size of the sample. Although the sample is more or less constant, the answering respondents may differ from month to month. Approximately 80-90% of entities are the same, the rest are changeable. There are statistical methods of dealing with the problem of non-panel data (Kowalczyk & Tomczyk, 2008; Kowalczyk, 2013). This is however not an issue while using hidden Markov models. There are no assumptions concerning the panel data input in that method.

The business tendency survey by RIED consists, among others, of eight questions:

- Question 1 – level of production,
- Question 2 – level of orders,
- Question 3 – level of export orders,
- Question 4 – stocks of finished goods,
- Question 5 – prices of goods produced,
- Question 6 – level of employment,
- Question 7 – financial standing,
- Question 8 – general economy situation.

The questionnaires are available on the websites of the RIED<sup>27</sup>. For each of the questions respondents are answering considering the case of a current month (present situation) and the case of the following month (respondent's prediction for

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<sup>26</sup> <http://stat.gov.pl/obszary-tematyczne/podmioty-gospodarcze-wyniki-finansowe/przedsiębiorstwa-niefinansowe/działalność-przedsiębiorstw-o-liczbie-pracujących-do-9-osób-w-2013-r-,21,1.html> (10 May, 2015).

<sup>27</sup> <http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Strony/metody.aspx> (10 May, 2015).

the next 3-4 months). There are three possible reply options: increase, decrease or no change. According to the methodology of calculating the indicator of business activity in industry for Poland by RIED<sup>28</sup>, answers are weighted by the size of employment in the entity (up to 50 employees, 51-250, 251-500, 501-2000, above 2000 employees). Respondents are weighted by 1, 2, 3, 4 and 5 respectively for the consecutive employment intervals. However as an input data for the hidden Markov model explored in this paper respondents are not weighted. For every question simply the balance is calculated as a difference between proportions of positive and negative answers<sup>29</sup>.

For the calculations the monthly data from March 1997 to October 2014 were taken. Numerical experiments (Bernardelli & Dędyś, 2012) show that the input time series should be cleaned from seasonal and random fluctuation. Preprocessing the data was done based on the time series decomposition<sup>30</sup> from the procedure STL (Cleveland, 1990). In Figure 10.2 the decomposition of time series of the balance of answers to the question about general economy situation (question 8) is presented. The decomposition (using the notation from the Figure 10.2.) could be written as follows:

$$data = seasonal + trend + irregular\ component\ (remainder).$$

As the input data to the Baum-Welch algorithm only the trend component is used.

### 10.3.2. Output data

The used in the study procedure takes on input the data after decomposition and returns the Viterbi path (path of states that has the highest probability in the whole considered period). Due to the numerical stability, time of computation and most of all, ease of interpretation, there were considered models only with two, three and four states.

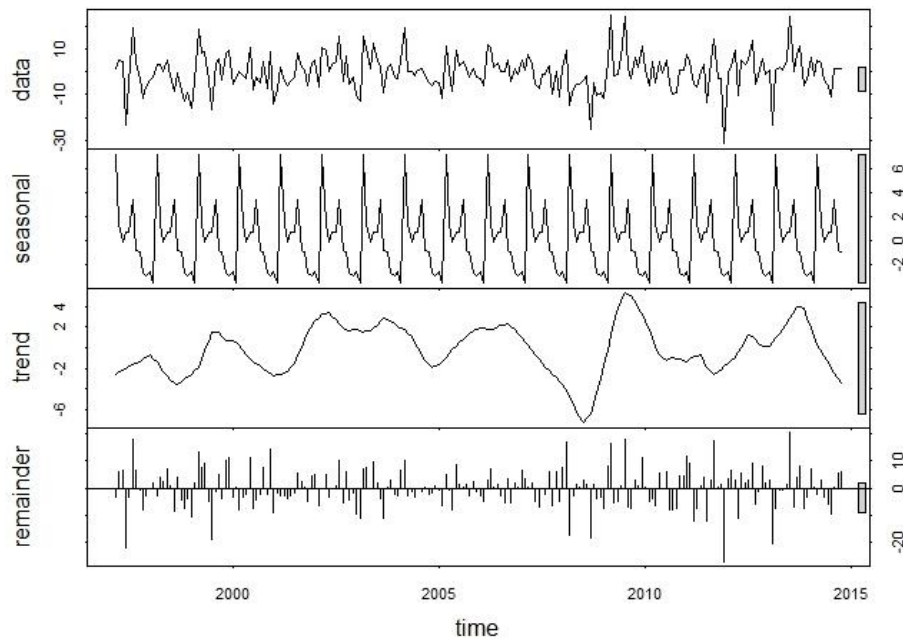
The interpretation of the states in the case of a two-state hidden Markov chain is straightforward. It is assumed that the zero state is associated with periods determined by the respondents as worse (in limiting to the considered question) and the other state (denote by one) is related to the situation assessed by respondents as better. The interpretation of states 0 and 1 in case of a three-state model is exactly the same. There is however an additional state  $\frac{1}{2}$  symbolizing the transient situation between states 0 and 1. The state  $\frac{1}{2}$  is meant to reflect the situations un-

<sup>28</sup> See [http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Documents/metoda\\_badawcza.pdf](http://kolegia.sgh.waw.pl/pl/KAE/struktura/IRG/koniunktura/Documents/metoda_badawcza.pdf) (10 May, 2015).

<sup>29</sup> Answers “no change” are not taken into consideration.

<sup>30</sup> There are many methods of filtering the data, for example Baxter-King, Butterworth, Christiano-Fitzgerald or Hodrick–Prescott filters, see more in (Einicke, 2012).

certain and difficult to unambiguous classification. Analogously to the three-state HMM, the space of states of four-state hidden Markov chain has the form  $\{0, \frac{1}{3}, \frac{2}{3}, 1\}$ . State 0 indicates strong economic downturn, state 1 indisputable economic recovery, while the states  $\frac{1}{3}$  and  $\frac{2}{3}$  are transients: the state  $\frac{1}{3}$  indicates the uncertain status of a worse economic situation in the country, whereas the state  $\frac{2}{3}$  suggests rather better economic conditions.



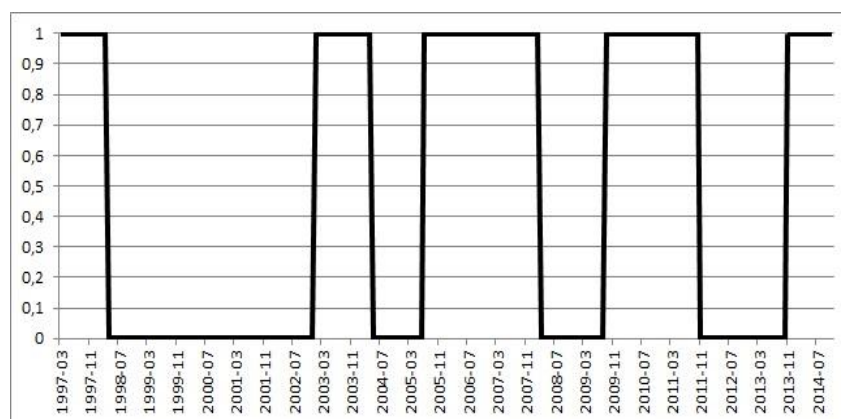
**Figure 10.1. Time series decomposition with the STL procedure. The question about general economy situation**

Source: own elaboration.

The integral part of the hidden Markov model is not only the set of states, but among others also the transition matrix. The important assumption was made about probabilities of transition between the states: non-zero probabilities are permitted only between the adjacent states. This is the mathematical reflection of an economically justified situation of gradual changes in the economy. This restriction is meaningless in case of two-state model, but when the number of states is greater than two, it influences the optimal solution and the resulting Viterbi path. In other words it means that the multistate HMM to get from the state 0 on Viterbi path to the state 1, must pass all other states ( $\frac{1}{2}$  in case of 3-state model or  $\frac{1}{3}$  and  $\frac{2}{3}$  in case of 4-state model) between.

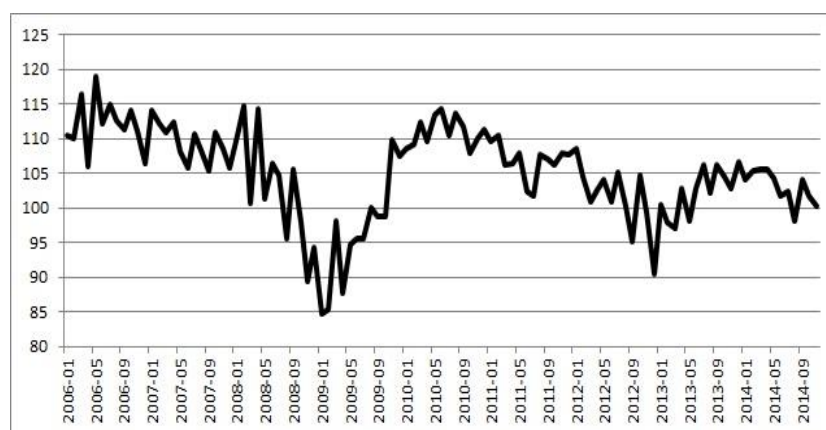
### 10.3.3. Reference time series

To verify accurateness of the respondents' opinion the Viterbi paths were found and confronted with the reference time series. There are not so many long enough and reliable time series describing business cycle turning points in Poland. In this study the business cycle turning points dated by OECD on the basis of CLI (Composite Leading Indicator) was used<sup>31</sup>. The visualization of turning points in Poland is given in Figure 10.3.



**Figure 10.2. Business cycle turning points in Poland dated by OECD**

Source: own elaboration on the basis of the data from the Organisation for Economic Co-operation and Development (OECD).



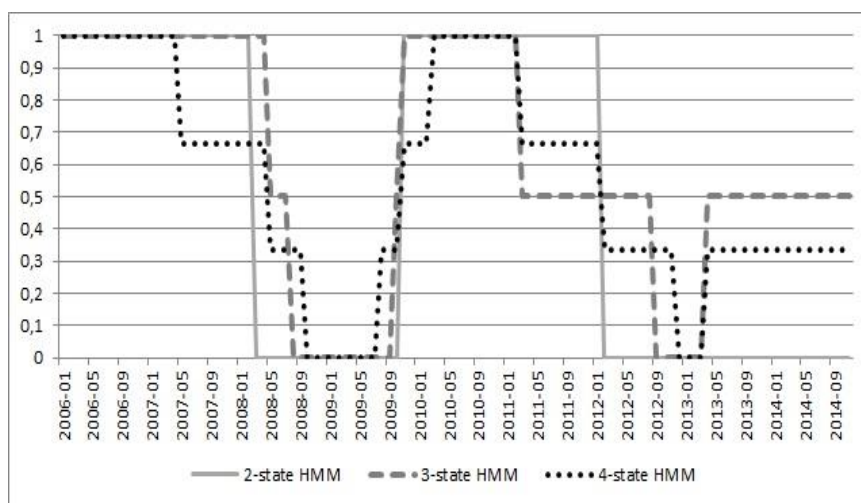
**Figure 10.3. Sold production in industry in Poland (constant prices)**

Source: own elaboration on the basis of the data from the Central Statistical Office of Poland.

<sup>31</sup> For others, like business cycle dated by Drozdowicz-Bieć, see (Bernardelli, Dędyś, 2012).



For the more complete analysis of the results of the survey also hard economic data were used. More accurately as a reference time series there was used the time series of the sold production in industry in constant prices (data from Central Statistical Office of Poland). Due to the data availability the time period had to be shortened to the time interval from January 2006 to November 2014. The graph of the time series is presented in Figure 10.4. This time series need to be transformed into the path of states. Results of an application of the Baum-Welch algorithm to the sold production in industry time series are presented in Figure 10.5.



**Figure 10.4. Viterbi paths of the hidden Markov chains with two, three and four states for the time series of sold production in industry in Poland (constant prices)**

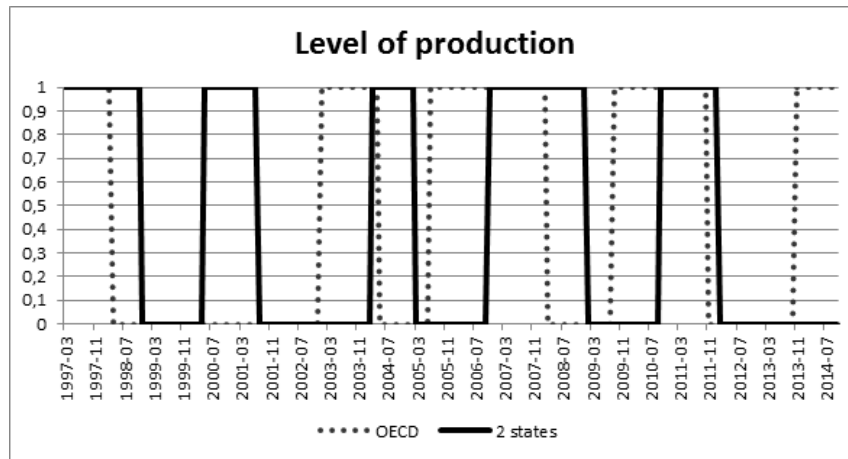
Source: own elaboration.

## 10.4. Empirical analysis

### 10.4.1. Assessment of the current and future situation

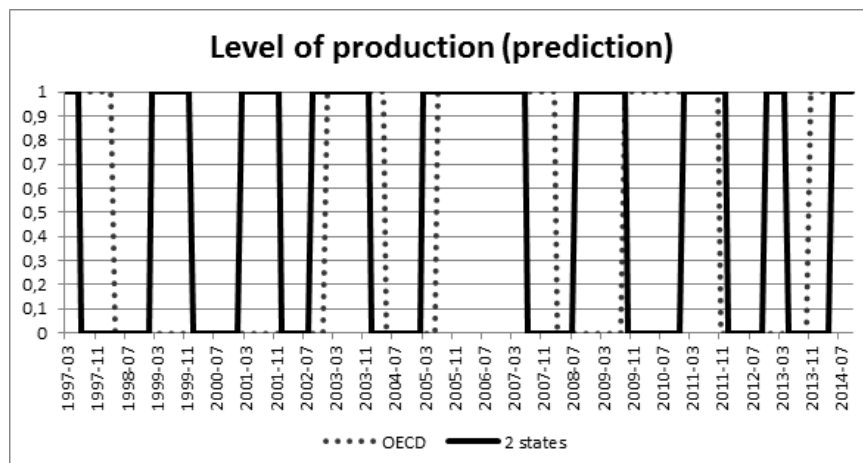
The first part of research covers the period from March 1997 to October 2014. As a reference time series the business cycle turning points dated by OECD were used. The Viterbi paths of HMM with two, three and four states were compared with the reference time series. There were also compared with each other Viterbi paths of the hidden Markov chains for the same questions about the current and the future situation. Due to space limitations in the article there were presented results only for the questions 1 (level of production), 5 (prices of goods produced) and 8 (general economy situation). These questions from the survey were chosen to

emphasize the potential differences between Viterbi path and accuracy of the presented approach.



**Figure 10.5. Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about level of production**

Source: own elaboration.



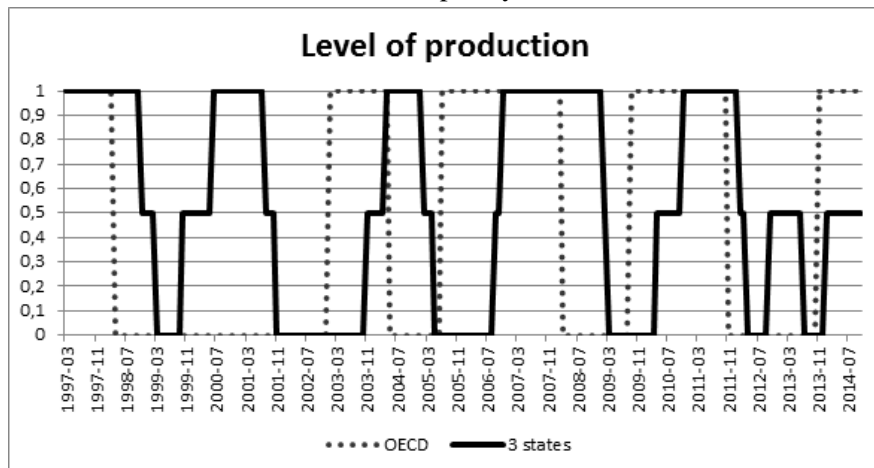
**Figure 10.6. Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about predicted level of production**

Source: own elaboration.

In Figure 10.6 and Figure 10.7 the results of applying 2-state HMM to the time series of balances computed for the question about level of production (current and future situation) are presented. It seems to detect all the turning points with long delay. The path based on the respondent's opinions about the current

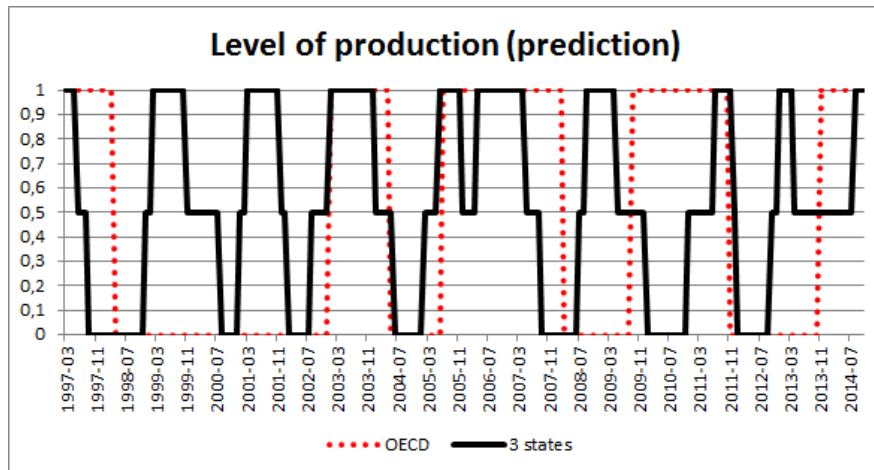
situation gives one extra peak compared to the turning points provided by OECD. It is worth noticing, that this peak is consistent with the compound reference time series proposed by (Bernardelli & Dędyś, 2012) or dating given by (Drozdowicz, 2008). Also, as it was previously stated, the time series by OECD is a leading indicator. The path for the future situation (Figure 10.7) shows much false information about turning points. Although all real turning points are caught properly and time delay is much smaller comparing to the path from Figure 10.6 (as should be expected, because it is the path for future situation), the path consists of projected states seems to be useless comparing to the path connected to the current situation, due to those false information and high volatility of time series.

Figures 10.8 and 10.10 present results for 3-state and 4-state HMM, which seem to enrich the analysis. The signal of not detected (yet) last peak is strengthened and delays are weakened. An extra peak (years 2000-2001) is, as in case of 2-state HMM, consistent with other than the OECD dating. With an increasing number of states, transitions between states become smoother. Graphs on Figures 10.9 and 10.11 are the visualization of the Viterbi path for 3-state and 4-state HMM calculated from the data about the future situation. Looking at the prediction of the respondents it looks like they have completely no connection with the real situation in the country. Number of false signals may indicate the excessive sensitivity and/or susceptibility of the respondents to the external factors, like public sentiment, information in the media, momentary economic fluctuations, etc. For different (shorter) time interval or for panel input data, predictions – contrary to the assessment of the current situation – still poorly reflect the actual situation.



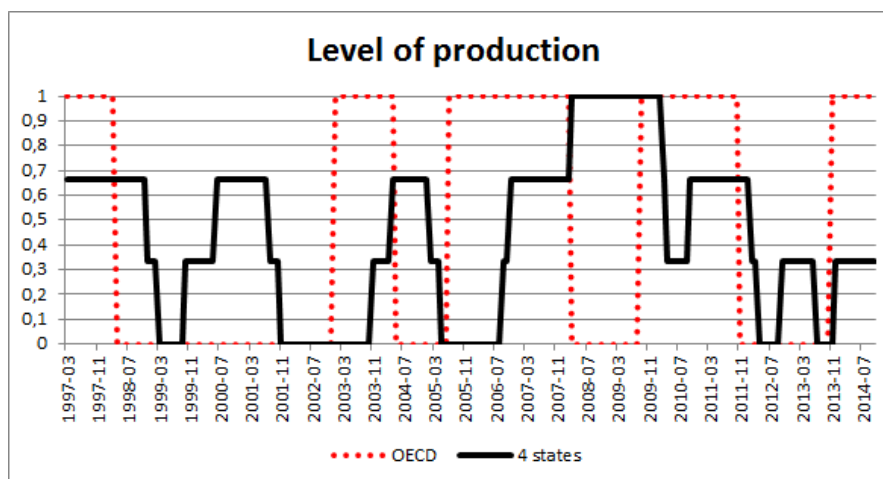
**Figure 10.7. Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about level of production**

Source: own elaboration.



**Figure 10.8. Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about predicted level of production**

Source: own elaboration.



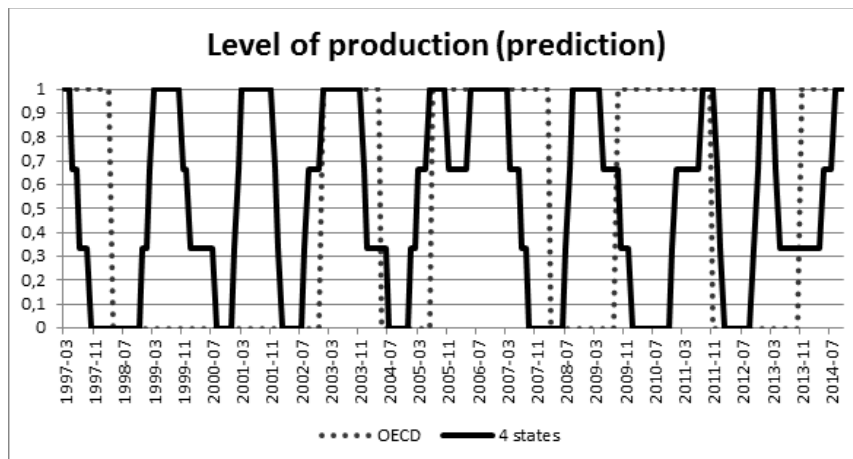
**Figure 10.9. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about level of production**

Source: own elaboration.

Comparison of all: two-, three- and four-state HMM for the current situation are gathered in Figure 10.12, whereas the same comparison, but concerning the future situation in Figure 10.13. Delays in announcement turning points confronting with the dates given by OECD may indicate, that in general, the reaction of the enterprise policy-makers affects the level of production to late<sup>32</sup>. Worth mentioning

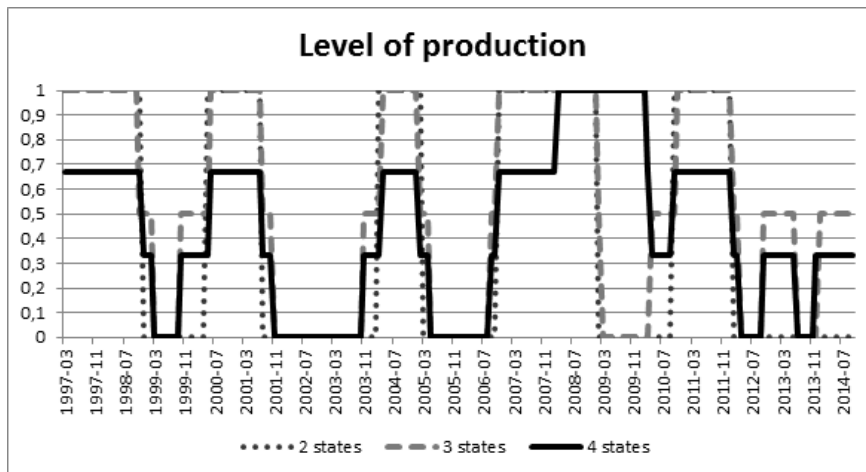
<sup>32</sup> Of course sometimes it cannot be shortened, due to the long-term contracts.

is the fact, that usually level of production is considered as a good approximation of the current situation in the industry, and often it is treated as a leading indicator or a component of the composite indicator (like in indicator calculated by the RIED). Changing the period to the shorter one or adding complementary information, besides the level of production, should improve the accuracy of the hidden Markov model (see Bernardelli, 2013, 2014).



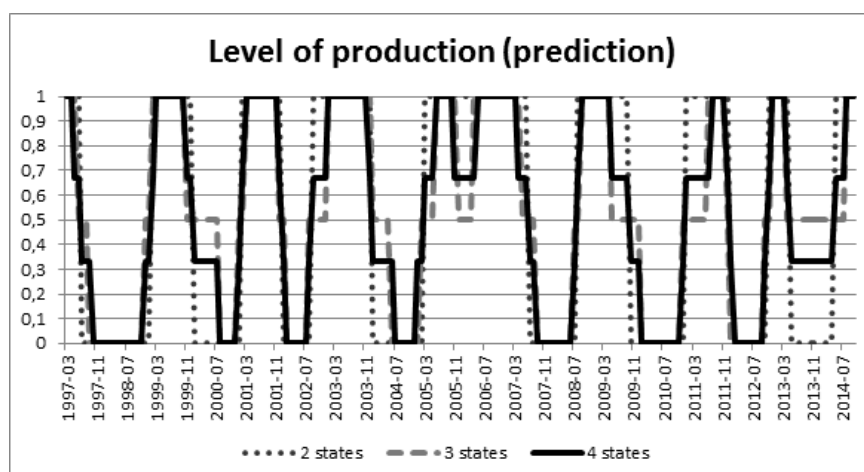
**Figure 10.10. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about predicted level of production**

Source: own elaboration.



**Figure 10.11. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about level of production**

Source: own elaboration.



**Figure 10.12. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about predicted level of production**

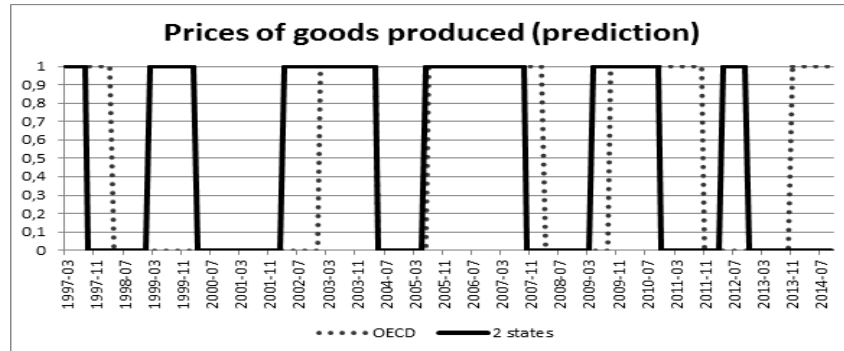
Source: own elaboration.

Analogously to the question about the level of production, the graphs of the Viterbi paths for the question about prices of goods produced (Figures 10.14-21) and general economy situation (Figures 10.22-29) are presented. Like in case of the level of production increase the the number of states makes the graph smoother. It is clearly visible on graphs with gathered all: two-, three- and four-state HMM for the current (Figures 10.20-21) and the future situation (Figures 10.28-29).



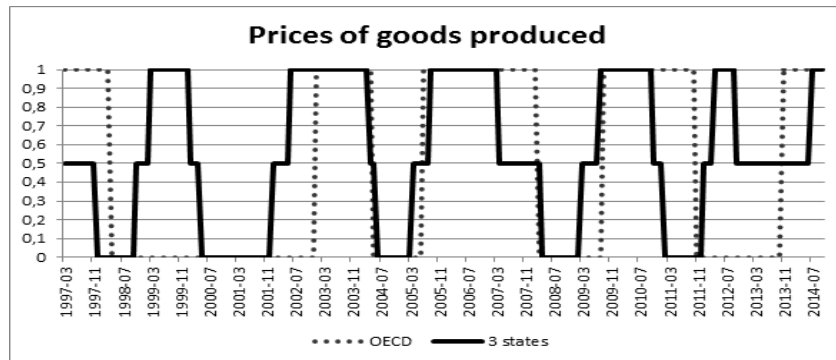
**Figure 10.13. Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about prices of goods produced**

Source: own elaboration.



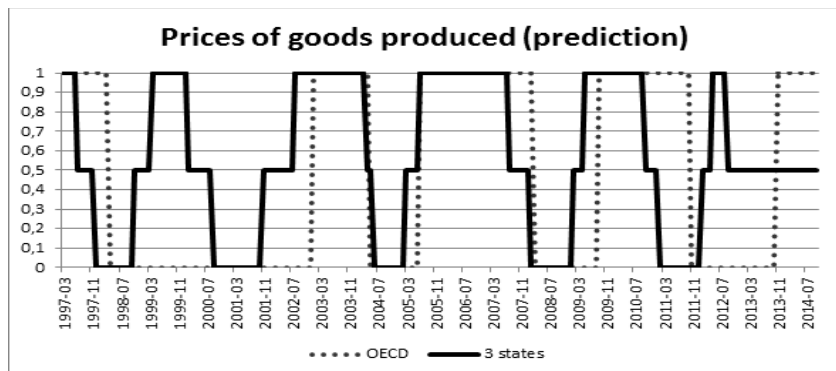
**Figure 10.14.** Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about predicted prices of goods produced

Source: own elaboration.



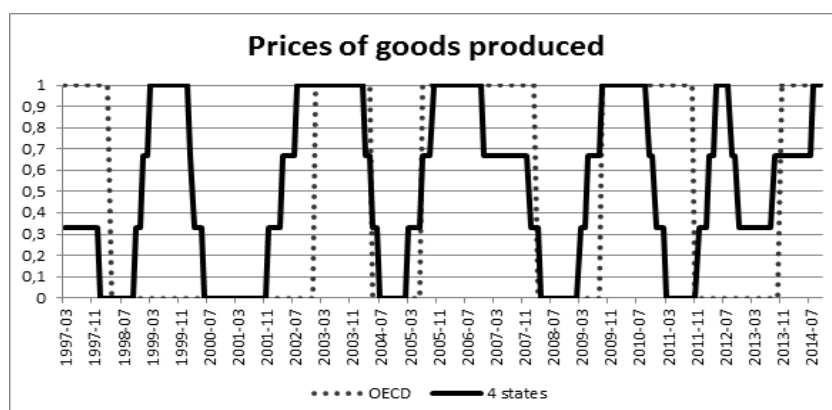
**Figure 10.15.** Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about prices of goods produced

Source: own elaboration.



**Figure 10.16.** Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about predicted prices of goods produced

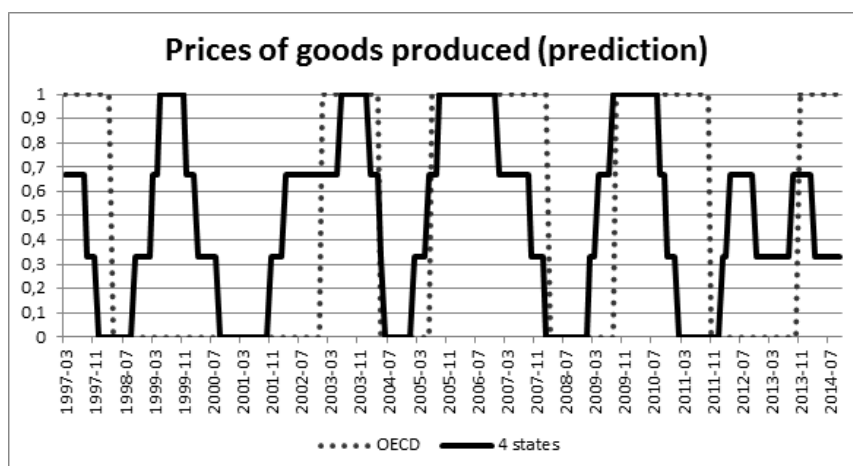
Source: own elaboration.



**Figure 10.17. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about prices of goods produced**

Source: own elaboration.

Model for prices of goods produced gives two extra peaks, but at least one of them (chronologically the first one) is reflected in other than the OECD dating. All the other turning points are detected correctly and often in advance. Predictions are quite similar to the assessments of the current situation, but in general they do not bring anything new into the analysis. Prices in general are not considered as a good indicator of the economic situation – their variable nature makes them too vulnerable to fluctuations in short-term and therefore not reliable source of the assessment of the situation (compare the states of the prediction path after 2011 in Figure 10.19).



**Figure 10.18. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about predicted prices of goods produced**

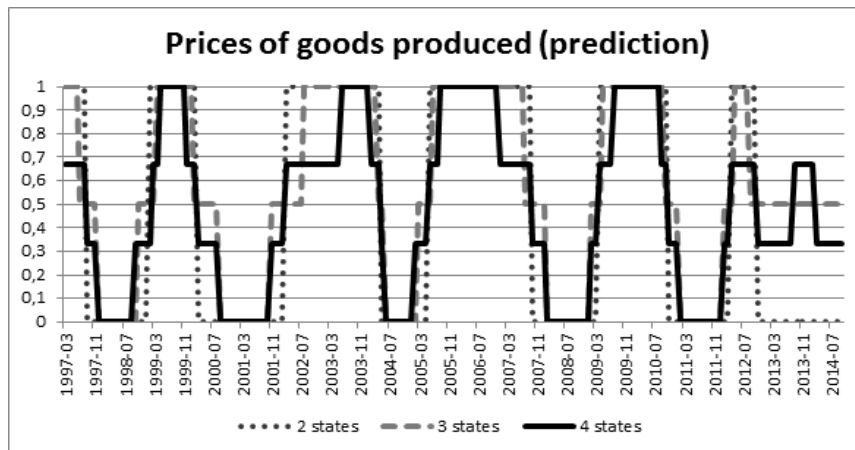
Source: own elaboration.





**Figure 10.19. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about prices of goods produced**

Source: own elaboration.

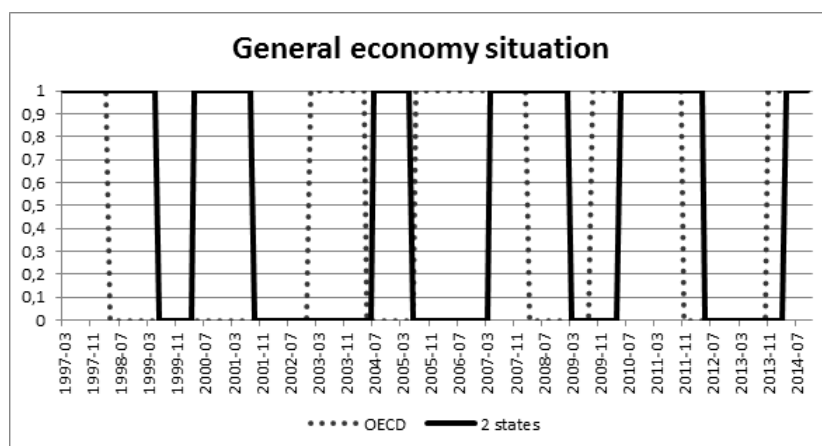


**Figure 10.20. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about predicted prices of goods produced**

Source: own elaboration.

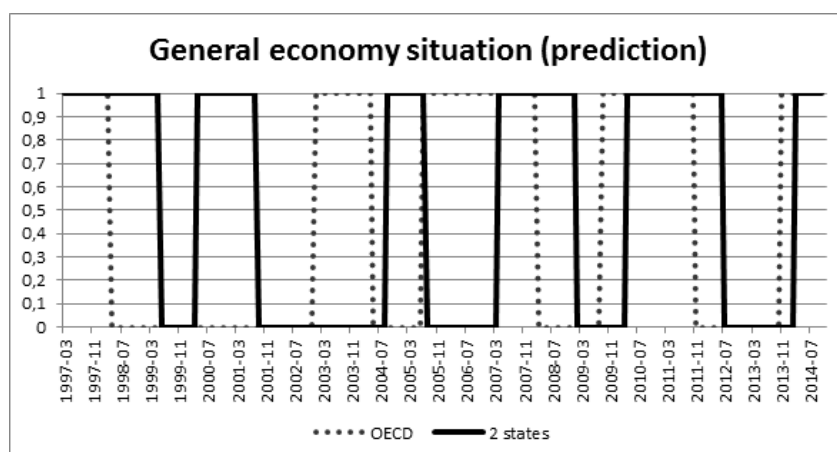
Viterbi paths of the 2-state hidden Markov chain for the question about the general economy situation (Figures 10.22.-23) are similar regard to the current and future assessment. Both reflects every turning point, including the one that is not considered as a turning point by OECD. Predictions comparing to the approximation of the present situation get no additional information. The same remains valid for 3-state (Figures 10.24.-25) and 4-state models (Figures 10.26.-27). Although in more than two states the differences between paths are noticeable, the information

hidden in the respondents' predictions is not better than the information concealed in their assessment of the current situation (see 4-state HMM in Figures 10.26.-27). In case of 3-state HMM for the question about predicted general economy situation it can be also said that it gives much worse output data. It practically omits the crisis 1998-2002 and treats the evident big crisis of 2008 as a minor deterioration. The gathered graphs of the Viterbi paths are presented in Figures 10.28-29.



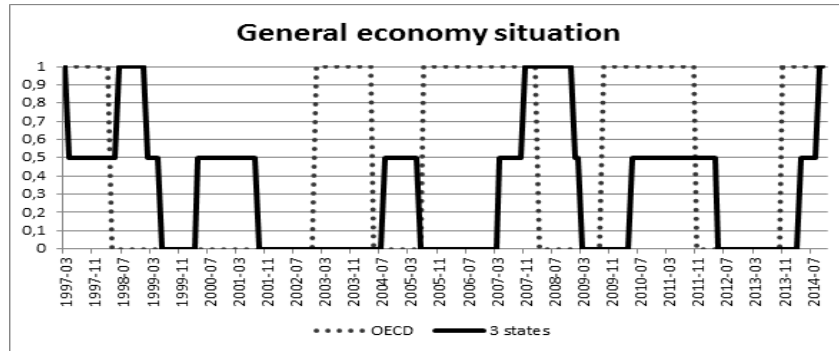
**Figure 10.21. Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about general economy situation**

Source: own elaboration.



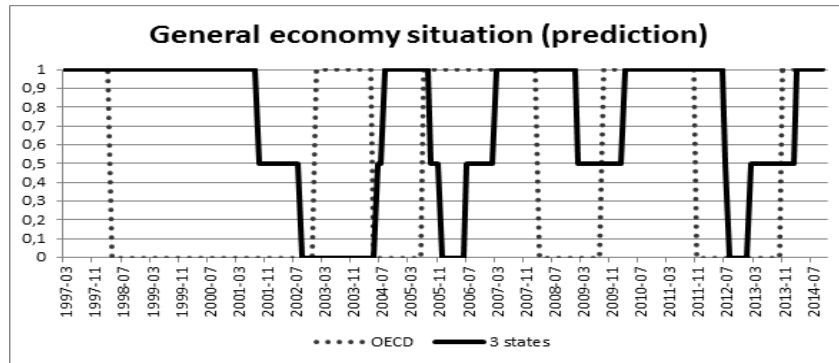
**Figure 10.22. Comparison OECD reference time series with the Viterbi path for 2-state HMM for the question about predicted general economy situation**

Source: own elaboration.



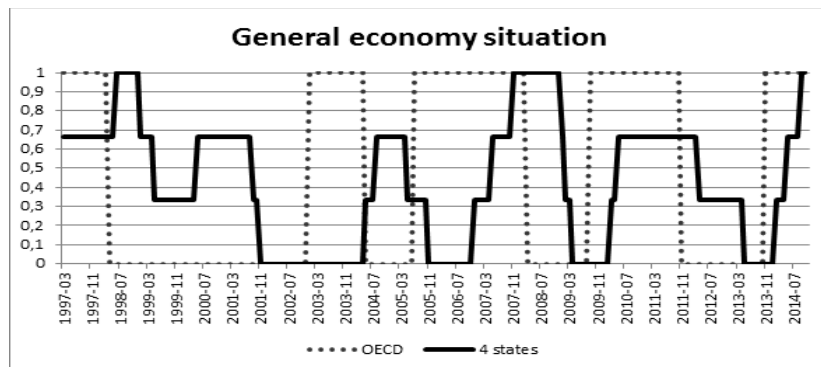
**Figure 10.23. Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about general economy situation**

Source: own elaboration.



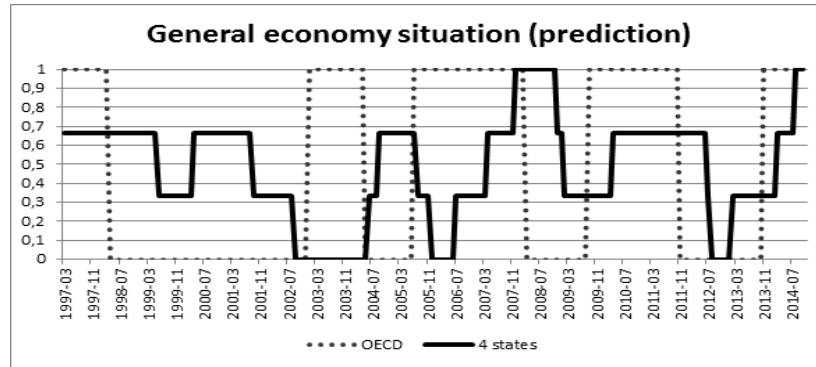
**Figure 10.24. Comparison OECD reference time series with the Viterbi path for 3-state HMM for the question about predicted general economy situation**

Source: own elaboration.



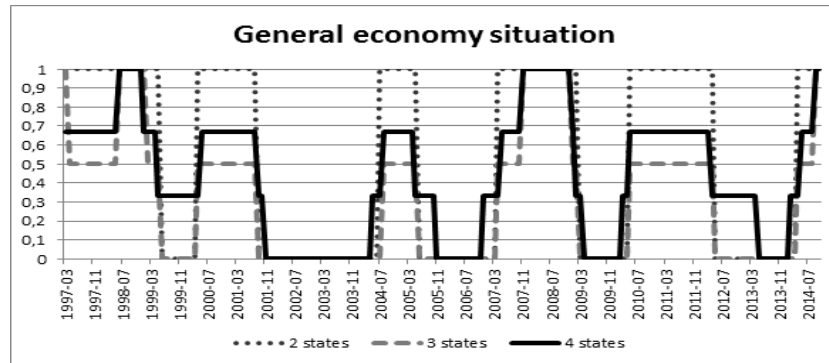
**Figure 10.25. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about general economy situation**

Source: own elaboration.



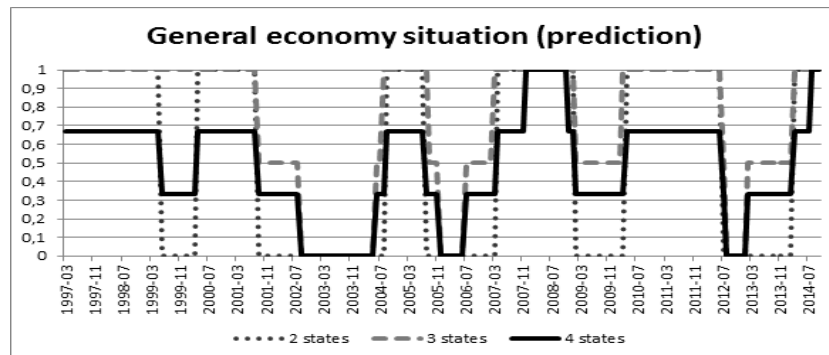
**Figure 10.26. Comparison OECD reference time series with the Viterbi path for 4-state HMM for the question about predicted general economy situation**

Source: own elaboration.



**Figure 10.27. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about general economy situation**

Source: own elaboration.



**Figure 10.28. Comparison of Viterbi paths for 2-state, 3-state and 4-state HMM for the question about predicted general economy situation**

Source: own elaboration.

Comparing the future and current assessments leads to the conclusion that it is better to trust the opinion about present situation. For every question predictions are not superior to the estimations of the current situation. This however doesn't mean that respondents' opinions are meaningful. Viterbi paths for the question about the general economy situation are really similar for the current and future assessment in case of two-state HMM. The long delay comparing to the OECD reference series indicates that the predictions made by respondents are rather the effect of the already existing bad situation in the country not progressive deterioration of the situation in the enterprise. Increasing the number of states in the model blurs the signals about the situations given by the respondents. They are definitely not so clear, which means that the opinions vary widely between the respondents. Therefore for a larger number of states opinions do not seem to correspond to the actual situation in the country.

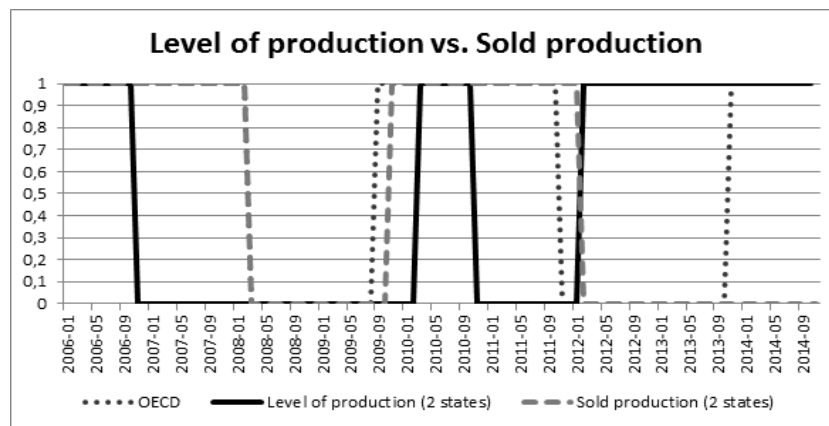
It is important to emphasize that the procedure based on the Baum-Welch algorithm proved to be very accurate in detecting business cycle turning points in Poland. However due to the lengthening time series the considered period must be chosen carefully. To get the good approximation of the actual situation in the country (possibly in advance), it is also better to use panel input data, that is more than one time series of balances of the answers of the respondents as the input to the Baum-Welch procedure. It doesn't change the dependencies between the current and future assessment of the situation in the enterprise. First of all predictions generally have a poor reflection in the reality. Secondly, most respondents' opinions associated with only one aspect of the enterprise (a single survey question) are usually created under the big influence of external factors.

#### **10.4.2. Effectiveness of the procedure**

The second part of the analysis was intended to confront the results of the Baum-Welch procedure with the hard economic data. It is an excellent way of determining the meaningfulness of an aggregation of the answers to the questions from the survey. As a reference time series the sold production in industry (in constant prices) was chosen. Due to the availability of the data the time interval was restricted to the period from January 2006 to November 2014.

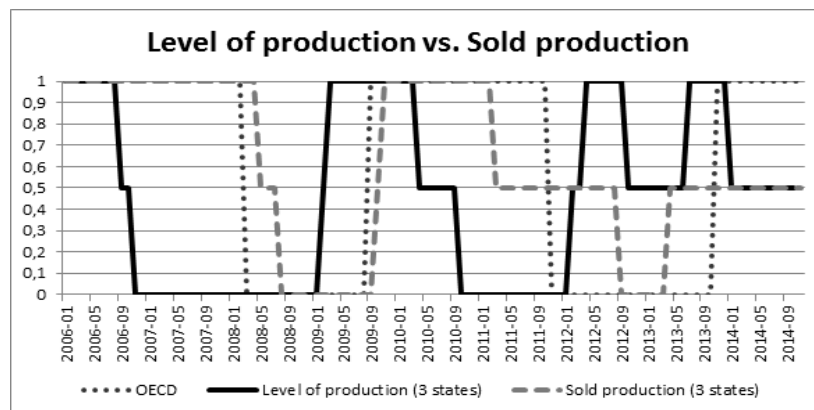
The Viterbi paths obtained for the data connected with the time series of sold production are presented in Figures 10.30-32. From the graphs one can observe that the most likely path of three-state and four-state Markov chains for the sold production and the level of production are really similar, but shifted in time. Moreover, increase of the number of states seems to make the fit smoother and closer to the actual situation. Observing the time shifts it is clear, that almost all turning

points are caught much earlier. For the level of production the situation is much better than in the first part of the research (see section 10.4.1), where the turning points were detected with delay. It confirms the importance of choosing the right time interval. Too short period makes impossible for the Baum-Welch algorithm to find the proper model parameters, while too long period makes it necessary to averaging and associated with that the deterioration of the fit. Nonetheless the result of the procedure is the proof for effectiveness of the opinion of a larger group of respondents for some questions of the survey.



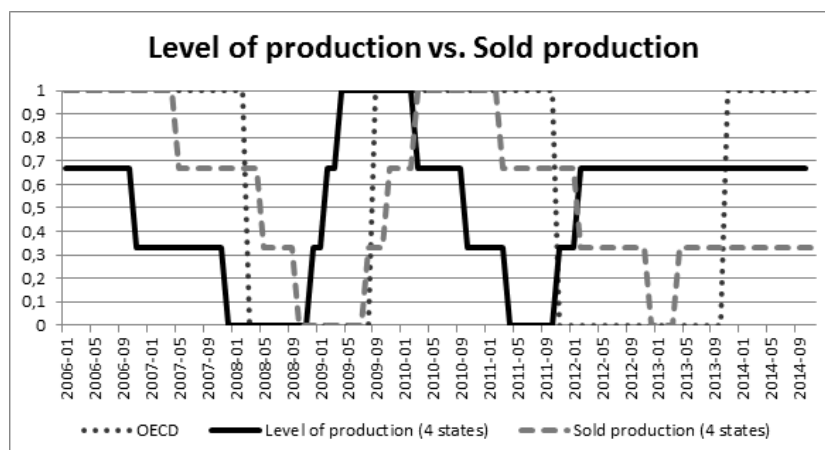
**Figure 10.29. Comparison OECD reference time series with Viterbi paths for 2-state HMM for the question about level of production and data about sold production in industry**

Source: own elaboration.



**Figure 10.30. Comparison OECD reference time series with Viterbi paths for 3-state HMM for the question about level of production and data about sold production in industry**

Source: own elaboration.



**Figure 10.31. Comparison OECD reference time series with Viterbi paths for 4-state HMM for the question about level of production and data about sold production in industry**

Source: own elaboration.

## 10.5. Summary

This chapter extensively introduces the theory of multistate hidden Markov models and the concept of the Viterbi path. This methodology is used on the data from the business tendency survey in industry conducted monthly by the Research Institute for Economic Development in Warsaw School of Economics. The aim was to analyze the relationship between the opinions of the respondents about the current and the future economic situation in the enterprise against the official indications of the economic situation in the country.

Based on the previous research (Bernardelli & Dędyś, 2012) and results of experiments it is justified to draw the following conclusions about the usefulness of the described procedure. Definitely it is a flexible and efficient way of an analysis of the result of the questions of business tendency surveys and turning points detection. Main advantages are an ease of generalization, minimal assumptions and a high accuracy of fit. It is a powerful alternative for classical econometric methods. As a drawback the non-deterministic character of the procedure and the lack of the guarantee of finding the global optimum can be pointed out. Also, no clues as to choose the appropriate time interval on input is a gap requiring complementation.

Regarding the aim of the research from the enterprises' point of view there are few conclusions that can be drawn from the empirical analysis. Most of all, usefulness of the predictions made by the respondents is questionable. Assessments

based on opinions about the current situation are not worse than those based on opinions about the future situation. In most cases they provide much better accuracy of fit to the real situation. Secondly, aggregate opinions of the respondents in the proper (not too long and not too short) time interval offers quite accurate assessment of the current situation. However not every question from the survey is equivalently useful. Most of them seem to be only the delayed reflection of the global economic situation in the country. Only properly chosen set of answers to the survey questions could give the leading indicator.

It appears that in many cases respondents' opinions work on the principle of self-fulfilling prophecy. Therefore only careful analysis of the enterprise data can provide the reliable assessment of the situation. In other cases it is wiser and safer to depend on the official scientific reports. Determining the direction of the relationship considered in terms of cause and effect connected with the respondents' predictions and official indicators requires further study.



## **CHAPTER 11**

### **THE INNOVATIVE ACTIVITY OF THE POLISH BUSINESS ENTITIES – AN ATTEMPT TO ASSESS**

#### **11.1. Introduction**

Due to curiosity, a perennial aspiration to fulfil needs, to improve the living conditions, to make work easier and more effective, innovativeness has been accompanying people since the beginning of humanity. The innovativeness is a derivative of creativity and the pursuit of values regarding continued search for new concepts, ideas and inventions as well as practical use of the results of research and development works. The innovativeness means also improvement and development of the sphere of services, existing production and operation technologies and the creation of new solutions in the organisation and management. Nowadays, the innovativeness implies the level and direction of the development of the modern business entities. It means progress, development and competitive advantage. However, it is a complex, long-term process which requires a system approach and adequate forms of coordination for the development, not only of enterprises, sectors but also of whole economy.

The notion of innovativeness is a leitmotif of this chapter. The attempt to assess the innovativeness of the Polish economy created by the national business entities is the main aim of the chapter. The comparative analysis was used as the research method. The characteristics of chosen rates of innovative activity was presented and assessed. The level of the innovativeness of the Polish business entities was determined with the use of the statistical methods as well as the direct indicators based on the results of product, process, organisational and marketing innovativeness. Subsequently, the comparison and assessment of the level of the innovativeness of the Polish economy with the countries from the European Union was made. The determinants of the innovative activity of the Polish business entities, indicating strengths and weaknesses as well as recommendations to increase the innovativeness of the Polish enterprises, were specified.

## **11.2. The characteristics and assessment of the indicators of the innovative activity**

The innovative activity refers to all scientific, technical, organisational, financial and commercial actions with the aim to implement the innovation. Research into innovations is a very important aspect which, except from the practice connected with their implementation, supports the innovativeness. Specified monitors are the implementation tools. In practice, two groups of indicators, direct and indirect, used to measure innovative activity were approved (however measuring innovation is a difficult) (Dodgson et al., 2008, p. 55).

The indirect indicators specify the value of expenditures and the effects obtained regarding Research and Development Activity (R&D). They measure the results of the inventive activeness and the conclusions concerning the innovativeness of a given economy are drawn on their basis. These are substitute indicators based on the positive relationship between the level of spending on R&D as well as productivity and profitability of the business entities (Godin, 2004, pp. 121-122). These indicators base on the spending on the R&D, technological intensity, the number of patents as well as patent statistics (Nowak, 2012, pp. 154-155).

The GERD indicator is the main unit received as the result of the research into R&D Activity (Gross Domestic Expenditure on Research and Development). It is specified as gross domestic expenditure on the R&D activity which involves all expenditure incurred in a given year regardless of the source of it. The GERD constitutes labour costs, other current costs and gross capital expenditure on fixed assets used in R&D programmes. The GERD indicator has three components: the BERD (Business Expenditures on Research and Development) which is created by the enterprises, the HERD (Higher Education on Research and Development) which is created by education, and the GOVERED (Government Expenditures on Research and Development) which involves government spending (Matusiak, 2011, p. 283). It is calculated on the basis of the Frascati methodology. It includes the set of definitions and recommendations concerning: statistical surveys of R&D activity, classification of expenditures on this activity as well as staff employed in the R&D activity. An object-oriented approach is the essence of the Frascati methodology. It means distinguishing R&D activity from different types of activities led by entities which are in the economic system. (Frascati Manual, 2002).

High technology is another indirect measure based on R&D spending. It involves the fields of production and goods which are characterised by science intensity (the R&D intensity). K. Matusiak (2011, p. 328) states that high technology areas are specified by: high level of innovativeness; short life-cycle of goods and

processes and quick diffusion of technological innovations; demand for highly-qualified staff; great capital expenditures, high investment risk and fast “ageing” of investment; close scientific and technological cooperation; growing competitiveness in the international trade. Two categories of the division of the analyses of high technology are used: the industry approach and the product approach. According to the industry approach, the OECD uses two industry classifications based on R&D intensity. The older one is recommended in case of analyses devoted to 1970-1980, whereas, the new one, published in 1995, divided the enterprises into four categories:

- high-technology industries – more than 5% of the R&D share in turnover,
- medium-high-technology industries – 3-5% of the R&D share,
- medium-low technology industries – 1-3% of the R&D share,
- low-technology industries 0-1% of the R&D share.

Basic measures based on the technological intensity include: the indicator of share in the added value and employment in the industry and high technology services as well as international trade with goods of high and medium-high industry indicators.

In case of the high-technology indicators there is a correlation that the bigger share of the high-technology companies in the economy, the bigger is the level of innovativeness in the given country. The enterprises which belong to the group of high-technology increase the level of the competitiveness of the economy (Nowak, 2012, p. 155).

The patent indicators are another indirect measures which base on R&D Activity. They determine the effects of the patent activity through the number of the patent applications and the number of patents accepted (Feldman, 2005). The procedure of the application of an invention may be conducted in accordance with national and international procedures (Patent Cooperation Treaty). The PCT was signed on 19 June 1970, in Washington, and came into force on 1 June 1978. It has introduced international patent applications with the same effects as in case of applications in any of the countries which signed the treaty. Poland joined the PCT in December 1990. The national procedure concerns all types of patent applications which come directly to the Patent Office of the given country, which come from this country or from any other country under the Paris Convention of 1883. (Nowak, 2012, p. 156).

Assessing this type of the indirect measures, one should claim, that the patent statistics show that value of expenditures on R&D Activity may be transformed into the high patent intensity indicators. In the countries with a huge technological gap, it is not economically viable for the enterprises to conduct their own

studies and invest their means because it is cheaper to buy technology from the country which has already created it. What is more, the patent indicators have a lot of malfunctions: they underestimate innovative activity in the fields of lower technological chance; they overestimate innovative activity in the enterprises based on knowledge, which prefer to patent the solutions before the cooperation with other companies; overestimate innovative activity in the companies which have already had a patent due to their tendency to patent following solutions and underestimate innovative activity in small companies for which the cost of the patent application is too high (Nowak, 2012, p. 156).

The other group of measures of innovative activity constitutes the innovativeness indicators based on the Oslo methodology, which is based on the model of the chain link by Klin and Rosenberg (1986, pp. 275-305). The Oslo methodology introduces four types of innovations: product innovation, process innovation, organisational innovation and marketing innovation (Oslo Manual, 2008). The acceptance of the above-mentioned types of innovations, allows us to classify the Oslo method as subject-oriented which focuses on the innovative activity of enterprises, not only on the innovations. In this case, innovations are the result of the interactions and constructive feedback in the creation of economy based on knowledge. In the Oslo methodology, innovative solutions are not treated as an impetus or the mechanism which starts the innovation process but they are their effects (Nowak, 2012, p. 157). The Oslo methodology has been used in the research into the innovativeness of the OECD states as well as in case of the EU Community Innovation Survey (CIS) since 1992. After each of the editions of the conducted research, the methodology of research was developed and improved. The following editions of the research were extended with marketing and organisational innovations and went beyond the industry including service companies.

At the end of 2013, the EU introduced a new “innovativeness level indicator” which measures the level, in which the concepts worked out in the innovative sectors come to the market which causes at the same time the growth of competitiveness and creation of jobs in the EU states. This indicator is based on four components: technological innovations measured by the number of patents; the level of employment in the industries which require specialist knowledge; competitiveness of goods and services which require specialist knowledge and the level of employment in rapidly developing enterprises in the innovative industries. The novelty of “the innovativeness level indicator” is that it concentrates on the solutions introduced on the basis of investments. Moreover, it is the complement of the Innovation Union Scoreboard (the IUS) and the Synthetic Innovation Indicator (the SII) (EC, 2013).

Assessing the direct indicators, it should be stated that they describe innovative processes in a more complete way in comparison with the indirect indicators. The wealth and diversity of information concerning processes and innovative activity is their major advantage. Nevertheless, the use of the direct indicators in the international comparisons limit a short character of time series as well as frequent changes in the methodology of their research and calculation. Their disadvantage is that they are mainly focused on the expenditures which causes that it is hard to assess the influence of their actions on the enterprises and economy on their basis. The opportunity of the use is more difficult because the Oslo methodology is still under the development and the geographical area is limited to the EU countries (Nowak, 2012, p. 157).

### **11.3. The analysis of the innovative activity of the Polish enterprises**

Below, there is the analysis of the innovative activity of the Polish enterprises in accordance with the approved Oslo methodology on the basis of the newest study by the Central Statistical Office (pol. GUS). The study was published as a signal information of 24 October 2014 (the CSO, 2014).

In 2011-2013, 18,4% and 12,8% of the industrial enterprises and the enterprises from the sector of services (in comparison with 17,7% and 13,9% within 2010-2012) showed innovative activity, respectively. New or visibly improved product or process innovations were introduced by 17,1% industrial enterprises and 11,4% enterprises from the sector of services (within 2010-2012, 16,5% and 12,4%, respectively).

The analysis of the introduced innovations in accordance with the Oslo methodology indicates that:

- the product innovations were introduced by 11,0% industrial enterprises and 5,8% enterprises from the sector of services (in comparison with 11,2% and 7,0% in the previous sample period, respectively),
- the process innovations were introduced by 12,8% industrial enterprises and 8,5% enterprises from the sector of services (in comparison with 12,4% and 9,1%, respectively),
- the organisational innovations were introduced by 8,3% industrial enterprises and 7,1% enterprises from the sector of services (in comparison with 10,3% and 10,5%, respectively),
- the marketing innovations were introduced by 7,5% industrial enterprises and 7,0% enterprises from the sector of services (in comparison with 10,2% and 11,1%, respectively).

Under the product innovations, new or significantly improved goods were introduced by 10,2% industrial enterprises and new or significantly improved services were introduced by 3,9% enterprises from the sector of services. The new methods of production of goods and services and the new methods supporting the processes in the enterprises were most frequently implemented by the industrial enterprises (9,6%) and entities from the sector of services (6,2%), respectively.

The following branches of industry had the biggest share of enterprises which had introduced the product or process innovations: coke and refined petroleum production and processing (50,9%), mining of metal ores (50,0%), whereas in the sector of services subsectors: insurances, reinsurance and pension funding, except compulsory social security (60,3%) as well as research and development activities (35,9%).

When we take into consideration the organisational innovations, new organisational procedures were most frequently introduced by the industrial enterprises (5,9%) whereas new methods of the division of tasks and decision-making powers were most often introduced by the entities from the sector of services (5,3%).

The marketing innovations in the industry were used by the biggest number of the enterprises in the project/construction or packaging of goods or services (3,9%) whereas in the sector of services in case of new media or product promotion techniques (4,7%).

As far as the analysis of expenditure and revenue from the innovative products sale is concerned, data from the study shows that these expenditures constituted, in 2013, in case of the industrial enterprises PLN 20958,9m and in case of the enterprises from the sector of services PLN 11980,9m. The investment expenditure dominated in the industrial enterprises. It constituted 73,6% of all expenditure on the innovations. Own funds (71,1% ) were the main source of financing of innovative activity in the industrial enterprises. The enterprises from the sector of services spent most money on investment (42,4%) as well as on the research and development activity (23,0%). Moreover, expenditures were made on, inter alia, the purchase of software, purchase of knowledge from the external sources, trainings and marketing.

The expenditures on innovative activity in the industrial enterprises as well as in the sector of services were mainly financed from own funds (71,1% investment expenditures in the industrial enterprises and 79,7% in the sector of services). The smaller share in these expenditures constituted means from the group of remaining (11,3%) and the money from foreign countries as well as bank loans (both 8,3%) in the industrial enterprises and in the enterprises from the sector of services, respectively.

In 2013, the share of revenue from the sales of new or significantly improved products which had been introduced into the market within 2011-2013, in total revenue, constituted 8,6% in the industrial enterprises and 3,4% in the sector of services and it has been the worst result of the study since 2009.

#### **11.4. The innovativeness of the Polish economy in comparison with the EU countries**

“The Innovation Union Scoreboard 2014”, a cyclical document ordered by the Directorate-General for Enterprise and Industry of the European Commission for the Maastricht Economic and Social Research Institute on Innovation and Technology ( UNU-MERIT ), was used as a basis of assessment while conducting the comparative analysis of the Polish economy with the innovativeness of the EU countries. The document is the newest, widely-recognised and credible tool of assessment.

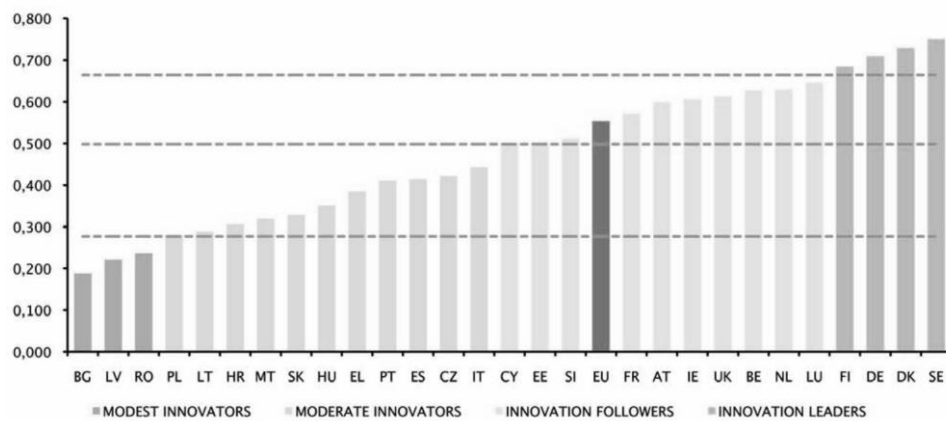
Building on this document, 25 most important indicators in three areas of assessment of the innovative activity were used.

The first area refers to Enablers, i.e. factors which give opportunities for the occurrence of innovations, such as: Human resources, Open, excellent and attractive research systems, Finance and support. The innovative indicators which are analysed in this group include: New doctorate graduates per 1000 population aged 25-34; Percentage population aged 30-34 having completed tertiary education; Percentage youth aged 20-24 having attained at least upper secondary level education; International scientific co-publications per million population; Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country; Non-EU doctorate students as a % of all doctorate students; R&D expenditure in the public sector as % of GDP; Venture capital investment as % of GDP.

Firm activity which is characterised by Firm investments, Linkages & entrepreneurship and Intellectual assets is the second area approved to assess the innovativeness of the economies of the EU. Indicators being assessed include: R&D expenditure in the business sector as % of GDP; Non-R&D innovation expenditures as % of turnover; SMEs innovating in-house as % of SMEs; Innovative SMEs collaborating with others as % of SMEs; Public-private co-publications per million population; PCT patents applications per billion GDP; PCT patent applications in societal challenges per billion GDP (environment-related technologies; health); Community trademarks per billion GDP (in PPS€); Community designs per billion GDP.

The third area is called Outputs and it determines Innovators and results which indicate how the innovativeness is transmitted into the economic effects for the economy. The indicators which determine this area include: SMEs introducing product or process innovations as % of SMEs; SMEs introducing marketing or organisational innovations as % of SMEs; Employment in fast-growing firms of innovative sectors; Employment in knowledge-intensive activities (manufacturing and services) as % of total employment; Contribution of medium and high-tech product exports to the trade balance; Knowledge-intensive services exports as % total service exports; Sales of new to market and new to firm innovations as % of turnover; License and patent revenues from abroad as % of GDP.

The composite innovativeness indicator of particular UE countries was calculated on the basis of the analysis of the above-mentioned indicators. The value of this indicator hesitates from the minimal result which is possible to receive (0) to the maximum result (1). The average of the EU is at the level of 0,550. The results of the innovativeness of the EU countries are shown in Figure 11.1.



**Figure 11.1. The results of the EU in the area of innovation**

Source: The Innovation Union Scoreboard 2014.

The results obtained in the Innovation Union Scoreboard divide member states of the EU into four groups, from Innovation Leaders to Modest Innovators.

The first group of Innovation leaders includes Member States in which the innovation performance is well above that of the EU, i.e. more than 20% above the EU average. These are Sweden (SE), Denmark (DK), Germany (DE), and Finland (FI).

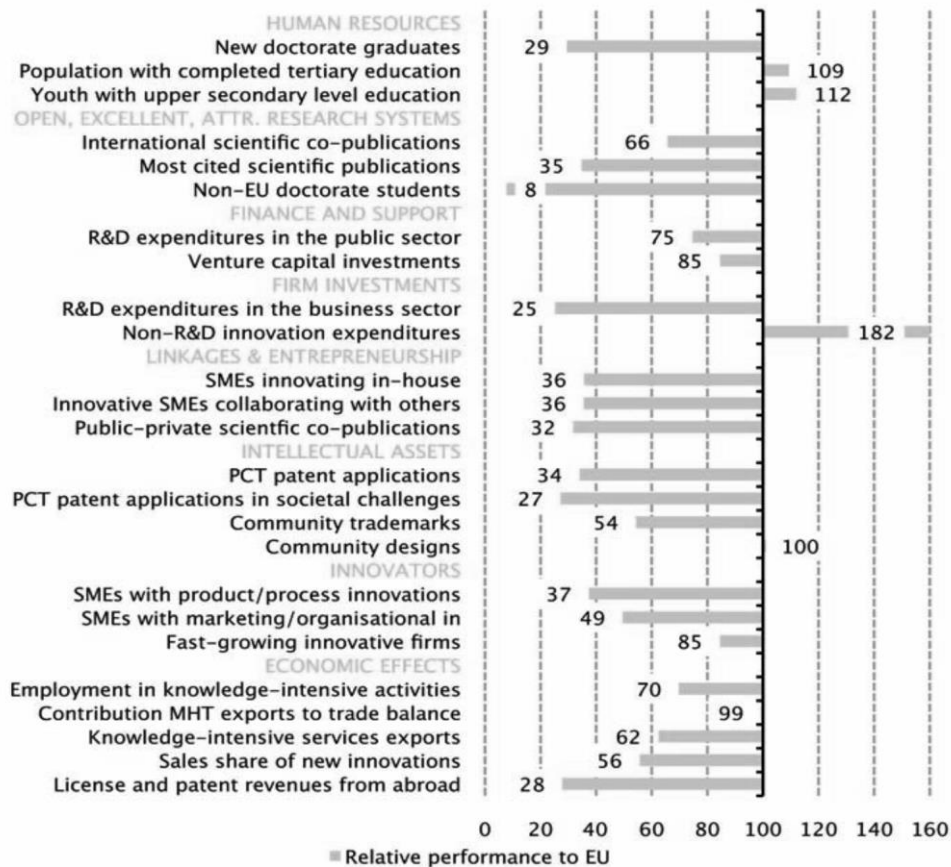
The second group of Innovation followers includes Member States with a performance close to that of the EU average i.e. less than 20% above, or more than 90% of the EU average. Luxembourg (LU), Netherlands (NL), Belgium (BE),



the United Kingdom (UK), Ireland (IE), Austria (AT), France (FR), Slovenia (SI), Estonia (EE), and Cyprus (CY) are the Innovation followers.

The third group of Moderate innovators includes Member States where the innovation performance is below that of the EU average at relative performance rates between 50% and 90% of the EU average. Italy (IT), Czech Republic (CZ), Spain (ES), Portugal (PT), Greece (EL), Hungary (HU), Slovakia (SK), Malta (MT), Croatia (HR), Lithuania (LT) and Poland (PL) belong to the group of Moderate innovators.

The fourth group of Modest innovators includes Member States that show an innovation performance level well below that of the EU average, i.e. less than 50% of the EU average. This group includes Romania (RO), Latvia (LV) and Bulgaria (BG) (European Union, 2014).



**Figure 11.2. The value of the innovativeness indicators of the Polish economy in relation to the average level of the EU. The average level of the EU=100**

Source: The Innovation Union Scoreboard 2014.

In the first area, Enablers, i.e. factors which give the opportunity for the innovation to exist, Poland exceeds the level of the EU with the percentage youth aged 20-24 having attained at least upper secondary education and the percentage population aged 30-34 having completed tertiary education. It is the result of the higher awareness of young people concerning the necessity of education as well as the attempts to reform universities and raising expenditures on education. Despite the fact that the venture capital investment and R&D expenditure in the public sector indicators are below the EU average level, they may be included to the positive trends of the innovativeness of the Polish economy. Planned, systematic raising R&D expenditure in the public sector indicator as well as all expenditures connected with R&D from the level of 0.9% this year to 1,7% of the GDP in 2020 will have undoubtedly positive influence on raising the innovativeness of our economy. The remaining indicators are at the lower level in relation to the majority of the EU economies. In the direct comparison New doctorate graduates indicator is six times lower than in Sweden, five times lower than in Germany, Finland and the UK. The worst situation is in the innovation dimensions, open, excellent and attractive research systems where, for instance, Non-EU doctorate students indicator is twelve times lower than the EU average level and Scientific publications among the top 10% most cited publications worldwide indicator is almost three times lower. The main reason is a low quality level of the research in Poland.

The second area which specifies the Firm Activities is the weakest from the presented areas. Only one out of nine analysed indicators, Non-R&D innovation expenditures, is higher than the EU average level and is the best assessed Polish indicator with the value almost two times higher than the EU average. The EU average level is reached also with the Community designs indicator. The remaining seven indicators are at the level which is three or four times lower than the EU average. In the direct comparison, e.g. R&D expenditure in the business sector indicator is almost seven times lower than in Sweden or Finland. The basic reason of low expenditure on R&D is a low priority for the innovative activity in the Polish enterprises as well as modest expenditures on R&D of the SMEs. Similar situation takes place in case of indicators concerning intellectual assets, i.e. PCT patents, whose results are almost five times lower than in Sweden, Finland, Germany. The reason is that our innovativeness is mainly dominated by the imitative paradigm of the development of enterprises, which is reflected by the number of the new patent applications.

In the third area, which specifies the economic effects of innovations for economy, Poland has the best notes with contribution of medium and high-tech product exports indicator, which is at the EU average level but in comparison with

Germany it is sixteen times lower. We catch up the EU with employment in fast-growing firms of innovative sectors indicator whereas other indicators in this areas are at the much lower level than the EU average. A very important indicator of the economic effects as licence and patent revenues from abroad is almost four times lower than the average level and, in direct comparison, it is six times lower than in Sweden or Finland and four times lower than in the UK, Germany and Holland.

Analysing the results of the Innovation Union Scoreboard 2014, one should state that the most innovative countries of the EU show a certain number of strengths in the matter of national research and innovations systems. Here is the key role of the innovative entrepreneurship, research and higher education. The sectors of economy of all leaders of innovations reach very good indicators of expenditures on the scientific research and development and are the front line taking into account most cited theses and patent applications and economic effects which are their consequence. The SMEs are the main driving forces of the development of innovations. There is a well-developed sector of higher education as well as close connection between education and industry which results in the commercialisation of innovations together with perfect research systems in these countries.

When we take it into consideration, the situation of the Polish economy is quite different. There is a lack of understanding of the importance of the innovativeness for long-term competitive position of the country in Poland. The Polish enterprises do not want to spend money on research and development. Low expenditures of the enterprises on research and poor cooperation between business and education does not only mean a lower number of companies which conduct research and development works or order them. It also means the drop in the number of companies which introduce innovations into the market. The Polish enterprises must switch to create own, innovative solutions which drive their development. The change of assumptions of development, from the model of development based on the ability of imitation of solutions, which have been created in the countries which are leaders in the innovation ranks, to the strategy of creation of own knowledge, which is the effect of the conducted scientific research in the cooperation with the enterprises, is very important for the innovativeness of the Polish business entities. Subsequently, the protection and commercialisation of this knowledge through patents and licences which are developed in Poland are also of significant importance.

Assessing the whole presented data, it is necessary to mention that the Polish economy is at the fourth place from the bottom in the cited-rank of the innovativeness of the countries of the EU of 2014. Only Bulgaria, Latvia and Romania are

less innovative. Even though, Poland has moved up from the countries belonging to “Modest innovators” to the group of “Moderate innovators”, we are still at the 25<sup>th</sup> place in the EU. This distance is confirmed by the newest world rank of innovativeness of 2014. Poland has 45<sup>th</sup> position in the rank (Cornell University, INSEAD, WIPO, 2014). Taking into account, that it is considered as the 23<sup>rd</sup> economy of the world with the tendency to be a member of the group of the 20<sup>th</sup> greatest economies in 2023, the result shows a considerable amount of work which still remains to be done in the matter of innovation. The innovation, which is the drive of the economy. Hence, the position of the innovativeness of the Polish economy is not satisfying and it is confirmed by the above-presented analyses.

### **11.5. Recommendations on the increase of the innovativeness of the Polish enterprises**

Building on the presented and analysed data concerning the innovativeness of the Polish business entities, it should be stated that this level is not satisfying and requires actions to develop it. The recommendations on the increase of the innovativeness of the Polish enterprises and thus the whole economy refer to: the improvement of the conditions of leading business entity through applying regulations and financing for the needs of innovative and effective economy; increase the level and the effectiveness of the education in the Polish schools and at the universities; increase of the engagement of science world into the practical research activity and bringing closer the sector of science and sector of enterprises; increase of the amount of money on R&D.

**The improvement of the conditions of leading business entity through applying regulations and financing for the needs of the innovative and effective economy.** The concentration of public expenditure on the pro-development and innovative actions in the industry through focusing the expenditure on key technologies and industrial areas with the strategic significance is the first aspect of this field. The development of these industrial areas will be priority for the Polish industry in 20 years. They include: industrial biotechnologies, nano-processes and nano-products, advanced manufacture and materials, information and telecommunications technologies, microelectronics, photonics, cogeneration and rationalisation technologies of energy efficiency, etc. (Kamieński, 2011, p. 13).

Another area is the simplification, assurance of cohesion and transparency of tax system which takes into consideration the needs of the effective and innovative economy. The level of use of the innovativeness potential in the economy depends

mainly on binding provisions and tax rules which allow enterprises to develop or stunt them.

The Polish system requires the simplification, elimination of unnecessary burdens and barriers for the entrepreneurship as well as the systematisation and protection against unjustified changes (MG, 2011). It is difficult to discuss beneficial business climate without transparency, cohesion and trust to the state in such a key aspect as paying taxes. Vast majority of the tax law experts claim that the current regulations are so bad that it is necessary to write them once again because their adjustment will not help (Leśniak, 2013).

The third aspect refers to the measures to improve access to the capital, especially risk capital and the SME sector. The sources of financing destined for the increase of competitiveness, expansion and new technologies influence the development of the company on the market, especially in the current realities of high competitiveness, globalisation and fast-paced specialisation. At the same time, the access to the basic form of external financing, i.e. a bank loan, is very problematic according to the so called financing gap for small and medium enterprises hypothesis (Gregory et al., 2005, p. 382). In case of innovative actions, the access to financing is even more difficult. Banks, because of reducing the risk and balancing the assets structure, are not suited to finance unusually risky projects, with uncertain (regarding time and value) rate of return. The increase of access of external sources of financing of the enterprise as well as extending the offer of financing for undertakings and enterprises from the area of research and innovations, both on the base of own equity as well as public-private capital, should be the priority of the development of the financial market. These operations should aim at support of the processes of mobilisation of savings and the creation of capital; the development of loan and guarantee system; the development and promotion of alternative sources of financing the business entity (other than a bank loan); development of the system of financing of the increased risk; creation of the system of the qualitative assessment of creditworthiness as well as financial mediation (MG, 2011, pp. 75-79).

**Raising the level and effectiveness of education in the Polish schools and at the universities.** Despite the fact that on 1 October 2011, the Act reforming the higher education system in Poland came into force as well as some attempts to change the system of education, reproduction and intellectual conformism, through the use of teaching and testing instruments based on tests and answer keys, are common in our education (Gmurczyk, 2014). The system fits into the model of the adaptive economic development approved by Poland, which copies and improves ready-made solutions. Both in the economy and education this system may cause the occurrence of a serious barrier to change the technological and development

path of our economy in the future. Modern enterprises need staff educated on the creative, lateral thinking with the aspects of criticism and the development of leaders based on the learning how to cooperate (Gajda, 2014). In the era of a very fast development of the product markets, information technologies and financial engineering, it is necessary to extend educational programmes with the creation of the entrepreneurial attitudes and the development of the management skills, i.e. the introduction of economic education on all the stages of education.

**Raising the engagement of researchers into the practical research activities as well as decreasing the distance between education and enterprises.** The actions taken in Poland to bring the sector of education and enterprises closer, seem to go into the right direction, e.g. the creation of the NCRD (pol. NCBR) and the NCS (pol. NCN), changes in the law which are to grant the scientist the right to the results of their work or increase expenditures on science by 10.2% in 2015. Nevertheless, these changes are too slow and are of limited nature. The changes in the below presented areas are needed in order to increase the engagement of education into the practical research activity for the industry.

The employment structures of scientists. The number of scientists who work in the enterprises is marginal in relation to the ones who work in the public scientific centres or in higher education. The biggest number of scientific research is created in the enterprises in the developed countries. It is the result of the higher effectiveness of the work of financial teams in relation to the national scientific institutions (Chrzanowski, 2013).

Inadequate criteria of assessment of the effectiveness of scientific research. Revenue from the real implementation of the scientific achievements is the most synthetic measure of the effectiveness of the scientific research. In our realities the revenue from the implementation has never been the most important criterion of assessment. More important criteria include: the number of publications, the number of acquired financial funds, the number of medals at the international innovation exhibitions or the number of patents.

The lack of adjustment of the research projects to the changes of globalisation. The projects aimed at the development of products are financed by the Polish enterprises. The example being high-tech on the national market in case when such products are without any market chances because some similar products have already existed and they are perfectly adjusted, cheap, competitive and developed in other countries (Chrzanowski, 2013).

**Raising expenditures on R&D.** In 2013, the expenditures on research and development constituted more than PLN14 billion and the amount is similar to the record score of 2012, where there was 23% increase in comparison with 2011.

Nevertheless, in relation to the GDP, the expenditures were at the level of 0,86%. Only in this context it may be seen that, taking into account the relations to the GDP, this level is twice lower than the average of the EU. This average may be reached in 2023 with the expenditures on R&D at the level of 2% of the GDP. Except from the low level of expenditures on R&D in relation to the GDP, Poland, when compared to other analysed states, has different structure of expenditures in this matter. It is mainly shown by the low expenditures of the industrial enterprises and the low share of the research and development works in current expenditures on research and development as a whole. The Polish enterprises do not want to invest in R&D and that is the biggest problem to solve. Besides, there is also a bad structure of expenditures which support scientific research. The biggest part of these expenditures is not designated for R&D and creation of own innovative products or technologies, but for so called business environment institutions (designed for the modernisation of the research infrastructure only in part) as well as capital investments, i.e. the support of purchase of new technologies, machinery and equipment. Therefore, it seems necessary to change the structure of financing the research through spending on the support of the whole or chosen elements of the process of creation of innovations: from the stage of the creation of the concept to the innovative activity on the foreign markets. Moreover, it is necessary to raise the expenditures on R&D and stimulation of the cooperation between education and business in order to use the scientific achievements in the economic practice and creation of the competitive advantage basing on the innovativeness. Increased funds on the research should aim at better adjustment of R&D supply to the needs of the market. They should also boost demand of the enterprises on innovations and the R&D works. Poland will receive more than PLN 10 billion from the EU. These funds should be focused *on chosen areas* of science and economy which constitute development potential of the country, for instance the key technologies and strategic areas of the industry presented in the chapter.

## **11.6. Findings**

The aim of this study was the attempt of assessment of the innovativeness of the Polish economy created by the national economic entities. The following conclusions may be drawn on the basis of the presented analyses, comparisons and assessments: there is a low priority of innovative activity as well as low expenditures on R&D, especially in the SMEs among the Polish enterprises; low level of the product, process, organisational and marketing innovations introduced by the SMEs; imitative paradigm of the development of the enterprises which is connected

with a small number of the patent applications submitted by these enterprises; low licences sales and patents income and as well as symbiotic lack of the cooperation between the research centres and business entities. These are undoubtedly weaknesses (barriers) of the innovativeness of the Polish enterprises and simultaneously the whole economy. They cause, inter alia, that in 2014 we had the 4th position from the bottom in the area of the innovativeness in the EU and as low as 45<sup>th</sup> position in the world ranks.

Current economic growth of Poland is based on the low costs of work, internal outlet and EU funds. Nevertheless, one should take into consideration that these simple growth reserves will be exploited in a few years and Poland could face the lack of opportunities to develop. Therefore, the development of the Polish innovativeness and actions which are to remove the distance between our country and the leading countries of the EU constitute a very important aspect.

Despite negative assessment of the innovativeness of the Polish economic entities and the whole economy, there are some positive trends (strengths), in the article, for increasing the level of our innovativeness, such as: human resources with the similar number of graduates of the second and third cycle studies as in case of the European leaders and permanent increase of graduates of technical and scientific studies which is a very positive trend for the development of innovation. Public expenses on R&D are the second among the elements of the innovativeness, especially in the context of the plans of the permanent increase of this indicator to the level of 1.7% of the GDP in 2020 (the effectiveness of research and development is another issue). The non-R&D innovation expenditures are the greatest Polish asset and here we belong to the group of leaders. The increase of expenditures on education, creation of institutions which will support the cooperation between the enterprises and the research sector will have, especially in the long term, the positive impact on the innovativeness of the Polish enterprises.

In conclusion, the chapter contains the attempt of assessment of the innovativeness of the Polish economy, which belongs to the group of the least innovative economies of Europe, as well as the attempt to indicate strengths and weaknesses and recommendations to change this unfavourable situation and to increase the innovativeness. It is neither remedy nor ready-made solution to the problems which exist in the Polish enterprises and whole economy, but it contributes to further works and scientific considerations in this matter.



## **CHAPTER 12**

### **CHANGING COMPANY PROCEDURES IN THE BACKGROUND OF PRODUCTION INNOVATION – CASE STUDY**

#### **12.1. Introduction**

Company change in production facilities is indispensable and is ever present in organizational life (Burnes, 2004). Within every day the innovators are working on how to improve our lives, on how to improve the newest model of I-phone or the newest TV set that just has been released to the market. And even when the consumer will just discover the new possibilities of for example I-phone and learn how to operate it – the team of Apple serves the newest I-Phone 6 version that is just beyond our expectations of our imaginations. Thus the production facilities need to be ready for implementation of further and faster innovations during the production process. However the implementation of the company change in the area of procedures can be very challenging. For the group of innovators it is very easy to adjust to the novelty. However, for the production teams; who are just the group of extremely high level specialist in the production; changing even smallest production procedure might be a kind of significant and substantial challenge as the production sector and its team characterize mainly with low level of flexibility and high level of routine.

The production environment then is very much exposed to the many difficulties during implementation of a change that we could sum up in the following points:

1. Production processes is characterized by high level of routine so preparation of team into implementation of a change is crucial.
2. Production investment usually involves huge capital investments. Huge investment not being properly used or misused can cause huge additional costs evolving in failure of investment and worsening cash-flow of the whole company.

3. Companies need to learn a) how to effectively implement the change (meaning implement it within reasonable time manners) and b) how to efficiently implement the change (meaning implement it without input of additional unforeseen costs).

The above challenges that production company comes across during the company change is so unexplored especially in Polish environment in production sectors where the change is a non-common phenomena. The ability of Polish companies to implement the company change is gaining more and more on the value during development of the country and during the development of high-tech technology. The innovations are becoming in Poland more and more important for Polish companies. In 90s Polish underinvested and oversized companies, have been only either privatized by international companies or they were disappearing from the market. The ones that have been privatized have been completely renewed and innovated once and it still takes them a long time to create the self-developing abilities to develop and improve the procedures.

Companies might be looking for knowledge from today literature on how to proceed with implementing changes. Lewin suggested strong planning of a change with 3 steps of defrosting stage, changing stage and frosting again in order to make the change last. However the critics of this stage appeared as Lewin's steps do not include the fact that during the change there might be new circumstances appearing which might influence on the change. Kotter included 8 steps of more detailed process in which the circumstances are observed and taken into consideration also treating the change as the emergent process rather than stable process (Kotter, 1995, 1966). Todnem sees a change as more as 'change readiness and facilitation for change' rather than creating the pre-planned steps. In this approach the organisation should focus on responding to internal and external environmental changes (Todnem, 2005).

However, using the conventional knowledge as steps like mentioned in above paragraph or various changing models (Voegel, 2011) is sometimes not the optimal solution. I think one need to act according to the concept of 'contextual intelligence' – the ability to understand the limits of our knowledge and to adapt that knowledge to an environment different from the one in which it was developed' (Khanna, pp. 59, 67, 68). Basically the companies need to conduct their own experiments and they need to judge their environment and its local abilities and specifics in order to proper manage the company. World is so complicated and challengeable that there is no one proper recipe on how to do things on general. Those things are always done with regard to the certain specific environment.

When managing we should investigate areas in our organisation and the elements of management systems that demand adjusting to new conditions in case of

transformations in environment or in case of increase of organisation size or organisation complexity (Belz, p. 207). The change in organisations starts not from the general structure of functioning of certain organisation but from the simple process of workflow. Thus the process change is crucial for functionality and success of change implementation. Evaluation from process through process approach to process management and finally to dynamics process management lead the companies to explore their processes and research on how the process should be improved (Bitkowska, p. 40). Process defined as series of actions combined with each other which all lead to transforming resources into the product of the process (Maganelli & Klein, p. 28).

In the chapter firstly it is depicted how important the company production innovative changes are common and how many companies could profit from the research of the area of improving process of change implementation. Then we can find out more about the company in which the research has been conducted to understand the background of the research. In the further text we can discover the methodology of research. It is depicted how the company organized the change of procedures which were impacting on introducing new to the company product via new machinery equipment. The work of three departments involved in a change have been measured. Finally there is sum up of the lessons which can be taken from the research. In final part besides the conclusion we will find the limitations of the research and further ideas for further research on the explored matter.

## **12.2. Research on innovation change in production company – case study**

### **12.2.1. Background of Polish innovations in production sector**

As mentioned above the company change and implementation of procedures implementing this change are very challenging and should be more explored in the area of production sector. On top of it nowadays we can observe that a lot of companies decide to implement the innovations more and more often. It is even stated that adaptability is the only true and effective competitive advantage (Reeves & Deimler, 2011, pp. 137-139). Reeves and Deimler claim that the traditional competitive advantage arising from positioning or resources as such is not enough to succeed in business. Nowadays a company need constant ability to changing environment. And this ability to proceed with innovative changes on time and correctly is the competitive advantage. Some companies have developed and are having financial resources to modernized the company. Some other companies might receive the financial resources in form of European subsidies which create new

innovation opportunities. Spending often huge amount of money on the new machines or new processes demands from companies 100% engagement in correct implementation of procedures supporting a change.

In 2012 16,5% of all production companies implemented innovative change or innovative procedure having spent on those innovative actions approx. 21,5 million PLN (GUS: February 2014). In 2013 this percentage has grown up to 17,1% and the level of expense for innovation has been at the level of approx. 21 million PLN (GUS: October 2013). Moreover a lot of companies have decided to invest in this direction of research and development. Statistics in Poland conducted by GUS has concluded that from 2008 year until 2012 the expenditures of industrial companies for Department of Research and Development has grown by 16,7%. Observing such high rate of growth we can expect even more innovations being introduced into the market. Types of innovation can be different from one industry to another. In 2013 11% of all innovations stated innovative products, 12,8% stated innovative processes, 8,3% stated organization innovations and 7,5% stated marketing innovations. No matter though which type of innovation we take into consideration, each of them involves changing procedures and reorganizing work of each department involved in implementation company change. Often this change is connected with bureaucratic flow of documentation or decision process on the level of various departments that impacts on change implementation. Out of the GUS statistics we find out also that 71,1% of the companies have financed the innovations on their own. Spending amount of money for often costly innovation makes the pressure on the employees to make the innovation work.

To sum up the company change in Polish industry is more and more visible. Innovations coming from high-tech sector, pressure of customers lead to implementing often change. Keeping the pace in comparison to the competitors is an area which need to be well explored before deciding about the change and before spending a lot of money on the newest machinery or programs in the company.

#### **12.2.2. Methodology of research**

As mentioned above reorganizing and repositioning procedures during successful implementation of a change in production company is worth further exploration. The author decided to implement research in a company where the change of procedures has taken place. The author describes the changed procedure and describes the characteristics of three departments that were involved in the certain procedure being changed. The research is conducted in Polish branch of International Group that produces packaging. The company has been chosen as medium sized company according to Polish GUS statistics with the employees headcount between 50 and 249. Company produces very standard products where processes

and procedures are very much stabilized, specialized, well-practiced and also have simply become routines as company has produced packaging for almost one century. No major investments has taken place for the past teen years from privatization of the company. Only lately the company decided to introduce extremely modern type of multicolor printing machine desired by market trends on the packaging market. The market price of the machine is approx 3 million EUR. The machine needs to pay off quickly in order for the company to successfully introduce the production of innovative for the company products. The company till now has produced packaging with limited number of colors and with no high quality technology. The process of development of new project on the machine was challenging for the company. In the article context, implementation of new project means starting production of new packaging on the production machine. The object of the research is to examine the procedure of introducing new projects on the printer. The machine itself is so modern and new to the previous possibilities of the factory. New successful procedure on producing new projects on the printer has key impact on successfully implemented innovation. New project not implemented on time or not implemented successfully may result with the following consequences:

- losing the project or losing possibility of further new projects within the volume of certain customer,
- being charged of additional costs of tools or other works and of punishment costs due to delay of delivery of goods.

The procedure of introducing new projects on the machine involves engagement of three departments which are the subjects of the research: Research and Development Department, Quality Department and Internal Sales Department. The key criteria of exploring the effectiveness and relations influencing on change are: the characteristics of each department, the characteristics of successfully introducing new project and the characteristics of faults that happened during introducing new projects during first half a year of using the new printing machinery equipment.

The characteristics of each department can observed in Table 12.1. The factory as mentioned earlier has long experience so a lot of employees also have long experience in the company. 4 areas has been chosen as the characteristics of the department: total size of department, average age of employee, average number of years of work in certain company, number of years of experience in certain department.

The three chosen departments are responsible for introducing successfully the new project on the new machinery. The procedure of new project introduction and the responsibilities of four departments are depicted in Figure 12.1 and involve 10 steps. The entry data of Internal Sale Team influences on: what sort of construction

should be used for packaging, what sort of raw material should be used and what sort of graphics should be used. When this data from customer are complete quality team prepares proposal of raw material for production the packaging. Afterwards the R&D Team is responsible for creating correct construction and artwork drawing (rework of graphic data), for preparing the proof (means sample of printed image) that is sent out to customer for approval. And finally all three: cliché, die-cut tool and approval on printing machine are made in order to approve the final first production of packaging.

**Table 12.1. Characteristics of Three Departments**

Features	R&D Deaprtment	Quality Department	Internal Sales De- partment
Total number of employees	5	4	7
Average age of employees	47,6	38,75	37,29
Average number of years working in certain company	18	15,25	11
Number of years working in different department than in the current one	1st employee-Production Department; 2nd employee-Production Department; 3rd employee-Production Department	0	0

Source: own elaboration and company data.

In order to conduct the company change, certain preparation actions have been taken. Usually the change nowadays tend to be described as sudden and fast decided. Of course it is quick decision when the company is bright and directed into pioneer ship. However, in production it takes some time to actually implement the production change. I would not tend to the theory of a change of Kurt Lewin who is claiming that the company change need to have at least three stages of 1 – defrosting the procedure 2 – creating the new procedure and 3 – stabilizing the new procedure and its fixing. In production sector when you decide to invest and order the most popular or the most modern technology in industrial sector – one might need for it as leadtimes might be long. Therefore the time of waiting for the lead time of the order might take even twelve months as it is in case with the analyzed company. One year it should be enough for preparing to changes, for organizing indispensable training for employees and for creating the procedures. The last ones – the procedures – we create usually during the actual change experience as it is not for 100% predicted that the change will go into the direction of the procedure

we have created. Some parts of procedure though could be defined and tested later during testing stage of the new machinery and testing new procedure.

AREA OF PROCEDURE	RESPONSABILITY	FAULTS MADE DURING 6 month period
Entry data on construction	Internal Sales Dept.	0
Construction	R&D Dept.	1
Entry data on raw material	Internal Sales Dept.	0
Raw material	Quality Dept.	0
Entry data on graphics	Internal Sales Dept.	0
Rework on graphics	R&D Dept.	0
Proof delivered	R&D Dept.	2
Approvals	R&D Dept.	2
Cliche	R&D Dept.	2
Die-cut tool	R&D dept.	0

**Figure 12.1. Characteristics of Procedures Linked with Responsibility of Departments**

Source: own elaboration.

The procedure of introducing new high quality printed projects is very similar to the procedure of introducing simple new multicolour not high quality printed projects. So all departments have been familiar with the procedure. For both high quality and not high quality projects one needs to gather entry data from customers, prepare the artwork, prepare the cliché and prepare the tools in order to produce the project on the machine. However, the high quality technology demands more sophisticated graphics, delivering proof which in standard old procedure did

not take place, more sophisticated and more expensive cliché and of course different raw material. In order the three departments to be ready to meet their updated responsibilities they have received special training on technical matters as following:

1. **Internal Sales Department** – training on data that need to be gathered from customer in order to start producing new project. The training involved: possibilities of high quality print, raw material being used for production, form of graphic data that need to be delivered to R&D Department and of course all the commercial, marketing facts that can help Internal Sales team to first inform and then sell the new multicolour packaging to the existing and new customers requiring modern high quality print.
2. **Research and Development Department** – training data that are indispensable technically for preparing files and tools for production. The training involved: technical requirements of the machine, cliché requirements, proof requirements, graphics, colours and ink requirements, measurement of colour intensity.
3. **Quality department** – Training involved: raw material requirements.

The results of first introduction of new projects are depicted also in Figure 12.1. The mistakes made during half a year of production on new machine depicted faults in the process only in R&D Department. The faults has been analyzed in details in order to find out the reason for such state of faults. The details are showed in Table 12.2.

**Table 12.2. Analysis of Faults**

Fault of R&D responsibility	Reason for fault	Actual performer of fault
Construction (1 fault)	too small plate for production, dimensions of plate used according to old procedures for not high quality printed projects	R&D Department
Proof delivered (2 faults)	proofs ordered by R&D correctly, proof delivered not on time, proof delivered with low quality	Supplier
Approvals (1 fault)	artwork had no sufficient overlay	R&D Department
Cliche (2 faults)	cliche made not correctly and requirements of machinery equipment not met	Supplier

Source: own elaboration and company data.

After analysis of faults it turned out that R&D department has been responsible for certain area of procedure. However, the actual performer of the part of



process affecting negatively on implementation of the project was the supplier. After interviews and questioning supplier with auditing questions, the supplier who delivered for the company for years was not ready to develop with the company and correctly prepared for change for high quality technology.

During research one other fact has been observed by researcher. There has been identified discrepancy between the procedure and actual performance of the department. Quality Department due to not changeable attitude towards new investment did not propose any raw material combinations for the new printed high quality projects. The one that was fully responsible for those decisions was Internal Sales team. After questioning of quality team it turned out that the quality department perceives their work as a very repetitive one and therefore they were too afraid of changes and proposing anything new. They were afraid of responsibility. This brought to the research of one other dimension of innovation – repetition of work. The researcher has asked the R&D, Quality team and Internal sales team to judge the repetition of their work from 3 to 1 when 3 means high repetition, 2 means medium level of repetition and 1 means low level of repetition of daily tasks. It turned out that majority of respondents in R&D Department considered their work as the work with low level of routine, Internal sales judges their work as the one with medium level of repetition and Quality team stated their daily work as a very repetitive one. This also brought to reflection about talent management in company that is being conducted by Human Resources Department and top management. Identifying groups of innovation-oriented employees should help company to manage change implementation. It can also lead to reduction of recruitment costs when concentrating on talents and engaging them to new project teams through internal process of recruitment (Skalik, p. 100).

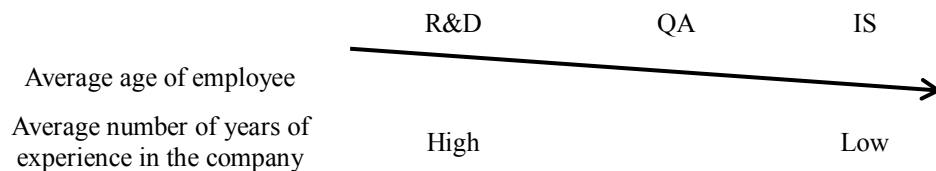
### **12.2.3. Results of research**

The above research brings us to conclude some reflections that might help the company with introducing further investments and change procedures. The company conducted so called breakthrough improvement (Slack et al., p. 594). The company bought new high quality printer and it was the first of investments made in the company for last ten years. The company in further 3 years has substantial further plans of developments. The outcome of research might be helpful with further change procedures designed for further investments.

As we can see from analysis of faults, majority of them were under R&D responsibility. However, the actual sides who were physically performing the task were various suppliers. It was then on suppliers' shoulders to meet the specific requirements. We can then come to the conclusion that one cannot forget that the

borders of organizations have evaluated. Internally the company might work efficiently and successfully without any doubt. And also externally having all deliveries from suppliers on time and correct. But when introducing the change the training and special preparation to implement the change must be taking place not only within the company but also within the day to day suppliers delivering equipment for production.

Also, there was no one supplier but the few ones that have been cooperating with the company. So one might suggest that R&D Department having great technical experience does not make the crucial faults in technical matter. However the soft skills of R&D team might be needing some support. Most of the team has production experience or technical experience where there is not too much space for exercising of negotiations or commercial conversations. When the team had the pricing and service stabilized for years the new change of technology demanded some new negotiations with regard to lead time of orders, prices, service and support given during implementations of new project. Especially that the R&D crew is the most specialized department and also with the highest level of experience in technical matter what is depicted on Figure 12.2. As on the executive level also the mixture of qualifications is very much recommended – the triumvirate of the skills: entrepreneurship, managerial and leadership in order to manage well the strategic renewal (Barabasz & Belz 2010, pp. 10-12). On the Teaching R&D team soft skills could help with implementation of further changes of procedures.



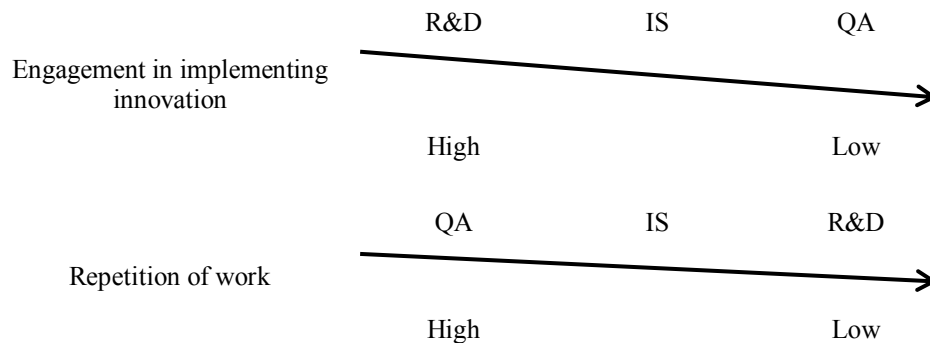
**Figure 12.2. Experience of departments**

Source: own elaboration.

The relation that we could also observe in the company was between the engagement of work and routines taking place in daily work of each department. This was not planned to research and came out during the research as the Quality Department has not been fulfilling the procedure itself. The relations are depicted on Figure 12.3.

The employees from R&D considered their work as innovating and with low level of repetitiveness. They are used to the innovative environment so easily they engaged in implementation of new procedures and investments. And although this team has the biggest experience and is also the most senior team of all three teams,

they had the highest level of engagement and the highest motivation to implement the novelty. While Quality team because of its high level of repetition of work could not deal with the change as other departments. Internal sales team with medium level of repetition and also with additional impact that the commercial team team knows better the customers. They hear about those technological changes every day. They are also the youngest team out of all teams and therefore they took on their shoulders work of other departments and decided about the quality.



**Figure 12.3. Engagement in implementing innovation and Repetition of work**

Source: own elaboration.

### 12.3. Conclusions

Company change is the one that going to be more and more common in production sector. As the machinery equipment which is modern always in not going to be cheap the company will need to take care greatly of implementing the change well. All procedures that need to be designed for implementing the change need to be well thought and well managed during the change.

Procedure in the example company involving three departments of R&D, quality and internal sales was well mannered. Some faults have been depicted in order to understand well the difference of the departments and different skills of the department in order to bear them in mind while implementing the procedure change with further investments. The following reflections might be brought into day light:

1. When implementing the change of procedures we must think broadly beyond the borders of organization.
2. Team in the departments need to be nowadays not only specialized but also little interdisciplinary to have the cross-departmental knowledge in order to support initiative of innovation. In technical departments although the level

of technical knowledge is great, there might be some need for more soft skills. The trainings might be involving more of the development of such skills.

3. Social networks need to be examined as they might impact on the innovation projects. Quality department in this matter turned out to be very passive towards the innovation. Their lack of bravery caused that actual work has been performed by another department.

And at the end the change of mind set is still challenging for the companies. To lead the team in order to perform well is an never ending act. However, still I think it is much better nowadays than in the past due to internet, e-trainings, youtube and wide spectrum of communication channels in business society. It can only get better. However, the study shows that while implementing change we could know what to do and how but the key element might be simply who is actually implementing change – certain department, supplier. Or what type of employee is implementing change – manager, leader, entrepreneur. The further study about who are the employees that are for company's disposal and how they influence of effectiveness of company processes of change might be next step for further exploration of supporting companies in successful change implementation.

## **CHAPTER 13**

### **ACT ON EMPLOYMENT ON MARINE VESSELS AS A CONDITION NECESSARY TO USE THE STIMULATING INSTRUMENTS OF THE TONNAGE TAX FOR THE DEVELOPMENT OF THE MARITIME ECONOMY IN POLAND**

#### **13.1. Introduction**

International merchant seafaring has been subjected to global competition nearly since the very beginnings of its existence. All oceans and seas of the world are open for merchant seafaring, and this fact is the source of the global supply and global demand for maritime transport services.

Merchant vessels bear the flags which stand for their submission to the jurisdiction of particular states and the so-called flags of convenience. The level of fiscal encumbrances and employment costs valid for the register of national flags in no way allows the vessel owners wishing to use national flags to compete with seafaring companies using the registers of flags of convenience. Due to this fact at the end of the previous century an “escape” of merchant vessels from underneath national flags to the flags of convenience became a common phenomenon.

Seafaring companies in states belonging to the European Union own ca. 41% of the world’s vessel tonnage. The maritime transport (Christowa et al., 2012, p. 97) has a significant importance for the European Economic Area, as 90% of trade between the European community and the rest of the world takes place using seas and oceans. Considering the size of the European merchant fleet and the negative consequences for states and their budgets connected with registering vessels in registers of flags of convenience, it would be advisable to create economic conditions for European vessel owners allowing them to bring back their vessels and provide them with European national flags. Such economic conditions would have to allow European seafaring companies to maintain the level of costs comparable

with the level of costs offered by the registers of flags of convenience. The Limassol Declaration of European ministers responsible for the integrated maritime economy and the European Commission on the maritime agenda for the economic and employment growth dated 7 October 2012 recognized the maritime sector as one of the key motors of the economic and employment growth for the EU economy. The yearly gross added value in this sector amounts to EUR 495 billion, and there are 5.4 million people employed in this sector. It should be also noted that the European coastal areas are populated by the total of 205 million Europeans, 88 million of whom work. The economic potential of the coastal areas results from the fact that the EU member states share numerous sea basins with overseas countries, and such seas constitute strategic ways to and from the European internal market, and therefore are important for the development of an integrated maritime economy.

With relation to the works on the European integrated maritime economy, an interdepartmental document has been drawn up in Poland, titled “Assumptions of the Maritime Policy 2009”, whose part devoted to the incentives for the maritime transport for vessels to come back under the national flag specifies – without limitations – the following needs:

1. To adjust the system of registering vessels under the Polish flag to the EU standards.
2. To fully implement the legal regulations pertaining to the tonnage tax for vessel owners.
3. To create favourable conditions for the operation of Polish vessel owners in terms of the labour costs by adjusting legal regulations in terms of welfare of seamen.
4. To create economic and legal conditions for the construction of Polish vessels (e.g. for the transport of LNG) for Polish vessel owners, including the system of sureties and guarantees of the State Treasury.

This chapter author's goal is to answer the question, whether the expected Act on Employment on Maritime Vessels shall contribute to actuate pro-development mechanisms of tonnage tax for shipbuilding industry and therefore for maritime economy in Poland. The author also attempts to address the question why the tonnage tax, in force in Poland since 2007, has not brought about the return of Polish vessels under the red-and-white flag. Furthermore, the author made an attempt at calculating the receipts to the state budget resulting from this tax.

Further on, the author also tackles the subject of the anticipated Act on Employment on Marine Vessels, as well as tries to calculate the encumbrances of the state budget relating to its possible introduction.

Finally, the chapter presents the condition of the shipbuilding industry in Poland, whose development could be stimulated by establishing a new Polish register of vessels – competitive towards the register of flags of convenience.

So far, various sea-related meetings and conferences are dominated by the view that the state authorities do very little to bring Polish vessels back under the Polish flag. Meanwhile, according to the Ministry of Transport, Construction and Maritime Economy the implementation of the provisions of the Act on Employment on Marine Vessels is to contribute to the transfer of 250 vessels under the Polish flag by 2020. Due to the fact that according to the data of the Head Statistical Office at the end of 2012 Polish vessel owners owned 110 vessels, and the investment agenda of the only large Polish vessel owner, Polish Steamship Company /Polska Żegluga Morska/, plans to increase its fleet by additional 38 vessels by 2015, the increase of the national fleet by another 100 ships by 2020, as it is assumed by the Ministry of Transport, Construction and Maritime Economy, could take place:

1. Either by increasing the fleet of the Polish Steamship Company by 68% during the next 5 years (rather impossible).
2. Or by the occurrence of a new large Polish owners of vessels, including vessels adjusted to the transport of LNG (feasible, but not in the expected number of vessels).
3. Or by registering vessels in the new Polish register by foreign vessel owners (feasible, but only if a new Polish register of vessels is established, competitive towards the flags of convenience, similar to the French RIF, the Norwegian NIS, the German GIS or the Danish DIS).
4. Or by the occurrence of all the three options referred to above at the same time (the most probable).

### **13.2. Literature review**

Number of research work on tonnage tax as well as the effect of future Act on Employment on Marine Vessels in order to transfer Polish vessels under the Polish flag, increase of income to the state budget by virtue of this title, development of shipbuilding industry as well as maritime economy – is limited. Many handbooks of tax law (Małecka, 2012, p. 333) even do not mention the tonnage tax. However, some handbooks that mention this tax treat this issue using a simplified way. According to the inter-department team for maritime policy of Republic of Poland<sup>33</sup>, Poland

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<sup>33</sup> [https://www.mir.gov.pl/aktualnosci/Gospodarka\\_morska/Documents/Polityka\\_morska.pdf](https://www.mir.gov.pl/aktualnosci/Gospodarka_morska/Documents/Polityka_morska.pdf) (2014, p. 22).

has not a large shipping under Polish flag. At the end of 2013, of 110 vessels operated by Polish marine vessel owners only 22 hoisted Polish flag. In order to change this situation, it was considered that the key factor influencing the decisions on vessels registration under Polish flag shall be operation of modern, friendly for employer and employee the labour law on marine vessels, both within the scope of employment conditions and work on vessel, as well as extra-wage labour costs (social protection and taxes) that make equal the conditions of their operation with condition they exist in EU countries. At the same time, undertaking the actions connected with lowering the economy activity costs of maritime enterprises is planned. In order to reconcile these excluding activity trends, public support instruments are to be implemented for maritime enterprises. The tonnage tax is one of this instruments. At the present day, after eight years from implementation, the tonnage tax relates to very narrow circle of taxpayers (Małacka, 2012, p. 337) and none of non-fiscal goals of tonnage tax (registration of Polish vessels under Polish flag, significant increase of orders from Polish vessel owners for vessels in Polish shipyards) was not achieved. In order to the number of vessels (not only Polish ones) registered under Polish flag could increase in Poland, a process of creating so called maritime laws should be accomplished based on public support for maritime transportation that contribute the competitiveness of maritime carriers that counteract (Christowa et al., 2012, p. 128) the growing fiscal and adjustment competition, so called, offshore financial centres. Implementation of maritime laws (including Act on Employment on Marine Vessels) shall permit establishing in Poland a newly-open vessels register following the example of many European countries such as Cyprus and Malta, where competition advantage (Christowa et al., 2012, p. 129) of vessels registration is based on simple model of direct public support that consists in exemption the sailors of incomes tax on physical persons who are tax residents and tax non-residents. European states such as Germany, Great Britain, Denmark, Norway, Cyprus (Christowa et al., 2012, p. 133) apply public support within the scope of labour costs on a vessel that is notified by European Commission to strengthen the competitive standing of national carriers who accomplish international shipping. The Law on tonnage tax in Poland is still the only public support instrument for maritime transportation. This adjustment condition does not permit Polish and other vessel owners to register them under Polish flag. Thus the mechanisms do not operate that allow ordering the vessels by Polish vessel owners in Polish shipyards. According to inter-department team for maritime policy of Republic of Poland<sup>34</sup>, the shipyard industry connected with maritime transport in

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<sup>34</sup> [https://www.mir.gov.pl/aktualnosci/Gospodarka\\_morska/Documents/Polityka\\_morska.pdf](https://www.mir.gov.pl/aktualnosci/Gospodarka_morska/Documents/Polityka_morska.pdf) (2014, p. 24).



Poland, the same as in other European countries, does not offer the maritime transport vessels that became the domain of Far East shipyards. Vessels manufactured at present in Poland are highly-processed products, of large added value, that include the innovative design and engineering solutions. Thus, the profile of transport services and the type of used vessels of the only large Polish vessel owner, Polska Żegluga Morska (Polish Steamship Company) shall not allow this vessel owner and Polish shipyards to take an advantage of future maritime laws to make common business.

### **13.3. Tonnage tax – the most important instrument of the transport policy of the European Union member states for merchant seafaring**

As it has been indicated in the introduction above, the phenomenon of “escaping” of the national flags to flags of convenience became a common phenomenon at the end of the previous century. In order to fight it, in 1989 the European Commission published guidelines referring to the public aid for the maritime transport permissible in the European Union states. According to those guidelines, the basic support instrument for seafaring companies in the European Union states should be the tonnage tax. In Poland the tonnage tax was introduced in the Act dated 24 August 2006 (Official Journal No. 183, item 1353, as amended). This act regulates taxation with the tonnage tax of selected types of income generated by seafaring companies exploiting maritime merchant vessels in the international navigation. Integral elements of this fiscal instrument are:

- accelerated depreciation of vessels under construction,
- exemption from taxation of receipts from the sales of vessels, as long as they are invested in the purchase of new ones.

The two components of the tonnage tax referred to above could have a crucial significance for the development of the maritime economy (mainly for the shipbuilding industry), and therefore for the entire economy in Poland, if the institution of the tonnage tax was applied by Polish vessel owners.

In 2010 the receipts from the tonnage tax to the state budget amounted to PLN 3,000, and in 2011 they increased to reach PLN 10,000. This tax has the lowest share in the state budget and its low share only confirms that vessel owners have not reregistered their merchant vessels under the Polish flag, and therefore they have not been using the mechanism of the tonnage tax in Poland.

Meanwhile, the tonnage tax, as the most important instrument of the transport policy of members states of the European Union for seafaring, is applied

and used by vessel owners in the majority of member states of the European Union. Its mechanisms contribute to the return of vessels to their national flags with all positive consequences for these states and their budgets connected with it.

The Act on the Tonnage Tax implies that the basis for taxation with this tax is the income of a seafaring company, corresponding to the product of the daily rate dependant on the net tonnage (NT) of a vessel (with the net tonnage above 100 units each) and the period of utilization in a specific month of all vessels belonging to the company the income from which is subject to the tonnage tax. The daily rate is specified depending on the net tonnage of the vessel from each 100 NT, according to the rates expressed in Euro, as defined in the Table 13.1. The tonnage tax equals 19% of the tax base and is payable for monthly periods.

**Table 13.1. Rates of the tonnage tax**

No.	Vessel net tonnage	Rates for the income calculation
1	Up to 1,000 NT	0.5 Euro for each 100 NT
2	From 1,001 to 10,000 NT	0.35 Euro for each 100 NT above 1,000 NT
3	From 10,001 to 25,000 NT	0.20 Euro for each 100 NT above 10,000 NT
4	From 25,001 NT	0.10 Euro for each 100 NT above 25,000 NT

Source: Act on the Tonnage Tax.

The Table 13.1 clearly suggests that the legislator encourages vessel owners to use vessels with higher cargo cubic capacity, because the tax encumbrances for vessels above 25 thousand NT are the lowest.

#### **13.4. Maritime transport fleet of Poland under the national flag – potential receipts of the state budget**

The condition of the Polish transport fleet falling under the responsibility of Polish vessel owners in the period 2000-2012 is presented in the Table 13.2.

This table suggests that the tendency in the development of our transport fleet is the increase in the tonnage of vessels, and not in their number, which is vital in the calculation of maintenance costs of the vessels in relation to their cargo capacities. An even more important tendency is the increase in the net tonnage (NT) of vessels, that is the cubic capacity of vessels dedicated to cargo.

The condition of the Polish transport fleet at the end of 2012 is presented in the Table 13.3, which illustrates further increase of the cargo cubic capacity of vessels belonging to Polish owners. In the context of considerations in the subject of the affiliation of vessels to the national flag, at the end of 2012 only 13.6% of the fleet was under the Polish flag. Since the introduction of the tonnage tax the

number of vessels operating under the Polish flag practically has not changed. Due to the tonnage tax, for the state budget an important indicator of the condition of the transport fleet is the “affiliation” of its cargo cubic capacity (not the number of vessels) to the national flag. At the end of 2012 this cargo cubic capacity affiliated to the Polish budget was 0.93% of the entire cargo cubic capacity of the Polish fleet.

**Table 13.2. Total Polish maritime transport fleet in the period 2000-2012**

Specification	2000	2005	2010	2012
Total number of vessels	128	130	121	110
Deadweight tonnage (DWT) in thousand	2551	2610	2942	3045
Net tonnage (NT) in thousand	1000	1024	1154	1194

Source: The author’s compilation after the Statistical Yearbook of the Maritime Economy 2013.

**Table 13.3. Polish maritime transport fleet – condition as of 31 December 2012**

Specification	Number of vessels	Deadweight tonnage (DWT) in thousand tons	Gross tonnage (GT) in thousand tons	Net tonnage (NT) in thousand tons <sup>35</sup>
Total	110	3044.8	2029.9	1194.0
Vessels operating under the Polish flag	15	28.3	18.9	11.1
Vessels operating under a foreign flag	95	3016.5	2011.0	1182.9

Source: The author’s compilation after <http://www.stat.gov.pl> and <http://www.seaman.pl/tresc/162/>.

The largest Polish vessel owner is the Polish Steamship Company, which owns 71 vessels of the total tonnage of 2.7 million DWT. On the basis of detailed data on the fleet of the Polish Steamship Company, an attempt to calculate the tonnage tax for this vessel owner can be made, assuming that the vessels belonging to the Polish Steamship Company sail incessantly 24 hours a day and 365 days a year<sup>36</sup>. The author’s own calculations suggest that this amount is ca. PLN 250

<sup>35</sup> The estimated conversion factor: 1 NT = 1.7 GT, 1 GT = 1.5 dwt. These figures refer to tankers and vessels adjusted to the transport of dry cargo up to ca. 25,000 DWT. They do not refer to refrigerated cargo carriers, ro-ro ships, passenger ships, etc. In case of large oil carriers and bulk carriers (ca. 100,000 DWT and more) 1G equals ca. 2 DWT.

<sup>36</sup> [http://www.polsteam.com/flota?ship\\_name=&ship\\_type=0&ship\\_dwt\\_from=&ship\\_dwt\\_to=&ship\\_sort=0&ship\\_section=2&btn\\_submit=Show&link=call&rpp=20&pid=1](http://www.polsteam.com/flota?ship_name=&ship_type=0&ship_dwt_from=&ship_dwt_to=&ship_sort=0&ship_section=2&btn_submit=Show&link=call&rpp=20&pid=1).

thousand per year. Using the tonnage tax calculator for the register of the Bahama Maritime Authority, under whose flag of convenience 34 Polish vessels operate, we can also calculate that the amount of the tonnage tax, assuming that all vessels belonging to the Polish Steamship Company sail under the flag of this register, would also reach ca. PLN 250 thousand per year<sup>37</sup>. The comparison of both calculations suggests that the tonnage tax in force in Poland can provide vessel owners who would decide to reregister their vessels to the national flag register with competitiveness in a part of their fiscal encumbrances.

Considering the fact that the condition of the entire Polish fleet as of the end of 2012 is 110 vessels of the total deadweight tonnage of 3.0 million (Tab. 13.4), it can be assumed that the receipts to the state budget resulting from the tonnage tax for the year 2012, provided all Polish vessel sail under the Polish flag, would reach ca. PLN 270 thousand.

From the point of view of the state budget, these receipts are not significant. From the point of view of vessel owners, low fiscal burdens comparable with the costs of using the flags of convenience can encourage them to make their ships return to the national flag. Polish ships (but also foreign ones) registering under the Polish flag stand for the possible receipts in the state budget not only due to the tonnage tax, but also due to the registration fees, fees for the issuance of documents, certificates or trainings.

Meanwhile, as it is indicated above, the number of vessels sailing under the Polish flag has been practically the same since the introduction of the tonnage tax. This means that the introduction of the institution of the tonnage tax has proved to be an insufficient condition for Polish ships to return under the Polish flag.

The return of the ships under the Polish flag signifies taking over by the employer (the vessel owner) all the burdens connected with the employees' rights for crew members of the ships in compliance with the Polish legislation. For the vessel owner this means costs which would make it uncompetitive towards registers of flags of convenience.

For the employment costs not to constitute an obstacle in the return of ships to the national flags, the European Union has allowed public aid for vessel owners. This aid should be manifested predominantly in the reimbursement of the social insurance contributions paid and by the reduction of the income tax rates for sailors. In Poland there is no Act on Employment on Maritime Vessels which would launch public aid for vessel owners and which, in doing so, would make the tonnage tax an effectively operating instrument, beneficial for the development of the maritime economy.

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<sup>37</sup> <http://www.bahamasmaritime.com/fee-calculator.php>.

### **13.5. Burdens and receipts to the state budget in connection with the act on employment on maritime vessels**

Seafaring together with its vessels is the last chain link in the sector of the maritime economy. The other links work for the benefit of the construction of these vessels and their operation. These other links take advantage of the entire economy.

Nowadays, seafaring has been experiencing global competition, in which the classic national registers of ships are simply not able to fight the competition of the registers of flags of convenience. It is the economic interest of Europe and Poland to fight this competition. This need has been noticed in Europe and according to the Guidelines of the European Community (Commission Communication C(2004)43 of 2004) it is permissible to grant reliefs:

- To vessel owners to the extent of the employment costs they incur – predominantly by the reimbursement of the social insurance contributions paid,
- To sailors by reducing the rates of the income tax on their wages as an incentive to find jobs on ships sailing under the national flag.

Poland as a flag state should use the option to grant public aid to seafaring in compliance with the Guidelines of the European Community and to adopt support for the maritime transport in order to reduce the fiscal costs and other burdens incurred by vessel owners and sailors.

The tonnage tax was introduced in Poland by the Act dated 24 August 2006, and without the Act on Employment on Maritime Vessels and relevant reliefs for vessel owners and sailors specified in this act is an unused institution. Addressing the recommendation of the European Union, aiming at the reduction of the share of vessels owned by EU-based owners sailing under foreign flags to 40% (currently it is 86,2%), in 2013 the Ministry of Transport, Construction and Maritime Economy approved the assumptions to the Act on Employment on Maritime Vessels.

According to the assumptions adopted for this act, “The maritime market of sailors is international in its character. Its essential part is the job market of sailors who are citizens of the European Union, employed on ships under the flags of member states of the European Union or on ships under the flags of third states. In the latter case, the participation of Polish sailors is considerable. More than 35 thousand people work on vessels under foreign flags”.

The assumptions adopted for the act further suggest that its coming into force will allow to obtain competitiveness and to increase the share of Polish sailors in the international and EU maritime job market by improving the legal environment, consisting in the protection of employment (jobs) of sailors (by introducing in the planned act appropriately designed legal institutions defined in the provisions of the Maritime Labour Convention and the EU law), as well as in combining

public aid for the maritime transport with jobs and employment options for Polish sailors.

In order to obtain competitiveness of Polish vessel owners on the global seafaring market, it is proposed to introduce changes in several acts currently in force, in particular:

1. Change in the Act dated 26 July 1991 on Income Tax of Natural Persons (Official Journal No. 14, item 176, as amended), to the extent of taxation according to the 0% rate of the income tax of sailors employed on Polish vessels utilized in international navigation and subject to the tonnage tax, staying outside the territory of the Republic of Poland longer than 183 days in the accounting year.
2. Change in the Act dated 27 August 2004 on Healthcare Services Financed from the Public Sources (Official Journal of 2008 No. 164, item 1027 as amended), to the extent of specifying the base for the calculation of a contribution to the voluntary health insurance of sailors, the manner of paying this contribution and the amounts of the fees paid by them to the account of the National Health Fund.
3. Changes in the Act dated 24 August 2006 on the Tonnage Tax (Official Journal No. 183, item 1353 of 2008, No. 209, item 1316 and of 2012 item 1540), to the extent of reimbursement of the social insurance contribution of sailors paid by seafaring companies.

Furthermore, the assumptions to the Act on Employment on Maritime Vessels suggest that in 2020 5 thousand sailors will be working on ships sailing under the Polish flag. The remuneration level of sailors employed on Polish vessels in 2020 is unknown. However, assuming that in 2013 5 thousand sailors will work on Polish vessels sailing under the national flag in connection with the Act on Employment on Maritime Vessels, according to the Table 13.4 it would result in burdening the state budget with social and health insurance contributions in the amount of ca. 65 million per year.

Further on, according to the Ministry of Transport, Construction and Maritime Economy, the introduction of the provisions of the Act on Employment on Maritime Vessels is to contribute to the establishment of 20 thousand jobs in professions connected with the maritime economy by 2020, due to the transfer of 250 ships under the Polish flag. Assuming that these 20 thousand new employees, but not sailors, started working in 2013, and considering the fact that the average gross remuneration in Poland in 2013 amounted to PLN 3771<sup>38</sup> (PLN 2694.13 net), the

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<sup>38</sup> [http://wynagrodzenia.pl/dane\\_gus.php](http://wynagrodzenia.pl/dane_gus.php).

receipts in the state budget resulting from the income tax would oscillate at the level of PLN 5 million.

**Table 13.4. Average remuneration of sailors employed on Polish vessels (gross/net) in PLN**

Gross remuneration	11,600.00
Pension insurance contribution	1.00
Disability insurance contribution	174.00
Sickness insurance contribution	284.20
Health insurance contribution	900.87
Tax deductions	960.00
Total deductions	3,451.23
Net remuneration	8,148.77

Source: <http://www.moja-pensja.pl/zarobki/932,ile-zarabia-Marynarz-statku-morskiego>.

### **13.6. Maritime economy as a stimulator of the development of the national economy**

In the Republic of Poland sea territories, which constitute over 10% of the surface area of the country, have been covered with the works on the “Concept of the Spatial Development of the Country by 2033”, conducted and coordinated by the Ministry of Regional Development.<sup>39</sup> According to the data of the Head Statistical Office, in 2012 the share of the maritime economy in the national economy reached 0.9%.<sup>40</sup> The share of the maritime economy entities in the total number of business entities in coastal provinces is presented in the Table 13.5. The data quoted in the Table 13.5 show that the maritime economy constitutes only a margin of the Polish economy. Therefore, there is evidence suggesting that the maritime economy, with its still existing infrastructure, which in territorial terms could cover the entire seaside (21% of the territory of Poland), does not have the economic conditions necessary to use the natural sea richness.

The development of the maritime economy is broadly associated with the shipbuilding industry. The Table 13.6 presents the number of ships constructed in the Polish shipyards in the period 2008-2011.

<sup>39</sup> <http://www.transport.gov.pl/files/0/1794063/Zalozeniapolitykimorskiejrpdo2020roku.pdf>, p. 6, Warsaw, 2009.

<sup>40</sup> [http://old.stat.gov.pl/cps/rde/xbcr/gus/rs\\_rocznik\\_gosp\\_morskiej\\_2013.pdf](http://old.stat.gov.pl/cps/rde/xbcr/gus/rs_rocznik_gosp_morskiej_2013.pdf).

**Table 13.5. Share of the maritime economy entities in the number of the total business entities in the coastal provinces in 2011**

Province	Share (%) of the maritime economy entities in the total number of business entities	Share (%) of employees in the maritime economy in the total number of employees
Pomorskie	2.2	5.2
Zachodniopomorskie	1.3	4.4
Warmińsko-mazurskie	0.2	0.4

Source: the author's own compilation after

[http://www.stat.gov.pl/cps/rde/xbcr/szczec/ASSETS\\_rocznik\\_gosp\\_morskiej\\_2012.pdf](http://www.stat.gov.pl/cps/rde/xbcr/szczec/ASSETS_rocznik_gosp_morskiej_2012.pdf).**Table 13.6. Production of ships according to their types in Poland in the period 2008-2011**

Types of ships	2008	2009	2010	2011
Total	20	25	24	14
Container ships and semi container ships	8	6	1	1
General cargo ships	-	3	2	2
Bulk carriers	-	-	1	-
Gas carriers	-	1	-	-
Cargo ships for transporting cars	5	2	-	-
Ferries	1	1	3	7
Shipping vessels	-	-	2	3
Non-cargo ships	3	12	12	1
Offshore	3	-	-	-

Source: the author's own compilation after

[http://www.stat.gov.pl/cps/rde/xbcr/szczec/ASSETS\\_rocznik\\_gosp\\_morskiej\\_2012.pdf](http://www.stat.gov.pl/cps/rde/xbcr/szczec/ASSETS_rocznik_gosp_morskiej_2012.pdf).

Currently, the shipyard production is connected not only with the construction of ships and their renovations, but also with the production of steel structures for the offshore sector. The picture of the shipyard production in Poland is presented in the Table 13.7.

The value of the order portfolio in Europe has been continuing the downward trend since 2007. The analysis of the structure of the production of ships and steel structures according to their type confirms a considerable weakening of Europe's position in the global shipbuilding industry after 2008, with a considerable rise in the production of ships and floating structures for the offshore sector.”<sup>41</sup> This tendency is also observable in the Polish shipyard production, which is depicted in the Tables 13.6. and 13.7.

<sup>41</sup>The current situation on the shipbuilding market in Poland – proposal of actions of the Group ARP S.A., p. 4, Warsaw, July 2013.



**Table 13.7. Outline of the shipbuilding market in Poland**

Shipyard	Renovations	Specialist vessels	Special production (MW)	Steel structures for the offshore sector
Gdańska Stocznia Remontowa S.A. (GSR)	+	+	+	+
Szczecińska Stocznia Remontowa Gryfia S.A. (GRF)	+			
Morska Stocznia Remontowa S.A. (MSR)	+			+
Stocznia Remontowa Nauta S.A.	+		+	+
Energomontaż Północ Gdynia sp. z o.o. (EPG)	+			+
CRIST S.A.		+		+
Stocznia Gdańsk S.A.		+		+
Naval Shipyard in liquidation bankruptcy (SMW)			+	
Konstrukcje Stalowe Offshore sp. z o.o.				+

Source: the author's own compilation after: Current situation on the shipbuilding market in Poland – proposal of action of the Group ARP S.A., p. 6, Warsaw, July 2013, [http://msp.gov.pl/porta1/pl/29/26378/Sytuacja\\_polskich\\_stoczni.html](http://msp.gov.pl/porta1/pl/29/26378/Sytuacja_polskich_stoczni.html).

Assuming that the sector of the maritime economy which is the most responsible for its development is the shipbuilding industry, it is necessary to seek mechanisms in the economic environment of this industry which could bring about the increase of the number of orders for shipyards' products.

The Act on the Tonnage Tax, apart from the tax itself, also specifies two instruments which could cause the increase of orders in the Polish shipbuilding industry. These are:

- accelerated depreciation of ships under construction,
- exemption of the receipts from the sales of ships from taxation, as long as they are invested in the purchase of new vessels.

Currently the Polish Steamship Company has been implementing an investment programme, according to which 38 new vessels are to be put into use by 2015.<sup>42</sup>

Details of this investment programme are unknown, but if this programme is to be completed by 2015, it means that the orders for 38 ships have already been placed in the shipyards. The Polish Steamship Company utilizes mainly bulk carri-

<sup>42</sup> <http://www.polsteam.com/flota>.

ers, and as the Tables 13.6 and 13.7, as well as the offers of the Polish shipyards suggest, these shipyards specialize rather in the production of ships other than bulk carriers. Bulk carriers are characteristic for Far East shipyards, which probably have the lowest costs of the welding and painting works, and such works dominate the production of bulk carriers.

Nevertheless, the Polish Steamship Company is a vessel owner which due to the scale of its investment programmes can have a significant impact on the development of the shipbuilding industry in Poland. The condition here is the return of the ships of the Polish Steamship Company and other smaller vessel owners to the national flag register. This return depends exclusively on the adoption of the Act on Employment on Maritime Vessels, with provisions concerning the public aid for vessel owners and sailors. If this act, which would enable to benefit from the provisions of the Act on the Tonnage Tax, is passed, it will offer a possibility to place orders in Polish shipyards for Polish as well as foreign vessel owners, who will find economic benefits in entering their ships to the Polish register.

The author deliberately does not use the name of the currently operating Polish Register of Vessels in this article, as perhaps after the introduction of all necessary tax and legal regulations in Poland, whose goal is to establish a national register competitive towards registers of flags of convenience, it will be an institution separate from the currently operating one, following the example of new registers, for example in Germany (GIS), in Denmark (DIS) or in Norway (NIS).

The first European country which adopted the tonnage tax was Holland (1997). The United Kingdom adopted this tax in 2000. According to (Steward, p. 3), it will take 10 years for the state budget to feel the effects of the introduction of the tonnage tax in the form of a significant increase of the number of jobs and receipts to the budget, resulting from the development of the maritime economy and economy as a whole. The main goal of the tonnage tax is to create a favourable fiscal environment for seafaring companies, as well as for investors. Since the introduction of the tonnage tax in the United Kingdom the fleet of this country has grown three times, and the number of registered vessels – six times (such a big increase resulted from a very low initial level). During the last decade this turn in the British maritime economy brought about benefits for the entire British economy in the form of increased turnover and added value. According to the statistical data, the gross receipt from seafaring activities in 2011 amounted to GBP 12.9 billion. Oxford Economics in the report on 2011 estimates that the contribution of the maritime industry to the budget of the United Kingdom increased during that time ca. twice to three times and caused the creation of ca. 70 thousand new jobs.

In relation to the British experiences connected with the introduction of the tonnage tax in 2000 and the positive effects of its introduction for the British state budget and job market after a decade, it can be expected that launching pro-development instruments of this tax in Poland will boost the development of the Polish maritime economy and the industry which operates for the benefit of this economy.

### **13.7. Conclusions**

Minor burdens for vessel owners by way of the tonnage tax and the Act on Employment on Maritime Vessels with provisions pertaining to the public aid for merchant vessel owners and sailors may become a stimulus for deregistering Polish vessels under the national flag. For the pro-development stimulus to occur, it is necessary to organize public aid for seafaring companies in the amount of ca. 60-70 million per year.

The justification to the Act on Tonnage Tax dated 20 October 2005<sup>43</sup> reads, “The analyses and simulations conducted suggest that the introduction of the tonnage tax:

- will cause a gradual return of vessels belonging to Polish owners under the national flag,
- the tonnage tax will be a permanent income in the state budget, irrespective of the fact whether the utilization of the vessel falling under it generates profits or losses,
- the economic situation of vessel owners will improve, whereas today their profits directly depend on the results of the seafaring activities,
- mechanisms will be created, enabling Polish vessel owners to commence the process of placing orders for the construction of new ships in Polish shipyards,
- Poland will obtain an ability to fulfil the NATO allied obligations to be met by the maritime transport.”

After 8 years of the validity of the Act on Tonnage Tax, it cannot be stated that vessels have been gradually coming back to the national flag. Mechanisms that would enable Polish vessel owners to commence the process of placing orders for the construction of new ships in Polish shipyards have not come into being, either. Still only a minor cargo cubic capacity “sails” under the Polish flag and vessel owners have no grounds to use the accelerated depreciation and exemption from

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<sup>43</sup> bip.kprm.gov.pl

taxation of the receipt generated by the sales of ships. During the last 8 years, Poland has not obtained the capability of fulfilling the NATO allied obligations to be met by the maritime transport, either. The reason of this situation consists in lack of interest of decision-makers and society with maritime economy issues, in lack of system, comprehensive and modern approach to maritime issues in state administration bodies as well as its weak activity in European Union. Everything contributes to legislative delays to implement, so called, maritime laws.

Currently, Polish shipyards specialize in the production of specialist vessels, passenger and car ferries, offshore units, special units, sea steel structures, wind power plants and in the renovations of vessels. They do not specialize, however, in the production of bulk carriers, which constitute the core of the fleet of our only large vessel owner, Polish Steamship Company. Nevertheless, it cannot be excluded that with favourable cost-related conditions for vessel owners which could be offered by the new Polish register of ships operating under the regulations of the Act on Employment on Maritime Vessels, foreign owners of specialist (merchant) vessels could register their vessels under the red-and-white flag and order them in Polish shipyards.

In Poland there is no large owner of merchant vessels which at the same time would be technologically advanced structures (gas carriers, chemical tankers), and the production of which could be taken over by Polish shipyards. Due to the labour costs, Polish shipyards are not able to compete in the production of relatively simple structures, such as bulk carriers, with shipyards from the Far East. However, Polish shipyards successfully compete on the global market of technologically advanced vessels. Despite the lack of the Act on Employment on Maritime Vessels and thus despite the lack of opportunity to benefit by vessel owners from favourable fiscal conditions resulting from the tonnage tax when ordering ships, Polish shipyards are developing. The best example of this development is Stocznia Remontowa Shipbuilding S.A. (Gdańsk Renovation Shipyard), which belongs to the capital group of Remontowa Holding S.A. Currently it is the largest shipyard in Poland, employing over 7 thousand people in all companies belonging to it. Remontowa Shipbuilding S.A. is the largest producer of offshore vessels in Europe. This paper author's goal was the answer the question, whether the expected Act on Employment on Maritime Vessels shall contribute to actuate pro-development mechanisms of tonnage tax for shipbuilding industry and therefore for maritime economy in Poland. The result of comparison analysis made of level of potential charges by virtue of tonnage tax between register Bahama Maritime Authority and new Polish register of vessels indicates that the tonnage tax in force in Poland can provide competitiveness in part of fiscal encumbrances to vessel owners, who

would decide to reregister their vessels to the national flag register. In the light of calculations made of possible incomes on tonnage tax to the state budget, encumbrances of this budget by virtue of public support for mercantile maritime shipping the advantages by virtue of expanding the shipyard production in Poland could reveal only in case when specialist vessels (liquid gas carriers, chemical tankers) owner appear, whereas the advanced manufacture of which the Polish shipyards could be interested. Suppliers of LNG to the gas port in Świnoujście shall use the LPG ships. Polish chemical industry also uses transportation by chemical tankers. Thus, there is demand resulting from the structure of Polish industry for this type of special maritime transportation services. This denotes that there is demand for Polish or foreign vessel owners registering its special vessels under Polish flag, whose competitiveness would result, among other, from existence of laws on tonnage tax and on employment on maritime vessels. Implementation in Poland the Act on Employment on Marine Vessels is the necessary condition of utilisation of maritime economy potential in Poland for development of shipyard industry, the remaining domestic industry, creating working posts mainly in traditional professions.

## **CHAPTER 14**

### **BUSINESS DYNAMICS IN POLAND IN COMPARISON TO SELECTED COUNTRIES**

#### **14.1. Introduction**

There are abundant scientific analyses demonstrating the existence of a wide range of companies operating in the economy. The population of companies in all countries undergoes significant changes over time. Some companies fail and others are established at the same time. If new companies come into existence, competition increases, and competition causes the least effective companies to be vulnerable to failure. This process is of fundamental importance for the growth of the economy. Moreover, companies that were small yesterday are now transforming into larger ones. The cycle repeats itself at various speed and both as far as emergence or failure of companies and market transformations are concerned. It would be interesting to determine what is their influence on the flourishing of the economy. The principal aim of this chapter is to compare business dynamics in Poland against the selected EU member states and determine the extent of influence of the changes that are taking place over the general efficiency, the rate of unemployment, and the GDP.

#### **14.2. Teoretical background**

It is attempted to provide an explanation for heterogeneity of companies on the basis of the available theory. Firstly, researchers invoke the process of creative destruction (Doms & Bartelsman, 2000). A distinguishing element of Schumpeter's theory is that it looks at diversity and constant change taking place among business entities through the prism of an entrance, exit, expansion, or shrinkage and treats this as the inevitable changes in the process of development (Bartelsman et al., 2003). In accordance with this theory, the continuous process of creation and

destruction of business entities, newly-emerging innovative products and processes is necessary for growth to occur and smoothes out the fluctuations of business cycles (Caballero & Hammour, 1994). Initially, the theory had not been treated seriously, however since empirical proof was produced, the idea that establishing new companies and the downfall of those who are not productive is the key to the general dynamics in the economy has become widely accepted (López-García & Puente, 2006).

This context serves as background for consideration of two models of entry into the market: active and passive. In the passive model, a new entity enters the market without knowledge of the cost function and the possible rate of return (Jovanovic, 1982). Entrepreneurs make decisions based on quite vague concepts of their future business activity. They learn while operating. In line with this theory, the process of creation of new companies is accidental. The model provides arguments able to explain why some participants to the market go under relatively quickly after being set up. It also predicts that smaller and younger companies will have a faster and more volatile growth rate.

In the active model, a company first actively examines the business surroundings and invests in order to enhance its ability to increase the rate of return. Such an approach is based on a conviction that a substantial amount of such companies is established for the purpose of introducing innovation to the market. An entrepreneur makes a fully knowledgeable decision of starting a business, aware of the conditions the business will be facing. The company expands, if it succeeds or shrinks or, which is however less likely, is shut down in case of failure (Ericson & Pakes, 1995).

Another theoretical aspect, which the relevant literature pays attention to, is the fact that, apart from technological and organizational changes, a significant factor contributing to the growth in productivity is reallocation of resources from not productive companies to the highly efficient ones (Ahn, 2001). To recap, it might be said that at sectoral level the increase in efficiency may be apportioned among the consequences of the dynamics of entrances and exits as well as reallocation of resources within and among the existing businesses (Bishop et al., 2009).

Some role in explaining the processes behind creation of new companies is played by the concept referring to the theory of the labour market. It equates the creation of a company with self-employment. It is historically related to the works of F. H. Knight. Contemporary theories originating from the theory of the labour market dig deeper – they look into the characteristics of persons making a decision to self-employ and their motivation. Besides the personal characteristics, the concepts based on the theories of the labour market emphasize the importance of the human capital (Dominiak, 2005, p. 218).

The theory of economics regarding demographics and business dynamics is based on a paradigm of the so called representative firm (Bartelsman et al., 2003). It almost encourages empirical research in this respect, taking into account the fact that, as pointed out in the relevant literature, behaviour of individual companies on the market may be dramatically different, even within the same sector (Masso et al., 2004).

### **14.3. Review of research**

E. Bartelsman, S. Scarpetta, and F. Schivardi studied companies from Canada, Denmark, France, Finland, the Netherlands, Great Britain, and the USA (Bartelsman et al., 2003). The demographics of firms was observed through the prism of several indicators. The most important of them was the number of companies entering and exiting the market in a given sector in a given year. Additionally, the indicator of the size of a company, the rate of survival, and change in employment were calculated. Among the numerous conclusions that they drew, they noticed that the average size of companies varies significantly across sectors and countries. The average size of a company is generally smaller in the United States than in most European countries. Dispersion of company size within a sector is usually connected with the size of the market. Countries with a bigger domestic market are likely to have a greater variety of company sizes in most sectors. Elimination of companies from the market is quite severe, i.e. about 20 to 40 per cent of firms entering the market fail within the first two years of operation. Additionally, only about 30-50 per cent of all companies entering the market in a given group will survive longer than seven years. The likelihood of failure in the first years of operation is very much correlated with the size of a firm. The smaller the company, the higher the likelihood of failure. Furthermore, companies that manage to survive are not only bigger but also have a tendency for fast growth (Bartelsman et al., 2003).

OECD analyses concerning the influence of the phenomena of entrance and exit as well as expansion and shrinkage of companies on the aggregated increase in efficiency have demonstrated that the demographics of companies may result in (or contribute to) growth in general productivity amounting to between 20 and 30 per cent (Foster et al., 1998). Apart from reallocation of resources from companies with a low productivity level to those with a high one, the indices of entrances and exits exert an indirect influence over the increase in efficiency through intensification of competitive pressure placed on the existing and new business entities.

J. Masso, R. Eamets, and K. Philips have examined the effects of entrance/exit (business dynamics) on the efficiency of companies in Estonia. The



analysis was concerned with the period between 1995 and 2001. They noticed that the index of entrances and exits is quite high in comparison to the international standard and had been going down in the studied period. The general conclusion drawn from their research was that entrances and exits (business dynamics) are good for the improvement of efficiency and economic growth. M. Dejardin and M. Fritsch have carried out a more detailed analysis. They came to a conclusion that, as demonstrated in practice, the effects of economic growth are mainly consequences of the process of creative destruction, first and foremost, and increase in the competition initiated by new entities entering the market (Dejardin & Fritsch, 2011). Interestingly, the study conducted by M. Fritsch and P. Mueller, which took Germany into account, shows that new companies entering the market may influence the increase in productivity over a medium period of time and the observable dynamics of starting and shutting down businesses may also affect a decrease in employment. Only after about 5 or 6 years, the impact of the latter phenomenon on employment becomes positive (Fritsch & Mueller, 2008). Nevertheless, the consequences of establishing new economic entities may differ considerably among regions and states (Acs & Mueller, 2006; Stel & Suddle, 2005).

It is undeniable that taking into account the presented influence of business dynamics on the factors in the real economy, it is necessary to identify the conditions surrounding the phenomenon of creation and downfall of companies. D. B. Audretsch and T. Mahmood claim that companies survive longer periods in the sectors of the economy in which innovation, research, and development are less significant (Audretsch & Mahmood, 1994). D. B. Audretsch investigated the indices of survival of companies referring to such variables as innovation and benefits of scale or concentration. He found out that the rate of survival is low in high technology-related sectors with large benefits of scale. Whereas concentration of the market has turned out to promote short-term (one or two-year) survival (Audretsch, 1991).

P. Lopez-Garcie and S. Puente demonstrated that in Spain the index of entrances and exits is lower than in Finland, Italy, Germany, the USA, the Netherlands, France, Portugal, Denmark, Canada, and Great Britain (López-García & Puente, 2006).

#### **14.4. Empirical part**

The relevant economics literature quotes the terms birth and death of a company as well as entrance and exit. The first pair of terms usually refers to the formal side of a company's existence – it is connected with registration and de-

registration. The other pair is associated with the economic act of entering the market or exiting it. Therefore, the terms entrance and exit seem to be broader ones. However, one should note that these terms are usually used interchangeably, i.e. entrances and exits are births and deaths and the other way round (Dominiak, 2005, p. 188).

Table 14.1 presents the birth rate of companies in the selected EU member states for which statistical data published by Eurostat are available. The rate is calculated as a ratio of the number of newly-established companies in a given period to the total number of active firms.

**Table 14.1. The birth rate of companies in the selected European Union member states between 2007 and 2011 (in percentages)**

State/year	2007*	2008	2009	2010	2011
Belgium	6.95	5.41	4.58	5.23	5.25
Bulgaria	15.12	18.17	17.62	11.39	10.96
Czech Republic	9.48	3.81	10.93	11.43	10.55
Spain	9.55	7.47	7.19	7.81	7.98
France	10.14	9.70	12.98	12.78	11.02
Italy	8.38	7.06	7.22	6.65	6.67
Cyprus	3.32	3.27	3.04	3.91	4.52
Lithuania	24.73	20.04	14.72	21.07	23.71
Luxembourg	10.07	9.92	9.27	9.52	9.70
Hungary	9.01	10.15	9.17	10.01	9.98
Netherlands	13.25	14.45	12.10	9.85	11.01
Austria	7.54	6.64	6.11	6.08	6.17
Poland	13.24	13.15	12.84	13.81	12.46
Portugal	13.78	14.62	12.13	11.85	12.39
Slovenia	10.21	11.72	11.33	10.33	10.16
Slovakia	13.28	15.51	16.34	13.19	14.39
Great Britain	14.28	12.99	10.09	10.48	11.57

\* for 2007 data in accordance with NACE Rev. 1.1 (industry and services except management activities of holding companies; public administration and community; services; activities of households and extra-territorial organizations)

Source: Eurostat,

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&code=tin00142> accessed on 20 November, 2014, last updated on 18 November, 2014.

While analysing the data provided in Table 14.1, one should pay attention to a very large disproportion between the countries under analysis – unquestionably, the fewest companies are established in Cyprus (on average only 3.04-4.52 out of 100 active business entities). While the country standing out in a positive way is Lithuania where, except for the year 2009, the rate of births was on a very high level of

over 20 per cent. Poland's rate was over 13 per cent giving it a score above the average which was about 10-11 per cent in the group of 17 countries under analysis.

As far as companies are concerned, the rate of deaths is defined as the number of firms that cease operating in a given year in relation to the number of active companies in the year under analysis. In line with Eurostat methodology, "death of a company" may be pronounced only if it does not reactivate within the 2 subsequent years following termination of its activity. Simultaneously, if such reactivation takes place, it is not considered birth of a company. In consequence of the adopted measures, data on deaths of companies are available after a lapse of two years (at the moment of producing the paper, data from Eurostat were available for the year 2011).

Table 14.2 presents data on the rate of deaths of companies in the analysed group of EU member states. Similarly to the rate of births, the rate of deaths too was characterized by an immense diversity among the states. The value of the indicator was the lowest in Cyprus (especially between 2007 and 2009 when it amounted to 2.2%-3.83%) and in Belgium for which throughout the whole period under analysis, it was between 4.35 per cent in 2007 and 2.64 per cent in 2011. Just as in the case of the birth rate, the death rate was the highest in Lithuania. Between 2007 and 2009 in this country, over 20 per cent of active entities disappeared from the market each year, and the rate peaked its highest in 2008 when it reached over 29 per cent. Between 2010 and 2011 in Lithuania, there was a clear reduction in the death rate, however, out of 100 active enterprises about 17 would be closed down. Besides Lithuania, the death rate of companies was relatively high in Portugal (where an upward trend from 13.88% in 2007 to 18.37% in 2011 was observable in addition), Slovakia, Bulgaria, and Great Britain.

In the case of Poland, the death rate was slightly above the average for the analysed group of 17 states and a clear upward trend could be observed from 9 per cent in 2008 to 12.27 per cent in 2011.

Intensification of the processes of births and deaths is most often called enterprise turnover. It is a measure which is calculated as a sum of the rates of births and deaths.<sup>44</sup> Enterprise turnover is treated as one of the more significant indicators of business dynamics.

Table 14.3 presents the development of enterprise turnover. A high value is usually a consequence of both a high birth rate and a high death rate, which should lead to a more effective allocation of resources.

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<sup>44</sup> In line with the terminology applied by Eurostat, the sum of the rates of births and deaths is referred to as the *business churn*.

**Table 14.2. The rate of death of companies in the selected European Union member states between 2007 and 2011 (in percentages)**

State/year	2007*	2008	2009	2010	2011
Belgium	4.35	3.36	3.66	3.35	2.64
Bulgaria	13.90	13.07	7.87	7.92	12.25
Czech Republic	8.14	8.20	8.21	8.95	10.68 <sup>p</sup>
Spain	7.46	9.45	9.56	9.05	9.49
France	7.07	7.74	7.54	6.86	6.49
Italy	6.88	6.99	6.08	6.47	7.98 <sup>p</sup>
Cyprus	2.20	2.38	3.83	7.28	9.94
Lithuania	20.29	29.05	21.47	16.9	16.73 <sup>p</sup>
Luxembourg	7.72	7.75	7.35	7.47	7.59
Hungary	9.76	10.81	9.64	11.08	15.3 <sup>p</sup>
Netherlands	8.08	7.74	5.95	8.06	6.49 <sup>p</sup>
Austria	6.16	5.76	6.17	6.28	6.69
Poland	9.52	9.00	10.82	10.58	12.27 <sup>p</sup>
Portugal	13.88	15.41	16.18	15.66	18.37 <sup>p</sup>
Slovenia	5.92	6.64	7.43	8.51	8.26
Slovakia	14.03	11.38	10.57	7.19	15.94 <sup>p</sup>
Great Britain	11.23	11.76	14.15	11.14	10.10

\* for 2007 data in accordance with NACE Rev. 1.1 (industry and services except management activities of holding companies; public administration and community; services; activities of households and extra-territorial organizations); p – provisional

Source: Eurostat,

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&code=tin00142> accessed on 21 November, 2014, last updated on 18 November, 2014.

Out of the 17 states that underwent analysis and were presented in Table 14.3, enterprise turnover was high for the following ones:

- Lithuania – enterprise turnover ranged between 36.19% and 49.09% in the period under analysis,
- Portugal – between 27.52% and 30.76%,
- Bulgaria – between 19.31% and 31.23%,
- Slovakia – between 20.38% and 30.32%.

**Table 14.3. Enterprise turnover (birth rate + death rate) in the selected European Union member states between 2007 and 2011 (in percentages)**

State/year	2007*	2008	2009	2010	2011
Belgium	11.30	8.77	8.24	8.58	7.89
Bulgaria	29.02	31.23	25.49	19.31	23.21
Czech Republic	17.62	12.01	19.13	20.39	21.23 <sup>p</sup>
Spain	17.01	16.92	16.75	16.86	17.46
France	17.21	17.44	20.52	19.64	17.51
Italy	15.25	14.04	13.3	13.12	14.64 <sup>p</sup>
Cyprus	5.25	5.65	6.87	11.18	14.46
Lithuania	45.02	49.09	36.19	37.97	40.44 <sup>p</sup>
Luxembourg	17.79	17.67	16.62	16.99	17.29
Hungary	18.77	20.96	18.82	21.08	25.28 <sup>p</sup>
Netherlands	21.32	22.18	18.06	17.91	17.51 <sup>p</sup>
Austria	13.70	12.40	12.28	12.36	12.86
Poland	22.76	22.15	23.66	24.39	24.73 <sup>p</sup>
Portugal	27.67	30.03	28.3	27.52	30.76 <sup>p</sup>
Slovenia	16.12	18.36	18.76	18.84	18.42
Slovakia	27.30	26.88	26.9	20.38	30.32 <sup>p</sup>
Great Britain	25.51	24.75	24.24	21.62	21.66

\* – for 2007 data in accordance with NACE Rev. 1.1 (industry and services except management activities of holding companies; public administration and community; services; activities of households and extra-territorial organizations); p – provisional

Source: Eurostat,

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&code=tin00142> accessed on 21 November, 2014, last updated on 18 November, 2014.

The indicator had relatively low values in the case of:

- Cyprus, where the sum of the rates of births and deaths was between 5.25% and 14.46% (the indicator was especially low – about 5-7% in the years 2007-2009),
- Belgium – between 7.89% and 11.30%,
- in Italy – between 13.12% and 15.25%.

As far as Poland is concerned, enterprise turnover was over the average for the 17 EU member states under analysis and amounted to between 22.15 and 24.73 per cent. High enterprise turnover suggests that the probability of survival of a company is getting lower (Dominiak, 2005, p. 239). It is perfectly demonstrated by the rate of survival of companies, which shows what percentage of enterprises survive through the first (usually the hardest) two years of their activity (Tab. 14.4). The data reveal that this indicator is particularly low in Lithuania, i.e. below 50 per cent throughout the whole period under analysis, which means that more than half of Lithuanian start-ups shut down within the first two years of operation. Between

2009 and 2010, the indicator was merely 30 per cent in Lithuania, which means that out of 10 companies set up between 2007 and 2008 about 7 disappeared from the market. Due to the fact that high enterprise turnover between 2008 and 2009 in Lithuania was to a large extent determined by a high rate of deaths, the dynamics of the GDP slowed dramatically (a decrease by 17.7% in 2009) and the rate of unemployment leapt up increasing from 5.8 per cent in 2008 to 13.8 per cent in 2009 and again to 17.8 per cent in 2010. Nevertheless, it must be noted that between 2010 and 2011 Lithuanian economy returned to the path of growth, which caused gradual improvement to the labour market (the unemployment rate was 4.4 pp lower in 2012 than in 2009). It was mainly a consequence of a reverse in the correlation between the death rate and the birth rate of companies as between 2010 and 2011, enterprise turnover was still very high in Lithuania – about 37-40 per cent; but in contrast to the previous years, it was determined by the rate of births to a larger extent than by the rate of deaths. In other words, although between 2010 and 2011 the rate of survival of companies in Lithuania was below 50 per cent, a large net increase in the number of companies contributed to gradual encouragement of economic growth and improvement of the situation on the market.

**Table 14.4. The rate of survival of companies in the selected European Union member states between 2008 and 2012 (in percentages)**

State/year	2008	2009	2010	2011	2012
Belgium	76.10	74.87	78.45	80.39	80.36
Bulgaria	63.33	67.66	70.42	66.25	64.30
Czech Republic	65.95	67.31	67.74	65.59	67.80
Spain	66.97	64.06	65.89	65.04	62.08
France	76.93	78.60	77.25	65.40	63.00
Italy	74.04	75.49	73.24	70.86	70.05
Cyprus	no data	no data	79.95	75.83	76.83
Lithuania	43.73	30.86	29.47	46.63	48.02
Luxembourg	78.49	78.67	79.38	77.73	77.22
Hungary	63.26	61.19	60.71	61.54	56.74
Netherlands	63.41	69.72	70.52	74.33	82.09
Austria	79.01	78.36	76.81	76.18	78.43
Poland	71.08	74.51	71.55	69.85	70.15
Portugal	56.63	51.35	46.54	46.96	47.26
Slovenia	83.48	81.00	78.13	74.93	76.33
Slovakia	61.15	51.76	61.35	67.07	64.79
Great Britain	80.52	77.64	65.23	72.89	71.97

no data – not available

Source: Eurostat,

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00142> accessed on 21 November, 2014, last updated on 18 November, 2014.

Enterprise turnover was also high in Portugal, which to a large extent determined a relatively low rate of survival of companies in this state as well (below 50% since 2010). In the case of Portugal, the rate of deaths had a greater influence over enterprise turnover than the rate of births throughout the whole period under analysis, i.e. between 2007 and 2011 (additionally, the difference between these rates increased from 0.1 pp in 2007 to as much as 5.98 pp in 2011). The reason behind such a state of affairs is low competitiveness of Portuguese economy and its limited ability to create stable jobs (the rate of unemployment in this country has been continuously increasing since 2008).

On the other hand, states enjoying relatively low enterprise turnover (e.g. Cyprus, Belgium, or Italy) had a high survival rate oscillating between 70 and 80 per cent. In the case of Poland, both stable turnover may be observed (about 22-25%) and a relatively high rate of survival which was usually over 70 per cent<sup>45</sup>. At the same time, a positive net increase in the number of companies is noticeable throughout the whole period under analysis in Poland, which allowed to avoid an increase in the unemployment rate during the economic crisis (in accordance with Eurostat's statistics, the rate of unemployment in Poland was 9.7% in 2011 and was 0.1 pp higher than in 2007).

In the theoretical part of this chapter, it has been mentioned that company demographics (e.g. the index of entrances and exits) may exert influence over companies' efficiency and the economic growth. Table 14.5 presents the values of the GDP per one employed person in the group of EU member states under analysis.

The presented data suggest that the dynamics in terms of efficiency are generally greater in new members of the EU in comparison to the countries belonging to the old EU. It might be related to the so called catch-up effect – in states with a lower level of efficiency, the rate of improvement of this quality is higher. Hungary was an exception, though, as in this state, efficiency increased by merely 2.1 per cent between 2007 and 2011, i.e. below the EU average of 3.3 per cent. It is worth noting a high rate of changes with respect to efficiency in Bulgaria (+38.0%), Slovakia (+27.4%), Lithuania (+24.6%), the Czech Republic (+19.7%), and Poland (+17.7%). The state standing out from among the other countries under analysis in a negative way was Great Britain whose efficiency decreased by 13.7 per cent<sup>46</sup>.

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<sup>45</sup> Only in 2010, the rate amounted to 69.85 per cent.

<sup>46</sup> This country was quite severely affected by the crisis – GDP per capita dropped from 118 per cent of the European average in 2007 to 105 per cent in 2011.

**Table 14.5. Efficiency (value of the GDP/number of employed people) in the selected EU member states between 2007 and 2011 (in thousand Euros)**

State/year	2007	2008	2009	2010	2011	change 2011/2007
UE 28	58.51	58.25	55.90	58.81	60.42	3.3%
Belgium	78.78	79.86	79.11	81.48	84.27	7.0%
Bulgaria	9.80	10.85	11.09	12.04	13.52	<b>38.0%</b>
Czech Republic	28.04	32.18	30.07	32.01	33.57	<b>19.7%</b>
Spain	52.52	54.53	56.47	57.73	58.36	11.1%
France	76.15	77.10	75.64	77.79	79.97	5.0%
Italy	69.34	69.77	68.35	70.20	71.36	2.9%
Cyprus	46.06	49.02	48.11	48.24	48.94	6.2%
Lithuania	20.01	22.91	20.45	22.44	24.93	<b>24.6%</b>
Luxembourg	177.20	185.39	166.18	178.31	188.66	6.5%
Hungary	25.79	27.62	24.69	25.87	26.33	2.1%
Netherlands	71.92	73.99	71.85	75.45	76.83	6.8%
Austria	70.10	71.38	70.19	71.82	74.49	6.3%
Poland	20.58	23.02	19.83	23.25	24.23	<b>17.7%</b>
Portugal	34.46	34.96	35.31	36.73	37.17	7.9%
Slovenia	35.68	38.10	36.88	37.49	39.39	10.4%
Slovakia	23.78	26.99	26.96	29.00	30.30	<b>27.4%</b>
Great Britain	74.32	64.95	57.52	62.77	64.10	-13.7%

Source: prepared by the author of the paper on the basis of data obtained from Eurostat.

As mentioned earlier while presenting previous research results, it should be expected that business dynamics – turnover should contribute to the improvement of efficiency and stimulate economic growth. We have made an attempt at verification of these correlations. Unfortunately, the time series of data which were available to us caused our examination to be severely limited. Analysing the correlation between enterprise turnover and efficiency with the use of Pearson's correlation coefficient, the level of significance (p) was found to be lower than 0.05 only for one state<sup>47</sup>. The calculated correlation coefficient could thus be reliably interpreted only in the case of this one state. Such a result was achieved for Austria. There is a strong correlation (0.942) between the values under analysis observable for this state. In other words, an increase in enterprise turnover increases economic efficiency in this country. A similar result was obtained while examining the correlation

<sup>47</sup> The number of years of observation was 5. The period between 2007 and 2011 was analysed due to its heterogeneity and availability of data. As far as enterprise turnover presented in table 14.3 is concerned, data are presented in accordance with NACE Rev. 1.1 (industry and services except management activities of holding companies; public administration and community; services; activities of households and extra-territorial organizations) and starting from 2008 in line with the Statistical Classification of Economic Activities in the European Community NACE Rev. 2 (excluding activities of holding companies).



between enterprise turnover and the GDP. This time, assuming  $p < 0.05$ , a relatively strong correlation between the examined variables was noted for three states – Austria (0.913), Lithuania (0.795), and Cyprus (0.794).

Interesting conclusions may be drawn from an analysis of the correlation between enterprise turnover and the rate of unemployment.

**Table 14.6. Unemployment rate by sex and age groups – annual average (in percentages)**

State/year	2007	2008	2009	2010	2011
UE 28	7.2	7.0	8.9	9.6	9.6
Euro zone 18	7.5	7.6	9.6	10.1	10.1
Belgium	7.5	7.0	7.9	8.3	7.2
Bulgaria	6.9	5.6	6.8	10.3	11.3
Czech Republic	5.3	4.4	6.7	7.3	6.7
Denmark	3.8	3.4	6.0	7.5	7.6
Germany	8.7	7.5	7.8	7.1	5.9
Estonia	4.6	5.5	13.5	16.7	12.3
Ireland	4.7	6.4	12.0	13.9	14.7
Greece	8.4	7.8	9.6	12.7	17.9
Spain	8.2	11.3	17.9	19.9	21.4
France	8.0	7.4	9.1	9.3	9.2
Croatia	10.0	8.9	9.6	12.3	13.9
Italy	6.1	6.7	7.8	8.4	8.4
Cyprus	3.9	3.7	5.4	6.3	7.9
Latvia	6.1	7.7	17.5	19.5	16.2
Lithuania	4.3	5.8	13.8	17.8	15.4
Luxembourg	4.2	4.9	5.1	4.6	4.8
Hungary	7.4	7.8	10.0	11.2	10.9
Malta	6.5	6.0	6.9	6.9	6.4
Netherlands	3.6	3.1	3.7	4.5	4.4
Austria	4.4	3.8	4.8	4.4	4.2
<b>Poland</b>	<b>9.6</b>	<b>7.1</b>	<b>8.1</b>	<b>9.7</b>	<b>9.7</b>
Portugal	8.9	8.5	10.6	12.0	12.9
Romania	6.4	5.6	6.5	7.0	7.2
Slovenia	4.9	4.4	5.9	7.3	8.2
Slovakia	11.2	9.6	12.1	14.5	13.7
Finland	6.9	6.4	8.2	8.4	7.8
Sweden	6.1	6.2	8.3	8.6	7.8
Great Britain	5.3	5.6	7.5	7.8	8.1

Source: Eurostat,

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00142> accessed on 24 November, 2014, last updated on 6 November, 2014.

At the significance level  $p < 0.05$ , reliable indicators of correlations were found for Bulgaria, the Czech Republic, Cyprus, Lithuania, the Netherlands, and Great Britain. The unemployment rate was positively correlated with enterprise turnover in the Czech Republic (0.917) and Cyprus (0.966). A negative correlation was found for Bulgaria (-0.850), Lithuania (-0.844), the Netherlands (-0.856), and Great Britain (-0.875). The positive correlations in the Czech Republic and Cyprus may be connected with a relatively high level of entrepreneurship in these countries (the highest in the Czech Republic) – calculated as the number of entrepreneurs per 1000 citizens, the number of the self-employed as a proportion in the total number of working people (Cieślik, 2014, p. 101), and, at the same time, lower in comparison to other EU member states level of employment in an average company in these states oscillating around 5 people. Therefore, an increase in enterprise turnover in the Czech Republic and Cyprus may cause serious disturbances on the labour market within a short or medium period of time. The phenomenon that we have observed may serve as confirmation of a claim previously made by Fritsch and Mueller that an increase in enterprise turnover may initially be negatively correlated with the level of employment (Fritsch & Mueller, 2008).

Business dynamics are endowed with experimentation. It is not, however, the only feature of this phenomenon but it certainly plays a major role in it. J. Kornai claims that the process of creation of innovation is connected with experimenting, which means that there are ten or even a hundred failures behind one successful attempt (Kornai, 2013, p. 196). Thus experimenting, improvement of efficiency, and seeking better more effective solutions underlies creation of innovation. Nonetheless, there is no simple pattern that one could use to ensure that after a certain number of attempts, one will enter a higher level of innovation. Moreover, there is objective difficulty standing in the way of identifying the level or extent of innovation. The notion of innovation is attributed an enormous range of meanings and its character is anything but precise (Duraj & Papiernik-Wojdera, 2010, p. 61). The attempts made at defining the extent of innovation require a lot of partial variables to be taken into account, which is one reason for its deep inner diversity and does not foster unambiguous analysis of the phenomenon. We have made an empirical attempt at finding a correlation between enterprise turnover and innovation with the use of the *European Innovation Scoreboard*. Unfortunately, we have not obtained results that could be subject to interpretation. One of the factors contributing to our failure was surely a too short time series of data but it was also the difficulty we experienced in identifying the phenomenon of innovation that stood in our way.

## **14.5. Conclusions**

The conducted analysis allowed to formulate the following conclusions:

- despite certain negative aspects connected with e.g. loss of human capital in the period of lack of employment (Eliasson, Johansson & Taymaz, 2005), the dynamics of the process of creation and shutting down of companies are essentially seen as a positive phenomenon which may contribute to economic growth and improvement of competitiveness of a given economy;
- there are major differences among states in terms of the values of indicators characterising demographic processes occurring among enterprises, such as the birth rate, the death rate, enterprise turnover, or the rate of survival;
- Lithuania is undoubtedly a country with a very high rate of turnover as between 2007 and 2011 it fluctuated around 39 and 49 per cent; which had a direct impact on a very low 2-year rate of survival that ranged between about 29 and 48 per cent in the period under analysis; in spite of high "mortality" among Lithuanian business entities, as demonstrated by the conducted statistical analysis, an increase in enterprise turnover in Lithuania had a positive influence on the GDP as well as on reduction in the rate of unemployment;
- an example of a state with very low enterprise turnover is Cyprus for which the sum of births and deaths between 2007 and 2011 ranged between 5.25 and 14.46 per cent; it is interesting that it was possible to confirm a relatively strong correlation between the rate of turnover and the GDP in the case of this state as well; the conducted statistical analysis has shown, however, that greater dynamics in terms of creation and termination of companies caused (at least in the period of transition) the unemployment rate to rise in Cyprus (the situation was similar in the Czech Republic);
- in the case of Austria, it was possible to statistically confirm a strong positive correlation between enterprise turnover and the efficiency of the economy;
- although it was not possible to statistically confirm the correlations between the studied values in the case of Poland, it seems that the indicators characterising demographic processes taking place among business entities raise no concerns; enterprise turnover was stable between 2007 and 2011 and fluctuated around 22 and 25 per cent and the rate of births was higher than the rate of deaths each year; simultaneously, there was an increase in efficiency, which was measured with the relation of the GDP to 1 employed person, as it increased by 17.7 per cent (higher efficiency was recorded only in Bulgaria, Lithuania, Slovakia, and the Czech Republic between 2007 and 2011); if we add a considerably high 2-year rate of survival of about 70-75 per cent

(which is one of the highest in the group of 8 new EU member states that were admitted between 2004 and 2007) to the picture, we may notice that the dynamics in terms of starting and closing business activity down did not have a negative influence over the level of unemployment in Poland (in the period under analysis, the unemployment rate increased by only 0.1 pp and was below the average in the EU).

## **CHAPTER 15**

### **DO POLISH LEGAL PERQUISITES TO DECLARE BANKRUPTCY CORRESPOND WITH ECONOMIC ONES?**

#### **15.1. Introduction**

Recently, in Polish jurisprudence takes place the discussion about the perquisites to declare bankruptcy. Abovementioned issue can be considered from two different approaches: economic and legal. Each approach have specific requirements for the perquisites of bankruptcy.

Generally, from the economic point of view, the debtor shall be considered as bankrupt if he cannot settle his debts (lack of liquidity) and total value of his assets is not sufficient to cover all his obligations (insolvency) (Prusak, 2001, p. 80; Tokarski, 2012, p. 174). Altman and Hotchkiss (2007, p. 19) defined two kinds of insolvency: technical insolvency and insolvency in sense of bankruptcy. Technical insolvency exists when a firm cannot meet its current obligations, signifying a lack of liquidity. Such insolvency may be a temporary condition, although it is often the immediate cause of formal bankruptcy declaration. Besides cessation of payments must be caused by impossibility to perform the obligation, not the debtor's indolence or negligent accounting. The measurement of technical insolvency is subject to discussion. The latter kind (insolvency in sense of bankruptcy), usually indicates a chronic rather than temporary condition. A firm finds itself in this situation when its total liabilities exceed a fair valuation of its total assets. The real net worth of the firm is, therefore, negative. To meet the requirements of economic bankruptcy the debtor must satisfy the requirements of technical insolvency (also referred to as cash flow insolvency) as well as the requirements of insolvency in sense of bankruptcy (balance sheet insolvency), (Prusak 2001, p. 80; Świerk & Banach, 2013, p. 441).

The legal perquisites to declare bankruptcy differ in various states. Current Polish regulation is considered to be one of the most restrictive in Europe. According

to current regulation contained in art. 10 of Polish act of 28 February 2003 – The Law on Bankruptcy and Reorganisation (hereinafter referred to as: BRL)<sup>48</sup>:

*The bankruptcy shall be declared with respect to a debtor who has become insolvent.*

Article 11 BRL:

1. *A debtor is considered to be insolvent when it fails to perform its due pecuniary obligations.*
2. *A debtor who is a legal person or an unincorporated organisational unit granted legal capacity by a separate law shall also be deemed insolvent when the sum of its obligations exceeds the value of its assets, even if the debtor duly performs these obligations.*

It is sufficient if the debtor fulfils any perquisite. In consequence, abovementioned articles state that the grounds to declare bankruptcy exist if the debtor possesses due pecuniary obligations in regard to at least two creditors, regardless of liabilities' value, as well as of the proportion of amounts due to the total value of debtor's assets. The debtor is obliged to file for bankruptcy no later than within two weeks of the date on which the basis for declaring bankruptcy occurred.

## 15.2. Polish regulation in practice

According to current regulation, two creditors, for instance telephone operator and Internet service provider, could theoretically commence the procedure leading to declaration of bankruptcy. Obviously there exists the negative perquisite of bankruptcy declaration contained in art. 12 BRL, when the delay in performing the obligations does not exceed three months and the amount of unperformed obligations does not exceed 10% of the balance sheet value of the debtor's enterprise, but in this case, the dismissal of the petition is only optional, and even if the petition will be dismissed, the procedure could cost the debtor a lot of money and stress.

The insolvency proceedings are also used by the creditors as a means to force the debtor to satisfy the specific creditor's claim, rather than to collectively pursue the claim. The intensification of abovementioned practice can be observed in recent years. As an example can be cited the Polimex-Mostostal S.A. case. In 2014, the creditors submitted 22 petitions for bankruptcy of the company<sup>49</sup>, none of them effectively. Subsequently, the petitions were either dismissed or rejected or withdrawn. In this way creditors aim to induce the debtor to satisfy their claims

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<sup>48</sup> Act of 28 February 2003 Bankruptcy and Reorganisation Law (Ustawa z dnia 28 lutego 2003 roku Prawo upadłościowe i naprawcze, Dz.U. 2012.1112 j.t.).

<sup>49</sup> Source: <http://www.polimex-mostostal.pl/pl/relacje-inwestorskie/raporty-biezace/2014>.

and after receiving satisfaction, they withdraw the petition, as they lose the legitimation to pursue the petition. Hence, the court is obliged to dismiss the case. In such situations the creditors' actions contradict the fundamental function of bankruptcy law. In addition, it causes detriment to another creditors, diminishing the debtor's assets, in favour of one, specific creditor.

When the creditor files the petition to declare debtor's bankruptcy, art. 31 BRL states that the court may admit expert evidence in order to examine both the condition of the debtor's enterprise and manager's observation of the time limit to submit the petition. Courts usually admit this evidence. During bankruptcy perquisites' examination expert evaluates:

- liabilities, including: liabilities according to recent annual financial report, current liabilities according to book accounts, liabilities overdue, liabilities overdue for more than 3 months (if the delay in performing the obligations does not exceed 3 months and the amount of unperformed obligations does not exceed 10% of the balance sheet value of the debtor's enterprise, the petition may be dismissed),
- fair value of the enterprise,
- insolvency costs,

Finally, the expert makes the observation if the debtor is insolvent, as well as if he fails to perform his due pecuniary obligations. The expert also makes a statement about the liabilities overdue for at least 3 months. If the debtor's assets are sufficient to cover the costs of proceedings and negative perquisites are not fulfilled, the court shall declare bankruptcy of the debtor.

### **15.3. Economic postulates with regard to optimal bankruptcy law**

At the very beginning of economic perquisites characterisation, it is necessary to shortly introduce the concept of agency conflict. Manager is the person that has the most complete knowledge about the state of the company. Consequently, he shall be the only one entitled to file for bankruptcy of company, he governs. Unfortunately, as Jensen and Meckling (1976, pp. 305-311) argue, due to agency conflict, the managers aim to maximize their utility. Hence, the manager, in absence of effective incentive instruments (as pecuniary benefits or criminal and quasi-criminal penalties), will delay or prevent filing the petition for bankruptcy. Therefore, the bankruptcy laws must provide for relevant incentives<sup>50</sup> for the managers to

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<sup>50</sup> It must be noted that the incentive mechanisms shall not be too strict. Excessive strictness may lead to lower absolute level of innovation by firms, as well as relatively lower innovation by firms in technologically innovative industries. When creditor rights are stronger, technologically innovative industries employ relatively less leverage and grow disproportionately slower. To learn more in this issue see: Acharya, Subramanian (2009). The authors provide empirical support for this claim.

file the petition, as well as necessary instruments for the creditors, allowing to secure their interest.

However, it is almost impossible to create universal model of specific bankruptcy perquisites. Each country's economic system shows differences in comparison to model economy. Besides the economies change, sometimes very rapidly. In addition, the models that compare different microeconomic factors become obsolescent. The phenomenon can be observed on the example of bankruptcy prediction models, that use the data contained in the companies' balance sheets. As Prusak (2005, pp. 173-182) proves, such models are susceptible to, and become obsolete under influence of:

- legislative changes (for instance amendments to the accounting act<sup>51</sup> from 2002 caused obsolescence and reduced the effectiveness of models formulated on the basis of balance sheets prepared in accordance to previous legal regulation),
- the method of accounting (in Poland there are present two models of presenting results in balance sheets: first model contained in Polish Accounting Act and second – International Financial Reporting Standards),
- changes in the national economy.

As the empirical research shows (see for instance: Prusak, 2005, pp. 105-171; Hołda, 2001, pp. 69-79; Hadasik, 1998, pp. 165-169; Godlewska, 2010, p. 705), all models are not 100% effective. Finally, it should be noted that the bankruptcy perquisites serve to *ex post* observations, while models of bankruptcy prediction are used to prognosticate the company's situation *ex ante*. *Ex post* observation does not require such scientific instruments. In addition, scientific instruments require specialised knowledge, allowing to use them. The managers, especially in small enterprises, often do not possess such knowledge. Thus, it would create an obstacle to efficient bankruptcy system.

Nevertheless, some economists attempt to build the optimal bankruptcy perquisites models. They focus on the incentives to declare bankruptcy and legal models rather than on the study of balance sheets. One of the models was formulated by Berkovitch and Israel (1999, pp. 360-368). The authors proposed two mechanisms: one that is optimal for informed creditors economy and second, for uninformed creditors economy. Subsequently the authors combined abovementioned mechanisms to propose laws for: market-based system, bank-based system and under developed system. As Polish economy is considered to be bank-oriented (see Oplustil, 2010, pp. 289-293), below there is cited law proposed for such system:

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<sup>51</sup> Act of 29 September 1994 Accounting Act (Ustawa z dnia 29 września 1994 Ustawa o rachunkowości, Dz.U. 1994 nr 121 poz. 591 z późn. zm.).



*When creditor commences bankruptcy:*

1. *The creditor allows the manager to make a take-it-or-leave-it offer to the creditor.*
2. *The creditor rejects the offer, the court liquidates the firm and pays the proceeds from liquidation to the creditor.*
3. *If the creditor accepts the offer, it becomes the new debt contract.*

The authors argue that in bank-based system there suffices the creditor's chapter and the debtor need no possibility to file for bankruptcy. According to them, by allowing the manager to submit a take-it-or-leave-it offer, the mechanism prevents the creditor from profiting by strategically commencing bankruptcy, when he learns that the firm is about to continue efficiently. Thus this mechanism enables an uninformed court to implement the best outcome by simultaneously giving the creditor the highest cash flow possible when the firm is liquidated and giving the manager just enough power to prevent any attempt by the creditor to strategically use the mechanism.

Abovementioned mechanism could function only in ideal world. In reality, the creditors never have full information about the company. The model could refer only to big enterprises, where the managers either are obliged to disclose information to the public or strategic creditors have their representatives in the supervisory board. Complete information concerning small firms is much more difficult to acquire. Besides it is difficult to find good reason supporting lack of debtor's possibility to file for bankruptcy.<sup>52</sup> However, the possibility to submit the take-it-or-leave-it offer in case, when the creditor files for bankruptcy of the debtor could be very interesting possibility of restructuring the debt (preventing the declaration of bankruptcy) as well as it would probably block the unwanted actions of the creditors aiming to strategically file for bankruptcy in order to induce the debtor to satisfy the specific claim.

In Polish economy Hołda (2012, pp. 69-79) postulates the introduction of the fair value category to BRL so that during the evaluation of bankruptcy/insolvency prerequisites, especially one relating to capital shortage (balance-sheet insolvency), the market value of assets was taken into account. The postulate shall be considered as reasonable. The fair value is more relevant to liquidation and collective pursuit of the creditors' claims than broadly used method based on historical cost. Nevertheless, fair value estimation may be, in some cases, inconvenient. Sawicki (2012, pp. 97-111) shows disadvantages connected with fair value method. The author points out that the procedure of valuation is complicated and costly, bears a possibility of subjectivation, the result is hard to verify. Despite abovementioned

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<sup>52</sup> One of the reasons could be that the manager shall seek the possibility to eliminate the state of insolvency instead of filing for bankruptcy, but often the companies' situation cannot be repaired.

inconveniences, fair value method would be much more suitable for bankruptcy procedures than historical cost method. The postulates pointed by Hołda (2012) are worth sharing, although, despite that the fair value method is not implemented to BRL during expert valuation for the purposes of examination of grounds for bankruptcy, the expert values the enterprise in accordance to fair value method.

#### 15.4. Foreign bankruptcy laws

European Union regulates part of insolvency law through European Insolvency Regulation (hereinafter referred to as: EIR)<sup>53</sup>, but the scope of EIR does not cover the insolvency prerequisites. EIR focus rather on multinational and procedural problems. However, on 15 November 2011 European Parliament adopted the resolution with recommendations to the Commission on insolvency proceedings<sup>54</sup>. In detailed recommendation, contained in annex to the resolution, the European Parliament proposes harmonisation of the conditions under which insolvency proceedings may be opened. The European Parliament considers that a directive should harmonise aspects of the opening of proceedings in such a way that proceedings could be opened if the debtor is insolvent, in example unable to satisfy the payment obligations; if the request is made by the debtor, the proceedings could also be opened if the debtor's insolvency is imminent, in example if the debtor is likely to be unable to satisfy the payment obligations. The recommendation is not binding upon, but hopefully will lead to adoption of the directive. Harmonisation of some aspects of insolvency laws on the European level would increase legal certainty, that is significantly important in respect of free movement of capital within EU.

As the Polish regulation is thought to be strict and inefficient, European Union provides no regulation (except guidelines for EU legislative institutions), it is worth to cite and to compare another states' regulations. In current article will be cited British and French regulations. British Insolvency Act 1986 contains two chapters: creditor's and debtor's. In accordance to first:

*Section 267*

*(1) A creditor's petition must be in respect of one or more debts owed by the debtor, and the petitioning creditor or each of the petitioning creditors must be a person to whom the debt or (as the case may be) at least one of the debts is owed.*

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<sup>53</sup> Council Regulation (EC) No 1346/2000 of 29 May 2000 on insolvency proceedings, Official Journal of the European Communities L 160/1.

<sup>54</sup> European Parliament resolution of 15 November 2011 with recommendations to the Commission on insolvency proceedings in the context of EU company law. Insolvency proceedings in the context of EU company law. (2011/2006(INI)), P7\_TA(2011)0484, Official Journal of the European Union CE 153/1.

*(2) ..., a creditor's petition may be presented to the court in respect of a debt or debts only if, at the time the petition is presented —*

*(a) the amount of the debt, or the aggregate amount of the debts, is equal to or exceeds the bankruptcy level,*

*(b) the debt, or each of the debts, is for a liquidated sum payable to the petitioning creditor, or one or more of the petitioning creditors, either immediately or at some certain, future time, and is unsecured,*

*(c) the debt, or each of the debts, is a debt which the debtor appears either to be unable to pay or to have no reasonable prospect of being able to pay, and*

*(d) there is no outstanding application to set aside a statutory demand served (under section 268 below) in respect of the debt or any of the debts.*

*(4) "The bankruptcy level" is £750 but the Secretary of State may by order in a statutory instrument substitute any amount specified...*

Section 268 specifies the notion of "inability to pay":

*(1) For the purposes of section 267(2)(c), the debtor appears to be unable to pay a debt if, but only if, the debt is payable immediately and either —*

*(a) the petitioning creditor to whom the debt is owed has served on the debtor a demand (known as "the statutory demand") in the prescribed form requiring him to pay the debt or to secure or compound for it to the satisfaction of the creditor, at least 3 weeks have elapsed since the demand was served and the demand has been neither complied with nor set aside in accordance with the rules, or*

*(b) execution or other process issued in respect of the debt on a judgment or order of any court in favour of the petitioning creditor, or one or more of the petitioning creditors to whom the debt is owed, has been returned unsatisfied in whole or in part.*

*(2) For the purposes of section 267(2)(c) the debtor appears to have no reasonable prospect of being able to pay a debt if, but only if, the debt is not immediately payable and—*

*(a) the petitioning creditor to whom it is owed has served on the debtor a demand (also known as "the statutory demand") in the prescribed form requiring him to establish to the satisfaction of the creditor that there is a reasonable prospect that the debtor will be able to pay the debt when it falls due,*

*(b) at least 3 weeks have elapsed since the demand was served, and*

*(c) the demand has been neither complied with nor set aside in accordance with the rules.*

On the other hand, the grounds for debtor's petition are much more facilitated in comparison with creditors' ones. They are specified in section 272:

(1) *A debtor's petition may be presented to the court only on the grounds that the debtor is unable to pay his debts.*

(2) *The petition shall be accompanied by a statement of the debtor's affairs containing —*

*(a) such particulars of the debtor's creditors and of his debts and other liabilities and of his assets as may be prescribed, and*

*(b) such other information as may be prescribed.*

As can be observed, the requirements for creditor's petition are much more strict than ones concerning debtor's petition. The creditor's motion needs to meet the legal conditions regarding bankruptcy level<sup>55</sup>, unsecured debt and legally defined inability to pay the debt. The concept of bankruptcy level seems artificial. It has no regard on the size and abilities of the debtor (it is unjustified to refer to the same quota level in case of small enterprise and gigantic international company). Probably percentage level, related to total value of debtor's assets would be more suitable. On the other hand, debtor's petition is dependent neither upon the bankruptcy level nor legal definition of inability to pay. Such model seems to be reasonable. It relies on debtor's business judgement, as well as prevents the creditor from filing strategic bankruptcy petitions.

French Code de Commerce provides for two kinds of bankruptcy procedure. According to article L631-1 constituting the *procédure de redressement judiciaire* (reorganization procedure):

*This article institutes a reorganization procedure available to any debtor (...) which, being unable to pay its accrued liabilities with its quick assets, is in a state of cessation of payments. The purpose of the reorganization procedure is to allow the continuation of the business's operations, the maintenance of employment and the settlement of its liabilities. It shall give rise to a plan to be confirmed by a court ruling at the end of an observation period and, as the case may be, to the formation of two committees of creditors...*

Consequently, the procedure of liquidation (*liquidation judiciaire*) can be opened, when the perquisites of article L640-1 of Code de Commerce are met:

*(...) a liquidation procedure (is) available to any debtor (...) that is in a state of cessation of payments and whose reorganization is manifestly impossible. The purpose of the liquidation procedure is to end the business activity or to sell the debtor's assets through a general or separate sale of its interests and property.*

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<sup>55</sup> Recently in United Kingdom, there has been discussed the increase of the sum; the level of 750 £ which has been in place for almost 30 years, is considered to be "no longer fair or reasonable"; see: <http://www.out-law.com/en/articles/2014/august/uk-government-consults-on-increasing-minimum-debt-before-creditors-can-trigger-bankruptcy-proceedings/>.

Both debtor and creditor can commence both procedures on the same basis (the creditor's petition has no stricter requirements in comparison to debtor's petition). The French regulation of prerequisites to declare bankruptcy is similar to Polish article defining cash flow insolvency.

### **15.5. Governmental project to amend the grounds for bankruptcy petition**

Abovementioned governmental draft was submitted to the Speaker of the lower house of the Parliament on 9 October 2014. On 21 October 2014 the draft was sent to first reading, that took place on 5 November 2014. According to governmental plans the amendment is to enter into force on 1 January 2016.<sup>56</sup> After amendments to article 11 of BRL, the prerequisites to declare bankruptcy shall be as follows:

1. *A debtor is insolvent when it lost the ability to perform its due pecuniary obligations.*
2. *The debtor is presumed to have lost the ability to perform its due pecuniary obligations, if the delay in making the pecuniary performance exceeds three months.*
3. *A debtor who is a legal person or an unincorporated organisational unit granted legal capacity by a separate law is insolvent also when the sum of its pecuniary obligations exceeds the value of its assets, and this condition sustains during the period exceeding twenty four months.*
4. ...
5. *In the pecuniary obligations referred to in paragraph 3 above, are not included future obligations, obligations on the condition precedent and obligations with respect to shareholder under the contract of loan or other legal act...*
6. *It is presumed that the sum of debtor's pecuniary obligations exceeds the value of its assets, when in accordance to the balance its liabilities, excluding: provisions for liabilities, long-term liabilities to related parties and short-term liabilities to related parties trade liabilities, maturing above twelve months will exceed the value of its assets, and this condition sustains during the period exceeding twenty four months.*

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<sup>56</sup> <http://ms.gov.pl/pl/informacje/news,6983,skuteczne-i-odformalizowane-postepowanie.html>

7. *The court may dismiss the petition for bankruptcy, if there is no risk of loss of the debtor's ability to perform due pecuniary obligations during short period of time.*
8. *Paragraphs 3-7 apply not to partnerships defined in act of 15 September 2000 – Commercial companies code, in which at least one partner liable to the creditors for the obligations of the partnership without limitation is natural person.*

In accordance to new article 12a of BRL:

*The court will dismiss the petition to declare bankruptcy filed by the creditor, if the debtor proves that the receivable is disputable, and the dispute arose before filing for bankruptcy.*

The draft stipulates introduction of article 29a of BRL:

1. *The court may consider withdrawal of the application inadmissible, if it would be to the creditor's detriment.*
2. *Performance of the debtor's obligation in relation to the creditor after filing the petition for debtor's insolvency has no influence on the bankruptcy proceedings.*

The project shall be considered as the step in the right direction. It aims to modernise Polish bankruptcy law as well as to eliminate selected pathological phenomena from Polish legal practise.

Firstly, the project amends the definition of cash-flow insolvency. It requires that the debtor lost its ability to perform due, pecuniary obligations. Sole failure to perform will not suffice to meet the requirement of "lost ability" in accordance to the draft. It is necessary, so that the poor state of debtor's finances made impossible to perform the pecuniary obligations. Consequently, each examination of the debtor's condition will require evaluation of its financial situation. The entity that does not perform due obligations, for reasons not connected with the financial aspect (for instance when the failure to perform is caused by accident and therefore debtor's state does not allow to submit a transfer order), shall not be considered as insolvent. In fact, from the creditor's point of view it is important, if the debtor is able to pay, rather than if he really paid. The creditor that files for bankruptcy must prove that the debtor lost the ability to pay. To facilitate the creditor's duty, in paragraph 2 of the article, there is proposed the mutable presumption, that when the delay in making the pecuniary performance exceeds three months, the debtor is insolvent.

Secondly, the draft proposed retention, as well as modification of the additional balance sheet prerequisite. After amendment, the balance sheet insolvency will be used only if the state is long-term and lasts at least 24 months. In the justifica-

tion to the amendment, the authors emphasize that the value of assets shall not be evaluated according to balance sheet, but on the basis of real value (transfer value) with the assumption of economic activity continuation.<sup>57</sup> The authors stress that the balance-sheet perquisite is adjusted as much as possible to the economic perquisite of insolvency, but full adjustment would require also introduction of changes to the Accounting Act. Unfortunately, the changes to Accounting Act are not planned in the near future.

Thirdly, the draft includes instruments softening the the strict balance sheet perquisite in paragraphs 7 and 8. Paragraph 7 stipulates the possibility for the court to dismiss the petition, if there is no risk of loss of the debtor's ability to perform due pecuniary obligations during short period of time. Moreover, paragraph 8 excludes from the scope of application of balance sheet perquisite the partnerships, in which at least one partner (that is liable to the creditors for the obligations of the partnership without limitation) is natural person. The exception is justified by the fact that after bankruptcy and liquidation of partnership, there still remains at least one entity, that can be held liable for the obligations of bankrupt partnership, that no longer exists.

Fourthly, articles 12a and 29a are the instruments that aim to eliminate the pathological practices from Polish bankruptcy courts, that were the petitions filed by creditors in order to exert pressure on the debtor, as well as to avoid high costs and excessive length of civil litigation. Drafted amendment grants the court the possibility to dismiss the petition if the receivable is disputable and the dispute arose before the date of filing the petition. Although, under current regulation the courts also practice petition dismissals because of the disputability of the creditor's claim (more in this issue: Sierakowski & Zimmerman, 2013, pp. 97-108), in the draft the possibility is verbally expressed. The second regulation is article 29a that allows the continuation of the insolvency procedure, even if the obligations subject to petition of the creditor would be subsequently performed. As a result, the creditor aiming to induce the debtor to satisfy his claim, will have to take into account that, when he commences the procedure and the debtor has another creditors, his actions will cause bankruptcy, but will not lead to satisfying the claim in other way, than after completing bankruptcy procedure.

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<sup>57</sup> Justification to the governmental draft of Reorganization Law, pp. 66.

## **15.6. Conclusions**

Current Polish regulation of the legal perquisites to declare bankruptcy is very strict and unfit to present economic relations. It also does not correspond with the economic perquisites that shall be met to declare bankruptcy. The economists stress that the bankruptcy in the economic sense requires simultaneous balance sheet and cash flow insolvencies to occur. According to BRL it suffices, if only one of the requirements is met. On the other hand, the legal regulation is probably more convenient for the creditors. It shall be marked that creditors rarely have the knowledge about the debtor's balance sheets. It would be very difficult for the creditor to prove that the debtor is insolvent according to both approaches. Additionally, such construction constitutes very efficient incentive for the manager to declare bankruptcy or to pay sums due without delay. If he does not file for bankruptcy, the creditors would do it instead. In this case manager must take into account that if the firm does not perform due obligations and the level of aggregated liabilities is high, there exists possibility of declaration of bankruptcy. Otherwise the manager, knowing that the balance sheet requirement is not met, could disregard the payment deadlines with impunity.

Secondly, the legal perquisite for cash flow insolvency does not correspond with the economic meaning of this institution. To be legally insolvent, the debtor need not be economically insolvent. It suffice if he does not regulate due pecuniary obligations. The intended amendments would change the situation positively. The draft assume that the debtor must lose the ability to pay.

Thirdly, the perquisite of balance sheet insolvency also need to be amended. The regulation has no regard on the fair value of the firm. Fortunately, the legal practice remedied the situation. In effect, during the examination of balance sheet insolvency the experts use the fair valuation method. Nevertheless, despite above-mentioned inconveniences (described in point 15.3.), the fair valuation method probably shall be expressly introduced to BRL, as well as to the Polish Accounting Act. In current situation the manager of the firm that uses historical method of the valuation, may (hypothetically) have no knowledge that the perquisites to declare bankruptcy are met. Perhaps, the postulate to introduce the fair value method to Accounting Act also needs to be considered. It would provide the consistency of legal regulation concerning bankruptcy and accounting (on domestic and international level).

The negative perquisites that allow the court to dismiss the petition are strict and they need to be met cumulatively. It is economically ineffective. The debtor (who usually is already in difficult financial situation) will have to prove that the



negative circumstances occurred and to bear additional costs of these actions. The changes planned in the draft, switching the burden of proof, are very desirable. After amendment, the creditor (in order to use the presumption) will have to prove that delay in making the pecuniary performance exceeds three months and that the sum of debtor's pecuniary obligations exceeds the value of its assets for longer than twenty four months.

The shape of the regulation allowing the creditors to instrumentally use the regulation to achieve their particular goals is also economically ineffective. The funds of the debtor are wasted in order to fight against the petition, one particular creditor's claim is supposedly satisfied and (if the debtor is really insolvent) none of the bankruptcy functions is fulfilled. Again, planned amendments shall be considered as the step in the right direction.

As to the proposal of Berkovitch and Israel (1999), currently, in Polish regulation, there is no instrument allowing the manager to submit the take-it-or-leave-it offer and, in consequence, to quickly restructure the debt. Of course, bankruptcy with the possibility to make an arrangement is no such instrument, as it often lasts for years, is costly, rarely leads to efficient debt restructuring. The draft of Restructuring Law stipulates new restructuring procedure. If the act will be adopted in such or similar form as the governmental project, probably the manager will be at the disposal of efficient instrument to reconstruct debt's structure. French *procédure de redressement judiciaire* serve similar purposes.

Regarding the discussion about the shape of perquisites (if they shall be more descriptive, as in current and proposed regulation, or arithmetical with regard to balance sheet), it can be stated that the current model is correct. General legal act is not the place for complicated mathematical formulas. Besides, for the managers and entrepreneurs it could seem unclear how to interpret these formulas. They would be forced to seek help of specialists. Currently the mathematical formulas to determine insolvency are used by experts during the pre-bankruptcy procedure and courts still have some extent of discretion during ruling on bankruptcy. Besides, general and descriptive perquisites are less susceptible to changes of other legal acts, as well as economic transformations.

Comparing Polish and English regulations of perquisites to declare bankruptcy, latter seems to be more suitable for modern insolvency law. English regulation facilitates requirements for debtor's petition. It seems to be rational. The manager is better acquainted with the firm's condition and to some extent, his judgement shall be trusted. Secondly, the requirement that the debt, being the reason of the petition, shall be unsecured is also reasonable. The creditor with secured claim is in the better position than other creditors and in case of delay, it can satisfy its claim from the security subject.

Finally, even if (as stated above) current legal regulation of bankruptcy prerequisites does not meet the economic requirements, it may be hoped that after adopting the governmental draft on amendment of BRL and introduction of new reorganizing procedure, some of abovementioned defects will cease to exist. Let us hope that the amendment will come into force as planned.

## **CHAPTER 16**

### **CORPORATE TURNAROUND – BIPRORAF CASE STUDY**

#### **16.1. Introduction**

This chapter is dedicated to a corporate turnaround subject and is based on academic research and practical experience. The structure is as follows. After the introduction, the second section is dealing with literature used for the dissertation. The third section shall explain objectives and methods used in the research. This will lead to the fourth section, which after exploring different approaches to a turnaround situation definition, symptoms and causes of turnaround management will show the research findings and discuss them with a reference to the Biproraf case study. The last section summarizes the research with recommendations for practice and implications for future research.

For the benefit of all its stakeholders companies in decline shall apply proper management techniques in order to emerge back on the growth path. This statement seems to be obvious however in reality the application does not take place or is executed too late which results in permanent company value decay and insolvency. Therefore it is extremely important for the corporate stakeholders to possess sufficient knowledge about symptoms and causes of a corporate decline allowing to raise awareness of the problem on time.

#### **16.2. Literature overview**

This chapter presents turnaround situation theory in all relevant aspects therefore the cycle, symptoms, causes and triggers are dealt with separately relying on different renowned authors.

Firstly the aspect of the turnaround cycle has been comprehensively described in Naresh R. Pandit research titled “Some Recommendations For Improved

Research on Corporate Turnaround”. The research is based on forty seven studies of turnaround and provides a valuable review of different authors approach to the turnaround subject. This research has been particularly useful in providing the theoretical background of the definition and recognition of turnaround cycle by different turnaround researchers including Schendel and Patton (1976), O’Neill (1986b), Pant (1991), Hambrick and Schecter (1983), Chowdhury and Lang (1996). This article has become a base for further literature exploration leading to the research conducted by Grinyer, Mayes, and McKiernan (1990) who analysed triggers of turnaround management.

As far as symptoms and causes of corporate decline are concerned different category approaches has been provided by Donald B. Bibeault (1998) and S. Slatter and D. Lovett (1999) with supporting comments by Błażej Prusak (2004). To support his study Donald B. Bibeault provided results of the survey conducted among 81 chief executives of turnaround companies.

The findings of the above researchers are presented in part 16.4. – Results and discussion.

### **16.3. Research objectives and methods used**

The aim of this chapter is to draw conclusions from the discussion on 1) when is the best timing of turnaround management application and 2) whether the academic research provides sufficient knowledge to company stakeholders to spot and analyze the turnaround situation.

The methodology of this research has been designed in such manner that the turnaround situation subject is decomposed into two parts:

- 1) definition and cycle, trying to address the conclusions of the first discussion;
- 2) analysis of symptoms, causes, triggers which is related to the second discussion.

The discussion is based on literature overview and synthesis which is confronted with a real life example of Biproraf turnaround case study. The case study shall examine how the turnaround theory may have been used to spot the symptoms of Biproraf’s decline and to analyse the causes.

Conclusions are drawn when they arise and are summarized in the last section – conclusions.

## 16.4. Results and discussion

### 16.4.1. What is a turnaround and a turnaround situation

For the clarity of the dissertation the term *turnaround* need to be explained. One of the definitions found in Webster dictionary is as follows:

“a complete change from a bad situation to a good situation, from one way of thinking to an opposite way of thinking, etc.”

While this seems to be straightforward, defining corporate turnaround need more in depth analysis. How can be “change”, “bad” and “good” situation described? The word “change” indicates process, words bad and good suggest there must be some kind of indicator used distinguishing both states from each other. Naresh R. Pandit (2000) suggests the corporate turnaround definition should include two following factors: measurement of performance and definition of turnaround cycle. The performance measurement consists of a very large catalogue of indicators both financial and non-financial therefore care must be taken to use effective mix of financial and non – financial measures. However the research conducted by Naresh R. Pandit (2000) showed that majority of turnaround management studies provide turnaround definitions that rely on profitability and accounting ratios based on profitability (return on assets ROA, return on investment ROI, return on sales ROS) . Only 2 out of 14 studies included non – financial measures:

- 1) mutual confirmation by investors, board members and managers,
- 2) one executive confirmation that the turnaround took place.

Definitions based only on profit measures have some limitations. Above all a gap between profitability and cash level must be considered: lack of profit might be caused by non-cash items due to accounting policy (write offs, depreciation), on the other hand profitable entities that encounter a rapid growth may experience a serious cash crisis leading to a collapse. Therefore it is advised to support financial indicators with qualitative measures and human judgment.

The second ingredient of a corporate turnaround definition is a turnaround cycle which need to be differentiated from a temporary decline cycle. Focusing on permanent decline situations there are number of approaches used to define it. The summary of benchmarks is presented in Table 16.1.

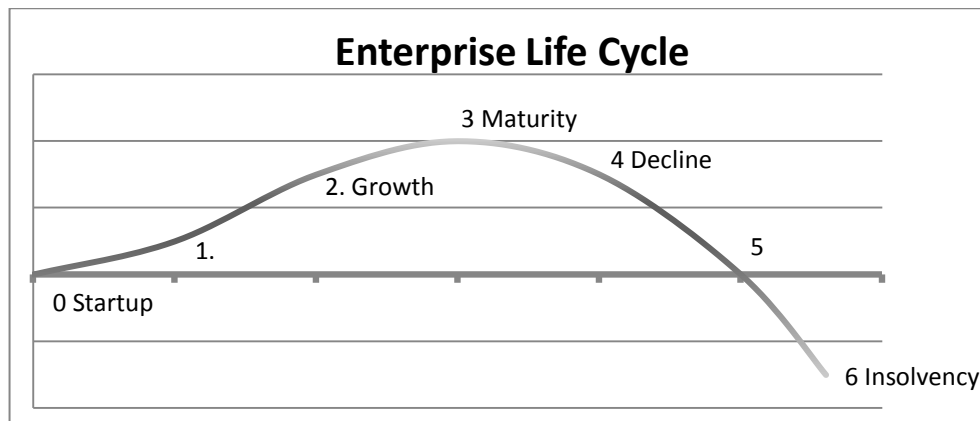
To conclude it is difficult to achieve the fixed definition of turnaround situation. In the competitive business environment the future is hard to predict and if a company fails to spot the signs of its decline introducing transformation plan it may find itself in a turnaround situation. Therefore we may suggest an assumption that turnaround situation refers to the point where the financial and non-financial

performance of a company indicates that it will fail in a foreseeable future unless corrective action is taken. The above discussion on the turnaround definition is illustrated on the Figure 16.1 from the maturity stage to insolvency using an enterprise life cycle concept.

**Table 16.1. Benchmarks of a turnaround cycle**

Study	Benchmark	
	Time	Performance indicator
Schendel and Patton (1976)	Four years of decline followed by four years of growth (allowing for slight deviations from the trend using a regression line).	GNP normalized growth in net income
O'Neill (1986b)	Three years of decline followed by two out of three following years of growth	Industry average normalized growth in net income
Pant (1991)	Two years in the bottom 25% of its primary industry, followed by 4 years out of which two consecutive years in top 25% of its industry	Industry normalized Return on assets (ROA)
Hambrick and Schecter (1983)	2 successive years of pre tax ROI under 10% followed by next 2 years of minimum average of 20%	Pre tax Return on investment (ROI)
Chowdhury and Lang (1996)	Average pre tax ROI less than 10% for 2 consecutive years followed by 2 consecutive years of average 10% pre tax ROI	Pre tax Return on investment (ROI)

Source: Based on: Naresh R. Pandit (2000).



**Figure 16.1. Turnaround situation in an enterprise life cycle**

Source: Based on S. Slatter and D. Lovett (1999).

#### 16.4.2. Symptoms and causes of corporate decline

Given the above the most critical factor is to establish early signs of warning of the turnaround situation. Donald B. Bibeault (1982) suggests 3 categories of symptoms of decline: mathematical forecasting methods, adverse trend signals, behavioral signals.

Most popular mathematical forecasting methods include such model as Robert I. Altman's Z-Score Method or Gambler's Ruin Prediction of Bankruptcy, which are based on values derived from past financial statements. Care must be taken when using these models as they assume the financial statements give true and fair view of a company, which not always is a case. Also, as Błażej Prusak (2004) suggests that in reality analysts apply several different models to the particular case and therefore the results need to be compared in order to choose the most comprehensive model. There are many comparison models measuring power and calibration of particular model available for example: Brier Score, Gini Coefficient or odds ratio.

Another group of symptoms suggested by Donald B. Bibeault (1982) are adverse trend signals that include declining margins, declining market share, rapidly increasing debt, management turnover. In his survey of 81 turnaround company chief executives he showed the following results of particular symptoms importance in Table 16.2.

**Table 16.2. Adverse Trend Signals Ranked by Importance**

Early – warning signal	Ranked first		Weighted rank	
	Number	Percent	Number	Percent
Declining margins	22	32	40	25
Declining market share	16	25	29	18
Debt increasing rapidly	12	19	33	21
Working capital declining	5	8	25	16
Management turnover	4	6	16	10
Other	6	9	17	10
Total	65	100	160	100

Source: Donald B. Bibeault (1982).

According to the survey's results the major signal of decline are deteriorating margins, however the author do not distinguish between different types of margin: gross profit margin, operating profit margin, or net profit margin.

The third category of symptoms is dedicated to behavioral signals. R. Moss Kanter (2012) suggests 9 such symptoms of corporate decline: communication decreases, criticism and blame increases, respect decreases, isolation increases,

focus turns inward, rifts widen and inequities grow, aspirations diminish, initiative decreases, negativity spreads.

Approach presented by Donald B. Bibeault (1982) is mostly based on internal data (except for behavioral signals), which is available for selected stakeholders e.g. senior management, shareholders. However internal information is rarely available for outside stakeholders e.i. customers, suppliers, employees. S. Slatter and D. Lovett (1999) proposed a description of symptoms visible for external stakeholders. They can be grouped as follows (depending on the type of observer):

- Client perspective – declining quality of customers service, invoice factoring, issue of credit notes after the year end, unresolved queries;
- Supplier perspective – late payments, increased supplier's disputes, poor communication, unresolved queries, more strict trade conditions;
- Employee perspective – increasing *blame culture*, slow or lack of decision making, emergency board meeting, lack of internal communication, leadership issues – loss of credibility;
- Auditor perspective – breach of bank covenants, poor working capital management, creative accounting, declining financial performance indicators;
- “Man in the street” – subject of takeover bid, major disaster, not attractive products.

Regrettably the knowledge of symptoms in many cases is not sufficient to trigger a turnaround management. S. Slatter and D. Lovett (1999) show the typical organizational behavior when facing corporate decline. At the first stage crisis is denied and signals are overlooked, then follows a hidden crisis which is believed to disappear and is explained away. At the further stage some action is taken but still there is no sense of urgency. Finally an organization collapses and is not able to take corrective action. Therefore the question that is worth asking at this point is what triggers a turnaround management? Naresh R. Pandit (2000) presented the following data adapted from Grinyer, Mayes, and McKiernan (1990) research in Table 16.3.

The above findings subscribe to the view that majority of turnaround actions are initiated by a new management. It is worth mentioning that 30% of turnaround cases are initiated by external bodies (e.g. lenders) and appointing a new CEO may be treated as a beginning of a turnaround process.

Once the symptoms have been identified it is extremely important to analyze the causes of decline in order to formulate an appropriate turnaround strategy. Grinyer, Mayes, and McKiernan (1988) identified nine principal reasons for declining performance: falling demand, increased competition, poor marketing, poor management, poor financial control, high costs, poor quality, inappropriate



acquisitions, large failed projects. S. Slatter and D. Lovett (1999) came to a similar conclusion classifying the causes into 2 categories: external and internal.

**Table 16.3. Triggers for Change**

Trigger event	Percentage of firms citing this factor
Intervention from external bodies	30
Change of ownership or the threat of such a change	25
New Chief Executive	55
Recognition by management of problems	35
Perception by management of new opportunities	10

Source: Naresh R. Pandit (2000).

Internal causes of decline include:

1. Poor management – in practice poor management can be responsible for all internal causes and some external causes of decline. However this approach would not be practical because most likely just changing management will not fix the problem. Also, as Stephen G. Moyer (2005) suggests the term *poor management* should be further analyzed as incompetent management and conflicted management.
2. Poor financial control – management must produce useful, relevant, timely and accurate information on which to base decisions. Lack of this will cause the underperformance not being identified on time. Some companies rely on intuition and statutory reports that are prepared after the year end, which makes the management information accurate but much delayed and therefore unreliable. Other group of entities use accurate and frequent reports but if a reporting system is poorly designed (too complex, inadequate for the purpose) again the management information will not be reliable.
3. Working capital management insufficient – improper management of debtors, creditors, inventory and cash levels not supported by effective financial control system can result in serious cash crisis.
4. High costs – companies with higher cost structures are more likely to lose market share to their competitors or deteriorate their profit margins to stay competitive.
5. Marketing effort not sufficient – this is often combined with external factors like severe price/product competition. Regardless of an external situation lack of marketing effort exists where salesforce is poorly motivated and has no robust sales manager, an advertising is inefficient, there is lack of a market research and promotional material, there is poor new product development, efforts are not focused on key customers and key products.

6. Overtrading resulting from rapid growth – this may be associated with poor working capital management and lack of financial controls. Rapidly growing sales need effective financing. If generated cash flow and credit facilities are insufficient the entity will find itself in a cash crisis despite being profitable.
7. Big projects including mergers and acquisitions – this include poorly estimated projects that are of significant value for the company. Unsuccessful projects include major contracts with poor project management or underestimated costing, introductions of new products, acquisitions of weak companies, poor post acquisition/integration management.
8. Organizational inertia – most likely to be identified in large companies, when the management is not able to make and/or implement decisions.

External causes of corporate decline theoretically are out of a company scope of influence but again there are approaches that suggest a good management should be able to avoid or mitigate the following external factors:

1. Changes in market demand – a reduction in the demand for a product or service, or a change in the pattern of demand to which the firm does not adjust. A reduction can be long term (due to social/technology/economy changes), cyclical (due to business cycles) or seasonal.
2. Competition – price/product severe competition can lead to a crisis situation. Declining prices lead to decreased profit margins that do not cover fixed costs. Lack of ideas of new products result in product become obsolete, not competitive.
3. Adverse movements in commodity prices – this include not only raw material but also currencies, interest rates.

In conclusion, corporate turnaround situation shall occur if the symptoms of decline are not identified on time and after a root cause analysis corrective action is not taken. When analyzing causes of decline one must remember about interaction of different types of causes. Table 16.4 presents results of a survey on major causes of decline conducted by Donald B. Bibeault in 1978, based on 81 turnaround company cases.

The research proved that majority of the causes are within reach of management and only 8 are outside of management control. This findings corresponds to the results of another research conducted by Grinyer, Mayes, and McKiernan (1990) presented in the Table 16.3 that only 35% of turnaround cases are triggered by a current management, and majority (55%) by a new appointed CEO. To conclude major and general cause of corporate decline is not taking corrective action by management when warning signs are visible.

**Table 16.4. The Principal Reasons for Corporate Decline**

Reason	Percent
Sheer Bad Luck	1
External factors beyond management`s control	8
Real balance of external and internal factors	24
Internal problems triggered by external factors	15
Internally generated problems within management`s control	52

Source: Donald B. Bibeault (1982).

**16.4.3. Biproraf Case Study**

Biproraf is a multi- branch engineering company delivering complex solutions, specializing in petrochemical sector and also in LPG related projects including loading and unloading stations for rail and trucks, gas stations, port terminals, small tanks filling stations and propane gas vessel installations.

The company was founded in 1973 as “Bipronaft”, Design and Execution Enterprise of Refinery Investments – Cracow, Department in Gdańsk. In 1989 the company changed its name to Design and Service Enterprise BiproRaf. In January 2007, KTI Poland S.A., acquired the shares from Lurgi S.A. and Grupa LOTOS S.A. Since August 2011 Automatic Systems Engineering Sp. Z o.o. has been the owner of 100% share capital of the company.

**Symptoms of Biproraf decline**

The selected financial data from year 2010 to 2014 is presented below:

**Table 16.5. Biproraf financial data 2010 – 2014 in 000` PLN**

Financial Year	2009	2010	2011	2012	2013	2014
Sales	11.476	8.838	7.436	12.932	11.242	11.620
Operating Margin %	3%	4%	-5%	5%	6%	9%
Operating Margin	304	393	-339	654	716	1024
Net Profit	414	269	-498	680	500	735
Assets	2.217	3.285	2.135	5.065	3.112	5.934

Source: based on statutory financial statements 2010-2014.

As per the above data adverse trend signals occurred indicated by declining margins and sales. Also the behavioral signs were visible from different stakeholders perspective: 1. clients suffered delays with ordered designs and eventually charged contractual penalties, 2. suppliers were not paid on time, 3. employees developed blame culture and lack of initiative 3. credit providers were reluctant to

arrange credit facilities and contractual guarantees. In spite of the visible deteriorating financial and non financial indicators no turnaround management was applied. As a result of declining results and unsatisfactory forecasts the owner decided to sell the company.

### **Causes of Biproraf decline**

In August 2011 Automatic Systems Engineering acquired 100% of Biproraf's share capital. Even before the takeover the acquisition team identified the major causes of Biproraf's decline:

1. Internal:
  - High costs – both fixed and variable costs were relatively too high. Excess fixed costs included expensive office rent, high IT and accounting fees, overstaffing. Major variable excess cost identified was a salary structure which was not related to the company performance;
  - Marketing effort not sufficient – lack of clear sales strategy, lack of promotional activities, reliance on one customer;
  - Poor working capital management – the entity was not able to obtain performance bank guarantees for their projects which resulted in retention of a portion of receivables during the guarantee period, bank was not able to provide an overdraft facility;
  - Organizational inertia – the company structure was not able to manage significant projects on time, the staff was skeptical about the change, organization was risk averse.
2. External factors:
  - Severe competition – the industrial design market was filled with smaller and more flexible entities with lower cost base;
  - Changes in market demand – market research proved that large design and execution entities operated not only as designers but also as a procurement and construction managers.

The question worth asking at this stage is whether the external factors were within a reach of management control? Can management be blamed for all causes: internal and external? A further subchapter reveals proper treatment of internal causes that allowed to tackle external causes such as fierce competition and adjustment to a market conditions.

### **Turnaround management assignement**

Officially the project started right after the acquisition in August 2011 but in fact key causes and issues had been identified during a due diligence process before the acquisition. The acquired company previously relied heavily on one cus-

tomer and previous owners used the entity as a tool for big refinery project. After the acquisition the major objective was to create a standalone entity ready to compete on national industrial design and execution market.

Key actions executed:

1. Cost reduction – transfer of IT and accounting services to ASE Technology Group shared service center, renegotiation of office rental agreement and ultimate removal to ASE TG premises, renegotiation with employees and trade unions of employment contracts reducing the gross salary and implementing performance bonus system.
2. Marketing effort – introduction of a new logo compatible with ASE TG corporate identity, inclusion of Biproraf identity to ASE TG marketing events (trade shows, technical conferences, seminars), sales trainings for selected employees.
3. Working capital management – overdraft facility renegotiated, invoice discounting arranged when it was necessary, the line for bank performance guarantees arranged by ASE TG bankers, tight spending control introduced, designing process enhanced resulting in faster invoicing.
4. Organizational inertia – the new strategy introduced based on Engineering, Procurement, Construction concept (EPC), during the turnaround project the senior management changed, the new project team leaders were selected and trained to manage significant multi branch projects effectively. Also to support better resource allocation a new IT system was implemented.

Above described responses to internal issues allowed to mitigate the external causes of decline. Biproraf has become more competitive and adjusted to the market demand.

Since the acquisition except for the year 2011 Biproraf financial results have been positive. Currently the firm is organized in two sections – one provides services to oil and gas sector the second, under an internal brand BiproEnergO caters for energy sector. Additionally there are plans to develop interior design section servicing both sectors. The market for engineering services is very dynamic and to stay competitive (profitable) the small corrective action in strategy is being made each year.

## **16.4. Conclusion**

The dissertation proposed the definition of turnaround situation as a point where financial and nonfinancial performance of a company indicates that it will fail in a foreseeable future unless corrective action is taken. The relevant literature

review and synthesis revealed that majority of authors focus on financial performance indicators while there is room for improvement in researching non financial performance indicators of corporate decline. Moreover the financial performance indicators have some serious weaknesses: they are based on financial statements that can be flawed and provide delayed information for other stakeholders than management.

The real life example presented in the case study as well as the literature findings support the view that very often current management do not take corrective action despite symptoms of decline are visible. The majority of turnarounds are triggered by new management and new owners. The Biproraf case also showed that the theoretical approach to causes and symptoms of corporate decline can be applied in practice. Therefore there is a strong recommendation for business leaders to gain further knowledge about turnaround management subject in order to avoid insolvency. It is also hoped that the theory will advance in researching non financial performance indicating turnaround situations which will provide not only managers but all company stakeholders with enhanced guidance in this respect.

This research is limited to qualitative design as the quantitative research designs had already been used as a basis of the analyzed literature. However the author's further studies of this subject plan to design quantitative researches through e.g. questionnaires. The purpose of the Biproraf case study was to verify the findings of the theoretical discussion. The limitation to only one case study results from limited overall availability of detailed information about such cases. The author believes that only participation in a turnaround project can provide a robust case study material therefore in the future it is planned to take part in more of such cases gathering more research material for better understanding of corporate turnaround phenomenon.

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