CONTENTS
Volume 3 Number 3 March 2014

David Luigi Fuschi, Manuela Tvaronavičienė
SUSTAINABLE DEVELOPMENT, BIG DATA AND SUPERVISORY CONTROL: SERVICE QUALITY IN BANKING SECTOR

Kristina Hunke, Gunnar Prause
SUSTAINABLE SUPPLY CHAIN MANAGEMENT IN GERMAN AUTOMOTIVE INDUSTRY: EXPERIENCES AND SUCCESS FACTORS

Aleksandrs Baikovs, Ivars Zariņš
SECURITY OF BUSINESS: COMMERCIAL SECRET’S LEGAL REGIME AND METHODS OF PRESERVATION

Vitolds Zahars, Maris Stivrenieks
SECURITY IMPLEMENTATION FACETS: CONVICTED WOMEN IN PRISON SENTENCE EXECUTION

Jūratė Antanavičienė
FOREIGN DIRECT INVESTMENT: DRIVING FACTORS AND OUTCOMES FOR SECURE AND SUSTAINABLE DEVELOPMENT

Rima Vasiliūnaitė
SUSTAINABLE DEVELOPMENT: METHODOLOGICAL APPROACHES TOWARDS ISSUES
Dear readers,

It's my pleasure and honor to welcome today the eleventh issue of well-established *Journal of Security and Sustainability Issues*. At first, I want to congratulate the publisher of the journal – The General Jonas Žemaitis Military Academy of Lithuania – with the international recognition of its product. As we can see, the journal is abstracted/indexed in numerous international databases, such as EBSCO, RePEC, ProQuest, EconBIZ, Lituanistika, Google Scholar and SCOPUS (Elsevier), what itself witnesses about high scientific quality of papers the journal publishes. Quality is driver of progress, to be it science or lives of societies. Quality compliments and enhances sustainability and conditions security.

Returning to the content of the journal, let me put an emphasis of especially contemporary and urgent scope the *Journal of Security and Sustainability Issues* tackles. Sustainability and security nowadays replaced topics, which practitioners, scientists and politicians were targeting a decade ago, i.e. economic growth, business management and public administration issues. Current concerns embrace more complex phenomena, hence interdisciplinary and convergence of various sciences is necessary as new emerging aspects of development have to be taken into account.

To add from my personal prospective and from point of view of my current responsibilities, I would like to bring your attention to security and sustainability issues related to sector development patterns. Agricultural sector has started to play a crucial role in economies of many countries due to a threat of global population growth, which might mean world resource exhaustion perspective. Alas, an increase in agricultural output does cause green gas emission, which, in its turn, is detrimental outcome of sustainable and secure development aim. This single contradiction illustrates complicity and controversy of path to common wellbeing.

Hence, let us together with *Journal of Security and Sustainability Issues* immerse ourselves into problem-solving process in order through fruitful discussion reveal efficient ways to our affluent, secure and sustainable future.

Kind regards

ŽIVILĖ PINSKUVIENĖ
Vice-minister of the Ministry of Agriculture of the Republic of Lithuania
The Journal of Security and Sustainability Issues is a peer-reviewed journal which publishes original research papers. It is the international journal published cooperating with the institutions indicated on the cover of the journal. It is published quarterly.

Areas of research include, but are not limited to, the following:
- Conceptual Approaches towards Security and Sustainability
- Globalization Processes and Social Security
- Defence and Security Technologies
- Innovations and Technological Development for Security and Sustainability
- Energy Security
- Regulation of the Security Industry
- Transition Issues and Secure Development
- Computer and Information Security
- Human and Environmental Security
- Biodiversity and Ecological Sustainability
- Economic Growth and Sustainable Development
- Economics of Sustainable Organizations and Industries
- Sustainable Entrepreneurship
- Intercultural Communication for Security and Sustainability
- Secure Development of Sector Economics
- Sustainable Finance and Investment
- Strategic Management for Sustainability
- Case Studies in the Process of Secure and Sustainable Development
- Evaluations of Security Measures

All papers published in the Journal of Security and Sustainability Issues are peer-reviewed by the members of the Editorial Board or by its appointed experts.

The papers published in Journal of Security and Sustainability Issues are indexed/abstracted by:

- Business Source Complete
- Sustainability Reference Center
- International Security & Counter Terrorism Reference Center
- ECONIS of the ZBW – Leibniz Information Centre for Economics
- RePEc
- Ulrich's Periodicals Directory
- Ulrich's Periodicals Directory
- Crossref
- Google Scholar
- SCIRUS
- The European Library
- Database Lituanistika
- SCOPUS

EDITORIAL CORRESPONDENCE including manuscripts and subscription
Prof. Dr. Manuela Tvaronavičienė
Tel.: +370 687 83 944
E-mail: manuela@post.omnitel.net, Manuela.Tvaronaviciene@vgtu.lt

JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES
2014, 3(3)

This work is licensed under a Creative Commons Attribution 3.0 License.
SUSTAINABLE DEVELOPMENT, BIG DATA AND SUPERVISORY CONTROL: SERVICE QUALITY IN BANKING SECTOR

David Luigi Fuschi¹, Manuela Tvaronavičienė²

¹Brunel University, Uxbridge UB8 3PH, London, United Kingdom
²Vilnius Gediminas Technical University, Saulėtekio Av. 11, LT-10223 Vilnius, Lithuania
E-mails: ¹David.Fuschi@brunel.ac.uk; ²Manuela.Tvronavičienė@vgtu.lt

Received 15 October 2013; 20 December 2013 accepted

Abstract. Sustainable development process is affected by contemporary phenomena. Big Data processing inefficiency is detrimental for banks’ activity excellence. The software used for running and handling the inter-bank network framework provides services with extremely strict uptime (above 99.98 percent) and quality requirements, thus tools to trace and manage changes as well as metrics to measure process quality are essential. Having conducted a two year long campaign of data collection and activity monitoring it has been possible to analyze a huge amount of process data from which many aggregated indicators were derived, selected and evaluated for providing a managerial dashboard to monitor software development. The paper provides insights about the issues related to Big Data processing inefficiencies. Context of sustainable development is being taken into account.

Keywords: Big Data, banking sector, software reliability assessment; sustainable development.

Reference to this paper should be made as follows: Fuschi, D.L.; Tvaronavičienė M. 2014. Sustainable development, Big Data and supervisory control: service quality in banking sector, Journal of Security and Sustainability Issues 3(3): 5–14. DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(1)

JEL Classifications: C81, C9, F02, G10

1. Introduction

There is unanimous agreement among scientists, practitioners, politicians and civil society that all possible efforts of all societal actors have to be directed toward sustainable development of separately taken countries, geographic and political regions and unions, blocs, more or less advanced societies (Lankauskienė, Tvaronavičienė 2012; Dudzięvičiūtė 2012; Vosylius et al. 2013; Bileišis 2012; Mačiulis, Tvaronavičienė 2013). On the other hand, having agreed on principal direction on rather high level of abstraction, the same protagonists of practice and science immerse into intense ongoing discussion, when level of abstraction has to be lowered and benchmarking of desired state has to be started (Stańczyk 2011; Makšturis et al. 2012; Balkienė 2013; Laužikas, Krasauskas 2013). The problem is that contemporary processes of development due to overwhelmingly rapid development of technologies, and, especially information technologies, start raising new urgent issues, which threaten businesses, industries, economies and societies (Białoskórski 2012; Matei, Savulescu 2012; Raišienė, Jonušauskas 2013). Aim of the presented paper is to discuss and articulate questions, which have to be draw attention of wider audience and serve as ground for further elaboration of scientific discussion in field of sustainable development in digital age of Big Data (Hsinchun et al. 2012; Fuschi, Tvaronavičienė 2014). In order to discuss how Big Data context affects perception, and, further, estimation of sustainable development state and progress, let us briefly overview sustainable development perception evolution.

Sustainable development as already classic concept
embraces economic, social and environmental dimensions of development. All dimensions are being measured by sets of indicators. What particular indicators should comprise those sets, how to integrate and benchmark selected indicators remains a contentious question (Dudzevičiūtė 2012; Makštutis et al. 2012; Laužikas, Krasauskas 2013). Not going into technicalities, let us draw attention to the gradually changing contexts, in which sustainable development processes are being analyzed. Term “security”, starts to be used in economic literature (Białoskórski 2012; Makštutis et al. 2012; Lankauskienė, Tvaronavičienė 2012). At first we talk about social security, later energy security becomes a topicality. Anyway, sustainable development and secure development appears to be related and, in some cases, overlapped (Lankauskienė, Tvaronavičienė 2012; Vosylius et al. 2013). Interrelation between sustainability and security can be graphically depicted (Figure 1; Figure 2).

To generalize, sustainable development, or, rather, economic and technologic development naturally triggers threats, which could be considered as side effect of development (Rašienė, Jonušauskas 2013). To put in other words, threats is development, or “development stage” either “development context” sensitive. Hence, we can generalize that rapid development of IT, IT penetration into virtually all spheres of life and business generated respective “side” effects.

Emerging of Big Data phenomenon conditions necessity of its Critical Infrastructures (CIs) monitor and control. In order to tackle this new threat to sustainable development, let us consider a case study of software random failure in the process of fulfilling tasks in banking sector. Before going into technicalities of the case study, which witness practice, we need to reveal what role Big Data processing plays in sustainable development process and what clarify why Big Data processing lacks control. We will base our elaboration on practical banking sector example.

Here we need to remind readers, who not necessarily are economists, that sustainable development actually is not possible without proper economic growth. There are a lot of theories, schools of economic thought, which try to explain why one country develops faster than other (Borseková et al. 2012; Wahl, Prause 2013). Despite myriad of nuances (Laužikas, Mokšeckienė 2013), which those theories discuss and disagree, there are several fundamental ideas, which do not cause argumentation. Those fundamental ideas are: economic growth requires investments, which are used for acquisition of productive capacities and building infrastructures (Antanavičienė 2014). Productive capacities are being called fixed assets. Very important part of fixed assets is machinery, which is a tool for production (“capital” in economics. Note, in that context term “capital” does not mean “money” (Antanavičienė 2014); “capital” here is fixed capital, comprised of movable part – machinery and immovable – building). In our considered case, specifically, banking case, hardware performs function of “machinery” with all following guarantees provided by “machinery” supplier. Alas, not least role here is being played by software. Software, especially sufficiently expensive, falls under “fixed assets” heading as well.
2. A case study in the banking and financial sector: witnessing Big Data processing shortcomings

Let us now turn to a case study, which will disclose Big Data processing inefficiency in banking sector. For commercial confidentiality reasons the operative con-text and location of the experiment cannot be fully disclosed. We just indicate, that the activity has been conducted in one of the G8 countries within the institutional service provider of the networking and application facilities to the country banking system.

*The institution structure and operation context.* The institution under exam is structured in three main divisions: banking applications, financial markets, and network infrastructure. Each division is responsible for internal software development and maintenance, interaction with subcontractors, service operation, and provision of help-desk services to customers. Provided services are extremely critical being used to manage the country’s financial and banking system. For this reason the provider is subject to strong contractual constraints and commitments (for example a minimum up-time of 99.98%). Based on the criticality of users’ request and the status of its internal operations, the scheduling of new releases is decided and planned carefully, and it is essential to evaluate existing relationship among incidents (i.e. customer reported problems), software anomalies (i.e. possible latent, yet not confirmed, errors), and software development so as to make informed decision for the suitability for release of a specific software release.

*Software engineering practice in place and their revision.* Back in 1994 a first software process improvement initiative aimed to monitor and measure products and processes was carried out. This was accomplished within the context of the ESSI project 21244 MIDAS. Activities were mainly focused on Change Management (CM) procedures, policies, and introduction of related tools (Cugola et al. 1997). Several metrics were regularly collected in relation to software development process and efforts incurred in the development. Available metrics and tools were assessed through a measurement program based on the Goal-Question-Metrics (GQM) paradigm. A further selection of the most relevant and the introduction of some derived indexes resulted in a significant improvement of the software development practices passing from Capability Maturity Model (CMM) level one to level four.

Let us describe metrics, which were used in the case study. The software production and maintenance process relates to a distributed infrastructure providing a full range of services for the management and operation of the national inter-bank network. The overall system was developed, maintained, and operated by the network division. The dimension of the software under exam amounts to more than five millions Lines of Code (LOC) in C programming language. The company attention was concentrated on anomalies management and the consequent impact on software maintenance, test and development process across releases.

*The board of anomalies.* The process to produce high-level indicators and reports evaluating data extracted from collected metrics was initially performed manually. Therefore the first activity performed was the automated extraction of data and report preparation. Anomaly related reports would be the starting point of discussion for Board of Anomalies weekly meeting. During the Board of Anomalies meetings newly opened and already opened anomalies would be individually discussed. Development team leaders would describe works progresses and provide indication on the availability of a fix (or the expected timeframe to such an event). According to the discussion, test activities would be planned; in particular test-on-demand activities could be requested to investigate anomalies origin. Suggested solution, work around, and information gained would then be spread through the company. Both the result of the discus-
sion and the report produced would also be given to the board of directors along with an historical report depicting the anomalies trend.

*Anomalies report automation.* Automation greatly reduced the effort required to produce anomalies report thus enabling its distribution via Intranet. Each project leader / manager could directly access trends and data on-line through a simple dashboard from which to choose what to see and how (overall counts, details, trends, etc.).

According to Malaiy and Denton (1998) the number of residual errors decreases with the testing coverage. Therefore when considering a series of subsequent releases of the same software it is reasonable to expect that an initial peak of anomalies should be found in correspondence with a new release (or a fix) due to introduced changes and enhancements, followed by a constant decrease in anomalies number as testing proceeds. In other words, it is reasonable to expect an overall monotonically decreasing trend towards a lower bound due to the fact that it will be impossible to totally avoid errors. Such behavior is shown in Figure 3.

![Figure 3. Theoretical behavior of anomalies trend](image)

On the other hand if the actual trend, as observed from field measures, is substantially different from the theoretical one, an accurate investigation should be carried out.

*Indicators selection criteria.* While many metrics can be collected, not all of them will be of use. Furthermore, different metrics are of interest to different kind of people. For example, project managers and technicians will be interested in KLOC, number of faults, MTBF, etc.; line managers will be interested in Productivity, Quality, Cost, On-time-delivery, etc.; finally, top managers will be interested in aggregated metrics useful to support decision taking. Metrics can be derived by adopting the model presented in Figure 4 hereafter.
The application of provided above model proved very effective, although it was necessary to add a feedback loop in the process so as to refine both the assumptions and the set of metrics to be used following the comments and requests placed by managers engaged in the process. This allowed achieving the best possible decision making support environment.

The experiment has been conducted processing metrics collected for the following system components:

- MTP - the front-end access point to the transport network (usually resident on a UNIX® machine);
- EAS - the actual application front-end access point to the network (an application usually resident on customer’s mainframe environment and interfacing with one or more MTP).

To ensure the management could base its decisions on a correct evaluation of provided indicators, only data related to software releases used in actual operation have been considered (i.e. releases that were not used in production environment have not been considered). Indexes have been classified in major categories according to the measured object or derivation metric. Examined classes can be summarized as follows. Analyzed indexes categories are provided in Table 1.

**Table 1. Analyzed indexes categories**

<table>
<thead>
<tr>
<th>Product quality</th>
<th>Process quality</th>
<th>Size &amp; Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTBF</td>
<td>MTTF</td>
<td>KLOC</td>
</tr>
<tr>
<td>Total failures</td>
<td>Efficiency degree</td>
<td>KLOCC</td>
</tr>
<tr>
<td>Failure rate</td>
<td>Test quality index</td>
<td>Product change rate</td>
</tr>
<tr>
<td>Integration failure rate</td>
<td>Maintenance test time for KLOC</td>
<td></td>
</tr>
<tr>
<td>Quality index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: normative literature, authors*
Most Key Performance Indicators (KPI) adopted regarding product development life cycle quality assurance have been based on theory (i.e. as per normative literature Gall et al. 1997; Schneiewind 1997). However, there are problems that are not described (or only partially addressed) in literature, therefore some indicators were adapted (or even derived anew) based on observation and practical experience. Indicators selected are reported hereafter.

**Mean Time To Failures (MTTF)**

It shows the mean elapsed time between two consecutive faults (Schneiewind 1997). It is computed as the ratio between total life time ($TL$) and total number of failures during life ($LA$). An increasing trend denotes an improvement in the reliability of the software.

$$MTTF = TL / LA$$  \hspace{1cm} (1)

**Mean Time To Repair (MTTR)**

It gives a synthetic view of the quality of software repair process. A low value implies either that anomalies are of minor relevance or that the repair process is efficient. Here TNA is the total number of anomalies found for the examined release at the time being. A high value denotes that anomalies solution is difficult. This is usually the case when a product is mature and therefore remaining uncovered bugs are difficult to find or solve.

$$MTTR = \left[ \sum_{i=1}^{TNF} (t_{AN \text{ closure}} - t_{AN \text{ opening}}) \right] / TNA$$ \hspace{1cm} (2)

**Mean Time Between Failures (MTBF)**

It gives a synthetic view of the quality of software. In fact if $MTTF$ is high and $MTTR$ is low, the overall process is running smoothly. It can be used for predicting fault occurrence only if derived from a long series of historical data. Anyhow as these are mean values, derived indication should be compared with anomalies distribution, failure rate, effort and elapsed time per process phase.

$$MTBF = MTTF + MTTR$$ \hspace{1cm} (3)

**Total Failures**

It shows the normalized ratio between failures during life and the total amount of changed lines in code. A decreasing trend denotes an improvement in software, only if there is an overall decrease in total number of failures during life ($LA$) as well as an increase in $MTTF$. In the specific case $KLCC$ stands for $KLOC$ changed in code that we have computed as the sum of newly inserted lines with changed and deleted ones.

$$TF / KLOC = LA / KLCC$$ \hspace{1cm} (4)

**Failure Rate (FR)**

Provides an intuitive indication of how the system is running as it is computed as the ratio between total number of failures during life ($LA$) and total life time ($TL$). If it is decreasing the process is running correctly and the product quality and reliability is increasing.

$$FR = LA / TL$$ \hspace{1cm} (5)

**Quality index (Quality)**

This is a very simple indication of product quality if plotted for subsequent releases. It is simple to compute and can give a clear indication of how the product development process is running. If everything is correct it will present a monotonically decreasing trend.

$$Quality = Defect / KLOC$$ \hspace{1cm} (6)

**Availability (AV %)**

This index provides an average indication of the product availability between failures. It is computed taking into account both $MTTF$ and $MTTR$. If the development process was behaving correctly this indicator should decrease in time (it grows linearly with increasing $MTTF$ and decreasing $MTTR$, while it increases in a logarithmic form with increasing $MTTF$ and increasing $MTTR$) (Figure 5).

$$AV \% = (MTTF) / (MTTF + MTTR) \%$$ \hspace{1cm} (7)
Availability vs MTTF and MTTR

<table>
<thead>
<tr>
<th>MTP releases</th>
<th>MTTF</th>
<th>MTTR</th>
<th>AV</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0.4</td>
<td>80,00</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>2.0.5</td>
<td>70,00</td>
<td>45%</td>
<td>50%</td>
</tr>
<tr>
<td>2.2</td>
<td>60,00</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>2.3</td>
<td>50,00</td>
<td>35%</td>
<td>50%</td>
</tr>
<tr>
<td>2.4</td>
<td>40,00</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>2.5</td>
<td>30,00</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>2.6</td>
<td>20,00</td>
<td>20%</td>
<td>50%</td>
</tr>
<tr>
<td>2.7</td>
<td>10,00</td>
<td>15%</td>
<td>50%</td>
</tr>
<tr>
<td>2.8</td>
<td>0</td>
<td>10%</td>
<td>50%</td>
</tr>
<tr>
<td>2.9</td>
<td>0</td>
<td>5%</td>
<td>50%</td>
</tr>
<tr>
<td>3.0</td>
<td>0</td>
<td>0%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Fig.5. Average indication of the product availability between failures

Source: Fuschi, Tvaronavičienė (2014)

Efficiency Degree (ED)

It gives an indication of the efficiency of the product as it compares Product Change Rate (PCR) to total product life time (TL). The smaller this ratio the more efficient have been product revision / maintenance process.

\[ ED = \frac{PCR}{TL} \]  

(8)

Integration Failure Rate (IFR)

It gives an indication on the quality of the product under integration (Schneiewind 1997). It is computed as the ratio of number of failures during test (TA) to test time (T_{test}). Retaining constant test time, a growth in its value denotes a decreased quality of product. While a decreasing value denotes an increased quality of the product.

\[ IFR = \frac{TA}{T_{test}} \]  

(9)

Test Quality Index (TQI)

Provides an indication of the test process quality as it is derived from the ratio of number of failures during life (LA) with number of failures during test (TA). Its increase means that the quality of the overall test process is increasing.

\[ TQI = \frac{LA}{TA} \]  

(10)

Maintenance Test Time for KLOC (MTT)

It shows how test time (TTEST) for KLOC changed in code (KLCC) varies (Gall et al.1997). An increase in its value means a heavier test effort or a more difficult test phase. A decrease suggests a reduced test activity or a very large increase in changes. In any case such value has to be compared with integration failure rate (IFR) and failure rate (FR) in order to gain proper information on the quality of the test process.

\[ MTT / KLOC = \frac{TTEST}{KLCC} \]  

(11)

Product Change Rate (PCR)

It gives an indication on the rate of change in the product (Gall et al.1997). To compute this index is required to perform the ratio between KLOC changed in code (KLCC) and total product KLOC (TPKL). KLCC has been considered as the sum of new, changed and deleted lines.

\[ PCR = \frac{KLCC}{TPKL} \]  

(12)

KLOC versus Function Points (FP)

Many indexes have been derived from KLOC data even if most of them could have also been derived from FP data. KLOC was preferred as FPs are more difficult to be evaluated. According to classics, FP can be roughly derived starting from KLOC using the following rule:

\[ FP = \frac{LOC_{application}}{(LOC/FP) * BAF} \]  

(13)
At first the attention focus was on index derivation and therefore tools like Excel® and SPSS® were used to process data extracted from metrics and effort database (implemented in Oracle®). Data extraction was achieved using Oracle ProC® and SQL tools. Most pre-processing computation was carried out in Oracle ProC® as it was allowing to select and process data on line. As a first step derived data were exported to plain field delimited ASCII files (with semicolons “;” as separator) and then imported in Excel® and SPSS® where further analysis and graphic generation could be easily accomplished. The second step was a further processing one in which retrieved data is indexed and graphically plotted using GDLIB® graphical utilities so as to enable plotted data usage in the designed web-based scoreboard system. Anomalies report, metrics and indexes suite could be tailored on demand thanks to the aforementioned process, and made available to a web server via a specifically available CGI interface. Users could then access data online via a simple browser.

Given the nature of available data and indexes it was possible to compute the average, the standard deviation, correlation and/or regression index. Such statistical operation could be request for all values or a specific subset. For example it would be possible to evaluate the correlation between MTTR and effort or between PCR, MTTR and Quality, thus allowing experienced users to get a quantitative evaluation of hypothesis arisen from metrics inspection and qualitative evaluation.

3. Conclusions

The provided case study proved that adopted quality control policies and data collection practices need to be constantly refined. It has also showed that statistical analysis has to be carried out on collected data in order to gain even more info from the past. The adoption of this monitoring of the software development and maintenance process (that was part of a quality assurance and testing automation effort) allowed passing from a ratio of 20% of anomalies identified in internal testing and 80% identified in external testing and/or production to a 80% identified in internal testing and 20% in external testing and/or production with a substantial increase in the management and customers satisfaction.

In conclusion based on the results of this experience it is possible to formulate the following recommen-
dation:

- any software development company should base its software process on a sound and reliable CM environment;
- different level of detail / aggregation should be available as different are the needs of professional involved in day by day operation;
- GQM paradigm should be used in defining indicators and what to track;
- metrics should be collected but they must be identified according to company’s need;
- indicators should be easily derivable form collected metrics;
- no unnecessary overhead should be introduced in the monitored process.

In order to implement suggested improvements Big Data processing complexity has to be taken into account and Big Data processing processes controlled. For efficient control appropriate legal framework has to be developed, since absence of ad hoc institutional context (e.g. legal responsibility of software producer for its functioning efficiency) will retard economic growth, and as in our case, will impede sustainable development processes.

References


Malaiya, Y.K.; Denton, J. 1998. Estimating the number of re-
sidual defects [in software]. *In High-Assurance Systems Engineer-


SUSTAINABLE SUPPLY CHAIN MANAGEMENT IN GERMAN AUTOMOTIVE INDUSTRY: EXPERIENCES AND SUCCESS FACTORS

Kristina Hunke¹, Gunnar Prause²

¹,²Tallinn School of Economics and Business Administration, Tallinn University of Technology
Akadeemia tee 3, Tallinn, Estonia
E-mails: ¹kristina.hunke@ttu.ee; ²gunnar.prause@ttu.ee

Received 30 September 2013; accepted 15 December 2013

Abstract. Climate change and environmental aspects are key issues on public agenda. Governments and politicians try to implement new regulations and limits to reduce the environmental burden of the industries around the globe. However, success can be seen only to a limited extend in many areas. On the other hand some industrial sectors themselves start to think about solutions to handle the big impacts. Some pioneers in this field discovered already also the competitive and economic advantage of implementing so called green and sustainable solutions in their business. This includes production, manufacturing and transport activities but also ways how to manage and monitor such activities from an eco-friendly perspective. This paper will give an overview of the implication of green logistics along the supply chain in regard to the automotive industry including supply companies from SME sector and will demonstrate the application of this issue. For that an example of the European market leader Volkswagen AG in Germany is chosen and analyzed in the case description.

Keywords: Supply Chain Management, sustainability, green logistics, automotive industry.

Reference to this paper should be made as follows: Hunke, K.; Prause, G. 2014. Sustainable supply chain management in German automotive industry: experiences and success factors, Journal of Security and Sustainability Issues 3(3): 15–22. DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(2)

JEL Classifications: D85, L62, M11, Q01.

1. Introduction

Global warming is the rise in the average temperature of Earth’s atmosphere and oceans that it is primarily caused by increasing concentrations of greenhouse gases produced by human activities such as the burning of fossil fuels and deforestation. The Intergovernmental Panel on Climate Change (IPCC 2007) report claimed global warming as the most important environmental problem of today’s society and industries. Due to globalization, today’s industry is not dependent solely on location of resources and raw materials but is present all around the globe and decision makers chose their locations more in consideration of cost factors like labor costs, real estate prices and tax regulations, but not on geographically close location to the markets and low transportation costs. Therefore, one of the main challenges connected to energy provision and use in a green logistics perspective is the energy consumption during transportation of goods. In a supply chain, CO2 emissions related transportation accounts for 14% of the total emissions according to Stern (2006). Transportation of goods usually also involves emissions of NOX, SOX and PM.

The challenge of today’s society is how industrial development can exist symbiotically next to the environmental concerns in a long-term perspective (Beamon 2005). When it comes to growth on the one hand and sustainable development on the other hand, the responsibility lies mainly on the companies’ shoulders as the supply chains can be seen as the key fac-
tors in creating a sustainable supply to the customers (Seuring 2004). In order to increase the acceptance of this ecological responsibility many governments introduced laws and regulations to the industry. These are for example the packaging and waste directive of the European Union since 1994 or the German Act on closed-loop resource management (1996). The aim is to provide a legal frame to force companies to reduce waste and to protect natural resources in the production process and the life cycle of the product. One of the major difficulties in implementing green logistics in most companies is the high cost investments that often have to be done long in advance of any returns. To do investments without return is not a normal thing to do for a business, at least not in the private sector. The fact that the problem of environmental problems is something that applies to everyone also makes it a problem that applies to no one. The thought of something serving the greater good can be used for a charity investment, but not for a business philosophy. Many companies are facing the issue that they try to balance between being environmentally friendly and saving the nature on one hand and pleasing profit-hungry shareholders on the other side (Gifford 1997). Nevertheless newer studies are showing that sustainable and green business strategies have a positive impact on the performance of a company (AT Kearney 2011; WiWo 2012).

2. Green supply chain management

Green and sustainable supply chain management is based on the principle of supply chain management with an extra add-on on green impacts, meaning environmental friendly and efficient aspects. Supply chain management aims at providing the logistic aspects of the production process in the company in the most efficient way. That means that also suppliers, manufactures, customers and disposal companies are involved in the supply chain activities including the involved SME sector. In the context of green supply chain management, there exists interdependency between conventional supply chain management and eco-programs (Sarkis 2001). This includes the approach on how ecological aspects can be considered in the whole business processes in the most effective way. It can be assumed that the involvement of green aspects in the supply chain of a company also initiates changes in the supply chain itself. Of course, this will then also have an impact on the cooperative alliances with suppliers, manufactures and the customer at the end of the logistics chain. By integrating these ecological aspects of the product’s entire life cycle into the overall closed-loop system, the extraction of raw materials is already taken into account, as well as processes after the useful life of a product, e.g. collection, transportation and inspection, until the product is finally disassembled, remanufactured or disposed (Trowbridge 2001).

The challenge within each supply chain is to choose the right mode of transportation, to use the right equipment, and to use the right fuel (Dekker et al. 2012). Among the modes of transportation we find plane, ship, truck, rail, barge and pipelines, all with different attributes when considering costs, lead time, environmental performance and availability. However, the reality is that it rarely happens that all modes of transportation are realistic options when shipping goods. The reason is that the goods might set limitations on which modes that can be used. The customers will also be very influential when choosing mode of transportation as they might be demanding a very high service level with quick delivery. When shipping goods over long distances, the alternatives are normally transport by air or ship. However, when distances are short, truck, airplane, train, or short sea ships are used (Dekker et al. 2012). Dekker et al. (2012) present a table which shows how the different modes of transportation performs up against another taking into consideration their emissions and kW h/t/km. The water-based modes can in general carry much higher weights than the land-based modes. Larger loads give better CO2-efficiency. However, the diesel train and heavy truck is superior when measuring NOx-efficiency, while ships emit high levels of NOx. When comparing PM, there are not any significant differences between the modes. One of the modes, the Boing 747-400, is clearly the least environmental friendly of them all. It is not possible to prefer one of the modes in front of the other, as there are many variables to take into account when choosing the transportation mode. Presently, road transport contributes to the largest share of the emissions, but because of the strict limitations that the EU has set for emissions for trucks, they are closing in on the other transport modes. This is much thanks to the fact that trucks are only used for 3–5 years, which means that new technology gets implemented swiftly.

Another important factor that has great impact on the environmental performance is the type of fuel that is used. Today the main categories of fuel are
gasoline, biofuels, and electricity. Modern gasoline is much cleaner than it used to be. Biofuel can be mixed with regular gasoline, but if biofuel is used extensively, then the engine will have to go through some costly adaption. Biofuel is fuel based on organic waste, and in that sense it is environmental friendly, but the problem is that it takes a lot of gasoline to make biofuel, which makes the total environmental performance of biofuel quite pure. However, if the technology and methods that are used for making biofuel are improved in the future, the environmental performance might raise significantly. Electric vehicles are clearly environmental friendly as they have very low levels of emissions, and the production of electricity can be controlled in order to calculate the emissions. The most important restriction for electrical vehicles is their range, which is too limited in order to be fully competitive with the combustion engine. This limitation might be eliminated in the future if the technology on battery capacity moves forward (Dekker et al. 2012).

Finally, there is also a possibility for a development and use of other types of equipment. This might for instance be to use Giga-liners (long trucks), to use extra-long trains, and larger vessels at sea. These are all improvements that could decrease the emissions per kilo transported. However, if then the load factor drops, then the environmental performance might get lower than it originally was. Another method that already is used extensively is to lower the speed; this is for instance used in the shipping industry when the rates are low. A bi-effect is that the environmental performance rises. Additionally, Dekker et al. (2012) proposed that Operations Research (OR) leads to a more efficient use of resources, which is not only cost attractive, but also tends to create less emissions of greenhouse gases. Therefore, with new methodologies in OR these savings and reduction of emissions can be considered as one solution to the challenge of high energy consumption in the transport and logistics sector. Furthermore, OR helps to identify transport solutions, especially with multi-criteria decision analysis, when it comes to multi-modal choice and alternative route optimizations. One key aspect of new solutions is the exploration of new and innovative transport connections by using multi-modal transport chains. The method of multimodal transports allows cargo to be transported faster with lower environmental impact. One attempt, mainly in the European aspect, is to consider transport chains as transport clusters along certain routes, the so called transport corridors. The emphasis is laid on green transport corridors, i.e. transshipment routes with concentration of freight traffic between major hubs and by relatively long distances of transport marked by reduced environmental and climate impact while increasing safety and efficiency with application of sustainable logistics solutions (COM 2011). Already in 2001, the Transport White Paper (COM 2001) of European Commission expressed the necessity of shifting some volumes of the dominant road traffic to other efficient transport modes. The goal was to prepare for an environmentally friendly transport sector and at the same time to provide safer and efficient transportation by reducing accidents, congestions and negative impacts through emissions, i.e. noise and pollution.

3. Investments for sustainable supply chain management

One of the major difficulties in implementing green logistics in most organizations is the high cost investments that often have to be done long in advance of any results. Recent results of Global Supply Chain Survey 2013 revealed that sustainability aspects in supply chain management are considered by about 60% companies but concrete investment measures are still very rare (PwC 2012). Only 42% of the participants of the PwC survey think that sustainable supply chain management is an important management issue at all. The crucial question asked before an investment from a company is who is paying for the investment and how does the society benefit from this investment. The three different options for who will be left with the bill are the company itself, the consumer or the society. In some areas the society pays for upgrades through handouts or tax-cuts to companies that operate more environmentally friendly. An example of this is the Norwegian shipping industry, where the government, through special taxes, pays for up to 80 percent of the costs of installing environmentally friendly equipment (NHO 2011). In other businesses the customers pays more for a certain product because it is made in an environmentally friendly manner. This strategy is most often used for food and groceries and will for some customers add a feeling of superior quality as well. This is impossible in many industries as customers are less aware of the environmental part of different products. For companies not covered by either of these two, it is important that the changes in them-
selves are economically defendable and that it gives them lower costs or higher profits. There have been few empirical studies on the impact of green investments, but a study done by Rao and Holt (2005) reveals some interesting findings. They have separated the logistics into three different areas:

- Inbound logistic
- Production
- Outbound logistic

In the inbound logistics there was huge savings by having green suppliers. The savings came in waste reduction, compliance with regulations and resource utilization. The greening of production led to savings in raw materials because of re-use, and water and energy usage. The lowering of costs in the supply chain led to greater competitiveness and a better opportunity to steal market shares from competitors, through efficiency.

The problem for these industries is to see the opportunities and get over the initial large investments. If the investments needed to become greener are too great, there should be possibilities for tax cuts or other carrots to help them overcome this obstacle. It is also a problem with an uneven playing field. In an international marketplace there need to be common rules that applies to everyone, by forcing every actor to do the heavy investments it will get easier for everyone.

4. Sustainability improves the business performance

But there exist also other investigations about sustainable supply chain management which give a more positive picture by pointing out that green supply chain management has a positive impact on the business performance. A couple of recent studies revealed that sustainability pays off for companies (AT Kearny 2011; WiWo 2012). These results are not restricted to logistics sector but they bear a special relevance for the supply chain management. The largest global study on CO2 – reduction, the Carbon Disclosure Project (CDP), brought to light that sustainability in supply chains leads to a better company performance and a higher Return on Investments (AT Kearny 2011). The reason for that is that the cooperation of sustainable supply companies and the optimization of supply chains according to CO2 – aspects represent a powerful tool for cost cuttings. CDP explored that more than half of all larger companies and about a quarter of all suppliers experienced significant cost reduction by sustainable supply chain activities. The results of the CDP project are based on a survey of more than 1000 leading, globally operating companies and they are fixed in the Supply Chain Report 2011.

Whereas the results of the CDP project are stressing more the cost reduction possibilities of green and sustainable business activities the results of two studies of the German business journal “Wirtschaftswoche” which were realized in cooperation with the two consulting companies “Serviceplan” and “Biesalski & Company” are pointing out a strong relationship between sustainable business strategies and demand and turnover (WiWo 2012). The studies focused on consumer behavior and are based on a sample of 7700 persons. Both studies were able to prove that those companies which were considered as sustainable in the client perception generated additional turnover due to a green company image. The additional turnover depends on the business sector and can yield up to 10% like the following figures show:

- Logistics & Travelling: 7.7 %
- Automotive: 7.0 %
- Energy: 5.2 %
- Telecommunication: 5.0 %

The second important outcome of the two studies is a sustainability ranking of 101 well known German companies where the 20 upper ranked companies are shown in the following picture including the four most important German car manufacturers (Table 1).

<table>
<thead>
<tr>
<th>Sustainability ranking of German companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

Source: WiWo (2012)

It is easy to see that the four big German automotive companies understood the lesson and worked on the development of strong green images in order
strengthen their market position. All together it can be stated that green and sustainable business strategies improve the performance of a company.

5. Green supply chain management in automotive industry

The empirical study of Thun and Müller (2010) about the green supply chain management in the German automotive industry showed that the supply chain management has been applied for a longer period of time than green supply chain management. The majority of the participating companies in this study have implemented the latter only within the last years. Green supply chain management still seems to be a new concept which has just started to evolve over the last decades. According to the study the implementation of green supply chain management was only done to a satisfying extend when the companies were forced by law or legal regulation. Only economic benefits seem not to be the motivation.

However, the study among German players showed that the fulfillment of the legal requirements was even higher than requested as the competition is big and the customer demand even more than the laws require. While customers and competitors are mentioned as important drivers, government and management as internal drivers only play a secondary role (Thun, Müller 2010). Therefore, green supply chain management can be regarded as market driven. A reason for this is the fact that in terms of the automotive supply industry the customers are original equipment manufacturers which are forced by legislation to deal with environmental aspects (Crotty, Smith 2006). Accordingly, they demand eco-friendly products and processes from their suppliers. Hence, customers are a driving force and green supply chain management is a way for automotive suppliers to gain competitive advantage.

In the study also internal and external barriers were identified. The main internal barriers are the lack of acceptance in the company and the increased costs. As an external barrier, and this applies mainly to global companies with production facilities in different countries, was mentioned the number of different environmental acts and regulations which result in a high complexity. However, since the green supply chain management seems to be a new or at least unknown concept many companies fear the dependency from partners in their eco-oriented partnerships. They prefer an internal focus first before trying to integrate eco-programs externally with their partners. Nevertheless, the cooperation with partners and the establishment of functioning partnerships with suppliers is the key factor in successful green supply chain management in the automotive industry.

6. Case description

Volkswagen Group (parent company is the German Volkswagen Aktiengesellschaft) is a German multinational automotive manufacturing company headquartered in Wolfsburg, Germany. It designs, engineers, manufactures and distributes passenger cars, commercial vehicles, motorcycles, engines and turbo-machinery, and offers related services including financing, leasing and fleet management. It is the world’s largest motor vehicle manufacturer by 2011 unit sales and has maintained the largest market share in Europe for over two decades. Volkswagen Group sells passenger cars under different brands like Audi, Bentley, Bugatti, Lamborghini, Porsche, SEAT, Škoda and Volkswagen marques. Motorcycles are offered under the Ducati brand; and commercial vehicles under the MAN, Scania and Volkswagen Commercial Vehicles marques. The Volkswagen Group is divided into two primary divisions, the Automotive Division and the Financial Services Division, and consists of approximately 340 subsidiary companies. The company has operations in approximately 150 countries worldwide and operates 94 production facilities across 24 countries. Volkswagen Aktiengesellschaft is a public company and has a primary listing on the Frankfurt Stock Exchange, where it is a constituent of the DAX index, and secondary listings on the London Stock Exchange, Luxembourg Stock Exchange, New York Stock Exchange and SIX Swiss Exchange. As of September 2012, 20% of the voting rights are owned by the State of Lower Saxony.

From the Sustainability Report 2012 (Volkswagen 2012) it can be read that Volkswagen aims to be the market leader by 2018. A logical consequence is that the production has to and will continue to grow. This means, also the resource and energy consumption will increase. Volkswagen intends to take also the ecological leadership. So already now, concrete measures for greater efficiency in the production must be taken to mitigate the increasing resource and energy requirements of the future growth. Therefore, under the program think blue. Factory the production will
be more environmentally friendly by a total of 25% until 2018. This will apply to all Volkswagen plants in regard to energy consumption, waste generation, emissions of airborne emissions and water consumption which will be reduced by 25% (Figure 1). In 2011, Volkswagen has implemented many concrete steps in the production.

There is a new system responsible for the efficiency measurement of the production. Standards were developed which apply to the whole organization around the globe. For example, only very energy efficient machineries and equipment is allowed to be purchases for production. Internally, the Volkswagen organization promotes to transfer knowledge and exchange best practice examples of different production locations. The energy management in production locations of SEAT in Martorell and Barcelona (Zona Franca), Spain, are certified according to the ISO 50.001 and UNE 16.001 standards. Thus, SEAT is the first Spanish company which is certified according to ISO 50.001 and can therefore testifies its position in the Spanish market when it comes to environmental protection.

Another tool in monitoring environmental efficiency is the so called energy consultant in the intranet of Volkswagen. All employees can see information and advises in order to save energy consumption and conscious usage of electricity. Typical users of energy are shown in the departments of management, production, planning and controlling who give exemplary advises how to save energy. Additionally, background information is given and the employees can learn about the standards and methods applied.

7. Volkswagen AG and green supply chain management

The sustainability efforts of the Volkswagen company are not only limited to the production of automobiles but also and especially to the logistics of the production and the product. In that respect it is paid attention to sustainability on the whole logistics process in all steps. The processes are analyzed and in cases where it is economically and ecologically necessary improvements were made. This applies to the internal logistic in the operation but also to the logistics of the suppliers of raw material and components as well the transport and shipment of the final products, the finished cars. This must be the responsibility of a global company especially when the complexity of the products and transshipments becomes bigger as the production grows worldwide. When it comes to Green Logistics Volkswagen aims at reducing the consumption of resources and water, reduction of emissions, particulate matter and waste. In the following some examples are shown how Volkswagen is taking these challenges of green logistics.
The transportation of components between the two locations in Spain, Martorell and Zona Franca, or the transportation of finished cars to the port of Barcelona, is only made with trains. SEAT, the local company, invested around 8.6 million € in building the appropriate infrastructure for that. But the savings are accounted significantly as more than 57,000 drives by truck each year can be circumvented.

At the main location in Wolfsburg, Germany, all short distance transshipments are made with bio-gas driven trucks. This pilot project was implemented by a research team of the Vienna University. This project resulted in the reduction of CO2 emissions of 20 %. The emissions of nitric oxide could be reduced by 30% whereas the noise emissions were reduced even with 50 %. Due to these positive effects this project will be also transferred to other locations in near future.

Another example of how also the single sub-brands handle the sustainability efforts in logistics is shown with the company Audi. Audi opened a new logistic centre at the location Neckarsulm, Germany. Because of the increasing number of new arrivals and model variations, the number of small part deliveries also increased. Small part deliveries are small transport boxes for components and small supplies. Since 2008 the number of these deliveries doubled. Traditionally these parts had to be sorted and distributed manually. However, with the new small part distribution center machines can now handle approx. 1,300 boxes each hour. Together with architectural improvements and energy saving measures only in the location Neckarsulm up to 500 tons of CO2 are saved every year. For this resource saving and partly CO2 emission free transport concept Audi was awarded already with the sustainability award of the Federal Association Logistic Austria and Germany (BVL 2012).

Audi also uses sustainable transport solutions for their finished cars. Since October this year, the DB Schenker Rail will transport the new manufactured cars of Audi from Neckarsulm to the port of Emden. And this transport will be totally CO2 neutral. This transport route is already the second one next to the transport between Ingolstadt and the port of Emden. The electricity which is used for running the train comes exclusively from renewable energy sources. This successful implementation of CO2 neutral transportation is another big step towards a total CO2 production of Audi, says the Audi production director Dr. Frank Dreves (DB 2012).

Conclusions

As the case shows and also the results of the empirical survey of Thun and Müller (2010) green supply chain management is a hot topic in the German automotive industry however, some constraints still exists as the concept is fairly new and unknown. Volkswagen AG paid a lot of attention to implement the green logistics concept in the supply chains and until now can also report positive results in regard to their performance. They are the European market leader. And this is not solely because of their green logistics approach but this is for sure also a driver for business performance. One result of the study was also that green supply chain management leads to better performance in terms of indicators such as environmental protection and efficient usage of resources. Therefore, the attempt of green supply chain management should be promoted further. It can be stated that companies are aware of the environmental issues but still lacking behind realizing the full potential of green supply chain management. Most businesses need more incentives to do environmental investments, either by law or by economic motivations. But there are also positive signs that green and sustainable supply chain management leads to cost reductions and a better business performance. Especially the consumers appreciate green business strategies so the green image of a company helps to strengthen the market position.

References


Kristina Hunke, Gunnar Prause
Sustainable supply chain management in German automotive industry: experiences and success factors


Ministry of National Defence
Republic of Lithuania
University of Salford
A Greater Manchester University
The General Jonas Žemaitis
Military Academy
of Lithuania
NATO Energy
Security Centre
of Excellence
Vilnius Gediminas
Technical University

SECURITY OF BUSINESS: COMMERCIAL SECRET’S LEGAL REGIME
AND METHODS OF PRESERVATION

Alekšands Baikovs¹, Ivars Zariņš²

¹Daugavpils University, LV-5400, Daugavpils, Latvia
²University Turiba, LV-1058, Riga Latvia
E-mails: ¹aleks_baikov@inbox.lv; ²ivars@orions.lv

Received 2 October 2013; accepted 10 January 2014

Abstract. In the article, on the basis of comparative-legal analysis, there is explored the content of concept “commercial secret”, considered the organisational, administrative (management), and legal measures of ensuring the safety of commercial secret, and criteria of referring information to commercial secret. The conditions of ensuring the confidentiality safety of commercial information, the methodology of selecting data constituting commercial secret, and information protection measures are sequentially analysed; the evaluation of the role of administrative information in competitive activity and authorization-based information access system is provided. In the article also the legal nature and kinds of agreements about confidentiality, as well as the content of some of them, measures of protection of commercial secret from disclosure, among which the main place is occupied by liability measures applied on law-breakers, and also basic questions on protection of commercial secret after termination of labour relationship with employee, are studied in details.

Keywords: Information, protected information, commercial (trade) secret, state secret, list of data considered to be the commercial secret, confidentiality regime, forms of confidential relationships, commercial secret regime, protection mechanism of commercial secrets.

Reference to this paper should be made as follows: Baikovs, A.; Zariņš, I. 2014. Security of business: commercial secret’s legal regime and methods of preservation, Journal of Security and Sustainability Issues 3(3): 23–44. DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(3)

JEL Classifications: K1, K2, K4, K12

1. Introduction

Efficiency of commercial activity largely depends on skills and abilities to manage such a valuable commodity as information. However, you can take advantage of only the information that is required by the market, but is unknown to competitors. Therefore, under conditions of increased competition, success of business, prospects and real profit opportunities are largely determined and depend on the extent of ensuring preservation of secrets of industrial, financial, commercial, and scientific and technical activities, based on intellectual potential, technologies and innovations of production, management, and social processes at the disposal of merchant (Grybaitė 2011; Dudzevičiūtė 2012; Lankauskienė, Tvaronavičienė 2012; Giriūnas, Mackevičius 2014). But emergence of market and development of market relations spawned unfair competition (Totyev 2000), one of the manifestations of which, according to clause 4 part 3 Section 18 of the Law of the Republic of Latvia On competition of 4 October 2001, is illegal acquisition, use or dissemination of information constituting a commercial secret of merchant (other market participant). Although the problems of legal regulation of information relations associated with the processes of formation and development of the information society, has become the subject of scien-
tic research, starting with the 70s, and recent years have seen tutorials on the information law (Tedeyev 2005), published monographs, doctoral researches, devoted to the analysis of the use of legal means in the Internet (Malakhov 2001), the concept of commercial secret, which is a form of information resources, is still among the least developed categories of jurisprudence. Adoption in different countries of legislative acts, which defined the legal regime of information resources, became a basis for justification of independent complex branch of law – information law, subject of which, according to the proponents of this idea, includes public relations related to the legal regulation of information turnover, its creation, storage, processing and use on the basis of communication technologies, its protection. They also, which seems to be more than justified, observed that in certain forms information is an element of any public relations, and legal norms themselves are, above all, information about the possible and proper behaviour, about the positive or negative consequences of legal and, accordingly, illegal conduct, i.e., contain legal information (Kudryavtsev 1981).

We should also note that agreeing with acceptance of information law as a complex branch of law, is quite difficult. Indeed, the very idea of separation of complex branches of law can hardly be deemed suitable, since construction of the legal system in general and allocation of one or another structural element thereof is primarily based on objective factors, first of all – economic factors. The idea of complex branches was once suggested by V. K. Raicher (1947), and was later supported by a number of scientists. Subsequently, it was repeatedly subjected to justified, quite convincingly grounded criticism. Thus, taking into account more than debatable nature of a concept of complex branches of law, as well as the fact that, in theory of information law, information, depending on its functional task, is divided into mass, industry and professional information, in structure of industry legal information one may not ignore its specific varieties – civil, commercial, labour information, etc. Each of them, of course, should be inherent in both general and specific (industry) signs of legal information. The latter are predetermined by particular subject composition (who information is about) and target orientation thereof. Taking this into account, it seems reasonable to talk about information as only an object of legal regulation of existing traditional branches of law.

Reference point of active work on legal regulation of public relations, related in one way or another to information, on international (universal) level is, obviously, approval of YUNSINTRAL Standard Law On legal aspects of electronic data interchange and related means of communication, which since 1996 is called On electronic commerce. Should be also noted here: Agreement designed to liberalize basic telecommunications (Telecommunications Annex) adopted on 15 February 1997 within the framework of the General Agreement on Trade in Services (GATS), Recommendations No 26 Commercial use of interchange agreements in electronic data interchange adopted on 23 June 1995 by Working Party on Facilitation of International Trade Procedures of the UN Economic Commission for Europe, EU Commission Recommendations 94/820/EC of 19 October 1994 concerning legal aspects of electronic data interchange.

2. Concept, signs, and legal nature of commercial secrets

In theory of information law, information is traditionally subdivided into proprietary information, information for official use, restricted access information, information for free use. Law On transparency of information of the Republic of Latvia of 29 October 1998 marks out publicly available information and restricted access information (Sec. 3). Sec. 8 of the same legislative act mentions information for official use. Proprietary information is usually only available for a very narrow circle of enterprise’s officials. Information for official use may not be transferred by employees possessing it to other enterprise’s employees, as well as to third parties. Restricted access information assumes existence of certain persons, who have limited or denied access to information, which constitutes or may potentially constitute enterprise’s commercial secret.

Commercial secret is a form of security provision for the most important commercial information, which provides for limitations of its dissemination. From legal point of view, it is generally accepted that enterprise’s commercial secret is a means of protection against unfair competition in the framework of realization of intellectual property rights. Minimum international standards for protection of commercial secret are established in some conventions and in Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which is the largest
multilateral international agreement aimed at ensuring protection of commercial secret. The need to establish measures of legal protection of information of commercial value has led to the emergence in Latvia of institute of commercial secret protection. However, unlike such countries as the USA, Germany, China, Ukraine, etc., which have adopted separate legal acts of almost the same name, norms of this institution are scattered across different legal acts. However, literature has repeatedly expressed opinion on necessity of a special law on commercial secret protection. According to Sec. 19 of The Commercial Law of the Republic of Latvia of 13 April 2000 (hereinafter – CL), commercial secret is understood as things of economic, technical or scientific nature related to merchant’s enterprise and information, recorded in written or other form or not recorded, with actual or potential property or non-property value, which, at disposal of other persons, could harm merchant, and in respect of which merchant takes reasonable measures for maintenance of secrecy. Thus, concept of commercial secret, formulated in this Section of CL, generally coincides with definitions contained in legal acts of Russia (cl. 1 Sec. 139 of The Civil Code of Russian Federation) and other industrial developed countries. Descriptively, not pointing to constitutive signs and focusing on possible adverse effects of its disclosure, commercial secret is interpreted by Sec. 7 of the mentioned law on openness of information. According to norm-definition laid down in it, a commercial secret is information created by and belonging to a merchant, disclosure of which could have significant negative impact on merchant’s competitiveness. Commercial secret is characterized as one of the types of restricted access information except when a procurement contract in accordance with the Law on Public Procurement of the Republic of Latvia of 6 April 2006 or other contract on disposition of public funds or municipal funds and property is concluded (cl. 3 part 2 Sec. 5).

Carriers of commercial secret are material objects, including physical fields, in which information constituting a commercial secret is reflected in form of symbols, images, signals, technical solutions and processes. In order to be considered a commercial secret, information must simultaneously satisfy the following three criteria: (1) information must have actual or potential commercial value when it’s unknown to third parties, (2) it must not have access on a lawful basis, and (3) information owner takes measures to protect its confidentiality. Subject of commercial secret is information related to enterprise’s commercial and economic activities: industrial and technological information, management information, financial information and information on other activities. This can be documents of enterprise’s commercial negotiations and pricing methods, documents related to marketing research, information on work organization and selection of employees, information on conditions of document storage, i.e. information with commercial value.

Commercial secret is one of the objects of intellectual property, to a certain extent being the result of creative activities and having a number of specific features, most notably: (1) de facto monopoly of commercial secret owner to a certain body of knowledge, (2) the highest, in comparison with other objects of intellectual property, versatility, since the volume of concept of commercial secret is so vast, that it can include any information related to production, management, finance, commercial activities, innovation etc., (3) unlimited period of its protection. Title to a commercial secret lasts as long as person’s de facto monopoly to information, which it consists of, is maintained and statutory conditions for its protection exist. This condition makes selection of this form of protection attractive to merchants in cases where they are not satisfied with urgency principle of patent protection, and (4) necessity of official recognition of its eligibility, public registration or settling any other formalities, etc. We should agree with A. P. Sergejev (2003), who claimed, commercial secret has all the properties of an object of intellectual property and is a special kind thereof. Scientific literature expresses a point of view, according to which objects of intellectual property rights are essentially objects of property law (Kulagin 1992). However, a more appropriate to the nature of intellectual property rights is its understanding as of not a corporeal, but a kind of absolute right. As V. E. Popondopulo (2006) rightly writes, use in this case of the term “property” emphasizes not so much identification of creative result with the thing (it is not a tangible good), as quality of absoluteness inherent in intellectual property right. At the same time, owner of intellectual activity result owns right of possession, use and disposal of information constituting its content. This fact does not imply the identity of property right. Features of intellectual property right are expressed differently: if objects of intellectual property right are usually subject to special registration, they are characterized
with temporary and spatially limited nature of legal protection, then objects of property right are in most cases not subject to special registration, and property rights themselves are not limited in time or any territory of their validity.

Besides commercial secret, we should mention state secret, official secret and bank secrecy. According to Sec. 2 of the law On state secret of the Republic of Latvia of 17 October 1996, state secret is a secret information of military, political, economic, scientific, technical or other nature, disclosure of which may cause damage to interests of the state in the field of security, economy and politics. One of the specific types of commercial secret is banking secrecy. More precisely, nowadays legislator, obviously, taking into account complex nature of relations in connection with ensuring confidentiality and non-disclosure of information constituting a secret, as well as guided by desire to extend regulations, which govern relations in this connection, to all types of credit institutions, does not use this term, using a broader concept of limited access information in legislative acts, such as the Law On credit institutions of the Republic of Latvia of 5 October 1995 (Sec. 1003), the Law On Financial and capital market commission of the Republic of Latvia of 1 June 2006. It is information, access to which bank, in accordance with the law, is entitled to restrict. Banks usually work with many clients, depositors, correspondents whose interests may be negatively affected by disclosing information about their operations, transactions, accounts, etc. Moreover, threats may come from both competitors and criminal organizations. In this connection, there is a need to protect information held by banks, including information about activities of persons using their services.

Features of legal regime of banking secrecy lie in the fact that (1) analysis of part 5 Sec. 62 implies that it is information not subject to disclosure and not constituting state secret, and (2) list of information to be included in it is defined not only by law. Moreover, banks themselves may include some of the information they possess in the category of bank secrecy (if it does not contradict the law). According to part 1 Sec. 62 of the Law On credit institutions of the Republic of Latvia of 5 October 1995; credit institution’s duty is to guarantee privacy of clients, their accounts, deposits and transactions. Employees of the bank must maintain banking secrecy, respecting the so-called rule of the wall. Information constituting bank secrecy may only be provided to clients themselves or their representatives. State bodies and officials thereof may only be provided such information in cases and according to procedure provided for by law.

Banking secrecy has traditionally been viewed in two senses: broad and narrow. In broad sense, information constituting bank secrecy is a specific kind of commercial secret, i.e., confidential information owned by the bank. But if it is viewed in narrow sense, it appears in form of bank’s duty to keep accounts and transactions of its customers and correspondents secret and not to allow banking operations to become known to improper parties and, above all, to competitors of its clients. Said above indicates very significant differences between banking secrecy, in its narrow concept, and commercial secret. It appears that these differences may be summarized as follows:

1) absolute nature of relationships in connection with ensuring maintenance of commercial secret (right holder, carrier of information constituting commercial secret, on one part, and unlimited sections of public not entitled to familiarization with this information), and relative nature of relationships in connection with ensuring confidentiality of information constituting banking secrecy (bank being obliged person and client as entitled person);

2) information constituting commercial secret is purchased for performance of certain activities, usually on the basis of a license agreement. In turn, provision of client with information constituting bank secrecy is carried on the basis of an accessory agreement (additionally to the basic one);

3) with respect to commercial secret, it is crucial to ensure inaccessibility of third parties to it as such, i.e., to create conditions that rule out possibility to familiarize with information constituting it per se, and in relation to bank secrecy – to ensure non-disclosure of existence of the very fact of such secret, i.e., existence of the fact of relationship between the client and the bank;

4) transfer of information constituting commercial secret to third parties is performed to obtain some benefit, and transfer of information constituting bank secrecy (client to the bank, and bank to third parties) has coercive nature;

5) right holder of commercial secret is taking measures to ensure its non-disclosure in order to obtain
competitive advantage and, ultimately, profit. Banking secrecy is protected by the bank by virtue of the assumed obligation to ensure its safety, failure to fulfil which results in liability;

6) information containing commercial secret may be disclosed to persons interested in receipt thereof on contractual basis for a fee. In contrast, purchase or sale of information containing banking secrecy is always illegal;

7) information containing commercial secret retains its status (secret status) in respect of all persons. In turn, banking secrecy only retains this status in respect of persons, to which person, which entrusted confidential information to the bank, has not communicated it.

Considering the said above, banking secrecy in narrow sense cannot be considered as a kind of commercial secret. In V. Zemljanov (2005) opinion, it is more correct to qualify it as a kind of professional secret. It is interesting to note that special legislative acts aimed at protection of interests of manufacturers, their owners and states from a possible leakage of secrets were adopted even in antiquity. For example, in ancient Rome a law was adopted, which provided for a penalty equal to twice the value of caused losses for forcing somebody else’s slaves to disclose secrets of their master (Novickiy 1996). Legal norms providing for liability for disclosure of valuable confidential information were contained in Russian Penal Code of 1845. Chapter VIII of the Code On crimes and misdemeanours against social order and decorum included sections dedicated to liability for disclosure of classified information (Sec. 1157, 1187, 1355). Criminal Code of 1903 included Chapter XXIX On disclosure of secrets consisting of 6 sections, dedicated to liability for disclosure of various kinds of secrets, three of which concerned, respectively, factory, commercial and credit secrets. Code did not specify content of commercial secret concept, but apparently it concerned secret of trade books, constituting, in G. F. Shershenevich’s words, undisclosable commercial secret. Moreover, except in cases listed in the law, including: (1) disputes in partnership issues, (2) disputes in inheritance issues, and (3) insolvency, no one, under any pretence, could claim disclosure of these books (Shershenevich 1994).

Information used in commercial activities is traditionally divided into two types: industrial and commercial. Industrial information includes information about technology and method of production, technical discoveries and inventions, know-how, design documentation, software, etc. Commercial information is information about financial and economic situation of the enterprise (financial statements), credits and banking operations, concluded contracts and contractors, structure of capital and investment plans, strategic marketing plans, analysis of competitiveness of own products, customers, plans of production development, business correspondence, etc. On the basis of function and target, the following necessary components of commercial secret can be specified: (1) business information – about contractors, competitors, consumers, business negotiations, commercial correspondence, concluded and planned contracts, (2) scientific and technology information – content and plans of scientific research, know-how, rationalization proposals, implementation of new technologies and products, (3) manufacturing information – technology, product roadmaps, scope of work in progress and inventory, plans of investment activities, (4) organizational and management information – information about firm’s management structure not contained in articles of association, original methods of management organization, labour organization system, (5) marketing information – market strategy, plans of promotional activities, provision for competitive advantages in comparison with products of other companies, methods of working in markets, plans of production distribution, analysis of competitiveness of products, (6) financial information – planning of profit, cost, pricing (calculation methods, structure of prices, discounts, possible funding sources, financial projections), (7) information on firm’s personnel – personal files of employees, plans to increase (reduce) personnel, content of tests for new employees, and (8) software – programs, passwords, access codes to confidential information in electronic data carriers.

Usually, competitors, partners, banks, criminal communities are most interested in the mentioned information. Information constituting commercial secret may exist in paper form, on floppy disks, CD’s, hard disk drives, in memory of enterprise’s employees. Regulation of relations connected with use of confidential information must begin with the main document of the Company owning respective enterprise, with articles of association, which give the concept of commercial secret and establish liability for failure to observe it. All this information has dif-
different value for merchant, and its disclosure may cause adverse effects of varying degree on enterprise's economic security.

Let us examine criteria of protectability in more details. According to the first criterion, information must have actual or potential commercial value due to the fact that it is unknown to third parties. In this regard, it should be noted that (1) as a commercial value, literature understands ability of information to be object of market turnover, (2) commercial secret itself includes information, use of which gives its holder certain economic benefits due to the fact that its competitors do not have such information, (3) commercial secret includes information of interest to third parties, which could get specific benefit in case of having this information. As third parties in this case should only be understood persons carrying out commercial activities, and (4) information constituting commercial secret must have not only actual, but also potential commercial value.

The next criterion, which information must comply with, in order to be considered a commercial secret, is that this information must not be legally freely accessible by third parties. This means that information must not be generally known. As generally known is to be understood what is known to indefinite sections of public and available for perception of anyone interested. Generally known information, even if it has a great commercial value, in principle, cannot be considered commercial secret. However, it seems, in exceptional cases such information will still be recognized a commercial secret, if secret is the fact that enterprise uses this very method or device and therefore achieves the greatest success. At the same time, emphasis may be placed on words free access. Legitimate way of obtaining information is its obtaining from publicly available sources (advertising brochures, periodical publications, scientific presentations, etc.). However, free access possibility does not mean that as soon as one or another piece of information is made available for third parties, it loses status of commercial secret. The very fact of free access does not automatically mean loss of status of commercial secret. Due to free access possibility, noteworthy is the question of whether combination of generally known data can be considered a commercial secret. There are different opinions in this regard. According to one of them, sometimes a new combination of already generally known data is sufficient for commercial secret. Another is that simple combination of obvious and well-known data does not meet the requirement of not generally known information and is not protected, even if such set of data can be valuable and useful. On one hand, indeed, generally known cannot become not generally known by the will of one person, and if any information is known to everyone, commercial benefit from use thereof is questionable. But if, for example, someone discovers that specific combination of generally known data gives unexpected positive results, it appears that such combination may still be considered a commercial secret. Commercial value of using such combination of data can be quite great, on the other hand, the fact that exactly such combination can give certain effect is not generally known. You can draw here an analogy to patent law, where as invention, in particular, is recognized use of known substances, combinations thereof, for a new purpose (part 4 Sec. 5 of Patent Law of the Republic of Latvia of 15 February 2007. Thus, in passing verdict, court of an American state pointed out that, although all essential elements of the process were known previously, combination making use thereof economically feasible was not known (Shamkhalov 1993).

Concept of access can be seen in broad and narrow sense. In broad sense, access means availability of information, possibility of free obtaining thereof by anyone. In a narrow sense, access can be understood as possibility of obtaining information constituting commercial secret from their owner, based on legislative or contractual norms for using for a particular purpose, which must be specified in these norms (Kuzmin 1993). This kind of access is some kind of removal of subject to information from the monopoly. Access can be based on voluntary or mandatory basis. Holder of commercial secret can voluntarily provide access to classified information to his contractors under contracts. In particular, this may occur when information is transferred under contract to interested persons. Mandatory provision of access is connected with possibility of reclamation of information constituting commercial secret by various public authorities in course of performance of their duties.

It appears that demands of public authorities to provide information constituting commercial secret are legitimate to the extent they are claimed in course of performance of their functions entrusted to them by law and in scope justified for implementation thereof. Simultaneously, right of public authorities, as well
as municipal authorities, to reclaim information constituting commercial secret, must only be provided to respective authorities by law or legal act defining status of such authorities, their competence, basic rights and duties. Possibility of obtaining information constituting commercial secret by public authorities and their employees shall not cause loss by this information of status of commercial secret: information must not become publicly accessible due to this, since only specific persons in specific amounts have access to it, and it does not make it available to general public.

The third criterion, which information constituting commercial secret must comply with, is measures to protect its confidentiality taken by the owner. These measures are three-fold: (1) officers and employees of the company - right holder must be obliged to observe commercial secret, should be notified of their obligation not to disclose information about it to third parties, of classifying respective information as commercial secret, and of liability for non-observance; (2) contract with its contractors, by which right holder transfers respective information, must provide for their duty to refrain from transferring this information to third parties, inform them that this information constitutes commercial secret, and establish liability for breach of this secret; (3) right holder must take measures to prevent unauthorized access to commercial secret by third parties, in particular, to prevent industrial espionage. Failure to comply with these conditions can be an obstacle to recognition of protection as existing. Existence of protection measures is perhaps the most important criterion for protectability. For example, US courts, in disputes concerning infringement of commercial secret, require plaintiff to prove that he was taking measures to protect information. When implementing protection of confidentiality, requirements of reasonableness must be respected. Moreover, all measures to maintain secrecy of information can be conditionally divided into three major groups: technical, organizational and legal.

However, not all information held by merchant can be categorized as commercial secret. Commercial secret is not: (1) constituent documents (articles of association, memorandum), (2) documents giving right to engage in commercial activities (registration certificate, licenses, certificates, patents), (3) information on prescribed forms of financial statements necessary to verify correctness of calculation and payment of taxes and other mandatory payments to the state budget, (4) documents on solvency; (5) documents on payment of taxes and mandatory payments, (6) information on compliance with norms of labour protection; (7) information on compliance with environmental protection norms, (8) information on violation of the antimonopoly legislation, (9) information on sale of products that caused harm to human health, and (10) information on involvement of company’s officials in other companies engaged in commercial activities. But this information also is not intended for public access to all interested. For example, information on remuneration of enterprise’s employees, financial statements may only be submitted on request of public authorities, management, regulatory and law enforcement authorities, sworn auditors, eligible in accordance with the current Latvian legislation. At the same time, firm’s clients may get acquainted with its articles of association, registration certificate, licenses, certificates, patents. Merchant himself defines list of objects of commercial secret and methods of protection against availability to third parties.

2. Subjects and content of subjective right to commercial secret

Commercial secret, as object of intellectual property protected by law, does not exist outside of activities of enterprises owned by merchants and is inseparable from them Accordingly, subjects of a right to commercial secret are merchants, i. e., physical persons (individual merchants) and legal entities (personal companies and capital companies), engaged in commercial activities, i. e., open economic activity for profit (Sec. 1 of CL). In general theory of law, subjective right is most often represented as a unity of three authorizations: (1) on own positive actions, (2) requirement from obligated person of performance of their responsibilities, and (3) on protection, which is expressed as the possibility to appeal to competent authorities for application of state enforcement measures in case of violation of subjective rights. However, as much interesting is the point of view that the entitlement to protection is a separate subjective right only arising for a right holder at the moment of violation or challenge of his right and realized in the framework of protective relationship appearing on this basis (Pokrovsky 1998).

Subjective right to a commercial secret is owned by its owner – a natural person or legal entity lawfully
possessing information constituting a commercial secret and associated right in full. Specificity of a right to commercial secret is that this right simultaneously is a duty, because the very possibility to protect information constituting a commercial secret depends on presence or absence of measures for its protection. Circle of entitlement to own positive actions includes authority to use information constituting a commercial secret, which suggests possibility of undertaking any actions by the owner of commercial secret for its use and application in their commercial activities. Owner of a commercial secret holds authority to disseminate information, i.e., to open access to information to third parties. Transfer of the right to use information to confidant of a commercial secrets (natural person or legal entity, who by virtue of official position, contract or legally knows another person’s commercial secret) takes place on the basis of license agreements, which are agreements of a special kind (sui generis), but not devoid of similarities with purchase, lease contracts. Finally, holder of a commercial secret has the right to dispose of confidential information belonging to him. This can be expressed in ending regime of secrecy of this information – holder of a commercial secret may at any time disclose information constituting a commercial secret to the public, if it does not violate rights of third parties, which entails termination of existence of commercial secret as an object of right. In addition, holder of a commercial secret may at any time destroy information belonging to them: by destroying documents, material carriers, on which information are recorded, etc.

Authority to require from third parties to refrain from misappropriation of information constituting a commercial secret shows another specificity of rights of holder of a commercial secret: protection is only provided against appropriation of information by illegal means. If information is received by third parties legally, they will not be deemed violators of rights of holder of a commercial secret. Legal protection of a right to commercial secret arises from the establishment of de facto monopoly of the holder to information constituting a commercial secret (in accordance with requirements established by law), and is valid indefinitely for the entire period of compliance with these requirements to a protected secret. Protectability of rights to a commercial secret does not require state registration and is only checked when rights to a commercial secret are violated (challenged).

Thus, holder of a commercial secret has the following rights and duties: (1) to determine independently criteria for classifying newly obtained information as a commercial secret, duration and scope of measures necessary to ensure regime of commercial secret regarding information already received and being received, including registration and removal of classification Commercial secret CS, definition of procedure of access to commercial secret, selection and use of means and methods of protection, storage and transmission of information constituting a commercial secret (except as permitted by applicable law), (2) to establish, modify and cancel regime of commercial secret (if it does not violate obligations assumed under contract), including with regard to know-how. Rights to know-how, as to an unconventional object of intellectual property, which are not subject to exclusive rights, must also be protected in regime of commercial secret, (3) to require provision of regime of commercial secret from persons, who gained access to commercial secret legally to ensure their de facto monopoly to this commercial secret (including consolidation of such obligations in license agreements and other agreements, special confidentiality agreements), and (4) to allow (cancel) access of employed person, with their consent, to a commercial secret on contractual basis.

Admission of the employee to information constituting a commercial secret involves: (1) familiarization of employee with norms of applicable legislation on commercial secret, providing for liability for violation of regime of commercial secret, (2) familiarization of employee with employer’s developed and approved list of information constituting its commercial secret, which employee will have right to access in order to fully carry out their work function, (3) adoption by employee of commitments to employer to comply with established regime of commercial secret, including on non-disclosure of commercial secret after dismissal during period established by law or contract, and (4) determination of employee’s wage, providing for compensation for a duty to comply with regime of commercial secret. Amount of such compensation may be established by a separate agreement. Simultaneously employee may seek judicial review of measures taken by the holder to ensure regime of commercial secret regarding information, which is known to him (may become known because of his employment relationship with employer).

Subject of a right to commercial secret is entitled to (1) insist on compliance with regime of commer-
cial secret by persons who gained access to it in result of circumstances, which right holder could not foresee or prevent. Simultaneously, party, which has taken obligation not to disclose commercial secret, is entitled to receive remuneration in money from holder of commercial secret, (2) ask for protection of commercial secret when received lawfully by officials of government bodies and local authorities in regime of official secret in accordance with the law, for the whole duration of its legal protection, (3) to dispose of commercial secret in sole discretion, including use thereof in own production, transmission to other persons on the basis of contracts, issue to other persons of licenses to use commercial secret in own commercial activities, as well as other ways to incorporate the mentioned confidential information in civil circulation, and (4) require from third parties to refrain from improper obtaining of confidential information, illegal access and use of commercial secret (industrial espionage, bribery, threats, misrepresentation of employees, theft of documents, interception of negotiations, review of correspondence, violation or instigation (coercion) to violation of obligations of complying with regime of commercial secret, as well as other illegal means of transferring commercial secret to third parties without permission of the holder of commercial secret. Part 2 Sec. 200 of The Criminal Law of Latvia provides for imprisonment for up to 5 years, or arrest, or compulsory labour, or a fine of up to 100 times minimum monthly wage. German law on unfair competition provides for criminal liability of up to three years of imprisonment for disclosing to unauthorized persons of information constituting commercial (industrial) secret (Bergmann, Dubovickaja 2005). When exercising rights, holder of commercial secret must comply with the following conditions: (1) not to violate the legally protected rights and interests of other persons, (2) not to use for protection of commercial secret means that can cause harm to human life and health, (3) to take measures to ensure confidentiality of information constituting a commercial secret, (4) to provide information constituting a commercial secret to public authorities, local governments, law enforcement agencies upon their request within their competence established by law under penalty of administrative liability, and (5) to take measures to classification of information, which used to constitute a commercial secret, but is classified in accordance with the law as a state secret (with the right to receive appropriate compensation). Responsibility to prove right to a commercial secret and illegality of violator’s actions in respect of such information rests with the holder of this commercial secret. If he cannot prove these circumstances, his subjective right is not subject to protection.

In civil proceedings, holder of a commercial secret independently determines ways to protect right to a commercial secret and is entitled to require violator to: (1) recognize right to a commercial secret (if this right is challenged), (2) indemnify for disclosure on part of employees and contractors, contrary to provisions of employment or civil contract, or on part of persons, who gained access to commercial secret illegally, (3) pay, on discretion of court, compensation in case of impossibility to determine amount of damage or injury caused by violation of a right to commercial secret, (4) annul act of public authority or local government, and (5) take other measures provided for by valid legislation protecting their rights. If rights of the holder of a commercial secret are violated by public officials (of tax, regulatory, law enforcement authorities, etc.), who have access to such information in cases provided for by law, norms of administrative responsibility must apply.

3. Legal regime of commercial secret in the enterprise. Sources of confidential information

Number of issues must be resolved in organization of protection of commercial secret, the first of which is definition of information constituting a commercial secret, as well as the possible distribution thereof by categories of importance, depending on value thereof to the enterprise, nature and extent of the damage that may be caused to him by disclosure of this information. As a result, company develops a commercial secret, which is a system of legal, organizational, technical and other measures taken by the holder of a commercial secret and confidant thereof to provide limited access to respective information.

All available information may be distributed by degree of confidentiality, depending on extent of negative consequences that may arise in case of its loss, as follows: (1) the highest degree of confidentiality – information is key in activities of enterprise, loss or disclosure of this information usually causes an irreparable damage, a consequence of which may be its liquidation, (2) strictly confidential information, leakage of which can cause very severe conse-
quencies. This is information on strategic plans, prospective agreements, etc., (3) confidential information – disclosure thereof inflicts damage to society, comparable to current costs, but in a relatively short time, it can be overcome, (4) limited access information – leakage thereof has a slightly negative impact on the economic situation of the company (job descriptions, management structure), and (5) public information – dissemination thereof does not threaten economic security of the company. On the contrary, absence of such information can have a negative impact on economic situation of the company.

For differentiation of information that needs to be protected, one can use the following criteria: (1) likelihood of threat to economic security of the firm. In case where competitors gain such information, firm will suffer economic damage. In case of disclosure of such information, firm will face serious economic difficulties, (2) possibility to protect information. If, for example, information is not included in mandatory list of public nature, one must define if there is a possibility to protect it by general or special means of protection, and (3) the economic feasibility of protection of information.

Sources of information constituting a commercial secret and, hence, potential sources of leakage thereof can be: staff of the enterprise, enterprise documentation, technology processes, communications, etc. Staff of the enterprise is the most vulnerable source of confidential information. Exactly staff of enterprise has invaluable commercial information, disclosure of which leads to a loss of competitive advantages, hard to restore negative consequences. Migration of specialists, especially those who have dealt with confidential information, is the main and difficult to control channel of information leakage. Qualitative and qualitative characteristics of personnel allow interested parties by using analytical calculations to draw conclusions on some of its other parameters – on labour productivity and, thus, level of production, on availability of contacts with suppliers or customers who purchase products or use services of the company. Such risks must be assessed depending on the nature of commercial activities. Perhaps, in some industries information openness of such kind may have rather positive than negative consequences. No secret that most part of losses of the enterprise is by the fault of employees or with their participation. In addition to purely criminal interests, employee can use knowledge of internal structure to solve their personal problems, such as revenge to superiors, promotion due to discredit of opponent or provision of stable workplace not burdened with responsibilities. In this regard, safety of confidential information largely depends on proper selection, placement and training of personnel.

Second most important channel of leakage of confidential information is documentation of the enterprise (incoming, outgoing, orders, business plans, business correspondence, various publications in mass media, deposited manuscripts, monographs, information on financial activities). Obtained information about principles of enterprise management provides insights into applied and, possibly, prospective methods of production management, facts of negotiations, objects and purposes of conferences and meetings of competitor’s controls, enterprise’s plans to expand activities of execution of works, provision of services and production, conditions of merger, acquisition, spin-off and associations of companies related to the whole enterprise. Methods of production management are know-how in the field of self-management. And because efficiency of the entire enterprise directly depends on how efficiently administration performs operative management and enterprise management, since principles and methods of management are object of commercial secret, which is most highly exposed to leakage to competitors or contractors in form of concentrated information. Enterprise’s products are a special source of information, characteristics of which are very actively sought by competitors. Particularly noteworthy are new products being in preparation for production. It is considered that there are certain stages of product life cycle for products: idea, model, prototype, testing, mass production, operation, upgrading and removal from production. Each of these stages is accompanied by specific information manifested by a variety of physical effects, which in form of camouflaging signs may disclose protected information. Volume and assortment of manufactured products or specifics of provided services is one of the most important economic characteristics of the enterprise.

Marketing research performed by enterprise, as well as experiments related to attracting potential customers to manufactured products or provided services are of interest as a finished product of information obtained in course of economically costly activities. Information of this kind must be protected especially carefully,
because exactly with the help of this information enterprise can achieve substantial increase in profitability of its activities, increase its share in commodity markets and service markets. Technical means as a source of confidential information is a broad and capacious group of sources in terms of information. Group of means of ensuring production activities includes a variety of means, such as, in particular, telephones and telephone communications, televisions and industrial television equipment, radio receivers, radio broadcasting system, public address system, amplification systems, security and fire safety systems, etc., which, by their parameters, can be sources of transformation of acoustic information into electric and electromagnetic fields capable of forming electromagnetic channels of leakage of confidential information. It is also necessary to mention safety of data circulating in enterprise’s internal computer networks, both wired and wireless. Network security objectives may vary depending on the situation, but usually there are three main objectives: (1) integrity, (2) confidentiality, and (3) availability of data. Priority is confidentiality of data being object of protection.

The next possible source of information leakage can be partners, contractors or customers, who are using or have used company’s services and often hold important secrets. Therefore, when analyzing protection system, they deserve special attention. Special channel of information leakage, at least, its commercial value, are collaborations with other firms, contacts with customers and investors, where negotiations occupy a special place (Bellanger 2002). Contrary to stable misconceptions, most of information is extracted from indirect sources (garbage, advertising, publications in press). This source is usually not given much attention, consequently, it is the most accessible. For example, production waste, as well as various publications, can tell a lot about the materials used, their composition, production peculiarities, and technology. Among other pieces of information, which are object of enterprise’s commercial secret, can be directly distinguished: (1) important elements of security systems, codes and procedures for access to information networks and centres, and (2) principles of organization of protection of commercial information and commercial secret in the enterprise.

4. Problems of functioning of legal mechanism for protection of commercial secret in the enterprise

The main factor contributing to protection of information circulating in the enterprise, are classified, i.e., special measures aimed at preventing diversion of specific information. Special measures aimed at protection of intellectual property depend primarily on the holder (holders) of information competitive circumstances emerging in environment of their activities, value of manufacturing or commercial information, and other factors. Certainly, to keep a secret, when it is only known to holder thereof, is not difficult and costly. Information carrier (document, floppy disk, and object) must have adequate storage place (safe or other place inaccessible to other persons). Slightly more complicated is protection of this information, when presence thereof becomes known to interested parties. It becomes necessary to restrict access of unauthorized persons to the place of storage of classified materials.

Enterprises, firms, associations, where there are several holders of information, especially where there are employees not admitted to production, commercial secrets, are a more difficult object of protection. It raises a question of the necessity to provide for internal and external security. In order to solve it, one can use commercial firms providing security services and, of course, own security service. Important place in the system of organizational, administrative, legal and other measures, which allow solving tasks of information provision for scientific and commercial activities, physical safety of material carriers of classified information, prevention of their leakage, preservation of commercial secret, is occupied by licensing system of access of performers to classified documents and information. Access is understood as obtaining a written permission of enterprise’s manager (or, under his authority, other senior officials) for issuance of specific (or all pieces of) classified information to an employee, taking into account their duties (of authorities). Provision for preservation of confidential commercial information requires compliance with the following conditions: (1) determination (identification) of information constituting enterprise’s commercial secret, (2) development of procedures for protection thereof, and (3) ensuring compliance with such procedure.
5. Methodology for separation of information constituting a commercial secret

Procedure of allotment of the most valuable pieces from the total volume of enterprise's own information for subsequent protection is closely linked to process of production of goods (services) and derived from the practice of competition. Factors determining competitiveness of the enterprise can only bring positive results if they are hidden from economic rivals. Therefore, assignment of such information to a commercial secret is a form of protection, economic security of the enterprise by decree of the manager. This decree lists information relating to commercial secret. Essence of forming methodology of allocation of valuable information lies in logic of actions and features characterizing a commercial secret.

After deleting information constituting state secret, as well as publicly known information, from information sources two types of information can be distinguished in the remaining information volume: (1) technology, management, and (2) business (financial and commercial) information. Some information, taking into account feasibility and commercial benefits, is secured by the Patent Law of the Republic of Latvia of 15 February 2007 and the law On copyright of the Republic of Latvia of 6 April 2000, as well as by major international conventions governing these provisions. After consistent performance of the mentioned actions, object of analysis and evaluation is a part of information unprotected by patents and copyright, as well as commercial and financial data. Key to understanding, protection of what information as a commercial secret is instrumental in specific period is competition (price and non-price based). That is why it is advisable to classify information, which gives (can give) significant advantages in competition, as a commercial secret. Disclosure of this information causes economic damage due to loss of competitiveness of enterprise's goods and services. American businessmen believe that loss of 20% of information leads to firm's ruin within a month in 60 cases out of 100 (Solovjev 2002).

Further is performed analysis and evaluation of spheres and cycles of production of goods, in which innovations are possible: product, service, marketing, production, distribution, financing, management, social sphere. In each of these areas, based on the analysis, amount of innovations required for successful operation is determined in percents. The largest volume of information constituting a commercial secret (innovations affecting competitiveness) lie in the following areas: product, marketing, production, service, management. Considering production cycle from the perspective of protection of commercial secret, it should be noted that most firms can achieve dynamic growth and financial and commercial success by successive improvements. Taking into account market peculiarities, commercial secret must include information on improvements of manufactured products, including technology and other issues (and not just significant innovations). Arrangements for protection of information must include problem of differentiation of product quality compared to competitors' products. At the stage of product development, specific value will be represented by information about its properties, providing a significant difference from products existing on the market. This is the most valuable information of the enterprise (firm) constituting a commercial secret. In purchases, one is guided not only by price, but also by indicators of product differentiation achieved by efficient design. Efforts of enterprises are aimed at improving price significance of own products in customer's eyes and at intensification of the differences between own products and competitor's products. In this regard, it is advisable to make an exhaustive list of own product properties, and then to ask which of these properties after improvement would provide it with the most competitive difference. Exactly these facts are more likely to be classified as a commercial secret.

Assessment of the role of management information in competition for obtaining advantages over economic rivals allows including range of information from these activities of the enterprise in the list of data constituting a commercial secret. Significant economic damage may be caused by disclosure of a commercial secret on the stage of testing the developed product on the market. The most important in the process of market testing is to assess attractiveness of the product for consumers. It is necessary to ensure protection of such information that would facilitate the adoption of appropriate countermeasures by competitors. Usually, at this stage should be protected product trademark, name of the company conducting tests, test results, time of start of product mass production, etc. To hold or gain enterprise's market position, actively is used advertising, in which it is important to prevent disclosure of valuable information, since, after gaining it, competitors can make necessary adjust-
ments in the process of competition. Proven method of advertising, providing for protection of a commercial secret, is the so-called black box method. Simultaneously, problem is being described, achieved results, gained advantages are shown, but how this is achieved is disclosed in truncated form, with extreme caution. In recent years, in industrialized countries, security services began to take measures to protect information, which rival firms may obtain in the analysis of waste products entering disposal or market. The main form of protection is to keep secret information on enterprises supplying raw materials by firms specializing in sale of industrial waste.

Particular attention should be paid to protection of contracts concluded by merchant. Most of them belong to a commercial secret. Moreover, in certain cases protected is not only text of the contract, but also fact of conclusion thereof. Not disclosable is information, disclosure of which may lead to adverse effects (home phone numbers, addresses of employees, work plans, information on conflict situations in a team). The first step to be made by merchant, who wants to keep production or technological secrets, is to develop a list of information constituting a commercial secret of the enterprise, as well as to approve Regulations on procedure for securing commercial secrets of the enterprise. Documented commercial secret of the enterprise, expressed in a certain volume of data, acquires, under part 1 Sec. 83 of the Labour Law (hereinafter LL), status of information constituting a commercial secret of the employer and is employer's property.

In order to make a decision on inclusion of data on enterprise’s activities in the list of information constituting a commercial secret, it is advisable on the first stage to define possible negative consequences in the event of disclosure. Negative consequences include: termination of business relations with partners, failure of negotiations, loss of possibility to conclude a lucrative contract, reduction of level of cooperation with business partners, failure to fulfill contractual obligations, necessity to perform additional market research; rejection of decisions that have become inefficient in result of information disclosure and necessity to take additional measures related to financial costs, use of obtained information by competitors to improve efficiency of economic competition, loss of possibility of patenting and licensing; improving technology; reduction in product prices or decline in sales; damaging firm's credibility, reduction of economic security; advance by competitor of output of similar product to the market; worsening of crediting conditions, emergence of difficulties in supply, purchase of equipment, dismissal of enterprise’s leading specialists.

To avoid errors, it is necessary to take into account additional criteria for classifying information as a commercial secret. The most common of these are: time gain for the enterprise in comparison with competing firms, unique design, novelty (new consumption function, new technology, application in new areas); advantages in technical and economic characteristics of the product over competitor’s products, original use of materials, technologies; advantages in price competition; significant labour costs in obtaining information; enterprise’s monopoly to information in this direction of industrial and commercial activity; degree of evidence of use of information by competitors in case of its publishing; prospect to obtain information, hidden by competitors, independently and term of obtaining; emergence of opportunity to enter the international market; degree of influence on formation of positive image of the company by consumer; ability to ensure safety of information in the enterprise in the case of its classification as a commercial secret.

Structure and content of the list of information constituting a commercial secret depends on characteristics of the enterprise. List should specify terms of revision of information constituting a commercial secret and transfer thereof into the category of publicly known information. After making a list of technologies and business information according to acceptable scheme, first of all, it is necessary to provide for provision of valuable information, leakage of which can cause damage exceeding cost of its defence.

Practice shows that this issue is better addressed collectively. To develop a list, committee of the most qualified and competent specialists of main divisions and representatives of security service are created by decree of enterprise’s manager. One may not use classification of any information as a commercial secret, in order to evade taxes, conceal facts of damaging human health, as well as other illegal activities. Result of work of experts should be a list of information constituting enterprise’s commercial secret. Quite naturally, that this list should be reviewed, modified and supplemented, when necessary. In the list, if possible, it is desirable to specify a time period for which some information is classified as a commercial secret. List is communicated to structural units and sub-
6. Development of procedure for protection of commercial secrets

Organizational and legal protection of commercial secret is realized by establishing of regime of confidentiality in the enterprise. Confidential relationship is a fundamental category characterizing mechanism of protection of commercial secrets. Three forms of confidential relationship can be distinguished: (1) between employees and employer as a legal entity, arising from the moment of particular person’s employment and continuing throughout the period of his work in the enterprise, (2) between a particular employee and other employees of the enterprise, created and developing both vertically and horizontally, and (3) between customer and contractor, created by work performance or service provision contract.

As noted above, right to establish regime of commercial secret has holder of a commercial secret. Confidant of a commercial secret must respect regime of a commercial secret established by its holder or establish regime of a commercial secret if it follows from obligations contained in agreement concluded with holder of a commercial secret. Access to commercial secret can be granted in accordance with manager’s approved regulation on access system, where authorities of enterprise’s officials for distribution and use of information are legally fixed. Enterprise’s manager may allow use of any protected information by any employee of this enterprise or by a person, who has arrived at the site from another organization to deal with any issues, if no restrictions are set in respect of this information to acquaintance on part of production and commercial partners in joint production, etc.

In small enterprises with limited amount of classified works (documents and articles), manager has opportunity to personally distribute all classified information coming from outside and created inside the enterprise between employees regardless of their positions. In this case, so-called direct distribution of classified information is performed. However, direct distribution becomes impossible in the enterprise with large amount of classified works scattered among different structural units and divisions with employees of various job categories. In order to perform quality management functions, enterprise’s manager may transfer a part of their rights to dispose of the motion of classified information to managers of lower levels. Manager usually reserves the right to dispose of the most valuable information constituting a commercial secret (confidential contracts with firms, reports of the results of work on promising products, etc.).

Effective work of permit system is only possible under certain rules: (1) permit system as mandatory rule includes a differentiated approach to permit for access taking into account importance of classified information in respect of which access issue is addressed, (2) documentation of issued permit to specific protected information. It means that manager, who gave permission to use, must fix it in writing in respective document or in accounting form of the enterprise. No verbal instructions and requests for access for someone else (except for the enterprise’s manager) have legal force and are required for security service personnel. This requirement also applies to managers of all levels, working with classified information and carriers thereof, and (3) principle of control should be strictly observed by security services. This means that any permit to acquaintance with classified documents, information and objects must be security service manager. Permit must include: date of registration and issue, surnames, positions of persons, specific classification documents and products, to which they may be admitted.

Permit system must meet the following requirements: (1) apply to all types of classified documents and products available in the enterprise, regardless of their location and capacity, (2) determine order of access for all categories of employees who qualify to work with commercial secrets, as well as specialists, temporarily attending the enterprise and related to joint classified orders, (3) establish a simple and reliable procedure for issuing permits for access to protected documents and products, allowing to react immediately to changes in the area of information in the enterprise, (4) clearly distinguish rights of managers of different job levels in documentation of access for respective categories of contractors, (5) exclude possibility of uncontrolled and unauthorized issue of documents and products to anyone, and (6) not allow persons working with classified information and objects to make changes in account-
ing data, as well as substitute accounting documents. Classification of commercial secret of certain documents usually contains phrase commercial secret, indicating attribution of information to commercial secret. The mentioned classification is marked on information carrier or accompanying document. In the upper right corner of the document is written CS (or completely – Commercial secret), Confidential. Such indication is classification of secrecy, but merely shows that ownership of this information is protected by law. On documents containing commercial secret and submitted to public authorities, other government agencies and local government authorities, classification Commercial secret must be marked on information carriers. Person establishing regime of commercial secret independently determines criteria for classifying newly obtained information as a commercial secret, validity of regime of commercial secret and set of measures to ensure regime of commercial secret regarding obtained information, including classification and declassification of commercial secrets, procedure of access to commercial secret, selection and use of means and methods of protection, storage and transmission of information constituting a commercial secret, except in cases provided for in the contract.

In developing permit system, special attention should be given to allocation of the most important information most valuable for the enterprise, which would allow providing strictly limited access to it. If there are joint works with other enterprises (organizations), foreign firms or individual representatives thereof, it is necessary to provide for a procedure for access of these categories to enterprise’s commercial secret. Regulation of firm’s permit system should indicate that transfer of classified documents and products from contractor to contractor is only possible within a structural unit and with permission of its manager. Transmission, return of such documents, products is made according to procedure established in the firm and only during normal business hours of this day. Regulation of firm’s permit system must indicate that closed meetings on business issues are only conducted with permission of firm manager or their deputies. Special requirements may apply to meetings of academic council, meeting on reviewing results of research and financial and commercial activities, etc. It is recommended to document mandatory permit lists for such activities and only include those enterprise’s employees, which are directly related to planned activities and have a duty to participate. As noted above, employees of other firms may only participate in closed meetings with personal permission of firm’s management. Lists are usually prepared by the person responsible for organizing the meeting in contact with interested managers of structural units. List is the basis for organization of control over admission to this meeting. Prior to the meeting, security service officer warns those present that the disputed information is confidential and not for distribution outside the sphere of circulation established by the firm, and gives instructions for the conduct of business records.

Validity of regime of commercial secret is established within regime of a commercial secret and is determined by validity of conditions necessary and sufficient for recognition of certain information as a commercial secret. Necessary measure to ensure regime of a commercial secret is conclusion of properly executed confidentiality agreements or other supporting obligations not to disclose commercial secret of contracts by holder and confidant of a commercial secret. Confidant of a commercial secret, who obtained commercial secret by virtue of a civil contract and permitted its disclosure, must immediately notify holder of a commercial secret. If his actions do not contain a crime, confidant of a commercial secret is civilly liable in accordance with applicable law. A prerequisite for establishing regime of a commercial secret in conclusion and execution of a civil contract is conclusion of written confidentiality agreement by the parties along with contract or inclusion of respective conditions in labour contract. According to part 1 Sec. 83 of the Labour Law (hereinafter – LL), employee is obliged to keep secret information at his disposal constituting enterprise’s confidential information.

Confidentiality agreements may be unilateral or mutual, i.e., binding by obligation to remain silent either for one party thereof, or for both the employee and employer. Unilateral confidentiality agreement is most often found in practice. Unilateral is usually confidentiality agreement concluded with an employee. Mutual confidentiality agreement is concluded usually in case where an employee, more often high-level manager or senior technical specialist, comes in a large company with a ready business plan or development, and company provides data on its marketing, financial and other possibilities. Any confidentiality agreement must, first of all, accurately and with the highest possible degree of detail and
specificity define its object and a complete list of the information, which parties will deem confidential.

It is necessary to keep in mind that not every information, although secret, on the basis of local regulations of this enterprise, may be recognized as such under confidentiality agreement concluded with specific employee. For example, if company employs developer, who created a new technology, similar to that already used in your plant, you can hardly extend his obligation of confidentiality to information on this development. The most important condition of any confidentiality agreement is its validity. The most urgent question is, whether confidentiality agreement is valid after termination of employment contract. Confidentiality agreements are used to prevent leakage of any confidential information, from production secrets to personal data. Its use is required by law in most developed countries, and claims related to it are accepted by the courts unconditionally.

A characteristic feature of confidential relationship is documentation thereof. This raises another problem – issue of assigning a document appropriate confidentiality classification and development of a system of regime measures providing for protection of confidential information. Analysis of available domestic and foreign publications allows a number of authors to recommend, in relation to business structures, a following approach. Define two classifications of marking information relating to a commercial secret: (1) strictly confidential – when loss (disclosure) of information creates preconditions for possible catastrophic consequences, most often bankruptcy, and (2) confidential – when loss (disclosure) of information causes economic or moral damage to the enterprise, but cannot lead to its death. However, it should be taken into account that use commercial secret non-disclosure agreements are not an independent measure of protection. By offering employees to sign such agreement, firm’s management warns employee that a whole system of measures to protect information comes into play: legal, organizational, and technical. Agreement provides a legal basis to prevent potential wrongdoing. Principal also seems reflection of issues of compliance with commercial secret in the agreement concluded with firm’s manager, when the latter is elected as provided for by law. By law, manager is granted exclusive rights to determine composition and content of information constituting a commercial secret, and procedure for protection thereof. However, he is imposed certain obligations for appropriate provision of preservation of commercial secret and responsibility for state of affairs in this area.

Therefore, agreement with enterprise’s manager should reflect the following: (1) he should be obliged to strictly keep enterprise’s commercial secret and not use it to engage in any activity at the expense of the company, (2) it should be emphasized that enterprise’s manager is personally responsible for creating necessary conditions to provide for preservation of enterprise’s commercial secret, and (3) as well as members of the personnel, enterprise’s manager must be warned that his violation of requirements in part of organization and procedure of protection of commercial secret may result in termination of the contract, as well as criminal, administrative, civil liability in accordance with valid legislation. The presence of the mentioned documents gives opportunity to speak about the presence of legally enforceable procedure of protection of commercial information in the enterprise. This creates opportunity assume responsibilities for preservation of customer’s commercial secret, relating it to classified information. Contracts with customer must clearly and unambiguously indicate information relating to protected information. Holder of commercial secret has the right to change or cancel regime of commercial secret, if it does not violate responsibilities assumed at conclusion of confidentiality agreement or other contract. In case of changing or cancelling regime of commercial secret, holder of a commercial secret must notify confidant of commercial secrets, which concluded corresponding agreement or contract, thereof in written. In case of liquidation of legal entity, holder of a commercial secret, liquidation commission (liquidator) makes a decision on possibility and procedure of further use and protection of information constituting a commercial secret of liquidated legal entity.

7. Ensuring compliance with the established procedure for protection of commercial secrets

Of course, issue of legal protection of commercial secret exists not only in Latvia, but also in other countries, such as the UK, Germany, USA, and France. It is worth noting that legislation in industrialized countries formulates concept of commercial secret fuller and wider. It mentions trade, commercial and official secret. For example, English law understands
information, disclosure of which could harm interests of the enterprise, as a commercial secret. Concept interests of the enterprise broader defines circle of responsibilities for violation of regime of commercial secret, since it does not bind value of enterprise’s commercial information only to monetary equivalent.

If we compare Latvian legislation on protection of commercial secret with foreign legislation, a conclusion on feasibility of development and adoption of legislative act on commercial secrets in Latvia arises. It makes no sense to supplement existing laws, which, though containing reference of commercial secret, do not provide for complex regulation of all problems associated with it. Adoption of a separate law on commercial secret is also favoured by almost complete absence of jurisprudence on claims for indemnification of damages incurred in result of disclosure of confidential information.

Importance of information and awareness of individual enterprise on the market grows every month. If enterprise’s secret, secret information, which gives it an advantage over competitors, will not be defined and restricted by law; fair competition will hardly exist in a complete form, since lawful acquisition of valuable information on the market is its main element. Questions related to protection of confidential information of commercial nature involve not only legal entities, but also individual specialists. Legislative protection of know-how is a necessary element of legal protection of their accumulated knowledge and experience, as well as intellectual property in general.

Among the ways of protection against disclosure of commercial secret, main place is occupied by sanctions applied to violators. Unlike other cases of infringement of rights of holder of a commercial secret (such as illegal receipt or use), where it is possible to prevent or terminate respective violations, in case of disclosure of valuable information, right holder usually is already put at already accomplished fact of disclosure and, in the best case, can only rely on material compensation of losses. Disclosure of commercial secret may be committed by employees of the holder of a commercial secret. This, of course, does not mean that every employee is a potential violator; however, literature indicates that disclosure of commercial secrets by employees is the most common case of violation of commercial secrets. According to Sec. 86 of LL, employee is liable for damages, which he caused to employer. In interpretation of Sec. 1770 of The Civil Law of the Republic of Latvia (hereinafter – CL), as losses are understood any damages subject to property assessment. Every loss except for occasional losses is refundable (Sec. 1775 of CL). Loss is a decrease in actual property of the victim. The law also mentions loss of anticipated profit (Sec. 1771 of CL). With regard to employee’s civil liability, these legal subjects are regulated by Sec. 79, 80, 81, 83, 86, 87-89 of LL. Thus, according to LL, employee must submit to internal labour regulations, which, in essence, are an expression of employer’s power. Unlike civil relations, participants in which are persons independent from each other, in employment relationship employees are in subordination to the employer. Clause 1 Sec. 83 of LL provide that employee must not disclose information constituting employer’s commercial secret at his disposal. As previously mentioned, in order to make employee liable for disclosure of a commercial secret, necessary is a contract with such employee on non-disclosure of a commercial secret, which becomes known to employee in course of employment. In terms of improving legal regulation of preservation and protection of commercial secret, considerably interesting is legislative experience of Western industrialized countries. Thus, for example, in British commercial practice, contractual provision for safety of commercial secret is the main means of successful protection. British courts adhere to a literal interpretation of confidentiality clause and consider rights and obligations of parties in accordance with specific provisions of agreement (oral or written). Usually, broader interpretation of the contract is not permitted. However, this rule is supplemented with possibility of using implied terms, which are derived from conclusive action in accordance with concluded agreement. What is important in such a contract? First, determine what exactly constitutes a commercial secret. It is important to give a fairly clear definition without disclosing, at the same time, the secret itself. Usually such an agreement includes a list of information not subject to disclosure. Second, clear contractual establishment of obligations of a party, which is informed on or otherwise obtains commercial secret. In most general sense it is obligation to keep confidential information secret, as well as not to use commercial secret in unauthorized purposes. As important as a duty not to disclose, is a duty not to use legally obtained confidential information. It is clear that by using commercial secret for personal purposes, employee (partner or another person) still
harms interests of the holder of commercial secret, though actual disclosure does not take place. Therefore, it is very important that agreement determines, how commercial secret is permitted to use, and provides that any other use is prohibited or requires a special permission. Third, contract must establish period of validity of a duty to respect confidentiality of information, because, as a general rule, it is not limited to the period of validity of employment contract or other relationships. Very often, such agreements do not provide for any time limit, but simply contain phrase \textit{...as long as the relevant information is a commercial secret}, i.e., still valuable, unavailable to a wide range of people, and protected. To clarify and not create grounds for possible future disputes, whether information is a commercial secret or not, you need to set a specific period of restriction, for example, 3, 5, or 10 years. Defining this term, try to imagine, how valuable confidential information will be after expiration of set time intervals.

One of the most complexes is an issue on amount of employee's liability for violation of confidentiality. Losses from disclosure of secret information can be calculated in considerable amounts. It is clear that no employee has enough money to compensate them to the employer. In this regard, it is clear how important is a careful selection of employees and establishment of reasonable restrictions for access to classified information within the enterprise. Since damage caused by disclosure of enterprise's commercial secret is very difficult to estimate in property, it must be acknowledged that recovery from guilty employee of indemnification for losses incurred in this regard, would hardly compensates leakage of confidential information about the enterprise to third parties.

Basis of civil liability of employee is mandatory existence of the following conditions: (1) direct (real) damage, (2) wrongfulness of behaviour of employee, who caused damages, (3) guilt of employee in causing damage, and (4) causal connection between employee's actions (inactivity) and damages. Unlike indemnification of damages in civil law, civil liability of employees according to norms of labour law has its own peculiarities. First, civil liability of employees occurs for causing damages to the enterprise. Based on the meaning of respective sections of LL, we can conclude that property in this case is understood in a narrow sense, namely \textit{actual, really existing property}, that is, everything understood in civil law as a concept of \textit{thing}. Second, employee is only civilly liable according to norms of labour law in case of existence of a direct actual damage. As direct actual damage is understood decrease in actual property of the enterprise as a result of loss, deterioration or decrease of its value, as well as need to bear costs of restoration, acquisition of property or other assets, or make unnecessary payments (Sec. 1770 of CL). Third, in assigning liability to worker, only direct actual damages are considered, loss of earnings is not included here (unless it is a malicious wrongdoing). Fourth, amount of liability is limited to the size of caused damage and, as a general rule, must not exceed 20-50% of employee's monthly wage, but in any case with preservation of minimum wage, in accordance with Sec. 594 of The Civil Procedure Law (hereinafter – CPL). Thus, holding employee to civil liability according to norms of labour law for disclosure of a commercial secret is only possible if (among other prerequisites of holding to civil liability, such as wrongfulness and guilt of employee) employee's actions caused real damage to property of enterprise, institution, organization. Furthermore, there must be a written agreement of parties (contract), governing list of enterprise's information of confidential nature and legal regime thereof. However, in most cases, disclosure of a commercial secret does not entail direct damages to real, actual property of the enterprise. For example, disclosure by employee of marketing research results constituting commercial secret of organization he works in, has no effect on the property of the organization, organization essentially only loses those opportunities it could use, taking into account de facto monopolistic possession of such information. In other words, we can talk about loss of profits, and it is not to be recovered from employee by virtue of direct guidance of clause 2 Sec. 86 of LL. In addition, due to the limited size of employee's civil liability for damages caused to employer's property (not more than one average monthly wage), interests of the holder of commercial secret in case of violation of a commercial secret by its employees, remain virtually unprotected.

Nevertheless, in some cases, interests of the holder of a commercial secret can still be protected. Here we talk about cases of full civil liability of employees. Employee is liable for all damages caused to employer, in accordance with clause 3 of Sec. 86 of LL, in cases of causing damages with malice or due to such his illegal, guilty actions, which are not related to performance of work provided for by employ-
ment contract. For collection of damages caused by fault of the employee, employer must obtain written consent of employee. If employee disputes basis or amount of claim for compensation of employer’s damages, he may file respective claim in court within two years (Sec. 79 of LL). Taking into account that Sec. 200 of Latvian Criminal Law (hereinafter – CL) provides for criminal liability for illegal disclosure or use of information constituting a commercial secret, employee’s full civil liability according to norms of labour law in this case seems to be quite real.

Under the current law, amount of liability of a person, who disclosed a commercial secret, practically is not defined. It is clear that damage caused to employer can be calculated differently. By and large, it would be enough to create a precedent. But there is still no such practice. Moreover, most specialists in corporate law had never faced similar cases. Large companies prefer to agree with employee independently, and usually dismiss him voluntarily. In case of recovery of damages through the court, competitors can get even more information on activities of affected merchants. And explaining why certain information is confidential is quite difficult for merchants. British procedural law, unlike Latvian, provides for the possibility of closed trials in case, where there is a threat of disclosure of commercial secret in course of proceedings. In addition, court decision may limit access to materials of the case. Very important is the requirement to plaintiff to provide the court with maximum clear information on what information he considers confidential. Plaintiff cannot be limited only with a general description, since content of the judgment must be precise restrictions and prohibitions addressed to defendant (Kiselev 1998). It should also be noted that in jurisprudence concerning protection of a commercial secret became widespread temporary (interim) remedies. Disclosure of a commercial secret may entail significant damage (and even termination of victim’s commercial activities), and disclosure, of course, cannot be re-classified. In this regard, objective of many claims filed in British courts is to prevent misuse of confidential commercial information or disclosure thereof even before it would entail property damages. Court’s task in this case is to establish a proper balance between rights and obligations of the parties, without making final decision substantively.

With regard to liability for damage not at the time of performance of employment duties, in this case there is uncertainty about the delimitation of moments, when employee was acting in the performance, and when – not in the performance of employment duties. Literature offers to consider disclosure of a commercial secret, committed not in the performance of employment duties, when violation is performed outside of working hours, i. e., labour regulations. Let us consider such problem as duty of preservation of commercial secret by employee after termination of employment contract between him and the holder of a secret. Employee may use information in form of issue, transfer, disclosure, etc., of a commercial secret of the former employer during employment with another employer or on own enterprise. LL provides for protection of a commercial secret also after termination of employment relationship (Sec. 84, 85 of LL). Agreement of employee with employer on limitation of competition after termination of employment contract is only permitted if such agreement meets the following criteria: (1) its purpose is protection of employer against such professional activity of employee, which can create competition in commercial activities of the employer, (2) period of limitation of competition is no more than two years from the date of termination of employment contract, and (3) employer undertakes to pay employee a monthly fee for compliance with condition of limitation of competition. Amount of such remuneration may reach very high values. This agreement must be concluded in writing, specifying type, amount, location, time of limitation of competition and amount of compensation paid to employee. After termination of employment contract, employee may not use commercial secrets of former employer (for example, list of very important customers). When defining scope of such limitations, court conditionally evaluates whether contested information can be considered part of professional experience and knowledge of employee with medium level of integrity and ability. It should be noted that British courts often deny employers in their demands, seeing attempt to limit competition in their respective claims.

The most important conditions of satisfying claims on protection of a commercial secret are the following circumstances established by the court: employee intentionally copied, memorized or moved documents; employee acted by deception or fraud; information is definitely owned by employer, and its use is beyond the scope of employee’s professional expe-
rarian; employee was specifically warned that information is classified and pledged to comply with this requirement; employee occupies managing position. Current LL gave opportunity to employer to actually prohibit dismissed employee to work in enterprises with identical activities or create such own firm operating in the same market sector, for two years. Prohibition of competition to some extent could be considered means of keeping people in the enterprise, if not statutory opportunity to challenge validity of this agreement, citing the fact that it is unjust restriction of further professional activities of employee (part 3 Sec. 84 of LL). Inclusion of restrictions in employment contract is only possible when they protect legitimate interests of employer and, in particular, their right to industrial and commercial secrets of the company, lists of customers. Protection of these interests in the contract must be reasonable and logical. Of course, in any case, employee, who was fired or resigned from the firm, may not use information he received while working, but he may continue performing the same kind of activities (Kuzmin 1993).

In the above case, reviewed before the Supreme Court, judge decided that, since technician did not use customer lists of the firm, where he worked before, and customer contacted him by ad, competition did not take place. The fact that the person, after quitting former place of work, continues working in the same area does not mean that he is competing with former employer. He has the right to work in the same industry, and any limitation thereof will be considered a limitation of constitutional rights. All of the above concerns very different spheres of activities – trade, intellectual labour, etc. Interesting also is the opposite example from the US practice. Three former employees of Novell created a new company developing cluster technology for a competitive Windows NT Server platform. Novell representatives were quick to apply to court, accusing the new company of stealing commercial secrets. Court imposed a temporary limitation on use of cluster technology of the latter. Police seized computers, floppy disks and other materials from founders of Wolf Mountain Group. According to the lawyer, all three deny their guilt, and their activities will not be affected by court prohibition to use Novell cluster technology. Contract prohibits disclosure of commercial secrets, – he said. – But it says nothing about prohibition of competition, which, in fact, is sought by Novell (Laura 1997).

In foreign practice, all these issues are dealt with in different ways. For example, in Estonia the law follows the principle that employer’s prohibition on former employee’s work in a competing enterprise after termination of employment relationship greatly limits employee’s freedom of choice in activities in their profession, and therefore it should be ensured that his economic situation is not worsened in result of application of prohibition. To do this, period of limitation of competition is limited – it may not exceed one year. In addition, employer must, within this period, pay monthly compensation, which may not be less than 60% of the average wage of the former employee. In Germany, in accordance with decision of the Federal Court on employment disputes, law enforcement practice recognizes employee’s duty to preserve employer’s commercial secret after completion of employment relationship. Prohibition to use information constituting enterprise’s commercial secret, after termination of contractual relationship between employee and holder of the secret is only set when employee obtained mentioned information in bad faith. If respective knowledge is obtained in good faith, there is no such prohibition. In determining good faith or bad faith of obtaining information while working in enterprise, German jurisprudence comes from duty to consider all circumstances of particular case, including importance of employee’s activities for the enterprise, his position, participation or non-participation in development of information constituting a commercial secret, compliance of his behaviour to good manners (guten Sitten), i. e., usual modus operandi for entrepreneurship (Kuzmin 1993).

In addition, German and US legislation includes mandatory provisions requiring employer to pay employee compensation or provide him with special advantages and benefits in case of conclusion of respective agreement. Thus, paragraph 74a of German Commercial Code establishes duty of the employer to appoint and pay employee a monthly cash payment in case of signing agreement on prohibition of subsequent competition, period of validity of such agreement, as a general rule, may not exceed 2 years. US legal doctrine includes principle, according to which employee, who signed respective agreement, must be provided with commensurate benefits and advantages, but provision thereof is usually based on the agreement between parties and is purely contractual in nature. According to the definition given above, another important feature of a commercial secret
in accordance with US legislation is the condition on its holder’s need to take reasonable measures to ensure confidentiality of information. The law does not require absolute secrecy – amount of necessary measures is determined by specific circumstances and must comply with the principle of reasonableness.

In practice, reasonable efforts mean, for example, message to employees about the necessity to observe confidentiality, signing by employees of agreements on non-disclosure of commercial secrets, storage of classified documents under lock and key, etc. Usually, resigning employee notify organization about undertaken obligations on preservation of commercial secrets in writing. Manager of the organization of resigned employee may notify new employer on employee’s awareness in the area of commercial secrets. By preventing possible violations by hired personnel, employer may offer employee to notify him about existence of commitments on non-disclosure of commercial secrets.

In French law, in case of a dispute concerning the disclosure of a commercial secret, jurisprudence establishes absolute priority of rights and interests of entrepreneur in relation to a former employee. Courts rely on the fact that after the termination of employment relationship, former employee is obliged to keep former employee’s commercial secret, even if there is no corresponding legislative clarification on this issue.

In British practice, commercial secret is to be fully (but more rarely) protected after completion of employment on the basis of the former employee’s work. Be that as it may, centuries-old legal doctrine of restraint of trade is based on assertion that, after termination of employment relationship, employee is not civilly liable to former employer. It seems that occurrence of such optional obligation as obligation to keep information after termination of the principal obligation not only undermines accessory nature of its origin, but also leads to unilateral restriction of rights and interests of subjects of civil relations and contradicts the main idea – provision of balance of their rights and legitimate interests.

It seems preferable not to establish a general proclamation norm prohibiting use of commercial information by former employee for two years, but provision to former participants of guarantees to settlement of civil obligation upon its completion. In this case, it would not only emphasize the main feature of the civil law – dispositive orientation, but also reflects the very idea of dispositive regulation – provision of balance of rights and interests of members of civil relationship. In this regard, Western legal practice uses agreements on non-disclosure by former employee of former employer’s commercial secret.

In accordance with the Italian Civil Code, employee must to observe the so-called duty of loyalty. The law prohibits exercise by employee of competitive activities, transfer or any use of information about the enterprise or manufacturing processes, if it might harm the enterprise. It should be noted that the law does not set expiry date of duty of loyalty, and prohibition to disclose former employer’s commercial secret is established, regardless of how employee acquired respective knowledge. In Belgium and the Netherlands, any use by employee of information constituting former employer’s commercial secret, regardless of method of obtaining, is prohibited.

We should note that the jurisprudence of many industrialized countries has many cases of denying companies in their claims against former employees, considering such as an attempt to limit individual’s ability to obtain employment. For this reason, most courts insist that non-competition agreement had reasonable limits, both in time and geographical spread. For example, in the US agreements are recognized valid if: (1) they are suitable and necessary for protection of commercial information, (2) scope of activities covered by the agreement is clearly defined and is not too wide, (3) they are reasonable by period of validity (no more than 2-3 years), (4) they are reasonable by area of validity (within 1-2 states), and (5) they provide for commensurate remuneration/compensation to employee.

**Conclusions**

Summarizing the above, it should be noted that in order to ensure safety of a commercial secret, it is necessary to create such system of protection of information circulating in the enterprise that includes: (1) implementation of measures for development of a legal regime ensuring effective protection of a commercial secret in the enterprise, (2) acquisition of audio and video surveillance equipment, (3) hardware and software security solutions of corporate computer networks that will protect them from illegal actions by third parties, (4) ensuring continuous monitoring of compliance with confidentiality of
information in the enterprise; and (5) selection and training of personnel.

Most small and perhaps medium enterprises in Latvia today are not able to afford the entire complex of corporate security protective equipment due to high cost. And all it can be useless, given constant action of the human factor, which is the most vulnerable link in any system. Therefore, basic means and efforts at organization of and compliance with enterprise security should be aimed at personnel – from hiring to dismissal, including a two-year period of limitation of competition after termination of employment relationship. Security system can, more or less reliably, stand and reflect an attempt of intrusion from outside.

But if this invasion will be performed by enterprise’s employee, in most cases system will fail and sensitive information will leak. Practice shows that the leading role in preventing these violations belongs to prevention thereof. Only when level of sense of justice of the majority of members of civil society (personnel of the enterprise), coupled with constant monitoring system is high enough, one can hope for positive results.

But we should not forget about other protection mechanisms available to the merchant: law enforcement norms of copyright and patent law, which are closely connected with problems of protection of enterprise’s commercial secret, norms of competition law. For maximum effect, it is necessary to use the entire arsenal of legal means and methods.

References


Raicher, V. K. 1947. Social-historical types of insurance. AN USSR, Moscow.


SECURITY IMPLEMENTATION FACETS: CONVICTED WOMEN IMPRISONMENT SENTENCE EXECUTION

Vitolds Zahars¹, Maris Stivrenieks²

¹,²Daugavpils University, Parades st.1. Daugavpils, LV-5401 Latvia
E-mails: ¹vitolds.zahars@inbox.lv; ²maris.stivrenieks@inbox.lv

Received 15 October 2013; accepted 25 December 2013

Abstract. In recent years, there has been a considerable increase of total of the total number of female prisoners. Criminal offences committed by women are becoming more aggressive, more brutal and better planned. The offences are closely related to alcohol, psychotropic or narcotic substance abuse or domestic violence. Therefore, when rendering decisions that in any way affect the conditions of incarcerated women, it is important to pay special attention to the women's needs, namely their physical, professional, social and psychological needs. The assessment of risks and needs of the convicted women requires particular care and should be made in a tolerant manner, for it shall significantly affect the choice of the applicable social behaviour correlation tools or social rehabilitation tools and other measures that shall be the part of the convicted person's reintegration plan to prepare the imprisoned woman for productive life in society. This article identifies and analyses of the results of the conducted study on peculiarities of execution of the sentence of imprisonment in respect of convicted women in Latvia. Based on the study there has been developed a series of recommendations for the staff (of places of confinement) working with women prisoners, as well as pointed out the necessity to make amendments to the norms of The Sentence Execution Code of Latvia.

Keywords: Imprisonment, execution of the sentence, women, special needs, reintegration, human rights.

Reference to this paper should be made as follows: Zahars, V.; Stivrenieks, M. 2014. Security implementation facets: convicted women imprisonment sentence execution, Journal of Security and Sustainability Issues 3(3): 45–53. DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(4)

JEL Classifications: K1, K14, N43

1. Introduction

Society's security and sustainable development processes depend on many factors (Balkytė, Tvaronavičienė 2011; Bileišis 2012; Balkienė 2013; Borseková et al. 2012; Dudzevičiūtė 2012; Makštutis et al. 2012; Tūnčikienė et al. 2013; Teivans-Treinovs–kis, Jefimovs 2012; Grybaitė 2011; Stańczyk 2011; Taronavičienė, Lankauskienė 2011; Lankauskienė, Taronavičienė 2012; Mačiulis, Taronavičienė 2013). Institutional context play important role in the implementation of sustainable society security and development (Radović Marković, 2011). Let us elaborate security implementation facets in Latvia, through lenses of convicted women imprisonment sentence execution. There was a small perennial total amount of the female prisoners in places of confinement of Latvia. This is partly explained by the humanitarian approach during the trial processes against women, who have violated the provisions of the law, especially if these women have children, administering for committed offenses alternative punishments applying the sentence of imprisonment only in extreme cases. Criminal punishment now is not only legal consequences of the criminal offense, but also means by which the state tries to change the person's atti-
tude towards the public values in order to inhibit it from committing new offenses (Judins 2003). When conducting the analysis of the criminal offenses committed by women, it can be concluded that majority of these offenses are criminal property offenses i.e. theft, fraud. However, the number of violent criminal offenses committed by women increases every year, which are directed against human life and health i.e. infliction of serious bodily injuries, murder, etc. The analysis of the components of crime of the criminal offenses committed by women shows that the criminal offenses committed by women are becoming more aggressive, more brutal and better planned, which are often directly or indirectly related to alcohol, psychotropic or narcotic substance abuse or domestic violence. This article identifies and analyses of the results of the conducted study on peculiarities of execution of the sentence of imprisonment in respect of convicted women in Latvia. This study is the first amount of work in Latvia, which examines peculiarities of execution of the sentence of imprisonment in respect of convicted women, identifies certain issues and suggests possible solutions. International standards provide that female prisoners while being in a closed prison environment are defenceless and are at particular risk; therefore, the study obtains the status of vitally important topicality.

The aim of this study is to conduct the analysis of the existing norms of The Sentence Execution Code of Latvia concerning convicted women and their implementation in practice, as well as their compliance with generally accepted human rights, international and the Council of Europe norms and standards. Based on the study there has been developed a series of recommendations for the staff (of places of confinement) working with women prisoners, as well as pointed out the necessity to make amendments to the norms of The Sentence Execution Code of Latvia. The authors suggest that the drawbacks, issues discovered within the framework of this study, as well as proposed solutions will make a significant contribution to development of the penalty execution theory in Latvia. It will be possible to improve the sentence of imprisonment execution legal framework by using new scientific cognitions stated in this study.

2. Women in places of confinement of Latvia

A woman being in prison is an anomaly, but it is well known fact that the amount of female pris-

oners around the world is increasing. According to data provided by the administration of places of confinement, there are 345 women in places of confinement of Latvia, 106 of which are detainees; one of them has the status of the juvenile convict (the data of the administration of places of confinement 12.09.2013). According to data of the public report 2012 provided by the administration of places of confinement, in 2012 the 6.8% of all prisoners were women. UN and other international organizations express deep concern regarding the increase in number of offenses committed by women in a globalized world and the increasing number of women entering prisons. On March 16, 2011 the United Nations General Assembly (2011) has adopted the Provisions on Treatment of Convicted Women and on Types of Punishment of Non-Custodial Nature Regarding Female Offenders, which define valuable recommendations for criminal justice system and criminal punishment enforcement institutions in respect of choosing the criminal policy in treatment of convicted women and application of special norms and standards for convicted female representatives. The paragraph 2, second part of the section 4 of Law On Sentence Execution Code of Latvia provides that discrimination of convicts based on race, ethnicity, language, gender, social and financial status, political views, religious beliefs and other criteria is unaccept-

able, but the paragraph 3, second part of the section 4 provides that the law applies to all convicts without discrimination. The paragraph 25.4 of Recommendations of Committee of Ministers Rec (2006) for member states on European Prison Rules stress that particular attention should be paid to the needs of imprisoned women who have been victims of physical, psychological or sexual abuse. Humankind consists of two genders, which justifies idea that woman and man together form a whole person. However, the two parts of whole, that are taken separately, are not mathematically equal parts, but rather asymmetrical qualities. They complement each other (Vilks 1998). The paragraph 34.1 of the European Prison Rules provide that making decisions that in any way affect the conditions of incarcerated women, it is important to pay special attention to the women’s needs, namely their physical, professional, social and psychological needs.
3. Placement of the imprisoned women in places of confinement

The places of confinement have separate living premises for men and women, as well as for juveniles and adults. There are also separate living premises for convicts whose personal characteristics and criminal experience have a negative impact on other convicts, or convicts who oppress and exploit others. The persons to which has been applied such security measure as the arrest are held separately from other convicts, unless they agree to shared placement or involvement in joint activities with the consent of the investigating authority, prosecutor’s office or court at which disposal is the convicted person. In Latvia, convicted women begin to serve the sentence of imprisonment in semi-closed prisons, and only a small percentage of convicted women begin to serve their sentence in open prisons. International standards recommend to place convicted women in small open-type prisons, as close to place of residence as possible, but unfortunately, this recommendation is not followed (Zahars 2011). The convicted women are being placed either in semi-closed type prison of Ilguciems in Riga, or in open section of Olaine prison or in open type prison of Vecumnieki. According to present location of places of confinement on territory of Latvia, the placement of the confined women closer to a particular place of confinement is decided by the Head of Administration of Places of Confinement taking into account medical, security and crime prevention criteria. The paragraph 17.3. of the European Prison Rules provides that the initial location place and subsequent transfer from one place of confinement to another should be discussed as much as possible with prisoners themselves, but the paragraph 17.1. of these provisions provides that, as far as possible, the prisoners have to be placed in places of confinement close to their homes or rehabilitation institutions. In practice, the convicts are placed according to free places in specific place of confinement, complying with requirements stipulated by Section 131 of Code. In view of this, the authors suggest to read the Section 131 of Law On Sentence Execution Code of Latvia as follows: the placement of the confined women in a particular place of confinement is decided by the Head of Administration of Places taking into account medical, security and crime prevention criteria, as well as the prisoner’s opinion.

By placing the convicted women far from their place of residence it is more difficult to provide these people the opportunity to contact the outside world, help them to strengthen family relationships, meet with their families and children, etc. For many family members due to distance, financial situation or preoccupation do not visit convicts at the place of their confinement, therefore it causes the convicted women additional stress and suffering. Scientific evidence shows that emotional stress leads to psychological disorders. There may be grave and serious consequences. Emotional stress causes anxiety, depression, mental illnesses and suicidal thoughts (Cooke, Baldwin 1998). If a woman is in custody, this has consequences for her whole family, as majority of confined women are mothers who have children who are at liberty, who in most of the cases are minors. A woman plays a leading role, for she takes care not only of her children, but of the whole family as well. A good prison management is at prisons with culture, organized internal order and respect, and where each and every one receives humane treatment (Coyle 2009). Incarceration affects emotionally woman herself and her whole family as well. In some countries, the conducted research shows that during sentence of imprisonment the family of every second woman breaks up, therefore negatively affecting the former convict’s reintegration to society. In comparison, the number of broken families in case of male convicts is smaller, namely, every third convicted man loses family connections during sentence of imprisonment. The goal of sentence of imprisonment is to promote convicted person’s legal behavior, to give this person an opportunity to acquire social skills, general knowledge and abilities, preparing this person for law-abiding life in society, instead of isolating, degrading and causing this person unnecessary suffering (Stivrenieks 2013).

4. The assessment of risk and needs of the convicted women and needs of re-socialization

The first part of Section 61 of Law On The Sentence Execution Code of Latvia provides that within two months after placing the convict in the place of confinement to serve the sentence the head of authority shall provide the assessment of risk and needs of convicted person. When carrying out the assessment of risk and needs of the convicted women, it is necessary to identify the convict’s reintegration needs, as well the level of risk of repeated anti-social behavior and criminal offense at the place of confinement. The assessment of risk and needs of convicted women should be made with particular care and tolerance, for it shall significantly affect the choice of the applicable...
social behavior correlation tools or social rehabilitation tools, which are included in convicted woman’s re-socialization plan. The second part of Section 61 of Law On The Sentence Execution Code of Latvia provides that repeated assessment of risk and needs of convicted person is conducted at least once a year during entire period of time served in place of confinement.

The authors, by conducting assessment of re-socialization plan for convicted women and assessing the risk and needs factors, have come to the conclusion that up to this moment the re-socialization plans and assessment of risk and needs are not prepared or are just a formality. The officials of places of confinement explain this situation with great workload or lack of staff, as well as with the fact that the staff of places of confinement in some cases lack the understanding of importance of the risk and needs assessment when preparing convicted women for life in society.

5. Involvement of convicts in education programs

The paragraph 1 of the first part of Section 61 of Law On The Sentence Execution Code of Latvia provides that one of the means of the rehabilitation of the convicts shall be involvement of convicts in general, professional and educational programs, according to the prisoners’ interests. European Prison Provisions provide that the administration of the places of confinement tries to provide all convicts the opportunity to acquire the widest possible range of educational programs according to the individual needs and efforts of each convict, prioritizing the education of convicts who lack literacy, the ability to write and calculate, as well as those convicts who do not have the basic education or vocational training. According to the data of the places of confinement in 2012/2013, 55% of all convicts were involved in educational process. Unfortunately, it must be noted that the Ilguciems prison does not provide the opportunity to acquire the initial training program for women convicts who lack literacy, the ability to write and calculate. This basic training is very important and essential in preparing female convicts for law-abiding life in society and for them to be competitive at labor market. The lack of initial education hinders the acquisition of professional or general educational program. Fulfilment of obligations of convicts and realization of rights and lawful interests forms a legal regime of criminal punishment execution, which is the basis for implementation of penalty goals, namely, for correction of convicts and their adaptation for life in society (Zahars 1999).

The first part of Section 62 of Law On The Sentence Execution Code of Latvia provides that the place of confinement, within the integration of the convict into society, shall provide the juvenile convicts the opportunity to acquire general education. This existing norm of Law On The Sentence Execution Code of Latvia by providing that general education should be provided only for juvenile convicts is contrary to European standards and recommendations, which provide that the administration of places of confinement provides all convicts the opportunity to acquire the widest possible range of education programs. In view of this, the authors suggest to read the first part of Section 62 of Law On Sentence Execution Code of Latvia as follows: the administration of places of confinement promotes the acquisition of education, so that the convicts would be able to acquire general education.

European standards recommend that education in prison regime is just as important as work, so the convicts should not come financially or otherwise disadvantaged just because they are studying. Unfortunately, it must be noted that in Latvian prisons the convicts who have been involved in the process of education (and they do not receive scholarship), find themselves in financially disadvantaged situation in comparison to those convicts who are working. Due to non-compliance with these standards, the administration of places of confinement experiences problems with assembling of education program study groups as prisoners prefers to work.

6. Employment of convicts

In order to ensure the attainment of reintegration objectives, according to requirements of Section 56 of Law On Sentence Execution Code of Latvia the convicts who serve their sentence at remand prison, at place of confinement or at correctional institution for juvenile delinquents are employed for payment or without payment. According to the data of the annual public report of administration of the places of confinement in 2012, there were only 29% of employed convicts who received payment. In Ilguciems prison 65% of convicted women have been employed and received payment. The convicted women are involved in employment for a fee only in limited cases. In order to prepare the convicted women for normal living
and working conditions, employment is one of the most important social rehabilitation means in order to achieve the objectives of re-socialization. In the country, there has to be a system that would ensure a full life for women and that would contribute to social and economic security of the families. Women in the current period of time are less employed. Among women, there is a larger proportion of unemployment. Social programs should include measures to promote the employment of women (Vilks 1998). The convicts are being employed without payment to perform the work of maintenance, cleaning and improvement of the places of confinement and the surrounding territory, as well as to perform the work to improve culture of convicts and their living conditions according to the schedule, but no longer than four hours. The paragraph 26.10 of European Prison Provision provides that in any case the convicts have to receive equitable remuneration. When conducting the analysis of the existing Law On Sentence Execution Code of Latvia and European Prison Provision norms the authors have come to the following conclusion: the employment of the convict without compensation is contrary to the international standards and the Constitution of the Republic of Latvia.

7. Addiction issue solving

A large proportion of convicted women had somehow encountered with drug or alcohol problem. Drug use among women is increasing and the increases drug use means that the majority of these women will end up in prison. Experience has shown that it is extremely difficult to eradicate drug abuse only by force; there have to be alternative methods. Worsening of the problem and limited resources require new solutions (Kuks 1994). Currently at places of confinement, the addiction problem is being solved by National Probation Service and NGOs implementing programs for different profiles. The construction of the new rehabilitation center (with capacity for 200 convicts) for drug addicts in Olaine, which will implement both the drug and alcohol addiction reduction programs has brought new positive features to system of places of confinement. The rehabilitation center will be situated at the Olaine prison territory, it is important because it will be adjacent to Latvian Prison Hospital. It is no secret that convicts who use drugs usually have a whole bunch of different types of diseases. The establishment of this type of rehabilitation center for addicts is clearly a positive change, because only ad-

diction free persons can be rehabilitated.

8. Work with convicted women who have been victims of physical or sexual abuse

Women in prison are particularly vulnerable, especially those who before the imprisonment have been victims of physical or sexual abuse. They may have experienced this kind of abuse in childhood or from a partner, because historically women have been targets of gender discrimination and stigmatization. Modern society is still not ready to assess adequately crimes committed by women and to focus on it as a specific crime branch, examining the personality of criminals and explaining individual causes of the criminal behavior. It is necessary to conduct systematic study regarding criminal offense influencing factors, as well as the study of repetition of offenses (Zavackis et al. 2013). Society criticizes and condemns women for any-social behavior more than men. The experienced abuse and the resulting trauma are closely associated with the woman’s choice of criminal path or criminal activity. In view of this, the staff of the places of confinement has to identify the victims of abuse and hold additional activities with these women providing them with medical care and psychological support, and in some cases a legal advice as well. According to the assessment of risk and needs of the convicted women, the means of re-socialization should be applied individually. Ilguciems prison does not implement such kind of program; it only provides individual psychological counselling.

9. Christian education and training program Miriam

Ilguciems prison has a perennial and successfully implemented Christian Education and Training Program Miriam, which helps to bring into prison subculture spiritual and cultural values. Useful activities of the convicted persons are the values that should be protected always and everywhere. It is the best indicator for civilized punishment execution and the wish to integrate the ex-convicts back into society (Zahars 2011). Christian Education and Training Program Miriam helps the convicted women to get to know the power of the word in its spirituality, the music in its classical form and the performing arts in their multifunctionality. Christian Education and Training Program provide convicts the opportunity to learn history of arts and to get acquainted with impression-
ism by using colours and brushes. Within the program Miriam, the women are given the opportunity to enjoy freedom by singing gospels and learning to play various musical instruments. The long-running program, which is implemented at places of confinement, has a positive impact on the overall prison environment. According to international criminal justice, expert opinion the program Miriam that is implemented at Ilguciems prison is justly rated as one of the best programs in the world of similar type.

10. The staff of the places of confinement and effective prison management

The staff of the places of confinement and internal procedures plays a very important role in execution of the sentence of imprisonment. Good order in places of confinement can be achieved not only by providing security and by the performance of functions that are related to re-socialization of convicts, but also by ensuring certain regimen and internal procedure. As a result, successful interaction of all these functions can provide the maximum achievement of targets of sentence execution at the places of confinement (Stivrenieks 2013a, b). Section 72.1 of the European Prison Rules provide that the places of confinement are managed in accordance with the code of ethics, which recognizes an obligation to treat all convicts in a humanely, without insulting person’s dignity, it is especially important when working with female convicts. International standards provide that female convicts in closed environment of places of confinement are particularly vulnerable and therefore supervision at the places of confinement for female convicts should be performed by female employees, in order to exclude the possibility of violation of sexual immunity, or other forms of unacceptable behavior of male staff. When choosing new employees for work with female convicts, it should be emphasized that work with female convicts is particularly difficult, which requires such personal qualities like integrity, humanity and humanism, as well as it is important to ensure that all staff, during the professional activity, would preserve and improve its’ knowledge and professional capacity by attending training and development courses. Paragraph 81.3. of the European Prison Rules provide that those employees of the places of confinement who work with special convict groups, namely, foreigners, women, minors or mentally ill, etc. are provided with specific training corresponding to the nature of their work. Unfortunately, in recent years this type of qualification development courses for work with female convicts have not be organized.

Conclusions

In summary, the authors come to the following conclusions:

By placing the convicted women far from their place of residence it is more difficult to provide these people the opportunity to contact the outside world, help them to strengthen family relationships, meet with their families and children, etc.; it causes the convicted women additional stress and suffering. Incarceration has an emotional impact both on the woman herself and on her whole family.

The authors, by conducting the analysis of assessment of re-socialization plan for convicted women and assessing the risk and needs factors, have come to the conclusion that up to this moment the re-socialization plans and assessment of risk and needs are not prepared or are just a formality.

The places of confinement do not provide uneducated convicted women, the opportunity to acquire reading, writing and calculation skills or the opportunity to acquire early education programs. This fact seriously hinders the access of convicted women to the further education programs and contributes to the risk of their social exclusion. Such approach is inconsistent with Council of Europe’s standards and recommendations.

The norms of the Law On The Sentence Execution Code of Latvia state that general education should be provided only to young people. This is inconsistent with Council of Europe’s standards and recommendations, which provide that administration of the places of confinement, should provide all convicts the opportunity to acquire the widest possible range of education programs.

European standards recommend that education in prison regime is just as important as work, so the convicts should not come financially or otherwise disadvantaged just because they are studying. Unfortunately, it must be noted that in Latvian prisons the convicts who have been involved in the process of education, find themselves in financially disadvantaged situation in comparison to those convicts who are working.

The employment of the convict without compensation is violation of the international standards and
Council of Europe's norms and standards. The places of confinement do not have rehabilitation programs for women who have been the victims of physical or sexual abuse.

Council of Europe's standards provide that staff of places of confinement who work with special convict groups, namely, women are provided with specific training corresponding to the nature of their work. Unfortunately, in recent years this type of qualification development courses for work with female convicts have not be organized.

In view of this, the authors suggest the following possible solutions:

- to read the Section 13 of Law On Sentence Execution Code of Latvia as follows: the placement of the confined women in a particular place of confinement is decided by the Head of Administration of Places taking into account medical, security and crime prevention criteria, as well as the prisoner’s opinion;
- to read the first part of the Section 56 of Law On Sentence Execution Code of Latvia as follows: the convicts shall be employed without remuneration solely for cleaning residential premises of place of confinement and activities related to cultural improvement;
- to read the first part of Section 62 of Law On Sentence Execution Code of Latvia as follows: the administration of places of confinement promotes the acquisition of education, so that the convicts would be able to acquire general education;
- to make amendments to the Section 62 of Law On Sentence Execution Code of Latvia by adding to this section the third part. To read the third part as follows: convicts who are involved in education programs are paid scholarship. The amount of scholarship and the procedure of payment shall be determined by the Cabinet of Ministers;
- to provide the convicted women at places of confinement uneducated convicted women, the opportunity to acquire reading, writing and calculation skills or the opportunity to acquire early education programs;
- to provide the rehabilitation programs for convicted women who have been the victims of physical or sexual abuse;
- to organize qualification improvement courses for the staff of the places of confinement in order to draw plans and make assessment of risk and needs of the convicts, by explaining its necessity, topicality and investment in security of institution;
- to organize qualification improvement courses (to work with convicted women) for the staff of the places of confinement, with the assistance of professionals of various kinds if necessary, paying particular attention to the women’s needs, namely their physical, professional, social and psychological needs.

References


Zahars, V. 2011. Latvijas kriminalpolitika: retrospekceja un nākotnes vizīja [Criminal Law Policy of Latvia]. Daugavpils: Daugavpils Universitātes Akadēmiskais apgāds „Saule” [Dau-

FOREIGN DIRECT INVESTMENT: DRIVING FACTORS AND OUTCOMES FOR SECURE AND SUSTAINABLE DEVELOPMENT

Jūratė Antanavičienė

Vilnius Gediminas Technical University, Sauletekio av. 11. LT-112003 Lithuania,
Mykolas Romeris University, Ateities st. 20, LT-08303 Vilnius, Lithuania
E-mail: Jurate.Antanaviciene@vgtu.lt

Received 25 September 2013; accepted 15 December 2013

Abstract. Driving factors and implications of foreign direct investments were widely discussed during the latest decade. Anyway, impression remains that due to the specifics of that type of investment, misinterpreting of their economic composition is rather frequent than rare. Hence, the paper starts with detailed classification of investment types. The next part of the paper is devoted to a review of approaches to FDI driving factors and outcomes. Finally, current trends of foreign capital flows in Lithuania, Latvia and Estonia are being observed and evaluated. Novel insights about new consistent patterns of foreign capital directions are being provided. The paper is being finalized by indicating contemporary implications of FDI withdrawal for host country related to its further secure and sustainable development.

Keywords: Foreign Direct Investments, globalization, sustainable development.

Reference to this paper should be made as follows: Antanavičienė, J. 2014. Foreign direct investment: driving factors and outcomes for secure and sustainable development, Journal of Security and Sustainability Issues 3(3): 55–67. DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(5)

JEL Classifications: F2, F3, F6, R1

1. Introduction

In the past two decades the vast majority of countries effectively participated in the process of globalization defined as the broadening and deepening of links between national economies into a worldwide market for goods, services and especially capital. Because of globalization, a leading role in shaping and driving cross-border integration through the transfer of production facilities, functions and technology has been played by multinational corporations (herein after referred to as MNCs). Since the 1990s, trade and investment have become the prime driving forces behind globalization, while the growth of foreign direct investment (herein after referred to as FDI) has become one of the driving factors as well as one of the outcomes of development of separate countries and geographic regions (e.g. Sahoo 2006; Tvaronavičienė et al. 2009; Šimelytė, Antanavičienė 2013; Tvaronavičienė, Lankauskiėnė 2011; Tvaronavičienė, Lankauskiėnė 2012; Evrim-Mandaci et al. 2013; Tvaronavičienė et al. 2013).

Impact of foreign direct investment on economic growth and sustainable development during the last decade was discussed rather amply (Tvaronavičienė et al. 2009; Tvaronavičienė, Lankauskiėnė 2011; Šimelytė, Antanavičienė 2013, Tvaronavičienė et al. 2013). More companies are expanding their operations abroad through direct investment than ever before and countries are competing to attract multinational corporations (Tvaronavičienė et al. 2009; Tvaronavičienė et al. 2013). The rationale for increased efforts to attract more FDI stems from the belief that FDI has several positive effects, which include productivity gains, technology transfers, job opportunities, the introduction of new processes,
managerial skills, and how-know into the domestic market, employee training, international production networks, and access to markets. Multinational corporations also receive benefits: increased availability of raw material, cheap labour, lower production costs, ready market and legal facilities in such countries (Sahoo 2006; Tvaronavičienė et al. 2009; Šimelytė, Antanavičienė 2013; Tvaronavičienė, Lankauskienė 2011; Tvaronavičienė, Lankauskienė 2012; Evrim-Mandaci et al. 2013; Tvaronavičienė et al. 2013).

The role played by FDI in the economic growth of various economies spurred researchers and policy makers to explore the links between FDI and growth and identify the driving forces stipulating capital flows. Different studies that have been done through the years have found that FDI indeed affects economic growth while others have found no such connection (Tvaronavičienė et al. 2013; Tvaronavičienė, Grybaitytė 2013; Mačiulis, Tvaronavičienė 2013).

Indeed, the amount of research done on FDI has been increasing day by day in an attempt to identify the determinants and impacts of FDI however it remains a complex problem which depends on several characteristics specific to each country, sector and company. In fact, the level of FDI may depend on an host country economy growth patterns, total tax burden, business environment, institutional arrangement, market size, purchasing capacity, labour force qualification, innovative mind-sets and mobility, trade openness, geographical location etc. (Balkytė, Tvaronavičienė 2011; Dudzevičiūtė, Tvaronavičienė 2011; Tvaronavičienė, Grybaitytė 2012). The purpose of this article is to establish some of the determinants of FDI and their performance trends in the case of European countries.

The major aim of this article is to provide criteria for formulating efficient economic policy. The article is structured as follows. For methodological purposes, the article is divided into three parts. The first part explores scientific literature in order to compare different investment types. The second part is empirical and is based on ad hoc selected comparisons. The final part consists of a discussion and generalization of the results.

2. Types of investment: similarities and differences

According to different theories and principles the word “investment” can be defined in many ways and can be used in a number of contexts. In colloquial language, investment is being meant the use of money to earn more money. Investment can also mean savings or savings made through delayed consumption or, according to economics, investment is the utilization of resources in order to increase income or production output in the future. An amount deposited into a bank or machinery that is purchased in anticipation of earning income in the long run, are both examples of investments. Although there is a general broad definition of the term investment, and it has to be pointed out that it obtains slightly different meanings in different contexts.

According to classical economics, investment refers to any physical or tangible asset, for example, a building or machinery and equipment. On the other hand, finance professionals define an investment as money utilized for buying financial assets, for example stocks, bonds, bullion, real properties, and precious items. Sustainable development and economic growth is driven by investment into tangible assets, or, to put into another way, into factors of production.

To summarize, investment means money or tangible, intangible and financial assets invested in order to obtain profit (income) or other result from the object of investment. Investors are legal and natural persons, all government units and foreign states, international organizations, and also undertakings without the rights of legal person, that invest their own or borrowed assets or assets held and used on trust. An investor, performing an act of investment, acquires the right of ownership or the creditor’s right of claim over the object if investment, or the right to manage and use the object. Object of investment is own capital of the economic entity, all types of securities, fixed tangible assets and fixed intangible assets. Reinvestment means the investment of the profit in the same economic entity in which the profit was obtained. According to the object of investment, all investments can be divided into capital investments and financial investments:

Capital investment is the investment into (or a purchase of) capital assets that include fixed tangible assets and intangible assets. Capital investment is the investment into production, acquisition or the increase of value of capital assets. Capital asset is expected to be used for a considerable time in business in order to produce goods or provide services for future consumption. Examples of capital assets in most
businesses are land, buildings, plant, machinery, motor vehicles, investments in subsidiary companies, and etc.

Financial investment is the investment into (or a purchase of) financial assets, such as shares, bonds, and other debt securities, bank deposits, and so on, with a primary view to their financial return in future, either as income or capital gain. The level of financial investments in economy is related to such factors as the rate of interest, the extent to which the investment is likely to be profitable, and the general climate of business confidence. According to the influence of an investor on the economic entity, investments can be divided into direct and indirect (or portfolio) investments:

Direct investment is the investment aimed at establishing an economic entity and acquiring the capital of a registered economic entity or share in the capital, also reinvestment, loans, to economic entities the capital whereof is owned by the investor or in which he has a share in the capital, subordinated loans where the objective of the investment is to establish or maintain long-term direct links between the investor and the economic entity in which the investment is made, and the share in the capital acquired through investment accords the investor a possibility either to control the economic entity or to exert a considerable influence upon it.

Indirect (portfolio) investment is the investment where a share in the capital acquired through investment does not accord the investor any possibility to exert any considerable influence on the economic entity. According to the place of registration or reside of the investor, investments can be divided into domestic and foreign investments:

Domestic investment is the investment by residents in their own country. For example, investments in Lithuania made by the Government of Lithuania, natural and legal persons of Lithuania, also the domestic undertakings without the rights of the legal person.

Foreign investment is the investment in the country by foreigners (foreign governments, international organizations, foreign natural and legal persons). According to the status of the investor, investments can be divided into government and private investment:

Government investment is the investment made by using the government (central government, municipalities, extra-budgetary funds) budget resources, loans obtained in the name of the government, resources of state-owned (municipal) enterprises and other state-owned (municipal) assets as well as loan guarantees extended by the state (municipalities), in order to meet the needs of the state.

Private investment is the investment made by a private sector – economic entities and households.

Foreign Direct Investment is the category of international investment in which a resident entity in one economy obtains a lasting interest in an enterprise resident in another. A lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the investor on the management of the enterprise. The direct investment is established when a resident in one economy owns 10 per cent or more of the ordinary shares or voting power of an incorporated enterprise, or the equivalent for an unincorporated enterprise. All subsequent transactions between affiliated enterprises, both incorporated and unincorporated, are direct investment transactions. FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. Such investment involves both the initial transactions between the two entities and all subsequent transactions between them and among foreign affiliates, both incorporated and unincorporated. FDI can also be defined an internalized investment flow which includes capital assets as well as intangible assets. The investor keeps control of the subsidiary that it has established and derives benefits from its investment through:
- Increase in sales (either on local markets or through exports to third markets);
- Reduction of costs of production;
- Increase in production efficiency of the group as a whole. The foreign investor assumes the operational risks of its enterprise. A direct investment enterprise is an enterprise resident in one economy and in which an investor resident in another economy owns, either directly or indirectly, 10% or more of its voting power if it is incorporated or the equivalent for an unincorporated enterprise. The numerical threshold of ownership of 10% of the voting power determines the existence of a direct investment relationship between the direct investor and the direct investment enterprise. An ownership of at least 10% of the voting power of the enterprise is regarded as the necessary evidence that the investor has sufficient influ-
ence to have an effective voice in its management (Finance Maps of Word 2012).

A direct investor is defined as an individual, an incorporated or unincorporated public or private enterprise, a government, a group of related individuals, or a group of related incorporated and/or unincorporated enterprises which have a direct investment enterprise that is, a subsidiary, associate or branch, operating in a country other than the country or countries of residence of the direct investor(s). A subsidiary is an incorporated enterprise in which:

- the foreign investor controls directly or indirectly (through another subsidiary) more than 50% of the shareholders’ voting power, or;
- the foreign investor has the right to appoint or remove a majority of the members of this enterprise’s administrative, management or supervisory body.

An associate is an enterprise where the direct investor and its subsidiaries control between 10% and 50% of the voting shares. A branch is an unincorporated enterprise that:

- is a permanent establishment or office of a foreign direct investor;
- is an unincorporated partnership or a joint venture between a foreign direct investor and third parties;
- is land, structures and immovable equipment and objects directly owned by a foreign resident;
- is mobile equipment operating within an economy for at least one year if accounted for separately by the operator (e.g. ships, aircraft, gas and oil drilling rigs).

Foreign direct investment flows are made of three basic components:

1. Equity capital: comprising equity in branches, all shares in subsidiaries and associates (except non-participating, preferred shares that are treated as debt securities and are included under direct investment capital) and other capital contributions such as provisions of machinery etc.

2. Reinvested earnings: consisting of the direct investor’s share (in proportion to direct equity participation) of earnings not distributed, as dividends by subsidiaries or associates and earnings of branches not remitted to the direct investor.

3. Other direct investment capital (or intercompany debt transactions): covering the borrowing and lending of funds, including debt securities and trade credits, between direct investors and direct investment enterprises and between two direct investment enterprises that share the same direct investor (Finance Maps of Word 2012).

More specifically, the definition of direct investment flows is the following:

- for subsidiaries and associate companies
  - the direct investor’s share of the company’s reinvested earnings;
  - plus the direct investor’s net purchases of the company’s shares, debt securities (bonds, notes, money market and financial derivative instruments) and loans (including non-cash acquisitions made against equipment, manufacturing rights, etc.);
  - less the company’s net purchases of the direct investor’s shares, debt securities and loans;
  - plus the net increase in trade and other short term credits given by the direct investor to the company.

- for branches
  - the increase in reinvested profits;
  - plus the net increase in funds received from the direct investor;
  - plus inter-company flows, with the exception of certain flows between affiliated banks, affiliated intermediaries (e.g. security dealers), and Special Purpose Entities (SPEs) with the sole purpose of serving as financial intermediaries.

International direct investment positions are defined as:

- for subsidiaries and associates
  - the market or book (balance sheet) value of shares and reserves attributable to direct investor;
  - plus loans, trade credits and debt securities credited by direct investors (including determined but not yet paid dividends);
  - less reverse loans, trade credits and debt securities;
  - for branches
  - the market or book value of fixed assets, investments and current assets, excluding amounts due from direct investor;
  - less the branches liabilities to third parties

Rapidly growing economies became favourite investment destinations for the foreign institutional investors. These markets have the potential to grow in the near future. This is the prime reason behind the growing interests of the foreign investors. The promise of rapid growth of the investable fund is tempting the investors and so they are coming in huge numbers to these countries. The money, which is coming through the foreign institutional investment, is referred as ‘hot money’, because the money can be taken out from the market at any time by these investors.

Because of globalization the investment sector be-
came very strong. At the same time the developing countries understood the value of foreign investment and allowed the foreign direct investment and foreign institutional investment in their financial markets. Nevertheless, the foreign direct investments are long term investments; however, they could be unpredictable.

3. FDI stakeholders and driving factors

In order to understand why FDI flows to some countries are more substantial than to others it is necessary perceive motivation of companies that are involved in FDI and regulation of FDI both at international and local levels. Usually FDI flows through investor, which is being called a multinational corporation. A multinational corporation (MNC) is a corporation that is registered in more than one country or that has operations in more than one country. It is a large corporation which both produces and sells goods or services in various countries. The main objective of MNC is to maximise profit and to reduce cost. Therefore consideration is given to regions which are likely to bring highest returns on investments and enabling environment for business to succeed. This provides one of the main reasons why there are more FDI in some countries than others. MNCs investments are higher in regions that provide the best mix of the traditional FDI determinants.

There are different types of MNCs. Some are vertically integrated. The subsidiary provides inputs to the parent which produces a final good. Oil companies are good examples of vertically integrated MNCs. Oil exploration and production are accomplished abroad where the subsidiary exports crude petroleum to the parent corporation which then refines the crude into gasoline. Another example is the Maquiladora program. The US parent corporation exports components to an assembly Maquiladora subsidiary which in turn re-exports the assembled good back to the parent corporation. Other MNCs are horizontally integrated, meaning that the subsidiary produces a similar good to that of the parent. The soft drink industry is an example of horizontally integrated MNCs. The subsidiary is a bottling company which produces pretty much the same product as the parent company. The department of the United Nations that is responsible for the development of FDI is the UNCTAD. This body was established in 1964 specifically to integrate the developing countries into the world economy through the encouragement of foreign direct investment. Specific functions include providing technical assistance to developing countries with special attentions to the needs of least developed countries and creating a forum for intergovernmental deliberations so as to have enabling environment for FDI. Most FDI flows are from the industrialised world to the developing countries. The developing countries have a major role to play because the policies of such countries go a long way in determining the inflow of FDI to such countries. Hence most of these countries have investment promotion agencies to encourage foreign investment.

It is believed, that one of the advantages of foreign direct investment is that it helps in the economic development of the particular country where the investment is being made. This is especially applicable for the economically developing countries. During the decade of the 90s foreign direct investment was one of the major external sources of financing for most of the countries that were growing from an economic perspective. It has also been observed that foreign direct investment has helped several countries when they have faced economic hardships (Tvaronavičienė, Lankauskiene 2011).

FDI also permits the transfer of technologies. This is done basically in the way of provision of capital inputs. The importance of this factor lies in the fact that this transfer of technologies cannot be accomplished by way of trading of goods and services as well as investment of financial resources. It also assists in the promotion of the competition within the local input market of a country. The countries that get foreign direct investment from another country can also develop the human capital resources by getting their employees to receive training on the operations of a particular business. The profits that are generated by the foreign direct investments that are made in that country can be used for the purpose of making contributions to the revenues of corporate taxes of the recipient country. Foreign direct investment helps in the creation of new jobs in a particular country. It has been observed that foreign direct investment allows for the development of the manufacturing sector of the recipient country. Foreign direct investment can also bring in advanced technology and skill set in a country. There is also some scope for new research activities being undertaken. Foreign direct investment assists in increasing the income that is generated.
through revenues realized through taxation. It also plays a crucial role in the context of rise in the productivity of the host countries. In case of countries that make foreign direct investment in other countries this process has positive impact as well. In case of these countries, their companies get an opportunity to explore newer markets and thereby generate more income and profits. It also opens up the export window that allows these countries the opportunity to cash in on their superior technological resources. It has also been observed that as a result of receiving foreign direct investment from other countries, it has been possible for the recipient countries to keep their rates of interest at a lower level. It becomes easier for the business entities to borrow finance at lesser rates of interest.

The disadvantages of foreign direct investment occur mostly in the case of matters related to operation, distribution of the profits made on the investment and the personnel. One of the most indirect disadvantages of foreign direct investment is that the economically backward section of the host country is always inconvenienced when the stream of foreign direct investment is negatively affected. The various disadvantages of foreign direct investment are understood where the host country has some sort of national secret – something that is not meant to be disclosed to the rest of the world. It has been observed that the defense of a country has faced risks as a result of the foreign direct investment in the country. At times it has been observed that certain foreign policies are adopted that are not appreciated by the workers of the recipient country. Foreign direct investment, at times, is also disadvantageous for the ones who are making the investments themselves. Foreign direct investment may entail high travel and communications expenses. The difference of language and culture that exist between the country of the investor and the host country could also pose problems in case of foreign direct investment. Another major disadvantage of foreign direct investment is that there is a chance that a company may lose out on its ownership to an overseas company. This has often caused many companies to approach foreign direct investment with a certain amount of caution. At times it has been observed that there is considerable instability in a particular geographical region. This causes a lot of inconvenience to the investors. The size of the market, as well as, the condition of the host country could be important factor in the case of the foreign direct investment. In case the host country is not well connected with their more advanced neighbours, it poses a lot of challenge for the investors. It has been observed that the governments of the host country are facing problems with foreign direct investment. It has less control over the functioning of the company that is functioning as the wholly owned subsidiary of an overseas company (Disadvantages of Foreign Direct Investment 2010). This leads to serious issues. There have been adverse effects of foreign direct investment on the balance of payments of a country. Even in view of the various disadvantages of foreign direct investment it may be said that foreign direct investment has played an important role in shaping the economic fortunes of a number of countries around the world.

The concept of the investment development path (IDP), which relates to foreign direct investment (FDI), was first proposed by Dunning in the early eighties (Tvaronavičienė, Kalašinskaitė 2010). According to the basic IDP proposition, the inward and outward foreign investment position of a country is tied with its economic development. There is strand of economic literature, in which it is claimed that the impact of FDI on economic growth in a country depends on the degree of its development (Tvaronavičienė, Lankauskienė 2011; Tvaronavičienė, Lankauskienė 2012; Tvaronavičienė et al. 2013). The investment development path (IDP) suggests five stages that a country goes through and which affect the level of investment. During the first stage a country is considered to be almost unable to attract inward direct investment. This is the case due to low per capita income, underdeveloped economic systems and governmental policies, poor infrastructure and communication, and above all, a labour force with low human capital. The few direct investments made are mainly in the labour-intensive manufacturing and primary sector like agriculture. In the second stage, inward direct investment starts to rise. The investments are still mostly located in natural resources and primary commodities. In this stage, the host government is beginning to change policies in order to stimulate FDI. The domestic firms begin to move their production towards semi-skilled and knowledge-intensive consumer goods. The third stage
is characterized by rising domestic income which causes an increase in demand for high quality goods, partly enhanced by an increased level of competition among companies. The rising incomes cause a decrease in growth of inward direct investment and an increase in the growth of outward direct investment towards countries with lower levels of IDP. The competition between domestic and foreign firms increases as well when the domestic firms acquire competitive advantages. The enlarged market and increased innovation will enable economies of scale and encourage technology-intensive manufacturing. When the stock of outward direct investment exceeds the stock of inward direct investment, the country has reached the fourth level. The domestic firms can only compete with foreign firms in sectors where they have a competitive advantage. Instead they invest abroad in markets where the labour is cheaper. In the domestic market the capital-intensive production increases in turn. The fifth stage characterizes by a continuous increase in outward and inward direct investment where advanced industrial nations find themselves. The importance of MNEs is clear here. The domestic supply of natural resources is of less importance and instead the ability to exploit markets in other countries is significant (Dunning, Narula 2002).

There are many articles about Foreign Direct Investments, their impacts on various sectors of the country and a lot of different researchers’ hypothesis about driving forces, which attract these FDI to a specific country (e.g. Busse et al. 2007; Tvaronavičienė et al. 2009; Tvaronavičienė, Kalašinskaite 2010; Lankauskiene, Tvaronavičienė 2012; Tvaronavičienė, Lankauskiene 2011; Tvaronavičienė et al. 2013; Šimelytė, Antanavičienė 2013). Some statements are based on estimates, while others remain unproven. In this subsection a few of the most significant and widely acknowledged ideas about FDI and its main determinants will be presented. One of the most important factors in attracting FDI is a country’s tax policy. (Bellak et al. 2009; Bellak et al. 2010) analysis shows that South Eastern European Countries (further SEECS) which aim to increase FDI inflows should first reduce legal barriers toward FDI. Second, SEECS should keep corporate income taxes low at least in the short and the medium-run. Third, SEECS need to free financial means to improve their infrastructure endowment in the medium to long-run. Fourth, once the institutional environment and the infrastructure endowment have improved, SEECS might even consider to increase corporate income taxes again as “infrastructure rents” will accrue, which can be taxed without losing FDI (Bellak et al. 2009).

In addition, the direction of causality between investment climate and, more generally, business climate at the host country and FDI must be discussed. From a scientific point of view, some authors, who have studied the relationship between institutions and growth triggered by FDI and other driving forces, have stressed that positive institutional climate stimulates sustainable economic growth and development rather than vice versa. Some authors (e.g, Kaufmann et al. 2008; Tvaronavičienė et al. 2009; Tvaronavičienė, Grybaite 2012; Tvaronavičienė et al. 2013; Vosilius et al. 2013; Mačiulis, Tvaronavičienė 2013) claim that the quality of institutions has an impact on growth but the reverse influence depends on the democratisation process and on the public governance. Other economists point out that the quality of institutions has a more important effect on long-term growth than on short term. Some authors point out the sensitivity of context and indicate, that role of institutions depends on the ability of the country to make them effective within a local institutional arrangement. According to Busse et al. (2007) institution quality may be approached by governance defined by Kaufmann et al. (2008) as “the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them”. Nevertheless, despite the fact that some scientists and other stakeholders believe that business climate plays a very important role in attracting FDI, institutional factors are difficult to measure (Tvaronavičienė, Grybaite 2012). Estimating the strength of that driving force remains a methodological issue and hence, related research limitations have to be taken into account.

Some studies suggest that human resource development (HRD) is the key driving force determining FDI flows in developed and developing countries (Miyamoto 2008; Mačiulis, Tvaronavičienė 2013). While HRD and FDI individually affect growth, they also reinforce each other through complementary effects. In general, enhanced HRD increases incoming FDI by making the investment climate attractive for for-
eign investors. On the other hand, FDI contributes to HRD since multinational enterprises (MNEs) themselves can be active providers of education and training, bringing new skills, information and technology to host developing countries. Ultimately, this complementary effect leads to a virtuous circle of HRD and FDI where host countries experience continuous inflow of FDI over time by increasingly attracting higher value-added MNEs, while at the same time upgrading the skill contents of preexisting MNEs and domestic enterprises (Miyamoto 2008).

Scientists have the opinion, that the degree of a country’s openness can affect FDI in multiple ways. Lower import barriers discourage tariff-jumping FDI but may stimulate vertical FDI by facilitating the imports of inputs and machinery. Lower export barriers tend to stimulate vertical FDI by facilitating the re-export of processed goods, and other horizontal FDI by expanding the effective market size and leading to an improved business climate. Scientists claim that trade openness can create room for technological progress and efficiency by allocating inputs via the elimination of protection for import substitution industries which in turn influences economic growth and through it leads to sustainable development. It has been argued that a country with a higher degree of openness has a greater ability to absorb technological developments generated in the leading nations, and this absorption capability leads them to grow more rapidly than a country with a lower degree of openness. However, counter arguments of the positive link between trade openness and economic growth can also be found in empirical literature. For instance, there are claims that economic openness may bring macroeconomic instability by increasing inflation, depreciating exchange rates and inviting balance of payments crisis. Similarly others assume that a high degree of trade openness may increase inflation and lower the real exchange rates which may create a negative impact on domestic investment.

FDI flowing into any country depends upon the rate of return on investments and the certainties and uncertainties surrounding those returns. Therefore, private investors compare the potential return and risks of their investment in the context of different investment destinations. The literature on the determinants of FDI is very rich. The expectations of private investors in a host country are guided by a host of economic, institutional, and regulatory and infrastructure related factors. Before making an investment, investors look at certain major economic policy issues particularly relating to trade, labor, governance and the regulatory framework, and the availability of physical and social infrastructure. Some of the fundamental determinants of FDI, such as geographical location, resource endowment and size of the market, are largely outside the control of the national policy. However, national economic policies to create a favorable investment environment, and particularly the investment framework, can help to make FDI inflows consistent with economic potential. Countries can also act on their economic determinants to maximize their economic potential (e.g. Sahoo 2006; Tvaronavičienė 2014).

Different opinions and results of investigations on factors influencing Foreign Direct Investment are presented in the literature. Some authors have found that market size and labor force are most significant, while the results of others suggest that these determinants are absolutely insignificant and unimportant. The reason for this is the different statistical data, period and type of analyses used by the individual researchers. Therefore we cannot confirm who is right or wrong, because each test is based on different methods and hypotheses. In the second part of the article some hypotheses have been verified and used as a basis to perform regression analysis.

4. FDI outcomes for secure and sustainable development

In this section, we will discuss FDI performance in Lithuania, Latvia and Estonia. We have chosen those particular countries as FDI in this region is considered as very important driving factor conditioning secure and sustainable development. Since majority of theorists almost unanimously agree, that development level is directly related to FDI attraction, let us focus on that single indicator and juxtapose it to FDI performance. In order to reveal concrete processes we do not use correlation and regression analysis, which is more appropriate for generalizing and searching for consistent patterns. Let us glance at GDP per capita change pattern in Lithuania, Latvia and Estonia (Figure 1).
Fig. 1. Change of GDP per capita* in Lithuania, Latvia and Estonia during 2004-2012 year period


*GDP per capita (current US$). GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars

The following comment can be provided: countries developed very similarly; Estonia is seen as more advanced country, alas, following the same development pattern. Economies in all countries recovered after global crisis, and following economic logic, it would be natural to expect that gradual increase in FDI should be observed. Let us concentrate on the latest data on FDI flows in Lithuania, Latvia and Estonia and, though, consider data of years 2009 and 2012. Let us recall, that foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, acquired by foreign investor. On the other hand, if investors directs earnings to the capital origin country, and long-term capital depreciates, natural outcome is not inflow but outflow of foreign direct investment. It is peculiar how much attention in scientific literature is devoted to capital inflows of foreign capital and prevailing positive effect they cause. We reason, that instead, phenomenon of withdrawing capital of foreign origin should be tackled. In Figure 2 we display statistical data reflecting process of withdrawing foreign direct investments from Estonia and Latvia.
Fig. 2. Process of withdrawing foreign capital from Lithuania and Latvia reflected by indicator FDI, net inflows, year 2009

Source: UK data service Foreign direct investment, net inflows (BoP, current US$); http://ukdataservice.ac.uk/help/get-in-touch.aspx

In order to test if observed phenomenon can be attributed to category of signals of consistent patterns, let us glance at the same indicator in year 2012 (Figure 3).
Fig. 3. Process of withdrawing foreign capital from Lithuania and Latvia reflected by indicator FDI, net inflows, year 2009

Source: UK data service Foreign direct investment, net inflows (BoP, current US$); http://ukdataservice.ac.uk/help/get-in-touch.aspx

Data provided above verify our assumption about lasting phenomenon, or rather consistent pattern, of FDI withdrawing. Despite the decision to change direction of capital flows might be natural to investing party, it might be threatening security of sustainable economic growth of host country. Hence, we suggest a comparatively new question, which should be investigated and answered: what causes FDI outflow and what impact such outflow has for secure and sustainable development on foreign capital recipient country (e.g. increase of indebtedness (Baikovs, Zariņš 2013); need for subsidies (Girūnienė 2013); unsustainability of some industrial sectors (Laužikas, Krasauskas 2013; Tvaronavičienė 2014); enhanced need for new strategies (Laužikas, Mokšeckienė 2013; Laužikas, Krasauskas 2013; Wahl, Prause 2013; De Alencar, Almeida 2013).

Our assumption is that FDI have to be examined as phenomenon cyclical; outflows have to be foreseen, and negative outcomes hedged. That, as we indicated above, would be as new area of economic research, which would complement existing one by providing additional facet to complex picture of FDI driving forces and implications on secure and sustainable development of foreign capital recipient countries. Security of sustainable development, or interrelated taken security and sustainability has become a hub of contemporary scientific consideration (Lankauskienė, Tvaronavičienė 2012; Vosylius et al. 2013; Mačiulis, Tvaronavičienė 2013; Lankauskienė, Tvaronavičienė 2013)

Conclusions

Researchers distinguish different driving factors of Foreign Direct Investment. Usually, the problem of successfully competing for FDI is being emphasized. Discussion spins around determinants, which are the most effective in FDI attraction. Usually foreign direct investment flows are made up of three basic components: equity capital, reinvested earnings and other
direct investment capital. FDI has gained significant importance since the 1990s as a tool for accelerating growth and development of economies were MNCs play a leading role in cross-border cooperation and are heavily involved in international trade.

The major benefits of Foreign Direct Investment include: economic development, transferring technologies, creating new jobs, raising the productivity of the host country and others. However, disadvantages occur mostly in relation to operation, distribution of the profits made on the investment and the personnel.

The major factors influencing inward FDI are as follows: goods market efficiency, labor efficiency, fiscal incentives, institution efficiency, and development of infrastructure, financial market development, lower tax rates, lower inadequately educated labor force level, and level of corruption. Thus, authors try to identify which drivers are more important compared to others. However, identification is a complex problem due to the fact that the determinants can differ depending on characteristics specific to each country, sector and company. In the presented paper we formulate new insights and suggest new area for scientific research. We find that FDI may not only inflow, but may outflow as well. It means that causes and consequences of outflow of already invested foreign capital have to be investigated and assessed.

We claim that foreign investment drain might be threatening security of sustainable economic growth of host country. Our assumption is, that FDI have to be examined as phenomenon cyclical; outflows have to be foreseen, and negative outcomes hedged. That, as we indicated above, would be as new area of economic research, which would complement existing one by providing additional facet to complex picture of FDI driving forces and implications on secure and sustainable development of foreign capital recipient countries.

References


Bellak, C.; Damijan J.; Leibrecht, M. 2009. Infrastructure en-


Mačiulis, A.; Tvaronavičienė, M. 2013. Secure and sustainable development: Lithuania’s new role in taking the Presidency of the EU, *Journal of Security and Sustainability* 3(2): 5–13 DOI: http://dx.doi.org/10.9770/jssi.2013.3.2(1)


Sahoo, P. 2006. Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants, ADB Institute Discussion paper No. 56.


Tvaronavičienė, M. 2014. If industrial sector development is sustainable: Lithuania compared to the EU, *Entrepreneurship and Sustainability Issues* 1(3). DOI: http://dx.doi.org/10.9770/jesi.2014.1.3(2)


Tvaronavičienė, M.; Grybaštė, V.; Tunčkienė, Ž. 2013. Globalization drivers in developed and less developed countries: if consistent patterns can be traced, *Journal of Security and Sustainability Issues* 2(4): 5–11. DOI: http://dx.doi.org/10.9770/jssi.2013.2.4(1)


SUSTAINABLE DEVELOPMENT: METHODOLOGICAL
APPROACHES TOWARD ISSUES

Rima Vasiliūnaitė

Entrepreneurship and Sustainability Center, Čiurlionio 86a, LT-03100 Vilnius, Lithuania
E-mails: Rima.Vasiliuinaite@gmail.com

Received 15 October 2013; accepted 15 January 2014

Abstract. Aim of the paper is to outline a research methodology, which would ultimately allow predicting and enhancing competitiveness of less developed economies, which encounter energy security issues. The following theoretical questions are to be discussed. The first, what we mean by sustainable development in countries, which are in different economic development phases, i.e. if emphasis on different facets of sustainability (particularly economic environmental, related to energy consumption patterns) changes as country develops. The second research question raised in the paper deals with energy security issues. Authors tackle the following questions of methodological character: if/what natural consistent patterns of economies development exist; and how to indicate efficient ways of economic restructuring. Answer to the indicated questions would allow formulating policy implications directed towards energetically secure and sustainable development.

Keywords: Economic growth, sustainable development, energy security, economic structure, industrial structure.

Reference to this paper should be made as follows: Vasiliūnaitė, R. 2014. Sustainable development: methodological approaches toward issues, Journal of Security and Sustainability Issues 3(3): 69–75.
DOI: http://dx.doi.org/10.9770/jssi.2014.3.3(6)

JEL Classifications: L00, B41

1. Introduction

Sustainable development concept is being widely discussed and a numerous definitions have been provided (e.g. Vosylius et al. 2013; Dudzevičiūtė 2012; Tvaronavičienė et al. 2013). Nevertheless a question, what sustainable development means for countries at different stages of development remains open. This question obtains its special urgency when sustainable development aims are considered in energetically dependent country (Tvaronavičienė 2012; Vosylius et al. 2013; Smaliukienė et al. 2012; Korsakienė et al. 2014). We aim to clarify if sustainable development targets shift as a country follows its development path. To put it into another ways, we wonder if priorities change as a country develops. If we find that priorities do change, then the second question would follow: if any similarities in countries behavior could be found. The ultimate aim is to ground methodological approaches letting to indicate what criteria should be used for restructuring of economic (and special industrial) sectors having an ultimate goal to accelerate sustainable development of less developed energetically dependent country.

2. Methodological approaches towards sustainable development taking into account energy issues

In order to find out how various countries approach contemporary sustainable development issues, methodologies published in the latest articles are going to be reviewed. We will start from the most relevant and the newest papers found in Science Direct. One of the most recent papers “Evaluating the relationships among economic growth, energy consumption, air
Rima Vasiliūnaitė  
Sustainable development: methodological approaches toward issues

emissions and air environmental protection investment in China” (Zhang et al. 2013b) analyses China's economic growth linked to its energy consumption, air emissions and air environmental protection investment during 2000-2007. In their analysis authors emphasize threat of increasing energy use (Figure 1) (Zhang et al. 2013b). In order to estimate energy dimension, the following five indicators are used: a ratio of nonrenewable energy to renewable energy (RNR), energy use per unit GDP (EUPG), environmental cost per unit GDP (ECPG), impact of emissions per unit energy consumption (IEPEC), and environmental benefit per unit environmental protection investment (EBPEI) (Zhang et al. 2013b).

Fig.1. The relationships among economy, energy, air emissions and environment

Source: Zhang et al. (2013b)

Authors state that fast growing economy brings rapid increase of energy consumption. They admit that energy efficiency improves as country develops. On the other hand, article claims, that the performance of air environmental protection investment was obviously reduced during analyzed period (Zhang et al. 2013b), what points to incompatibility of sustainable development goals: to enhance economic growth, reduce energy use and preserve environment.

The article overview above supports our hypothesis about different strategies of countries at different stages of their development. In case of China, it appears, the country tried to employ different strategies to deal with the relationship between environmental protection and economic growth during its 10th Five-Year Plan and the 11th Five-Year Plan period (Zhang et al. 2013b). Nevertheless the tensions between the growth imperative and sustainability have been in evidence throughout those two five-year plans (Zhang et al. 2013b). As authors claim, no fundamental change in the inappropriate industrial structure was achieved and extensive economic growth mode has not been changed. There are also such problems as environmental protection lagging behind economic growth, poor or inflexible mechanism, insufficient input and capacity (Zhang et al. 2013b). Authors have no doubts that a conflict between energy based growth and environmental protection exists. They point out, that it is necessary to synchronize environmental protection and economic development. Alas, the task is complicated and there are no simple solutions allowing implementing general direction towards transformation from mainly employing administrative methods to protect the environment into comprehensive application of legal, economic, technical and necessary administrative methods to address environmental problems (Zhang et al. 2013b).
To generalize, China’s experience verifies, that country at the lower level of its development experiences difficulties in overcoming conflict programmed in aim to develop sustainably. Its case evidences that less developed country trade-offs its environmental health for faster economic growth. Methodology suggested by authors’ tackles efficiency of governmental policy considering environment protection. Recall, that the following indicators for development direction monitoring are being suggested: the indicator RNR reflecting the energy mix, the EUPG giving the energy intensity of economic activity, the ECPG measuring environmental cost per unit economic output, the IEPEC reflecting environmental loading intensity of energy consumption, and the EBPEI embodying the performance of environmental protection investment (Zhang et al. 2013b). Let us discuss economic meaning of each indicator. Ratio of nonrenewable energy to renewable energy (RNR) refers to the ratio of energy of nonrenewable resources to that of renewable energy resources. This indicator reflects the energy mix. The bigger the indicator, the greater dependence on nonrenewable energy resources the economic activity has, which most likely lead to the more emissions when all other conditions keep the same (Zhang et al. 2013a,b). That approach seems to be logical and uncontentious.

Energy use per unit GDP (EUPG, J/$): EUPG equals the energy (J) of total energy consumption divided by GDP. The higher the indicator, the lower the energy efficiency of economic activity is. The indicator is mainly affected by energy mix, industrial structure and technical progress. The authors claim that high share of renewable energy and/or advanced technology mean high energy efficiency of economic activity. They argue, that compared to those traditional energy intensity indicators for measuring economic activity, such as tonne of standard coal equivalents per unit GDP, tonne of oil equivalent per unit GDP, etc., this indicator is more convenient when comparing and tracing the energy efficiency of different countries or regions in different years (Zhang et al. 2013a,b). Our comment here is, that despite high share of renewable energy lead to pollution diminishing, from economic point of view that composition does not proxy high energy efficiency. Since economic approach suggests adopting cost-benefit analysis, expensive renewable energy does not lead to high energy efficiency of economic activity. That is we express opinion, which do not comply with one provided by authors of commented paper. Environmental cost per unit GDP (ECPG, sej/$): it is the ratio of the total energy loss caused by emissions to GDP. This indicator measures environmental cost of emissions in terms of energy. The bigger the indicator, the higher the environmental cost of economic activity is. The indicator is mainly affected by industrial structure, technical progress and environmental protection measures. High share of high-polluted enterprises, backward technology and environmental protection measures can lead to big ECPG values (Zhang et al. 2013a,b).

Emissions’ impact per unit energy consumption (EIPEC, sej/J): EIPEC is the ratio of the energy of emissions’ impact to the energy of total energy consumption. It reflects environmental loading intensity of energy consumption. The bigger the ratio, the larger the environmental loading intensity energy consumption brings about. This indicator is mostly affected by technical process, energy structure and environmental protection measures. Advanced technology and environmental protection measures and high share of renewable energy resources can lead to low EIPEC values (Zhang et al. 2013a). Here we needed to provide and insight that the authors are bias about renewable energy in terms that do not take into account the cost of it, what is important factors, and, actually makes all the relation between economic growth and environment that complicated. Avoiding indicating issues hinders prospecting of unconventional smart solutions. Raising right questions even without providing right answers is more valuable than compromising in indicating issues, which needs to be resolved.

Anyway the paper we are commenting on is of scientific interest. In order relate above indicated indexes authors devise a complex indicator, so called Structural coordination degree (SCD) indicator, which integrates indicators provided above (Zhang et al. 2013a). Structural coordination degree (SCD): this index is defined as follows:

\[
(\text{SCD})_i = \frac{(\text{RNR})_i}{(\text{RNR})_o} \times \frac{(\text{EUPG})_o}{(\text{EUPG})_i} \times \frac{(\text{ECPG})_i}{(\text{ECPG})_o} \times \frac{(\text{EIPEC})_o}{(\text{EIPEC})_i}
\]
here (SCD)$_i$ means relative coordination degree in $i$ year; (RNR)$_i$, (EUPG)$_i$, (ECPG)$_i$ and (EIPEC)$_i$ mean ratio of nonrenewable energy to renewable energy, energy use per unit GDP, environmental cost per unit GDP and emissions’ impact per unit energy consumption in $i$ year respectively; (RNR)$_o$, (EUPG)$_o$, (ECPG)$_o$ and (EIPEC)$_o$ refer to ratio of nonrenewable energy to renewable energy, energy use per unit GDP, environmental cost per unit GDP and emissions’ impact per unit energy consumption in reference year (authors in their paper refer to year 1978) respectively (Zhang et al. 2013a). On the base of reference year, the bigger value of the SCD means that the economic structure is more reasonable, and this can promote sustainable development of economy. Scale coordination index (SCI): According to Zhang et al. (2013a), economic development can keep sustainable only when economic scale and resources and environmental capacity are in coordination due to limited resources and environmental capacity. Based on different impacts of GDP population, nonrenewable resources and emissions on economic sustainability, the index SCI was constructed to reflect the relative sustainability of economic development in different years for one country or region based on reference year. This index is defined as follows:

$$SCI_j = \left( \frac{GDP_j \times GDP_o}{P_j \times P_o \times N_j \times N_o \times (IE_j \times IE_o)} \right)$$

Here, SCI$_j$ means scale coordination index in $j$ year; GDP$_j$, P$_j$, N$_j$ and IE$_j$ mean the gross domestic product, the population, the non-renewable energy consumption and the impact of emissions in $j$ year respectively; GDP$_o$, P$_o$, N$_o$ and IE$_o$ mean the gross domestic product, the population, the non-renewable energy consumption and the impact of emissions in reference year (authors in their paper refer to year 1978) respectively. On the base of reference year, the increasing value of the SCI means the relationships among economic aggregate, population, energy consumption and environment become more harmonious, and the sustainability of economy is being improved.

We assume that indicators provide useful information, but not sufficient. The main target of criticism is related to the very assumption that renewable energy can stand for sustainability. We do not neglect importance of renewable energy, but indicate that in practice countries compromise environmental issues and go for economically efficient (in short-term) growth. Benchmarking here remains a grey zone. If we managed to find better argumented goalpost, we could have come to more efficient and prudent economic policies. Another argument, initiating search for different methodological approaches is related to the fact that renewable energy at current time comprises very tiny fraction in overall consumed energy structure. This feature of energy structure is characteristic not only to developing countries. E.g. even in Japan energy consumption structure renewable energy sources account for only 1% of both electricity and primary energy supply. While the share of renewable energy in global terms and Japan’s energy mix will grow, this will happen at a very slow pace due to relative higher costs and other structural impediments (discussed below) that inhibit a fast uptake of renewables (Vlado 2012). At that point we could formulate answer to the first research question raised: what we mean by sustainable development in countries, which are in different economic development phases, i.e. if perception of sustainability changes as country develops. To our minds, sustainable development changes its meaning as country develops. We can conclude that countries sacrifice environmental goals at early stages of their development. We support an opinion that there is a conflict between economic growth and economic development and policymakers face a tradeoff between these two policy objectives (Wu et al. 2012), despite opposite opinion exist (e.g. Wangjiraniran et al. 2011).

2. Consistent patterns of economies development and economic restructuring

Reason, why an economic conflict between economic and sustainable development exists lies in the limitations of current level of technology, which does not allow cutting significantly costs of renewable energy. Energy intensity and cost of energy mixed remains urgent issues, enforcing to trade-off between sustainable development and economic growth. Hence, complex ways of energy intensity diminishing are being elaborated. International variations in energy intensity are well understood as the consequence of the different technologies used in separately taken countries. Besides technologies country’s energy intensity is conditioned by economic structures. Alas, previous studies failed to take into account energy consumption structure and economic structure (Feng
et al. 2009). The lack of empirical evidence on the relationship between energy intensity, energy consumption and economic structure creates an obvious deficiency that may affect applied research and policy making in energy and economic development. Despite above expressed opinion, we need to contradict, that investigations, discussing relationship between secondary or tertiary industry and energy consumption could be found. The whole strand of scientific literature is devoted to analysis of relationship between energy intensity and economic structure. Let us recall that diminishing of economy’s energy intensity would lead towards more energetically secure and, at the same time, more sustainable development of a country.

Considering economic structure and its relation to energy intensity authors usually raise a specific question about impact of agricultural, industrial and service sector on energy intensity. E.g. Feng et al. (2009) that China’s gradual move away from secondary industry, which was generally energy intensive, to tertiary industry (service industry) contributed to China’s declining energy intensity. Another study e.g. is devoted to finding out the relationship between energy intensity and tertiary industry instead of studying energy intensity and industrial structure. Indirectly, the purpose of the paper is the same: to re-examine a statement that secondary industry is the main factor that causes over-consumption in energy (Tianli et al. 2011; Chontanawat et al. 2008). Convincing methodology for revealing relationship between energy consumption and economic growth bases on calculation of elasticity coefficient of energy consumption. According the authors, Energy consumption elasticity coefficient is the index to measure the relationship between energy consumption and economy development, indicating the sensitivity of energy consumption to economic growth. Formula is:

\[
\text{Energy consumption elasticity coefficient} = \frac{\text{the growth rate of energy quantity}}{\text{the growth rate of economy (GDP)}}
\]

The authors calculated energy consumption elasticity coefficient for China during 1996-2009 year period. Results revealed, that energy consumption elasticity coefficient increases year by year. It was especially high in years 2003 and 2004, when the growth rate of energy consumption exceeded that of GDP; i.e. it was equal to 1.53 and 1.59 respectively. This reflects that China’s economy has an increasing dependence on energy consumption. The following years, China made some adjustment in its energy policy, encouraging energy conservation and improving energy efficiency. There is a slight decrease of GDP dependence on the energy, and the cost of the economic growth declines, with the increasing energy efficiency. But the degree of energy consumption is still the obstacle to China’s economic development. Then authors explore China’s energy intensity. Recall, that Energy intensity is the ratio of energy use to the output of economic or material resources. At the national level, energy intensity is the ratio of the total amount of domestic primary energy use or final energy use to GDP. (In recent years China’s energy intensity about 6 times that of EU 25 countries - comment from the article). The cost of China’s GDP growth is far higher than the average level of the EU. The energy efficiency gap between China and developed countries is very obvious, with an economy growth depending on extensive energy consumption, rather than energy efficiency. Those tendencies could be found and in other developing countries (Miškinis et al. 2013). The main difference here is that in other countries the same development pattern is not that vivid. Authors generalize, and we completely agree, that energy efficiency and economic structure have to be changed in order to diminish energy consumption.

Presented above approaches let us to generate related but novel approach. We suggest tackling not country’s economic structure, i.e. proportion between agriculture, services and industry, but just industrial structure. The following argumentation would back this approach. The first argument is that agriculture plays a very important role in the context of increasing world population. Food security is already an agenda; hence energy intensity of economy has to be achieved not through diminishing role of agricultural sector; what was the case in the 5th and the 6th decade of 20th century. Besides, agricultural sector is very heavily affected by state policy, taken the EU or other regions. The second argument, grounding necessity of elaboration of industrial structure is related to general tendencies of industry-services ratio change. It is obvious that service sector has tendency to expand as countries develop. Service sector because of its nature, i.e. recourses used for value added generation is less energy intensive, if to compare to industry. Anyway, urges to adopt economic policies encouraging even faster service sector growth can appear to be detrimental to countries economic development,
since industrial export in majority of countries still prevails. Hence, we see that closer elaboration of industry sub-sectors would allow revealing directions of industry restructuring allowing diminishing energy consumption (and energy security at the same time) in medium and long-run. Search for efficient economic restructuring of industrial sub-sectors could be done by applying Long-range Energy Alternative Planning system (LEAP) (Heaps 2012; Pirlogea and Cicea 2012). Since the program allows to model a wide range of sustainable development indicators, we eliminate those, which are not relevant in the context of the research questions raised. To put it in another words, we make an assumption of ceteris paribus and simulate scenarios, in which industrial subsectors expand in accelerated ways. Acceleration mode or growth rate of selected industries would serve as modeling assumptions. Sub-industries, which have export potential, would be in a hub of scientific interest. Each scenario developed using LEAP software would result in energy balance, indicating what amount of energy energetically dependent country has to import. Comparison of scenarios would allow indicating direction of structural changes within industry that would let to increase value added created by industry by gradually diminishing energy intensity of overall industry sector. Suggested methodological approach is novel. Despite its scientific rigor, as we see it, research limitations have to be stressed. As it was already mention above, assumption is being made, that all other conditions remain the same. It means, beliefs, perceptions and mode of household behavior are the same, transport mode and institutions as well have not changed. One more moment has to be added: however grounded and rational methodologies are, all changes are “path dependent”, what means that transitions are gradual and therefore slow enough.

Conclusions

The first conclusion answers the first research question, i.e. what we mean by sustainable development in countries, which are in different economic development phases, i.e. if emphasis on different facets of sustainability (particularly economic environmental, related to energy consumption patterns). We found, that sustainable development changes its meaning as country develops. We can conclude that countries sacrifice environmental goals at early stages of their development. We support an opinion that there is a conflict between economic growth and economic development and policymakers face a tradeoff between these two policy objectives (Wu et al. 2012), despite opposite opinion exist (e.g. Wangiraniran et al. 2011). Trials to introduce goalpost of sustainable development related to renewable energy consumption do are not acceptable for practical use due to minor fraction of renewable energy used and comparatively high price. Another goalpost has to be suggested.

The second conclusion answers the second research question about existence of consistent patterns of economies development and ways to find efficient policies of economic restructuring. We conclude, due to natural tendencies of agricultural, industrial and service sectors development, it is more efficient to tackle industrial sub-sectors development, which, on one hand, are more energy intensive, and, on the other hand, remain main source of export. Sustainable development and energy security goals can became compatible if energy intensive industrial sub-sectors grow slower than less energy intensive sectors. Scenarios of industrial sector restructuring in the level of industry sub-sectors, resulting in respective energy balances for a country would let to indicate directions of efficient industrial restructuring.

References


Tvaronavičienė, M.; Grybaitė, V.; Tunčikienė, Ž. 2013. Globalization drivers in developed and less developed countries: if consistent patterns can be traced, *Journal of Security and Sustainability Issues* 2(4): 5–11. DOI: http://dx.doi.org/10.9770/jssi.2013.2.4(1)


International Entrepreneurial Perspectives and Innovative Outcomes

The General Jonas Žemaitis Military Academy of Lithuania is not responsible for the accuracy of the articles. Sole responsibility for the accuracy rests with the authors of the articles.

Responsible editor-in-chief Prof. Dr. Manuela Tvronavičienė


Published by the Military Academy of Lithuania,
Šilo 5a, LT-10322 Vilnius, Lithuania, http://www.lka.lt

Designed and published by Printing Subdivision of the Procurement Division of the General Affairs Department of the Ministry of National Defence

Printed by the Lithuanian Armed Forces Military Cartography Centre,
Muitinės 4, LT-54359 Domeikava, Kaunas District, Lithuania

PRINTED IN LITHUANIA
Instructions for Authors

Complete guidelines for preparing and submitting your manuscript to this journal are provided below.

The instructions below are specifically directed at the authors who wish to submit a manuscript to the *Journal of Security and Sustainability Issues*.

The *Journal of Security and Sustainability Issues* considers all manuscripts on the strict condition that they have been submitted only to it; that they neither have been published yet, nor they are under consideration for publication or in press elsewhere. It should be clearly indicated if a submission was previously declined by another journal. Authors who fail to adhere to this condition will be charged with all costs which the *Journal of Security and Sustainability Issues* incurs and their paper will not be published.

Contributions to the *Journal of Security and Sustainability Issues* must report original research and will be subject to peer-review.

**General Information**

All papers are to be written in English. The *Journal of Security and Sustainability Issues* is an internationally refereed journal designed to further the frontiers of knowledge in security and sustainability. Each article is reviewed by at least two experts, appointed by the Editorial Board, who will examine the manuscript through a double-blind refereeing process in terms of its relevance, academic rigor and high level applications. An electronic copy prepared in MS Word and printed in Times New Roman typeface should be submitted to the Editorial Board following the requirements presented below.

**Structure of the Article**

An article should include the following parts: title, authors’ names, name and address of their work place, summary, keywords, introduction (the object and goal of the research, the methods applied, the review of literature and its analysis, etc.), the main text, conclusions or recommendations, references, short biographical note about the contributors at the end of the article (name, surname, academic title and scientific degree, duties, research interests).

**Format of the Article**

The text of the article should be printed with single intervals on 210x297 mm format pages with the print area of 150x255 mm each. The length of the article should not be less than 8 pages and cannot exceed 25 pages.

The title of the article should be printed in 11 pt bold type and should be centered. There should be a single line space between the title and the author’s name.

The name and surname of the authors should be printed in small letters of 11 pt bold type and should be centred. Below the author’s surname, the name of the institution (represented by the author or co-authors) must be printed in 10 pt italic; its address and the author’s e-mail written and centred.

Abstract and Keywords should be printed single spaced, in 9 pt typeface, in one column and after the institution address and space of three lines below the institution address should be left. Words Abstract and Keywords must be printed in bold. The size of the abstract cannot be less than 600 typographic signs. There should be a space of one line between the abstract and keywords. 6-10 keywords should be provided and selected according to ‘Thesaurus, e.g. http://www.esds.ac.uk/search/hassetSearch.asp.

Introduction, main text and conclusions should be printed in 11 pt type single interval in one column at the distance of 1 line from keywords.

Figures or tables should be mentioned in the text and the place should be indicated in the separate line. The numbers of figures and tables and inscriptions below are written in 9 pt regular typeface. Figures and tables are separated from the text by one-line space.

The titles of chapters and sub-chapters are printed in small letters, 11 pt bold-regular type and aligned left. The introduction, titles of chapters and conclusions are numbered. The titles of chapters and sub-chapters should be separated from the text by one-line space.

The name of the author of the source, the year of publication and pages should be presented in the text in brackets. The list of references is given after the conclusions. The word References is spelled in small letters, 11 pt bold-regular type, left ranged and the list of references in 9 pt. The references are to be presented in the alphabetical order, in the original language; translation into English is given in square brackets. References according to the Harvard citation style, e.g. http://libguides.library.uwa.edu.au/harvard.
## CONTENTS

**Volume 3 Number 3 March 2014**

**David Luigi Fuschi, Manuela Tvironavičienė**
Sustainable Development, Big Data and Supervisory Control: Service Quality in Banking Sector  

5

**Kristina Hunke, Gunnar Prause**
Sustainable Supply Chain Management in German Automotive Industry: Experiences and Success Factors  

15

**Aleksandrs Baikovs, Ivars Zariņš**
Security of Business: Commercial Secret’s Legal Regime and Methods of Preservation  

23

**Vitolds Zahars, Maris Stivrenieks**
Security Implementation Facets: Convicted Women Imprisonment Sentence Execution  

45

**Jūratė Antanavičienė**
Foreign Direct Investment: Driving Factors and Outcomes for Secure and Sustainable Development  

55

**Rima Vasiliūnaitė**
Sustainable Development: Methodological Approaches Towards Issues  

69