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CONTENTS

POROVNANIE EKONOMICKEHO ROZVOJA SLOVENSKEJ REPUBLIKY A ČESKEJ REPUBLIKY NA ZÁKLADE INDEXU GLOBALNEJ KONKURENCIESCHOPNOSTI
COMPARISON OF ECONOMIC DEVELOPMENT OF THE SLOVAK REPUBLIC AND THE CZECH REPUBLIC BASED GLOBAL COMPETITIVENESS INDEX
BONDAREVA IRINA, TOMČÍK RÓBERT **6**

THE CZECH SCIENCE PARK CRITICAL LOCATION FACTOR ANALASIS
ČÍŽEK PETR **17**

PŘÍPAD ČESKÉHO TEXTILNÍHO A ODĚVNÍHO PRŮMYSLU A EKONOMICKÁ BEZPEČNOST REGIONŮ
THE CASE OF THE CZECH TEXTILE AND CLOTHING INDUSTRY AND ECONOMIC SECURITY OF REGIONS
GLOGAROVÁ MICHAELA, KRAFTOVÁ IVANA **26**

SOURCE ASPECTS IN THE REFORM OF LOCAL SELF-GOVERNMENT IN SLOVAK REPUBLIC
IMROVIČ MICHAL, ŠVIKRUHA MARTIN **34**

AN EMPIRICAL ANALYSIS OF SHARE PRICE DETERMINANTS IN NIGERIA: A DIVIDEND AND NET ASSET REPLICA
JEROH EDIRIN, EDESIRI GODSDAY OKORO **46**

MEZIREGIONÁLNÍ MIGRACE V ČESKÉ REPUBLICE
MIGRATION BETWEEN REGIONS IN THE CZECH REPUBLIC
KNĚZÁČKOVÁ RADKA, VOLEJNÍKOVÁ JOLANA **55**

ZNAMENÁ SAMOSTATNÝ ÚTVAR LOGISTIKY JINÝ DŮRAZ NA SPOLEHLIVOST, RYCHLOST NEBO NÁKLADY?
MEANS A SEPARATE LOGISTICS DEPARTMENT, OTHER EMPHASIS ON RELIABILITY, SPEED OR COST?
KOUTNÝ STANISLAV **66**

THE ECONOMIC INTEGRATION AS A DETERMINANT OF INTRA-INDUSTRY TRADE: THE CASE OF POLAND
ŁAPIŃSKA JUSTYNA **77**

THE PERFORMANCE EFFICIENCY OF THE VIRTUAL HADOOP USING OPEN BIG DATA
LNĚNIČKA MARTIN, KOMÁRKOVÁ JITKA **88**

QUATERNARY SECTOR AND ECONOMIC DEVELOPMENT IN JAPAN: A CAUSAL ANALYSIS
MALLICK JAGANNATH **101**

VYTVOŘENÍ MODELU KOMPETENCÍ KRIZOVÉHO MANAŽERA MALÉHO PODNIKU ZA POUŽITÍ SAATYHO METODY
CREATING OF A COMPETENCE MODEL OF SMALL ENTERPRISE CRISIS MANAGER USING SAATY´S METHOD
MIKUŠOVÁ MARIE, ČOPÍKOVÁ ANDREA **111**

TRENDS IN THE CHANGES ON THE INTERNATIONAL ART MARKET
SOKOŁOWSKA EWELINA **122**

THE POSSIBILITIES OF DETERMINING ENVIRONMENTAL IMPACTS OF ECONOMIC ACTIVITIES IN A REGION
ŠATERA KAREL, OBRŠÁLOVÁ ILONA **131**

ECONOMIC ACTIVITIES OF THE SLOVAK CO-OPERATIVES IN THE YEARS 2010 TO 2014
ŠÚBERTOVÁ ELENA **142**

RECENZE PUBLIKACE PODNIKATEĽSKÉ PROSTREDIE V EURÓPSKEJ ÚNII **152**

POROVNANIE EKONOMICKEHO ROZVOJA SLOVENSKEJ REPUBLIKY A ČESKEJ REPUBLIKY NA ZÁKLADE INDEXU GLOBALNEJ KONKURENCIESCHOPNOSTI

COMPARISON OF ECONOMIC DEVELOPMENT OF THE SLOVAK REPUBLIC AND THE CZECH REPUBLIC BASED GLOBAL COMPETITIVENESS INDEX

Irina Bondareva, Róbert Tomčík

Abstract: *The aim of this article is to analyze the competitiveness of the Slovak Republic expressed by the Global Competitiveness Index and compare its value with Czech Republic. The Czech Republic was chosen as a basis of comparison because of the similarity of its economy with the Slovak Republic. This article describes the methodology for assessing the competitiveness of countries according to the World Economic Forum. This article also describes pillars of competitiveness, which consist of the key factors affecting the competitiveness of any country. Classification of countries assessed into three main groups according to the sophistication of the economy can detect those factors that affect the level of competitiveness of the selected country the most. By analysis of the various pillars is also possible to recognize problematic factors, i.e. those pillars characterized by low values in the long period, which need attention. The article describes the most problematic areas of competitiveness of the Slovak Republic. These include mainly the low quality of public institutions, a significant level of corruption in the country and as another problematic factor is considered a low innovation activity of the country.*

Keywords: *Competitiveness, Global Competitiveness Index, Corruption, Innovation, Institutions.*

JEL Classification*: O11, O47.*

Úvod

Problém konkurencieschopnosti v svetovom ekonomickom priestore je pre ľubovoľnú krajinu mimoriadne dôležitý, osobitne v podmienkach globalizácie svetového hospodárstva, kde význam rôznych foriem vonkajších ekonomických vzťahov, stupeň otvorenosti národných ekonomík pre zahraničné výrobky, služby a kapitál prudko rastie. Proces globalizácie diktuje svoje tvrdé podmienky na prežitie, existenciu a dominantné postavenie, čo vnáša svoje korekcie do dynamiky, foriem a metód konkurenčného boja a konkurencieschopnosti podnikov, odvetví, jednotlivých regiónov, krajín a ekonomických zoskupení.

Možnosti Slovenskej republiky v rámci medzinárodnej deľby práce relatívne nie sú veľké, preto efektívna účasť SR si v globálnej ekonomike vyžaduje aktívne využitie existujúcich konkurenčných predností. Popri tom základnou úlohou ekonomickej modernizácie SR je rast konkurencieschopnosti ekonomiky, racionálna integrácia do svetového ekonomického systému prechodom na inovatívny smer vývoja. V tejto súvislosti je aktuálne vykonávať priebežné hodnotenie základných faktorov konkurencieschopnosti SR a ich kvantitatívne porovnanie s inými krajinami s transformujúcou sa ekonomikou.

1 Formulácia problematiky

1.1 Základné piliere konkurencieschopnosti krajiny

Podľa Svetového ekonomického fóra (World Economic Forum – WEF) je konkurencieschopnosť krajiny definovaná ako zoskupenie inštitúcií, politík a faktorov, ktoré spolu definujú a určujú produktivitu krajiny, t.j. konkurencieschopnejšie ekonomiky sú také, ktoré v priebehu času rastú rýchlejšie a efektívnejšie ako ostatné [10].

Na meranie konkurencieschopnosti krajiny slúži Svetovým ekonomickým fórom vypracovaný „Globálny index konkurencieschopnosti“ (Global Competitiveness Index - GCI).

Prieskum hodnotenia konkurencieschopnosti krajín prebieha každoročne a v roku 2013 sa doňho zapojilo viac ako 13 000 manažérov z celého sveta. Prieskum na Slovensku koordinovala Podnikateľská aliancia Slovenska a v ňom sa zúčastnilo 250 veľkých podnikov a 250 malých a stredných podnikov, náhodne vybraných podľa metodiky WEF [1].

Základné faktory, ktoré ovplyvňujú hodnotu GCI, zosumarizované do dvanástich kategórií – pilierov. Každý pilier predstavuje model, ktorý zohľadňuje sústavu špecifických faktorov charakterizujúcich úroveň konkurencieschopnosti krajiny. Model indexu GCI zahrňujúci jeho základné komponenty na základe informácií WEF je znázornený na Obr. 1.

Uvedených dvanásť pilierov sa rozdeľuje po troch subindexoch podľa významu ich vplyvu na hodnotu subindexu. Tak subindex „Základné požiadavky“ (Basic requirements) podporujú piliere 1-4, subindex „Stimulátory efektívnosti“ (Efficiency enhancers) 5. až 10. pilier a subindex „Faktory inovácií a sofistikovanosti“ (Innovation and sophistication factors) podporuje 11. a 12. pilier.

Výber práve týchto pilierov je podložený teoretickým a empirickým výskumom, pričom ani jeden pilier, ak pôsobí samostatne, nie je schopný zabezpečiť konkurencieschopnosť ekonomiky.

Experti WEF sa zároveň orientujú na trojúrovňový model ekonomického rozvoja M. Portera. Všetky hodnotené krajiny sú rozdelené do troch základných a dvoch prechodných skupín podľa toho, v ktorej etape ekonomického rozvoja sa nachádzajú. K uvedeným etapám (štádiám rozvoja) patrí:

1. etapa – faktorová ekonomika, na ktorej sa nachádzajú krajiny, ktoré sa rozvíjajú v podstate cestou využívania svojho prírodného bohatstva a lacnej pracovnej sily (lacných výrobných faktorov);

1.-2. – prechodná etapa od 1. k 2. etape rozvoja ekonomiky;

2. etapa – industriálna ekonomika, na ktorej sa nachádzajú industriálne rozvité krajiny, ktorých rozvoj je založený na využívaní vysoko rozvinutých technológií;

2.-3. – prechodná etapa od 2. k 3. etape rozvoja ekonomiky;

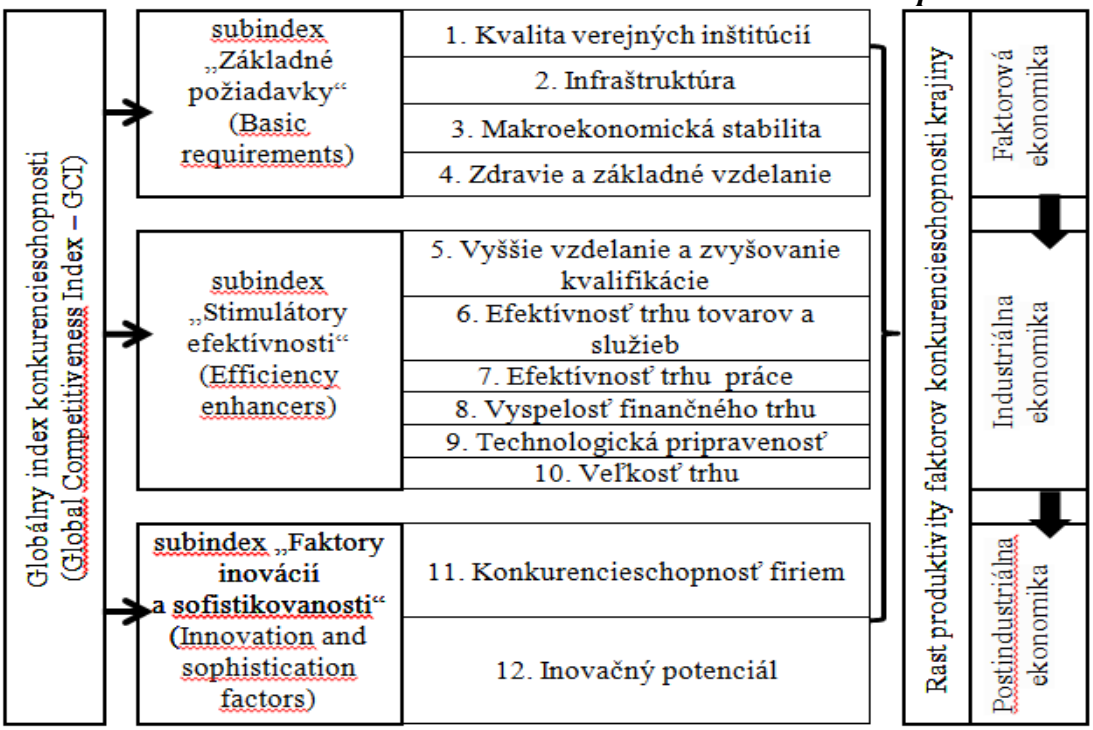
3. etapa – postindustriálna ekonomika, na ktorej sa nachádzajú postindustriálne krajiny, ktorých ekonomický rozvoj je založený predovšetkým na využívaní inovácií, vysoko výkonných technológií, znalostného manažmentu s vysokým podielom vysokokvalitných inovačných služieb v tvorbe HDP [4].

V prvom štádiu (Factor driven) ekonomika krajiny rastie v dôsledku využívania lacných výrobných faktorov a prírodných zdrojov. Úroveň konkurencieschopnosti v tomto štádiu je

úzko naviazaná na racionálnu funkčnosť štátnych inštitúcií (1. pilier), budovanie potrebnej infraštruktúry (2. pilier), stabilné makroekonomické ukazovatele (3. pilier) a existenciu kvalifikovanej pracovnej sily (4. pilier). V druhom, „efektívnom“ štádiu (Efficiency driven) sa rozvíjajú modernejšie výrobné procesy, rastie kvalita a objemy produkcie. Konkurencieschopnosť krajiny v tomto štádiu ekonomického rozvoja závisí od kvality systému vysokoškolského vzdelávania (5. pilier), efektívnosti tovarového trhu (6. pilier), efektívnosti trhu práce (7. pilier), dokonalosti finančného trhu (8. pilier), technologickej obnovy (9. pilier) a objemu trhu (10. pilier). V poslednom „inovačnom“ štádiu ekonomika krajiny rastie pomocou zavádzania inovácií a novej technológie. V tomto štádiu konkurencieschopnosť firiem (11. pilier) a inovácie (12. pilier) podmieňujú konkurencieschopnosť krajiny.

Každá krajina, v súlade s touto koncepciou, sa nachádza výlučne na niektorom z uvedených etáp rozvoja. Experti WEF prikladajú relatívne vysokú váhu indexom GCI tých pilierov, ktoré majú najväčší vplyv na rast konkurencieschopnosti jednotlivej krajiny, berúc do úvahy etapu jej ekonomického rozvoja.

Obr. 1: Model Globálneho indexu konkurencieschopnosti



Zdroj: vlastné spracovanie autormi na základe [1], [4], [10]

Cieľom príspevku je preskúmať základne faktory rastu konkurencieschopnosti Slovenskej republiky a porovnať ich hodnoty a vývoj s analogickými faktormi Českej republiky. Česka republika bola autormi zvolená ako základ porovnania z dôvodu tradičnej blízkosti ekonomiky SR a ČR.

2 Metódy

V príspevku bola použitá technológia porovnateľnej analýzy základných makroekonomických indikátorov konkurencieschopnosti krajín, tzv. „competitiveness benchmarking“, ktorá sa v dostatočnej miere využíva v ekonomických výskumoch. V medzinárodnej praxi sú vypracované a stále zdokonaľované rôzne metódy výpočtu ukazovateľov a ratingov konkurencieschopnosti. Tieto metódy sú spravidla nasmerované

na systemizáciu a výber potrebného počtu faktorov konkurencieschopnosti, hodnotených pomocou rôznych ukazovateľov.

Najkomplexnejšia ročná analýza konkurencieschopnosti národných ekonomík v systéme svetového hospodárstva je prezentovaná v metodikách Svetového ekonomického fóra a Medzinárodného inštitútu rozvoja manažmentu (International Institute for Management Development – IMD). Pre porovnateľnú analýzu a analýzu vývoja jednotlivých faktorov konkurencieschopnosti SR a ČR boli v príspevku použité metódy trendovej analýzy a tiež spider analýza.

3 Rozbor problému

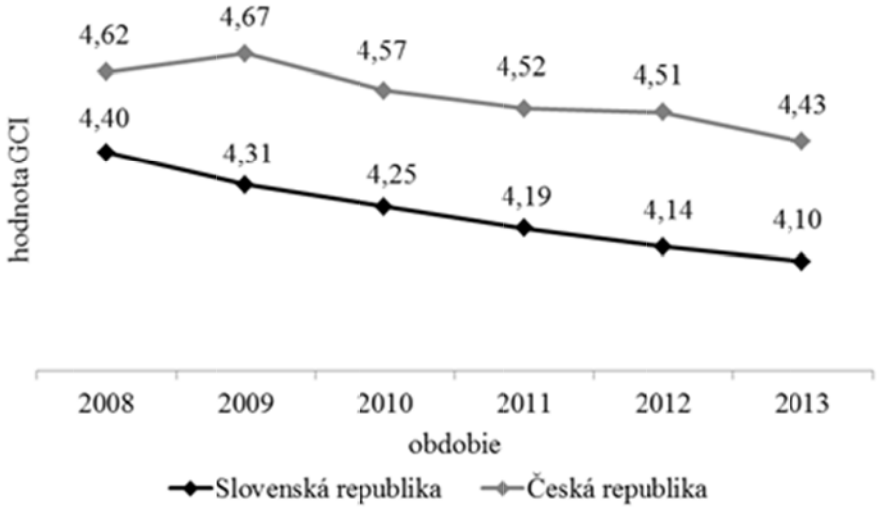
3.1 Analýza indexu GCI

Podľa hodnotenia WEF sa ekonomika Slovenskej republiky nachádza v oblasti prechodu z 2. do 3. etapy rozvoja, čo znamená, že pre ďalší rozvoj ekonomiky a rast jej konkurencieschopnosti bude mať čím ďalej tým väčší význam konkurencieschopnosť firiem (11. pilier) a inovačný potenciál (12. pilier).

Ekonomika Českej republiky sa nachádza v 3. etape rozvoja, t. j. patrí k postindustriálnym ekonomikám a jej udržateľný rozvoj taktiež určuje 11. a 12 pilier, spojený s faktormi inovácií a sofistikovanosti výrobkov a služieb.

Trendová analýza indexu GCI ukazuje, že index konkurencieschopnosti SR a ČR má v analyzovanom období klesajúcu tendenciu (Obr. 2).

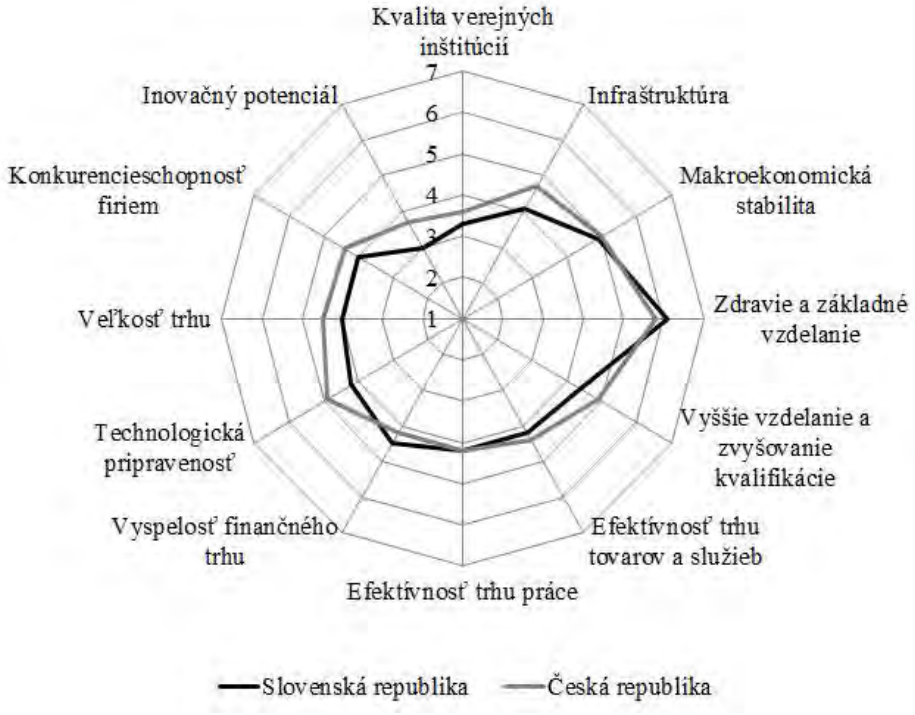
Obr. 2: Tendencia vývoja indexu GCI SR v porovnaní s indexom GCI ČR



Zdroj: vlastné spracovanie autormi na základe údajov [5], [6], [7], [8], [9], [10]

Analýza hodnôt základných pilierov konkurencieschopnosti SR dovoľuje ukázať na „kľúčové body“, ktoré v najväčšej miere obmedzujú jej rast. Podľa metodiky WEF je každý pilier hodnotený číselnou škálou od 1 do 7, kde hodnota 1 predstavuje najnižšiu a hodnota 7 najvyššiu, resp. najžiaducejšiu hodnotu. Spider analýza dovolila vypracovať graf (Obr. 3), ktorý predstavuje hodnotové vyjadrenie pilierov konkurencieschopnosti SR a ČR v roku 2013. Čím je dlhší hrot príslušného piliera, tým je úspešnejšia politika štátu v tejto oblasti a tým vo väčšej miere tento pilier spôsobuje rast konkurencieschopnosti krajiny.

Obr. 3: Hodnotové vyjadrenie pilierov konkurencieschopnosti SR v r. 2013



Zdroj: vlastné spracovanie autormi na základe údajov [10]

Analýza grafu ukazuje, že k silným pilierom konkurencieschopnosti slovenskej ekonomiky patrí predovšetkým zdravie a základné vzdelanie obyvateľstva (39. pozícia, hodnotenie 6,1 bodov), ktorý predstihuje identický pilier ČR taktiež patriaci k silným faktorom konkurencie českej ekonomiky (60. pozícia, hodnotenie 5,8 bodov). Využívaniu konkurenčných výhod Slovenska bráni predovšetkým nízka efektívnosť práce štátnych inštitúcií (119. pozícia, hodnota pilieru je 3,3 bodu) a nedostatočný inovačný potenciál (95. pozícia, hodnotenie 3,0 bodu). Oba tieto piliere majú podpriemernú úroveň. K najslabším faktorom konkurencieschopnosti ČR rovnako patrí nízka efektívnosť práce štátnych inštitúcií (86. pozícia, hodnota pilieru je 3,6 bodu) a nedostatočný inovačný potenciál (37. pozícia, hodnotenie 3,7 bodu). Avšak hodnoty uvedených pilierov v ČR máju nadpriemernú úroveň.

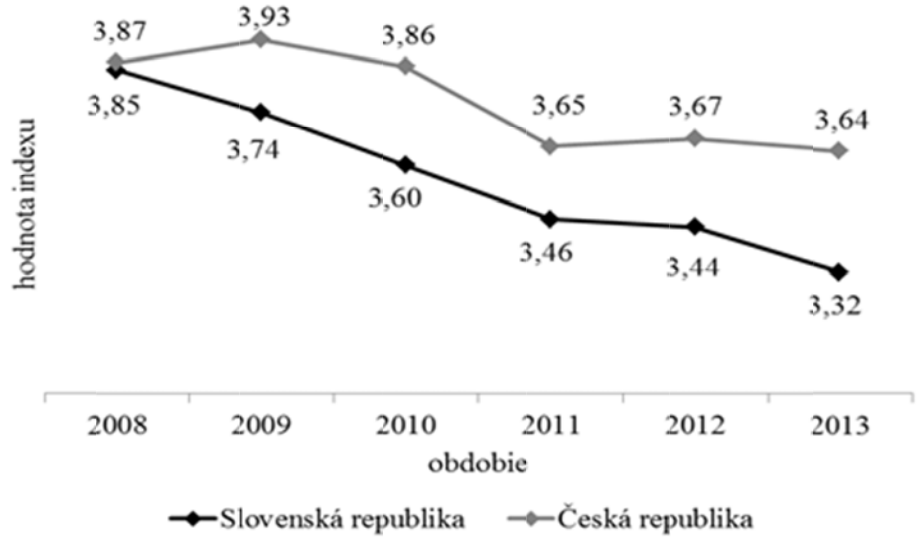
Pri porovnaní oboch krajín však spider analýza ukazuje na značné zaostávanie SR za ČR ako podľa faktora efektívnosti práce štátnych inštitúcií, tak aj podľa faktora inovačného potenciálu ekonomiky.

3.2 Analýza piliera konkurencieschopnosti „Kvalita verejných inštitúcií“

Kvalita verejných inštitúcií, ktorá sa posudzuje z pohľadu kvality verejnej a štátnej správy a efektívnosti podnikov či trhov. Pre potreby vyhodnotenia inštitucionálneho prostredia, ako jedného zo základných faktorov ovplyvňujúcich celkovú konkurencie-schopnosť krajiny, sa tu okrem iných posudzujú faktory ako vlastnícke práva, ochrana duševného vlastníctva, etické správanie spoločností, ale aj nezávislosť súdnictva od vplyvu vládnych organizácií a firiem a taktiež miera korupčného prostredia.

Dynamika vývoja pilieru „Kvalita verejných inštitúcií“ pre SR a ČR v rokoch 2008-2013 je uvedená na Obr. 4.

Obr. 4: Dynamika vývoja piliera „Kvalita verejných inštitúcií“ v SR a ČR



Zdroj: vlastné spracovanie autormi na základe údajov [5], [6], [7], [8], [9], [10]

Ako je vidieť na Obr. 4, dynamika vývoja piliera „Kvalita verejných inštitúcií“ v rokoch 2008-2013 má v SR stále klesajúcu tendenciu. V analyzovanom čase hodnota tohto piliera poklesla z 3,85 bodu (rok 2008) na 3,32 bodu (rok 2013). V ČR je zaznamenaný takisto pokles indexu v sledovanom období, avšak je jednak miernejší a jednak sú v ostatných rokoch hodnoty približne o dve desatiny bodu vyššie ako je tomu na Slovensku.

Podľa výskumu WEF k hlavným problémovým faktorom, ktoré znižujú kvalitu verejných inštitúcií ako na území SR tak aj v ČR patrí napríklad vysoká úroveň korupcie. Tento faktor uviedli ako obmedzujúci rast konkurencieschopnosti 18,7 % respondentov v SR a 17,2 % v ČR [10].

Korupcia vyvoláva široké spektrum nepriaznivých javov v rôznych oblastiach rozvoja krajiny, ako napríklad:

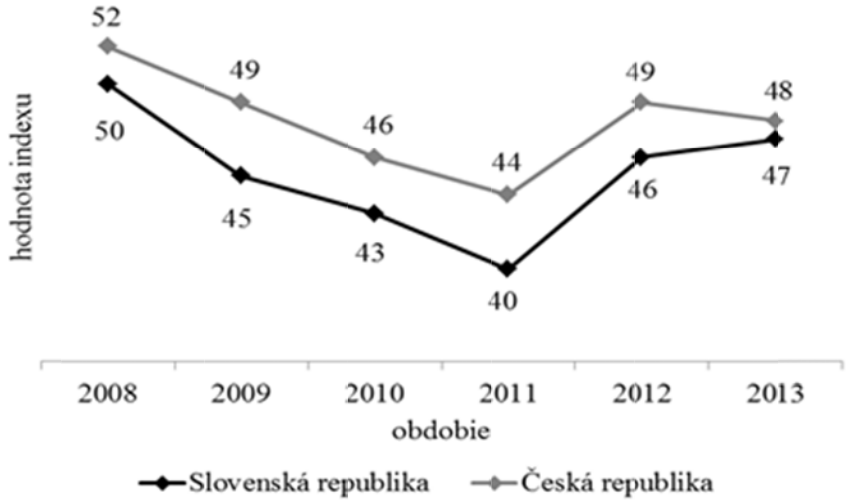
- Neefektívne rozdeľovanie a využívanie štátnych prostriedkov a zdrojov,
- neefektívnosť korupčných finančných tokov z hľadiska ekonomiky štátu tieňová ekonomika),
- zníženie príjmov do štátneho rozpočtu vo forme daní,
- bankrot podnikateľov,
- zníženie objemu investícií do výroby, spomalenie ekonomického rastu,
- obmedzený prístup k Európskym fondom pre malých a mikro podnikateľov,
- rozmáhanie organizovaného zločinu,
- pokles politickej legitimity štátnej moci,
- znižovanie kvality spoločenskej morálky a iné.

Uvedené ako aj ďalšie dôsledky korupcie značným spôsobom brzdia rozvoj konkurencieschopnosti krajiny. Na Obr. 5 je uvedené porovnanie vývoja Indexu vnímania korupcie (Corruption Perceptions Index - CPI) pre SR a ČR za obdobie 2008-2013.

Index CPI vyjadruje výsledky globálneho výskumu a sprievodný rating krajín sveta (napr. CPI 2013 hodnotí 177 krajín) podľa ukazovateľa rozšírenia korupcie vo verejnom

sektore. Bol stanovený podľa metodiky medzinárodnej nevládnej organizácie Transparency International, založenej na kombinácii voľne dostupných štatistických údajov a výsledkov globálnej ankety. Skóre krajiny naznačuje vnímanú mieru korupcie vo verejnom sektore na škále od 0 do 100, kde 0 znamená, že korupcia dosahuje kritickú (najvyššiu) hodnotu a 100 znamená, že krajina je vnímaná ako „veľmi čistá“ vo vzťahu ku korupcii [3]. V roku 2011 sa menila metodika výpočtu indexu CPI, ale za účelom porovnania indexu CPI v SR a ČR je možné uviesť skóre za celé sledované obdobie.

Obr. 5: Dynamika vývoja indexu CPI v SR a ČR



Zdroj: vlastné spracovanie autormi na základe údajov [3]

Ako je vidieť na grafe, skóre indexu vnímania korupcie v SR a v ČR má blízke hodnoty, pre obe krajiny predstavuje podpriemernú úroveň a v sledovanom období nepreukazuje značné zlepšenie v tejto oblasti. Hlavnou príčinou vysokej korupcie v SR je nedostatočná úroveň politických inštitúcií, ktoré zabezpečujú vnútorné a vonkajšie mechanizmy pre zabránenie jej rozširovania. K významným príčinám taktiež patri:

- Dvojzmyselnosť zákonov,
- neznalosť alebo nepochopenie obsahu zákonov zo strany občanov, čo umožňuje zodpovedným funkcionárom zabraňovať uskutočňovaniu administratívnych procedúr alebo predražovať príslušné úkony,
- nestabilná politická situácia v krajine,
- nedostatočne sformulované mechanizmy vzájomnej spolupráce vládnych inštitúcií,
- profesionálna nekompetentnosť byrokracie,
- klientelizmus a politická závislosť, ktorá vedie k prijímaniu tajných dohôd, ktoré oslabujú mechanizmy kontroly korupcie,
- nejednotnosť systému výkonných orgánov, t. j. regulácia tej istej činnosti viacerými inštitúciami,
- netransparentnosť, nízka úroveň účasti občanov v kontrole štátnych orgánov.

3.3 Analýza piliera konkurencieschopnosti „Inovačný potenciál“

Inovačný potenciál – pre vyhodnotenie tejto zložky konkurencieschopnosti krajiny sa uvažuje napríklad o inovačných kapacitách spoločností, o kvalite vedeckých a výskumných inštitúcií, o výške investícií do výskumu a vývoja, ale aj o dostupnosti vedcov a inžinierov v krajine a počte registrovaných patentov [10].

V ekonomickej literatúre sa pod pojmom „inovácie“ rozumie uplatnenie výsledkov výskumu a vývoja zameraného na zlepšenie výrobného procesu, ekonomických, právnych a sociálnych vzťahov firmy, transformácia potenciálu vedeckého a technického pokroku do reálnych výsledkov a pod. Teda, cieľom zavádzania inovácií je dosiahnutie ekonomického, sociálneho, ekologického, technického a iného efektu. Inovácie sú významnou konkurenčnou výhodou, pretože umožňujú včas chrániť firmu pred novými hrozbami z vonkajšieho prostredia, cestou priebežného vyhľadávania nových príležitostí pre prežitie a rozvoj. Pri tom sa posilňujú adaptačné schopnosti firmy, rozširuje sa horizont rozhodovania, zvyšuje sa rôznorodosť a sofistikovanosť produktov a technológií, v dôsledku čoho rastie produktivita práce. Slovensko sa radí medzi slabých inovátorov, nakoľko na Slovensku inovuje len 30 % podnikov [2].

Dynamika vývoja piliera „Inovačný potenciál“ pre SR a ČR za obdobie 2008-2013 je uvedená na Obr. 6.

Obr. 6: Dynamika vývoja piliera „Inovačný potenciál“ v SR a ČR

Zdroj: vlastné spracovanie autormi na základe údajov [5], [6], [7], [8], [9] [10]

Ako je vidieť na Obr. 6, dynamika vývoja piliera pre SR „Inovačný potenciál“ v prvých štyroch sledovaných rokoch vykazuje klesajúcu tendenciu. V tomto čase hodnota piliera poklesla z 3,28 bodu na 2,91 bodu. V nasledujúcich obdobiach je zaznamenaný mierny rast v tejto oblasti. Pre Českú republiku je charakteristický kolísavý priebeh hodnôt tohto piliera v uvedenom období, avšak hodnoty indexu vyjadrujúceho inovačnú aktivitu krajiny sú v niektorých rokoch vyššie takmer o jeden hodnotiaci bod.

4 Diskusia

Analýza ukázala, že k silným stránkam konkurencieschopnosti slovenskej ekonomiky patrí predovšetkým zdravie a základné vzdelanie obyvateľstva a zaradeniu medzi popredné krajiny bráni predovšetkým nízka efektívnosť práce verejných inštitúcií a nedostatočný inovačný potenciál.

Model Portera, na základe ktorého je postavený index GCI, neberie do ohľadu individuálnu špecifiku ekonomického rozvoja jednotlivých krajín. Model sa orientuje na to, že všetky krajiny idú rovnakým smerom, postupne prechádzajúc od faktorovej etapy rozvoja ekonomiky k inovačnej a znalostnej ekonomike.

Avšak hodnotenie jednotlivých faktorov konkurencieschopnosti krajiny v rámci štruktúry indexu GCI je veľmi prospešné z pohľadu identifikácie úzkych miest a problémových faktorov v ekonomike krajiny.

Dynamika výroby, úroveň zamestnanosti a príjmov obyvateľstva priamo závisia od toho, do akej miery „národné hospodárstvo“, jeho odvetvia a podniky využívajú svoje prednosti v ekonomickom súťažení so súpermi. Preto v závislosti od úrovne konkurencieschopnosti odvetví a firiem sa formuje objem a štruktúra exportu a importu, obchodná a platobná bilancia konkrétnej krajiny a vymedzuje sa pozícia konkrétnych národných ekonomík v svetovom hospodárstve.

Avšak, ako poukazujú viacerí autori, proces globalizácie z hľadiska jeho následkov je vnútorne protirečivý. Globalizácia nielenže nevedie k unifikácii, ale naopak, v perspektíve vyvolá prehĺbenie sociálne ekonomických rozdielov v jednotlivých teritóriách. Priestorové ohraničenie globalizácie má svoje hranice. Podľa názoru autorov, ak budú integrované všetky potrebné zdroje a teritóriá, vedúce ekonomiky sa budú uzatvárať od okolitého sveta. V tomto zmysle globalizácia je koncom nového rozdelenia trhu. Ďalej sa nevyhnutne bude rozvíjať regionalizácia.

V tejto súvislosti sa ukazuje potreba analyzovať ďalšie vyhľadávanie špecializácie nového typu pre ekonomiku SR, napr. idea „potravinovej špecializácie“ a v adekvátnej štruktúre jej modernizácia. Integrácia Slovenska do svetovej ekonomiky je založená na modeli, ktorý sa opiera o konkurencieschopnú, vysoko technologickú výrobu konečnej produkcie, čo vedie k narastaniu úlohy konkurencie na úrovni firiem, teda na mikroúrovni, kde by sa veľký význam prikladal inovačnej aktivite spoločnosti. Prvé miesto by zaujali výhody plynúce nielen z nákladov na výrobu, ale hlavne z kvality výrobkov a novosti tovarov a služieb.

Treba brať ohľad na to, že vytvorenie konkrétnych konkurenčných výhod je prerogatívou firiem (mikroúroveň). Na medzinárodnom trhu sú to práve firmy, ktoré si konkurujú, nejde priamo o krajiny. Konkurenčné možnosti firmy nie sú dané štátnymi hranicami krajín, v ktorých sú zaregistrované a konkurenčné výhody získavajú tie spoločnosti, ktoré majú vyššie konkurenčné schopnosti.

Popri tom, štát môže vplývať na všetky vyššie uvedené charakteristiky pomocou colnej, daňovej, finančnej a rozpočtovej politiky, zabezpečujúc efektívne stimuly rozvoja vybraných sektorov ekonomiky. Štát tu plní úlohu „tvorcu“ podnikateľského prostredia pre formovanie konkurenčných výhod (makroúroveň). Základom konkurenčných predností krajiny je štruktúra dopytu na vnútornom trhu. Úroveň a charakter rastu tohto dopytu môže zvýšiť jeho prednosti, vplývajúc na to kedy, kam a aký objem financií vkladajú firmy a prečo sa tak rozhodli.

Najdôležitejší vplyv dopytu vnútorného trhu na konkurenčné prednosti sa prejavuje prostredníctvom vzťahov a charakteru potrieb domácich spotrebiteľov. Štruktúra dopytu určuje skutočnosť, ako firmy chápu tieto potreby a ako na nereagujú. Krajiny sa snažia dosiahnuť konkurenčné prednosti v tých odvetviach alebo segmentoch, kde dopyt na vnútornom trhu dá domácim firmám predstavu o potrebách spotrebiteľov skôr

a presnejšie ako zahraničným konkurentom. Krajiny získavajú konkurenčné prednosti, ak miestne firmy v dôsledku tlaku spotrebiteľov sú nútené zavádzať inovačné prvky a bojovať o konkurenčné prednosti vyššieho poriadku, ako to robia zahraniční konkurenti. Teda základom týchto predností sú rozdiely v dopyte vnútorného trhu.

Záver

Problémy ekonomického rastu a hodnotenia udržateľného rozvoja ekonomiky jednotlivých krajín sú predmetom štúdia WEF od r. 1979. Na meranie konkurencieschopnosti krajiny slúži index GCI, ktorý vyjadruje výsledky globálneho výskumu a sprievodný rating krajín sveta, podľa ukazovateľa ekonomickej konkurencieschopnosti. Index GCI je generalizovaným ukazovateľom rozvoja krajiny a v dôsledku toho jej životnej úrovni a sociálneho rozvoja. Index vypovedá o perspektíve krajiny dosahovať udržateľný hospodársky rast v strednodobom horizonte.

Všetky zložky indexu GCI predstavujú 12 pilierov, každý z ktorých má podstatný vplyv na konkurencieschopnosť krajiny. Je pochopiteľné, že tieto faktory sa v priebehu času menia. Predpokladom je, že uvedené piliere nie sú samostatné, oni nie lenže sú spojene medzi sebou, ale sa navzájom posilňujú.

Analýza indexu GCI SR ukazuje, že k silným pilierom konkurencieschopnosti slovenskej ekonomiky patrí predovšetkým zdravie a základné vzdelanie obyvateľstva. Využívaniu konkurenčných výhod Slovenska bráni predovšetkým nízka efektívnosť práce štátnych inštitúcií a nedostatočný inovačný potenciál Oba tieto piliere majú podpriemernú úroveň.

Podľa výskumu WEF k hlavným problémovým faktorom, ktoré znižujú kvalitu verejných inštitúcií na území SR patrí napríklad vysoká úroveň korupcie, ktorá vyvoláva široké spektrum nepriaznivých javov v rôznych oblastiach rozvoja krajiny.

Úzkym miestom pre rozvoj SR je taktiež podpriemeru úroveň inovačného potenciálu krajiny, ktorý hovorí napríklad o inovačných kapacitách spoločností, o kvalite vedeckých a výskumných inštitúcií, o výške investícií do výskumu a vývoja, ale aj o dostupnosti vedcov a inžinierov v krajine a počte registrovaných patentov.

Nehľadiac na nedostatky indexu GCI ako globálneho modelu, hodnotenie jednotlivých faktorov v rámci štruktúry samotného indexu je veľmi prospešné z pohľadu identifikácie problémových faktorov, ktoré brzdia rozvoj ekonomiky SR.

Poďakovanie

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THE CZECH SCIENCE PARK CRITICAL LOCATION FACTOR ANALASIS

Petr Čížek

Abstract: *The contribution is focused on the critical location factor analysis of science parks in the Czech Republic. The analysis investigates four major critical location factors – Proximity to international airport, Proximity to capital cities, Good road network and Good rail link to capital cities. These factors are applied to the science parks registered at the Science and Technology Parks Association. The results show the dominance of the science parks located near the biggest cities – Prague and Brno. It is mainly because of the excellent access to the highway and international airport for the tenants. However many science parks from other regions performed well, which is mostly consequence of the above-standard access to the highway. On the other hand for the same reason science parks located apart from highways performed poorly. The contribution contains the results for the all science parks by individual factor or by overall score. The analysis is also focused on the data distribution of the results for better understanding the outcome.*

Keywords: *Critical factors, Location analysis, Science parks, Startups.*

JEL Classification: *M13, M21.*

Introduction

Science parks are organizations helping startup companies to accelerate their growth. However there are many needs and prerequisites which are related to the science park location. The analysis is focused on the one of the three critical factors for the science parks – park location. The analysis investigates four major critical location factors – Proximity to international airport, Proximity to capital cities, Good road network and Good rail link to capital cities. These factors are applied to the science parks registered at the Science and Technology Parks Association.

The aim of the contribution is to examine location factors of science parks and according to the result present the situation in the Czech Republic and make relevant conclusions.

1 Literature overview

1.1 Science parks

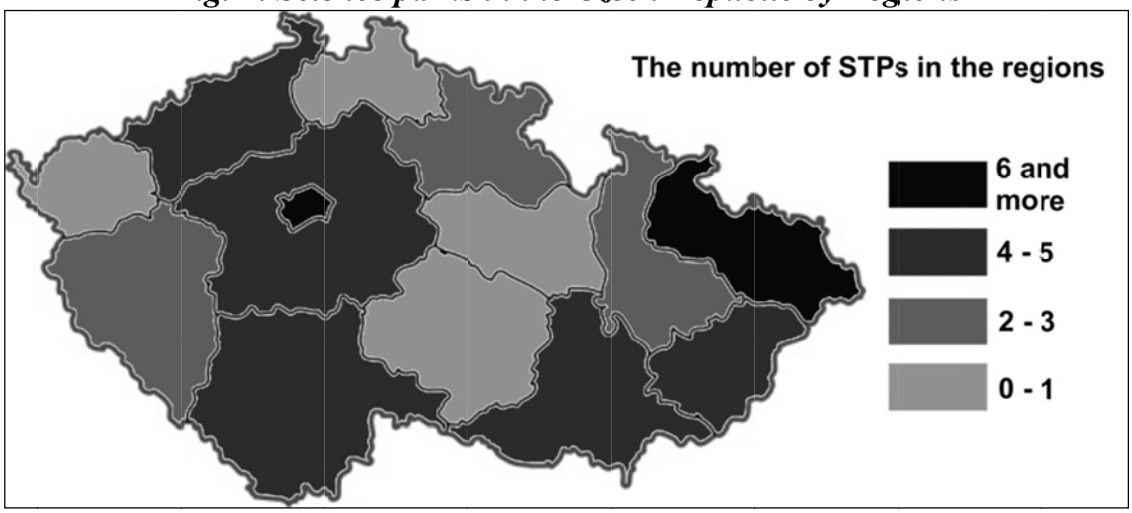
Science parks are one of the ways how small and medium enterprises could be accelerated in its growth. Science parks support SMEs by providing finance (grants and subsidies, cost effects of taxation and compliance), providing information, providing specialist advice and finally helping with training and personnel development. [2]

According to the International Association of Science Parks (IASP), the science and technology parks can be defined as "an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions". [5] The main roles of science parks are competitiveness growth, commercialization of science and support of innovation firms [1]

The concept of science parks is dated to the half of twenties century where the first science park was established within Stanford University, later well known as Silicon Valley. [7]

In the Czech Republic the first science parks emerged after the fall of the communism in the 1990's. Science parks in the Czech Republic are aggregated and certified by Science and Technology parks Association CR [8] Research shows that science parks are unevenly distributed across the Czech Republic as it is possible to see in Fig. 1. Therefore the location conditions are different for each science park. [4] Nowadays, the number of certified science parks in the Czech Republic is 42. [9]

Fig. 1: Science parks in the Czech Republic by Regions



Source: [4]

Koh et al states that science parks "play an incubator role, nurturing the development and growth of new, small, high-tech firms, facilitating the transfer of university know-how to tenant companies, encouraging the development of faculty-based spinoffs and stimulating the development of innovative products and processes."[6]

1.2 Critical factors of the science parks

According to Zhang science park's factors can be divided into three main categories – park location, park preparation and park management team. Studies show that there are several location factors for a successful science park which is presented in Tab. 1.

These location critical factors are similar in Europe and USA, therefore the factors can be considered as universal. Zhang defends importance of proximity to international airport because many technology industries serve an international market, also the desire to be close to the capital city and location with good road and rail links is important for the science park tenants. [11]

Similar research made Centre for Strategy and Evaluation Services, where location factors got medium importance in comparison to other factors. [3]

Tab. 1: Importance of location factors for a science park

Factor	Essential	Important	Relevant	Irrelevant
Proximity to supplier			*	
Proximity to domestic airport			*	
Proximity to international airport	*			
Proximity to seaport				*
Proximity to capital city		*		
Good road network	*			
Good rail link to capital city		*		

Source: [11]

2 Methods

The Science and Technology Parks Association CR has record of 42 science parks in the Czech Republic in the year 2014. These science parks will be examined in the analysis.

According to the literature review there were used four location factors which have importance at the levels Essential or Important to be applied to the Czech science parks.

These four location factors are:

- Proximity to international airport,
- proximity to capital city,
- good road network,
- good rail link to capital city.

The methodology for identifying the individual factors is different from factor to factor. However as a base factor calculation was used the formula for ranking the competitiveness of the countries by World Economic Forum and it is divided into two formulas – with positive and negative influence.

Positive influence

$$6 * \left(\frac{Country\ score - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 1$$

Source: [10]

Negative influence

$$-6 * \left(\frac{Country\ score - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 7$$

Source: [10]

The formula was redesigned for the purpose of the location critical factors used in the analysis.

Proximity to international airport

Because of the negative influence of the score (higher distance – worse score) it was used suitable formula and it was adapted to fulfill its purpose.

There are four international airports in the Czech Republic – in Karlovy Vary, Prague, Brno, Ostrava and Pardubice.

$$-6 * \left(\frac{T - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 7$$

Where T is ideal time needed to reach the closest international airport by car.

Proximity to capital cities

In order to eliminate clear advantage of the Prague science parks, the formula was adjusted not only to examine proximity to capital city, but the average proximity to reach Prague and Brno which are two of the biggest cities in the Czech Republic.

$$-6 * \left(\frac{(\frac{P + B}{2}) - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 7$$

Where P is ideal time needed to reach Prague by car and B is ideal time needed to reach Brno by car.

Good road network

$$-6 * \left(\frac{R - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 7$$

Where R is time needed to reach the closest highway.

Good rail link to capital city

$$-6 * \left(\frac{(\frac{P + B}{2}) - Sample\ minimum}{Sample\ maximum - Sample\ minimum} \right) + 7$$

Where P is ideal time needed to reach Prague by train and B is ideal time needed to reach Brno by train from the city where the science park is situated.

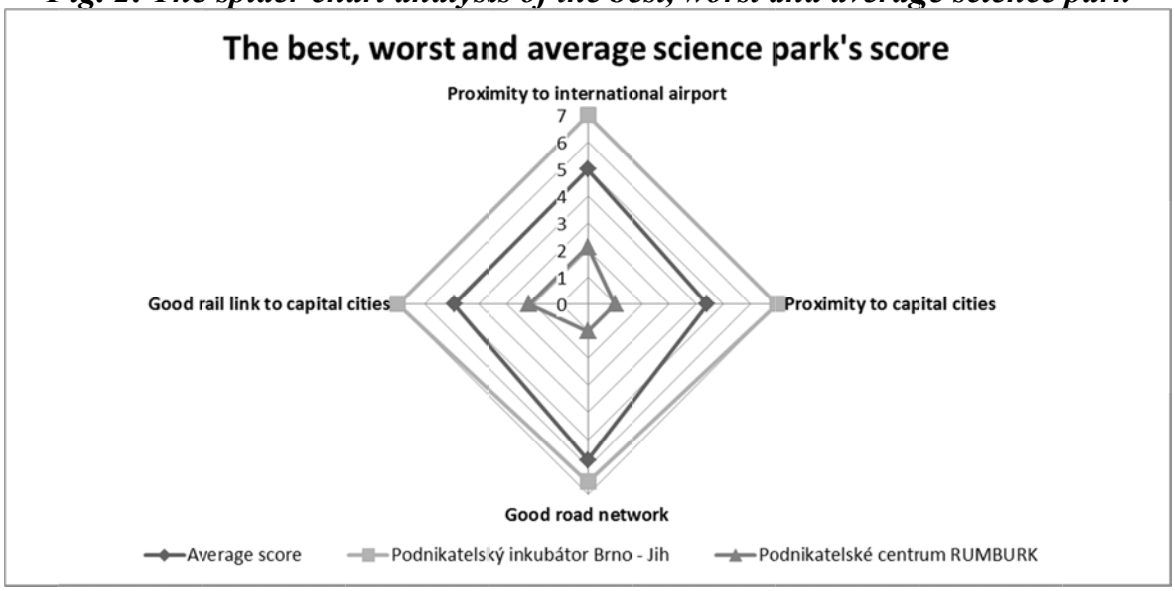
3 Problem solving

The analysis was performed on the sample of 42 science parks registered in the Science and Technology Parks Association.

The Appendix 1 shows the table with individual score of all science parks by explicit factors and total score. The best performed science park by total score is Podnikatelský incubator Brno – Jih and the worst score acquired Podnikatelské centrum Rumburk. In general it is possible to state that science parks in Prague region and Jihomoravský kraj received the highest ranks. It is due to the very good availability to the international airport and highways. However other science parks which are not situated in these regions also received high ranks. This applies mostly for the science parks situated near highways.

Fig. 2 shows chart representing the best, worst and average science park by individual factors.

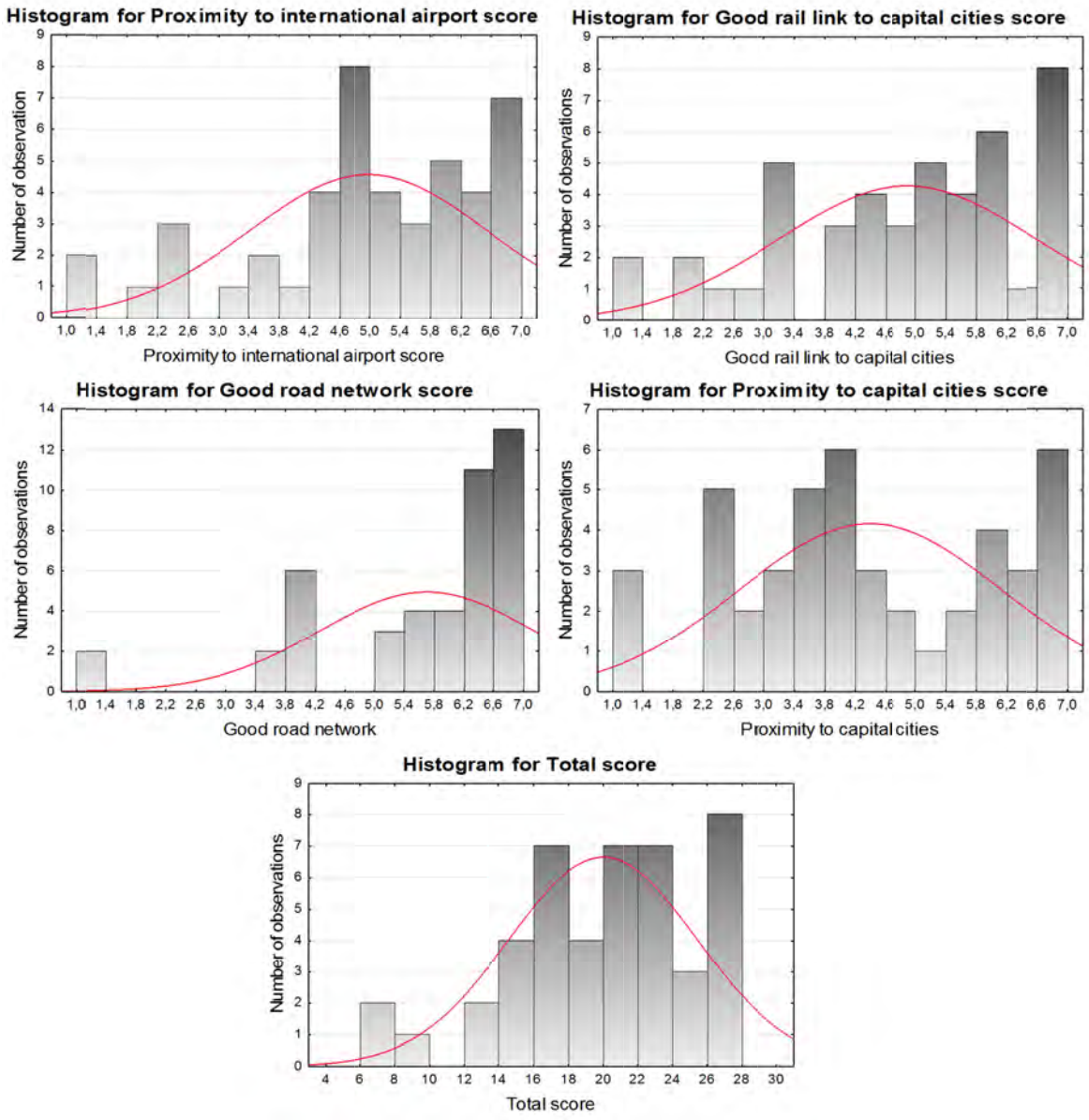
Fig. 2: The spider chart analysis of the best, worst and average science park



Source: Author

Results from the histograms performed on the separate factors and total score are showed on the Fig. 3. Chart shows data distribution of the critical factor analysis results.

Fig. 3: Distribution of data in the analysis results

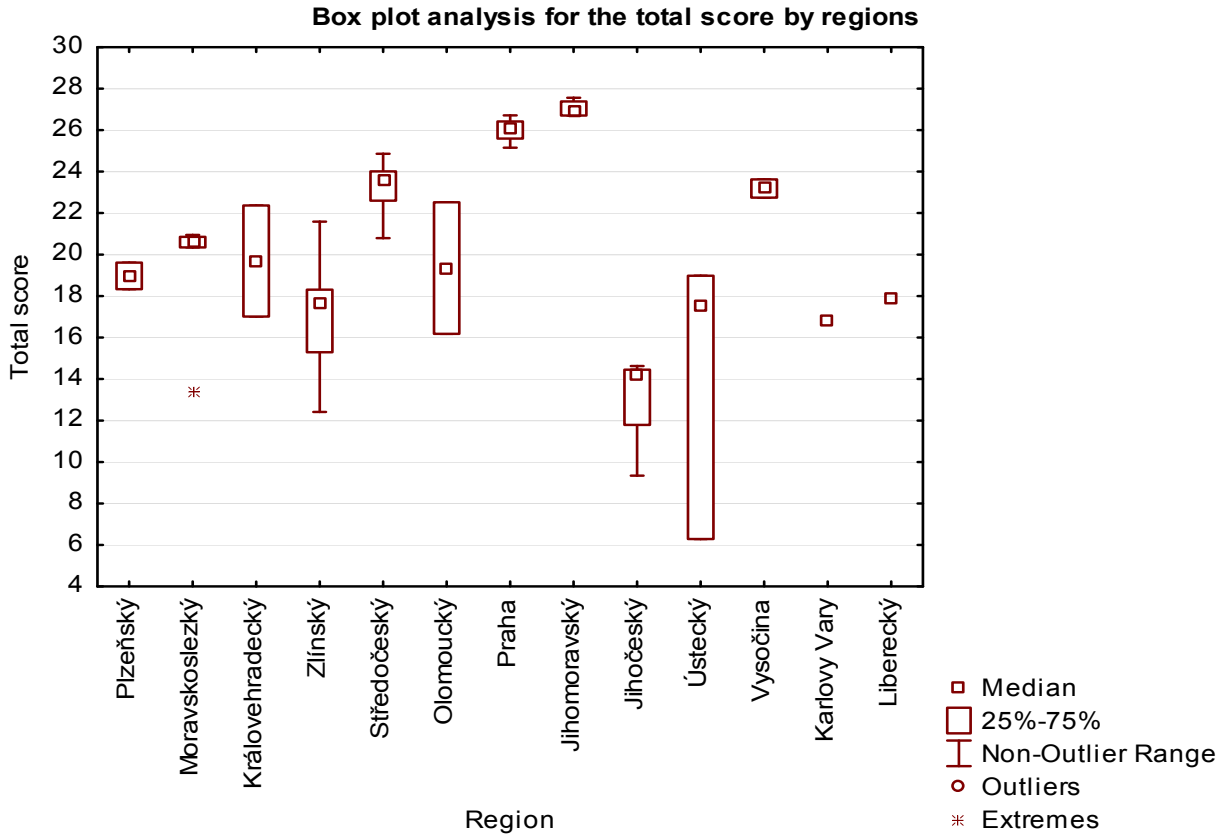


Source: Author

Another view on the data is by regions in the Czech Republic. The analysis is showed in Fig. 4. It was anticipated that science parks in Brno and Prague will seize the top ranks in the results, but there were found that also science parks from region Vysočina and Středočeský kraj received high total score. It is mainly because of the good access to highway and its location near the biggest cities.

The worst ranks received science parks from Ústecký and Jihočeský kraj. However the results have high level of variability. Therefore it vastly depends on the particular location of the science park in the region.

Fig. 4: Box plot analysis of the results by regions in the Czech Republic



Source: Author

4 Discussion

The critical location factors analysis has some restrictions. The calculations were artificially defined and it can't take in the consideration all the factors which location of the science park is influenced by. However it shows the importance of the quality highway network which allows companies first-rate access to the international airports and biggest cities.

According to studies there are three categories of critical factors for science parks - park location, park preparation and park management team. This contribution is focused solely on the park location critical factors. The results aren't therefore complete and the further studies which are focused on the other two critical factor categories are necessary to receive global view on the science parks critical factors.

Conclusion

Science parks are organizations which provide support to the startup companies. Because science parks are companies like others there are critical factors for their business. The studies define three main categories - park location, park preparation and park management team. The contribution focuses on the park location critical factors which were defined as Proximity to international airport, Proximity to capital cities, Good road network and Good rail link to capital cities.

The analysis performed score calculation for all science parks registered at the Science and Technology Parks Association. The results show the advantage of science parks situated

in region Praha and Jihomoravský kraj, which received highest ranks however other science parks from other regions such as Vysočina or Středočeský kraj received high score as well.

On the other hand science parks situated in the Ústecký and Jihočeský kraj performed second-rated. It is mainly because lack of the access to the highway which would reduce time needed to reach international airports and biggest cities. However the variability of the results in these regions is very high therefore it vastly depends on the particular location of the science park. In contrary to the previous example science parks in the Praha region and Jihomoravský kraj has much lower variability of the total score therefore the importance of the individual science park location in these regions is lower.

The recommendation according to the results is that the location of the science park is important part of the science park location decision making process. The competent person should also consider the location of the park and especially its access to the highway and not to focus solely on quality based attributes.

Acknowledgement

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PŘÍPAD ČESKÉHO TEXTILNÍHO A ODĚVNÍHO PRŮMYSLU A EKONOMICKÁ BEZPEČNOST REGIONŮ

THE CASE OF THE CZECH TEXTILE AND CLOTHING INDUSTRY AND ECONOMIC SECURITY OF REGIONS

Michaela Glogarová, Ivana Kraftová

Abstract: *Textile and clothing industry are two from the industries, which are affected by globalization processes extremely. In terms of historical development, these industries of the sectors of light industry belong to the major pillars of the Czech economy. The article focuses on assessing the impact of globalization on the economic security of the textile and clothing industry of the Czech Republic and the economic security of the regions where enterprises of mentioned industries operate, namely in the period of globalization. It shows that economic security of industry has absolute and relative dimensions, which are reflected on economic security of regions subsequently. To assess of the economic security are selected performance indicators (sales) and employment, the attention is paid to the period 1975-2012, with particular emphasis on the period 1995-2005.*

Keywords: *Economic security, Regions, Textile and clothing industry, Globalization, Performance, Employment.*

JEL Classification*: L67, R39.*

Úvod

Historicky vzato byl pro území Čech a Moravy z hlediska hospodářského rozvoje typický rozvoj lehkého průmyslu, v němž mimořádně důležitou váhu měl průmysl textilní. Např. v roce 1869, tedy v období druhé průmyslové revoluce, bylo na území ČR 75 % všech průmyslových dělníků zaměstnáno v lehkém průmyslu, v samotném textilním průmyslu přes 50 %. [6, str. 395]

Textilní a oděvní průmysl (dále jen „TOP“) představuje „nejstarší klasické tovární odvětví, které zahájilo proces industrializace světového hospodářství. Textilní a oděvní průmysl byly prvními odvětvími operujícími v globálním rozsahu.“ [7, s. 94] TOP lze zařadit mezi tradiční výrobní odvětví mnoha zemí světa. TOP zaznamenal výrazné změny v posledních desetiletích ve své teritoriální struktuře v souvislosti s globalizačními procesy. Výroba se posunula směrem k rozvojovým zemím, kde jsou nižší náklady na pracovní sílu, ale i další příznivé faktory. [3]

Globalizace není nový jev, je pokračováním procesu internacionalizace světového hospodářství. Globalizace výrazně ovlivnila mimo jiné mezinárodní obchod s produkty TOP. Podle české Asociace textilního a oděvního průmyslu působí procesy globalizace na TOP velmi intenzivně zhruba od roku 1970, hlavní globalizační změny se však odehrály od roku 1995 do roku 2005.

Globalizační procesy vyvolávají změny postavení regionů, mají silné konsekvence pro jejich ekonomickou bezpečnost, chápanou blízce duchu pojetí A. L. Friedberga [4, str. 19]. Ekonomická bezpečnost může být nazírána z různých úhlů pohledu; lze vymezit

jak ekonomickou bezpečnost regionu, tak ekonomickou bezpečnost odvětví jako mezoekonomické úrovně ekonomické bezpečnosti státu.

1 Formulace problematiky

Ekonomická bezpečnost regionů v globální ekonomice představuje takový stav, kdy se region zapojuje do mezinárodní dělby práce a jsou minimalizovány hrozby snižování jeho výkonnosti a zaměstnanosti; analogicky je možné vymezit ekonomickou bezpečnost odvětví jako stav, kdy se odvětví zapojuje do mezinárodní dělby práce a jsou minimalizovány hrozby snižování jeho výkonnosti a zaměstnanosti.

Cílem tohoto příspěvku je posoudit,

a) jak se vyvíjí v období globalizace ekonomická bezpečnost v rámci českého TOP, a to pomocí

   aa) vývoje tržeb jako ukazatele výkonnosti

   ab) a vývoje zaměstnanosti;

b) jak se změnilo regionální rozložení a intenzita zastoupení TOP v rámci České republiky.

Současně verifikovat hypotézy:

α) Ekonomická bezpečnost českého TOP se v období globalizace snižuje.

β) V podmínkách tržní ekonomiky se zvyšuje počet regionů ČR, v nichž operují subjekty TOP, avšak není to významným momentem narušování ekonomické bezpečnosti regionu.

2 Použité metody

Základní metodou je analýza statistických dat týkajících se vývoje TOP, jejich srovnání v čase významných změn v dané oblasti. Zprvu je akcentována mezinárodní komparace vývoje TOP pomocí podílu každého odvětví vybraných zemí (významných hráčů) na trhu příslušných výrobků jednak v EU, jedna v USA. Tato komparace je doplněna o zachycení změny pozice vyjádřené hodnotou vývozu a dovozu ČR v dané oblasti vůči jednotlivým světovým kontinentům.

Ekonomická bezpečnost sledovaných odvětví je posuzována pomocí parametru tržeb a zaměstnanosti, a to za relativně dlouhé období let 1975-2011, grafické zachycení je doplněno určením vývojového trendu pro každý parametr a odvětví.

Pro zachycení regionálních modů operandi jsou využity kartogramy, jejichž účelem je opět komparace v čase, kdy jsou zvoleny roky 1980 a 2012, které umožňují vnímat situaci regionálního rozložení odvětví v ČR jak na pozadí celosvětových odvětvových změn zapříčiněných dynamizací globalizačních trendů, tak na pozadí společensko-ekonomických změn samotné České republiky.

3 Rozbor problému a diskuze

3.1 Mezinárodní postavení TOP a jeho produkce

Již řadu desetiletí se vedou spory o ochranu či liberalizaci trhu s textilem a oděvy. Textilní a oděvní průmysl byl a je pro některé země strategickou komoditou. Kolem druhé poloviny dvacáté století se na mezinárodních trzích začaly prosazovat tendence rozvojových

států proniknout s textilní a oděvní výrobou na trhy rozvinutých států. Rozvinuté státy se proto snažily o ochranu svých trhů. Byla proto uzavřena Smlouva o textilu a oděvech (Multifibre Agreement-MFA) a Dohoda o textilu a oděvech (Agreement on Textile and Clothing-ATC), které se snažily zpomalovat liberalizaci obchodu s textilem a oděvy a chránit evropské a americké trhy před nekontrolovaným přílivem textilu a oděvů ze třetích zemí. MFA umožnila, že členové GATT, později členové WTO, mohli mezi sebou využívat množstevní kvóty při dovozu textilních a oděvních výrobků. Docházelo k tzv. rozrušení trhu, což znamenalo, že docházelo k nárůstu dovozu a tyto importované výrobky se prodávaly za podstatně nižší ceny než srovnatelné výrobky prodávající se na trhu dovozní země. Takové rozrušení trhu následně mohlo vést ke škodě domácích výrobců, ta se vyhodnocovala podle faktorů, mezi něž patří například obrat, podíl na trhu, zisk, výše vývozu a zaměstnanost. Podle MFA mohla země, do které byly takovéto dovozy směřovány, požádat o konzultace se zemí, která dovozy prováděla a v žádosti mohla uvést množství, na které by měly být dovozy omezeny. [2]

ATC posléze upravovala ve třech etapách zrušení dovozních kvót mezi všemi členy WTO. Cílem tohoto zrušení dovozních kvót neboli úplné liberalizace trhu s textilem a oděvy bylo zejména pomoci nejméně rozvinutým a rozvíjejícím se zemím. Po roce 2001, kdy do WTO vstoupila po dlouhých jednáních Čína, se projevil její velmi významný vliv na proces liberalizace TOP, byl zaznamenán zlomový krok v liberalizaci obchodu s produkty TOP. Výsledky uvedených tendencí lze sledovat na změně podílu na trhu textilních, ale zejména oděvních výrobků v Evropské unii a USA, jak zachycuje tab. 1 a 2.

Tab. 1: Podíl na trhu textilních a oděvních výrobků v EU v letech 1995 a 2005

Podíl na trhu textilních výrobků EU v %	1995	2005	Podíl na trhu oděvních výrobků EU v %	1995	2005
Čína	10	12	Čína	18	29
Indie	9	11	Indie	6	9
USA a Kanada	8	7	USA a Kanada	8	7
Indonésie	4	5	Bangladéš	3	4

Zdroj: převzato z [3]

Tab. 2: Podíl na trhu textilních a oděvních výrobků v USA v letech 1995 a 2005

Podíl na trhu textilních výrobků USA v %	1995	2005	Podíl na trhu oděvních výrobků USA v%	1995	2005
Čína	11	18	Čína	16	50
Indie	5	5	Indie	0	15
EU	16	14	EU	5	0
Mexiko	13	11	Mexiko	10	3

Zdroj: převzato z [3]

Z výše uvedených tabulek č. 1 a 2 je patrný nejen výrazné zvýšené podílu čínského TOP v obou teritoriích, navíc z tabulky č. 2 vyplývá absolutní ztráta pozice EU v USA na trhu oděvních výrobků.

Stav dovozu a vývozu v pozdějším období ve vztahu k ČR zachycuje tabulka č. 3, která ilustruje, jak dynamicky se vyvíjí i poměrně vysoká míra dovozu z Asie. Na druhou stranu ani nárůst vývozu není zanedbatelný a svědčí tak o konkurenceschopnosti českého TOP.

Tab. 3: Dovoz a vývoz ČR produkce TOP v roce 1999 a 2012 (v tis. Kč)

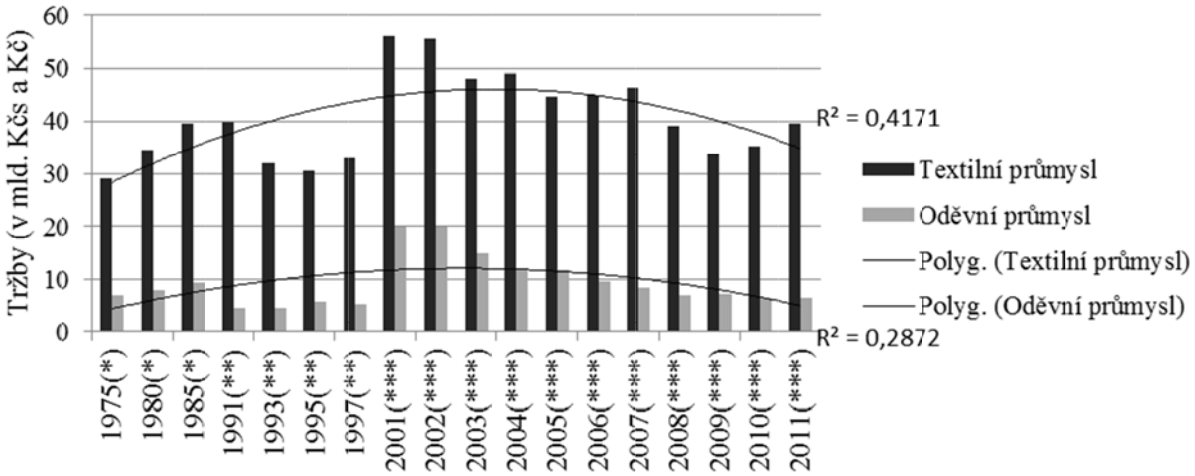
Kontinent	Dovoz			Vývoz		
	Rok		Index růstu	Rok		Index růstu
	1999	2012		1999	2012	
Evropa	35 120	35 471	1,01	35 687	44 900	1,26
Asie	2 938 305	7 635 174	2,60	458 331	727 373	1,59
Amerika	630 193	818 241	1,30	1 614	1 351 252	0,84
Afrika	127 123	255 367	2,01	98 813	2 086 231	21,11
Oceánie a polární	4 390	181 190	41,27	111 476	60 978	0,55

Zdroj: upraveno podle [1]

3.2 Úroveň výkonnosti a zaměstnanosti TOP jako výraz míry ekonomické bezpečnosti odvětví

Tržby vyjadřují peněžní částky, které podniky získávají za prodej své produkce. Na jejich úroveň má vliv jednak množství produkce, jednak jednotková cena. Z toho důvodu je ukazatel výkonnosti v podobě tržeb v běžných cenách poněkud problematickým v delším časovém období s ohledem na změny v cenové hladině, na vlivy technicko-technologicko-ekonomického pokroku v jeho souhrnu, který se promítá absolutně i relativně do úrovně tržeb. Nicméně určitý obrázek o vývoji výkonu TOP v období let 1975-2011 podává obr. č. 1.

Obr. 1: Tržby českého TOP v letech 1975 – 2011



Legenda:

** Výrobní subjekty bez ohledu na počet zaměstnanců*

*** Výrobní subjekty s počtem zaměstnanců 100 a více*

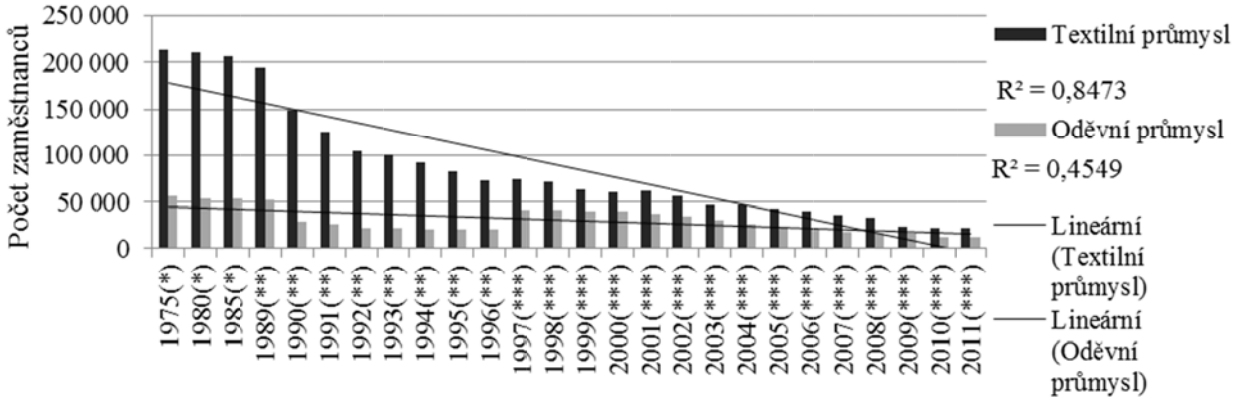
**** Výrobní subjekty s počtem zaměstnanců 20 a více*

Zdroj: převzato z [3]

Z obr. č. 1 je patrné, že výkonnost obou součástí TOP z dlouhodobého hlediska neklesá – dalo by se konstatovat, že stagnuje - , přestože v čase podléhá výkyvům. Druhou stranou mince je ale fakt, že prudce klesá podíl TOP na výkonu českého průmyslu. Měřeno například podílem na hrubé přidané hodnotě poklesl podíl textilního průmyslu na celkovém průmyslu ČR mezi roky 1993 a 2011 téměř na 1/3 (z 1,40 % na 0,52 %), u oděvního průmyslu byl zaznamenán pokles na cca 1/2 (z 0,60 % na 0,26 %) [3]. Při stagnaci výkonu TOP to znamená, že ostatní průmyslová odvětví rostou v ČR rychleji.

Druhým sledovaným parametrem TOP je vývoj zaměstnanosti. Zaměstnanost vyjadřuje počet pracujících osob, které vykonávají pro zaměstnavatele práci za mzdu. Vývoj počtu pracovníků v TOP od roku 1975 do roku 2011 prezentuje obr. č. 2.

Obr. 2: Vývoj počtu zaměstnanců v českém TOP v letech 1975 – 2011



Legenda:

** Výrobní subjekty bez ohledu na počet zaměstnanců*

*** Výrobní subjekty s počtem zaměstnanců 100 a více*

**** Výrobní subjekty s počtem zaměstnanců 20 a více*

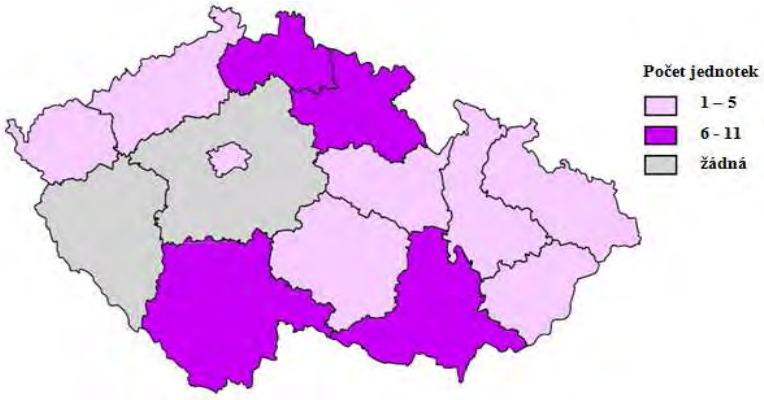
Zdroj: převzato z [3]

V roce 1975 zaměstnával textilní a oděvní průmysl velký počet pracovníků. Od tohoto roku počet zaměstnanců klesá. V roce 1975 byl počet zaměstnanců v textilním průmyslu 213 970 a v oděvním průmyslu 56 500, následoval pokles, který se zvýraznil po roce 1989. V roce 2011 už bylo jen 21 800 zaměstnanců v textilním průmyslu, v oděvním pouhých 12 300 [3]. Tento pokles zaměstnanců zapříčinila především konkurence, kterou globalizace umožnila. Vlivem globalizace se začalo dovážet více textilu a oděvů. K zastavování a omezování výroby a tím snižování zaměstnanců v českém TOP ČR docházelo i z jiných příčin, např. v letech 2006-2008 se potýkal TOP s problémy zdražování některých vstupů, zejména energie.

3.3 Změny v regionálním rozložení subjektů TOP v rámci ČR

Nechť je výchozím stavem porovnání rok 1980, kdy v rámci centralizované socialistické ekonomiky byly představiteli TOP výrobně hospodářské jednotky. V rámci dnešních krajů (NUTS 3) jich bylo průměrně 5 v kraji, nejvíce v Jihomoravském (11) a Královéhradeckém (10) kraji, žádné zastoupení nebylo v kraji Středočeském a Plzeňském, jak prezentuje mapa – obr. č. 3.

Obr. 3: Rozložení subjektů TOP ČR v roce 1980

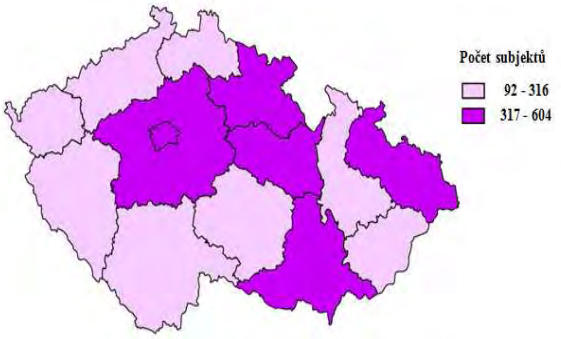


Zdroj: převzato z [3]

Kromě výše uvedených krajů Jihomoravského a Královéhradeckého se řadí ke krajům s nadprůměrným zastoupením TOP ještě kraj Liberecký a Jihočeský.

Porovnání se současností (rokem 2012) je rozděleno na obě součásti TOP, kdy v případě textilního průmyslu představoval počet subjektů v něm operujících hodnotu 4 418 podniků (průměrně 316 v kraji, s tendencí k poklesu celkového počtu); v případě oděvního průmyslu to bylo 32 099 podniků (průměrně 2293 v kraji, s tendencí k růstu celkového počtu). Následující obr. č. 4a a 4b ilustruje současné regionální rozložení subjektů TOP v ČR.

Obr. 4a: Regionální rozložení subjektů textilního průmyslu v roce 2012



Obr. 4b: Regionální rozložení subjektů oděvního průmyslu v roce 2012

Zdroj: převzato z [3]

Porovnáním ilustrativních obrázků č. 3, 4a a 4b lze odvodit poměrně výrazné změny v regionálním rozložení podniků českého TOP. Mezi kraje s nadprůměrným zastoupením textilního průmyslu se přiřadily kraje Středočeský, Hlavní město Praha, Pardubický a Moravskoslezský, naopak ubyl kraj Jihočeský. U oděvního průmyslu zůstal v rámci nadprůměrně zastoupených krajů kraj Jihomoravský, jinak se situace velmi změnila, přibyly další tři kraje – stejné jako u textilního průmyslu s výjimkou Pardubického kraje, který nadprůměrným zastoupením oděvního průmyslu nevyniká.

Závěr

Globalizace a její důsledky jsou neopomenutelným fenoménem z hlediska hodnocení rozvoje regionů i odvětví, zvláště u malé otevřené ekonomiky, jakou je ekonomika ČR. Mezi dopady globalizace na český TOP lze zařadit zejména:

- nárůst dovozů (Do České republiky se nejvíce textilního zboží dováží z Evropy a Asie již od roku 1999, oděvní zboží se dováží do České republiky zejména z Asie a poté z Evropy, v roce 2012 se dovezly oděvy především z Číny, Turecka, Bangladéše a z Německa a Itálie.) [1]
- exportní zaměření českých firem TOP s ohledem na nasycenost domácího trhu levnější importovanou produkcí (Český TOP získává své tržby především z přímého vývozu. Z celkových tržeb zaujímají tyto tržby z přímého vývozu téměř 70 %.) [5]
- výrazné snížení zaměstnanosti, které je nezřídka doprovázeno ukončením činnosti podniku, (například Tepna, a. s. se sídlem v Náchodě zkrachovala a Oděvní podnik, a. s., sídlící v Prostějově, je v konkursu.) [3]

Na základě provedeného výzkumu lze konstatovat ve vztahu k první stanovené hypotéze, že ekonomická bezpečnost českého TOP se v období globalizace snižuje, a to ve vztahu ke zvolenému indikátoru výkonnosti relativně (ostatní odvětví eliminují svým vývojem toto snižování odvětvové ekonomické bezpečnosti), ve vztahu k indikátoru zaměstnanosti absolutně. Díky snižování podílu TOP na výkonu českého průmyslu lze pak i tento

absolutní trend snižování míry zaměstnanosti v TOP vnímat relativně, avšak je zřejmé, že okamžikové stavy snížení ekonomické bezpečnosti odvětví nastávají a ty pak negativně ovlivňují bezprostředně ekonomickou bezpečnost příslušného regionu.

Ve vazbě na druhou hypotézu lze konstatovat, že se v rámci změny ekonomického systému (přechod na tržní ekonomiku) zvýšil počet regionů ČR, v nichž operují subjekty TOP. To je bezpochyby spjato i se změnami tržních struktur v odvětví TOP. Na druhou stranu je současně pravdou, že podíl TOP na celkovém výkonu průmyslu ČR se natolik snižuje, že si regiony vyššího řádu zachovávají potřebnou míru ekonomické bezpečnosti v tomto ohledu, je však narušována okamžikovými negativními projevy v regionech nižšího řádu či mikroregionech vázanými na jednotlivé podniky, zejména pokud jde o střední a velké subjekty.

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SOURCE ASPECTS IN THE REFORM OF LOCAL SELF-GOVERNMENT IN SLOVAK REPUBLIC

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Abstract: *To the basic principles of democratic state administration belongs administration of public affairs, what underlines importance of public administration in the modern state. Functions of the state are performed by the public administration in all spheres of society life. It has an important role in application of laws, including adoption of legislation, organizational activities, and ensuring public services. It also provides broad institutional tools of citizen participation in administrative processes at the local, regional or central level. In Slovakia is applied dual model of public administration, which consists of state and self-governing element. In our article, we focus on self-government part of the public administration, local self-government and its specifics, which resulted from management system applied on this level. It is concerning the element, which is very close to citizens, because it is a part of public administration that generally deals with issues of local or regional importance.*

Keywords: *Public administration, Local self-government, Regional self-government, Settlement structure, Citizen participation, Decentralization, Consolidation, Municipality reform.*

JEL Classification*: H11, H76.*

Introduction

There cannot be doubts about importance of public governance and therefore public administration represents important part of modern state. Functions of state are implemented through public administration in all levels of society, as close as possible to citizens. In this article, we will take focus on settlement structure, particularly to lowest level of local self-government in Central European countries. We will concentrate primarily on possibilities of improvement in this level of local self-government in Slovak republic. Lowest local level of self-governing territorial organization is in individual countries characterized by certain specifics. Therefore it is desirable to compare systems of local self-governments, applied in individual countries, and to sort out assets, which can be applied in other countries. To eliminate deficiencies in local self-governments and to achieve optimal functionality of this part of governance, at least we should get inspired by countries which models of local self-government are considered as effective. In Slovak republic, a municipal reform is often mentioned within this context. Not only specialists, but also politics are concerned by this issue. Municipal reform is perceived as an impulse to closer cooperation of municipalities. The purpose of these steps is to improve quality of public governance on the lowest level of administration and to bring authorities of this administration closer to citizens.

1 Formulation of issue

Current situation in local self-government in Slovakia is not optimal, because it is permanently part of a debate on reform, in field of regional and municipal government. These components, which are part of the public administration, carry out citizens' needs.

"Management of self-government is directly related to performance and efficiency of services, which are provided to citizens" [9, p. 155] This issue affects whole society.

Problems on municipal level are connected with regional level, because it is a linked complex of processes of self-governing authorities which are together connected. Therefore it is necessary to consider the changes in regional and also in municipal levels, because current situation becomes too fragmented, which has negative impact on mentioned levels.

1.1 Principle of decentralization and its importance for development of local self-government

After the end of WW2 in individual countries started changes within political systems and functioning of public administration. Especially in western countries arose a re-evaluation of administration perception. As a result, issue of public administration functioning came into focus, particularly from the view of municipal structure fragmentation. At the turn of the seventies and eighties of the 20th century[1], in Europe emerged tendencies aimed to reform public administration. Their main focus was to weaken centrist concept of public administration, and transition to pluralistic concepts. These concepts established trend of involvement into public policies and providing public services of participants, which are situated outside the institution of the government. At the same time began the transfer of greater scope of competence to the lower units of public administration. Until this time, the main power was centralized to state administration.

The situation changed, when existing key process of national states formation in the form of centralization was subjected to doubts and was replaced by contradictory tendencies. Side effect in the context of these new trends in governance was decentralization, which resulted in an increase of the transfer of powers to lower levels of local self-government [8]. This trend is emphasized by Bernard: „political authorities shall give up a part of its powers to supranational bodies and various types of local and regional authorities and agencies“ [3, p. 40]. These trends, which occurs at the expense of strengthening the central government, determines Rhodes by term “hollowing out”, what can be described as a limitation of the state role [24]. With this conception of governance, however, disagrees Kooiman, according whom it is appropriate to consider "only" shifting role of government instead of reducing its role. He does not consider traditional government interventions as obsolete, but on the other hand, he points to the rising awareness of the boundaries of traditional government intervention, regulation and control [16]. The decentralization process has increasing importance. This fact is underlined by Hendrych, who defines some important organizational principles that are used in the context of the organization's administrative and political systems. Already mentioned principles consider decentralization respectively its principle. Except that, there belongs principle of centralization, the territorial principle, the operating principle, the principle of concentration and deconcentration, collegiate principle, monocratic principle, the electoral principle, the spacer principle and the principle of subsidiarity.

Basically, decentralization represents a transfer of public power to lower than central areas, which means the transfer of independence in decision-making to local authority units. It means that this is an important factor in the process of construction of public administration in each country. Decentralization is universally defined as a process which

[1] Public administration reform, highlighting the status of regional government was put into motion as a result of the widening of European integration. We describe a landmark to 1986 and an approval of international treaty Single European Act [4].

“improves the quality of governance in the country by ensuring that decision-making is closer to those who are affected by it” [19, p. 4]. Its common feature is the basic approach consisting transfer of "power to the sub-central level of the state" [22, p. 8]. It does not represent only a process of shifting political level from central to a lower, but also the production of democratic decision-making bodies at the sub-national level. It shifts political arrangement closer to the ideal of democracy. In terms of the volume and type of transferred powers in the decentralization process, which can be varied, for example, we can distinguish process of administrative deconcentration, for which is specific the transfer of administrative responsibilities [29], process of devolution, which means the transfer of legislative powers and is often described as the most extreme form of decentralization [29], political decentralization, which brings an increase in jurisdiction by sub-national units and increasing their sovereignty while trying to increase the citizen participation and their elected representatives in public affairs [17, 29] or other processes such as: fiscal decentralization, market decentralization, deconcentration and others [17]. Decentralization can be often seen at redistribution of financial sources to lower levels. This case is the fiscal decentralization [18].

Reasons to decentralize public powers can vary. There exist many supporting arguments, but also arguments which point to the risks of powers transfer to lower municipal levels. One of the positive arguments is based on the fact that the decentralization of public authorities at local and also regional level, force public sector in a decentralized system presented by local regional government, to be more responsive to local and regional interests of population. Important economic argument for decentralization is efficiency increase of resource allocation, which means that produced goods and services reflect at best the preferences of citizens belonging to the corresponding region. That means that the decision-makers, coming from local or regional environment, are familiar with these conditions in shaping public policy. On the other hand, it is often emphasized that "decentralization may cause a discrepancy between the financial resources and technical skills which are necessary for its implementation" [10, p. 11]. The success of decentralization is mutually conditioned by several factors and is closely linked with the determination of the proper boundary between decentralization and centralization. However, generally is applicable state in which each task should be carried out by level of public administration that is the most efficient and most economical. Excessive centralization causes a decrease in flexibility of responses to problems. Here, we can argue that decentralization is important, whether it is political, which shift political power to the sub-central level, as well as the decentralization of competence, which redistributes responsibilities and competencies to individual levels of public administration and fulfills mentioned requirement.

These tendencies has important role after WW2 in the countries belonging to the Soviet sphere. Centralization tendencies were typical for these countries, and also strengthening the role of the state and the state apparatus at the expense of self-governing units. After the revolutions’ period in late nineties, decentralization tendencies appeared in these countries, reinforced with the increasing interest to join multinational organizations, especially the European Union.

2 Methods

In this article, we deal with the source aspects of local self-government reform in the Slovak Republic. The aim of article is to analyze importance and necessity of reforms

on local self-government level together with analysis of the impact effects on the further development of the regions. Methodical instructions were subordinated to our goal. In article were used logical-cognitive methods, which included comparison.

3 Problem analysis

3.1 Importance of consolidation reforms for the functioning of local self-government from a theoretical view

As a consequence of the decentralization tendencies, local authority units that previously belonged to the influence of state apparatus began to perform many functions, particularly at the municipal level. In this context arose the problem of excessive fragmentation, while several countries have coped with this problem by consolidation reforms.

Size of municipal structures has a significant influence on the whole system, not only in case of local authorities, but also on public administration as a whole. It also has an impact on layout of functions and form of relations between the central and local government [21]. In evaluation of direction (fragmentation or consolidation), we take into account the factor of economic efficiency, democracy, economic development and distribution [25]. Although from an economic point of view, the consolidation is favored. When comparing various criteria, it is not possible to identify the advantage and disadvantage of fragmentation.

Advantage of big self-governments and unification is the fact that they can offer space for realization of public on the policy at the local self-government level, what increased public interest in development at that level. This leads to the involvement of better candidates in municipal elections; while with the size of the office also grows prestige and power [11]. Larger units allow enabling more considerable support for local economic development and also offering more opportunities to create a strong civil society. Advantage of large self-governments can be increase of the tasks'efficiency, service quality improvement, as large municipal units can provide services beyond the capabilities of smaller municipalities and therefore the performance of tasks will be more professional. It means that large municipalities have greater opportunities to offer citizens all required services. As a result, larger municipalities can make better decisions on effective solutions, while larger municipalities have plenty of resources can use in claims of voters [20]. In large municipalities, the views of pluralistic society are pushed through more significantly and also there is much more developed party system. Finally, representation of different minority groups appears better in larger units, which are characterized by a greater degree of liberalization and also by acceptance of otherness. [25]. On the other hand, there are also arguments, which strengthen smaller municipalities or more precisely territorial fragmentation. One of the basic arguments for smaller units is that they are closer to citizens and their representatives. As a result, representatives have greater responsibility to public. Usually, the political participation of citizens in small communities is higher than in large ones. This is related to a sense of belonging, in comparison to lowest territorial self-government unit with regional governments consequently with the state [20]. Another fact is the greater homogeneity of small autonomous units at the lowest level, which ensures easier application of policies that satisfy the interests of a large number of people. In smaller territorial units, the participation of citizens in local politics is intensified, because it significantly influences the political process. A big advantage for small self-governments is that they are less bureaucratic. Fragmentation should lead to natural competition between the smaller self-government units in order to obtain capital. [25] As mentioned above,

the fragmentation as well as the consolidation of local self-government has its own advantages and disadvantages and it is not clearly determinable, which of these procedures is more favorable. D. Klimovský, commenting on the advantages of consolidation and fragmentation, indicates that, "although economic considerations favor the consolidation (or defragmented) structures, several sociological studies show a strong identification of municipalities inhabitants with settlement units and their results confirm significance of maintaining fragmented structures" [13, p. 183]. If municipalities are very small, it has a negative impact on the implementation of difficult projects and on services for citizens, as they do not have sufficient economic, organizational or human resources. In most European countries after World War II, there began process of creating large units, because small municipalities did not function suitably. Consolidation, respectively creation of larger territorial units was justified by better communication, social mobility, and also by technological development at the municipal level. Usually, the solutions to these problems are voluntary cooperation between municipalities, the establishment of common offices or merging of municipalities [13].

3.2 Local structure of the Slovak Republic in terms of population size in the context of Central Europe countries

In the last fifty years, the consolidation tendencies are typical for many countries in Europe. Especially in Western European and Nordic countries there has been a decline in number of municipalities[2], while in some countries to a greater or less extent. We focus on countries situated in the central European area, where consolidation process is characteristic even during the non-democratic regime. Before we will present the current state of the urban structure in the individual CEE countries, it is important to say that the network of municipalities can not be automatically put together with a local residential structure, because the municipalities represent authorities with their own transferred powers [15]. For example, in Poland there are almost 43000 residential units that are categorized to around 2400 municipalities. In this country, during merging of municipalities, in the seventies of the 20th century, there was a reduction of the lowest municipal units. Based on this step, there was decline by half from about 4,000 to the 2400. The process of amalgamation, merging and linking indigenous communities in the Czech Republic, lasted little longer, for almost forty years. From 1950 until the end of the eighties, there was a decline in number of municipalities by more than half, from almost 11,500 to about 4000. Similarly in Hungary in the sixties, was the number of municipalities around 3000 and in the late eighties almost 1300 [25]. Slovakia, as mentioned countries, has similar development. The process of dropping of municipalities, due to merging, was initiated even during the first Czecho - Slovak Republic, in the thirties, but reached a peak in the late seventies, during the second common Czecho - Slovak state. In comparison with Hungary, the Czech Republic and Poland, in conditions of Slovak republic there was not so significant decrease of municipalities during this period. Because in 1930 there were nearly 3,500 villages and in early eighties nearly 2,700 [2], what means a decrease of almost 23%, which is less in comparison to nearly 50% reduction in these municipalities.

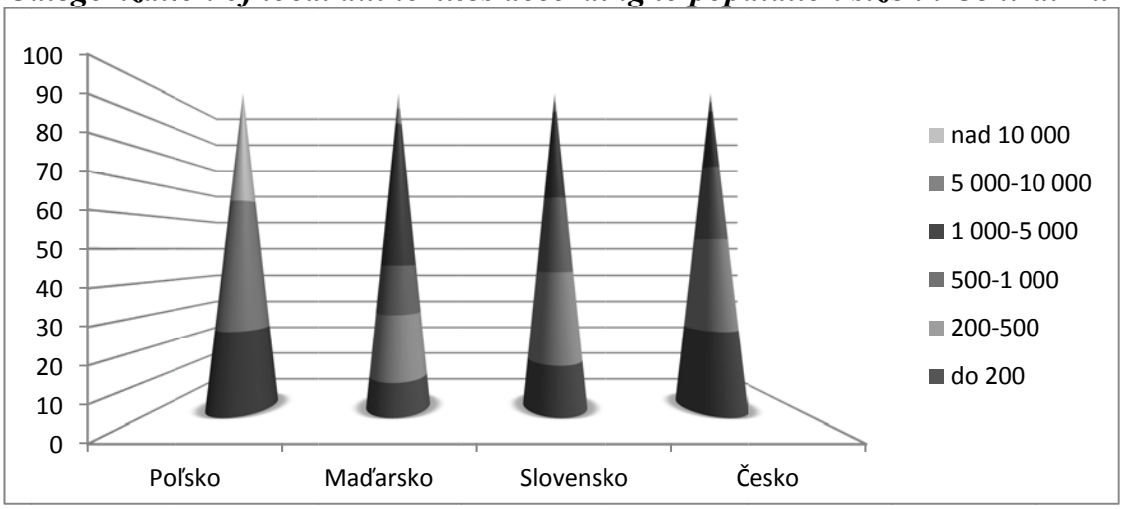
After the fall of non-democratic regimes, in all Central European countries started fragmentation wave, which resulted into increase of municipalities, but this is contrary to the consolidation course in other European countries, in which at this time ran an intensive process of merging. P. Swianiewicz supposes, that this process in Central European

[2] In Lithuania, the reduction municipalities almost by 90%, Sweden 87%, Denmark 80%, Belgium and the UK around 78%, Germany 51%, Netherlands 44%, etc. [13, p. 188]

countries "could be seen as a response to violent amalgamation in the seventies" [25, p. 12]. Klimovský says: "Naturally, the forced integration of municipalities in period after WW2 in countries of Central and Eastern Europe generally failed to gain popularity among the local population" [15, p. 5]. The most significant fragmentation is reflected in Hungary, where increase was 50%, from 1300 to around 3100 [13], which basically meant a return on position in the sixties. In the Czech Republic, the situation was similar even with significant fragmentation of municipalities. For two years from the ease of regime the number of municipalities increased of 1600 which meant that in that period in Czech Republic were almost 5800 municipalities. In Poland and Slovakia in early nineties increased lower territorial units, at fewer rates in Czech Republic and Hungary. Polish municipalities increased negligibly by 5% [25], like in Slovakia, where numbers increased by nearly 200 from 2669 in 1989 to about 2800 in 1991 [28].

The current situation of municipalities' size in Central Europe is almost identical with the status at the turn of the millennium, and even in some countries from the time of non-democratic regime. Based on mentioned facts, it is possible to identify municipality structure in Poland as consolidated, while current number of municipalities - 2479 [6] is equal to the number of municipalities after the merge process carried out in the seventies of the 20th century. Taking into account the average population, Polish municipalities are the largest in Europe and incomparably greater in comparison to neighboring countries, while the average population of Polish municipalities is 15000. Hungary is characterized by a fragmented structure of the lowest local government units, which currently number is 3175[3], while average size of population is 3170 inhabitants [15]. In the Czech Republic and Slovakia, there are smaller municipalities in terms of population size, while in the Czech Republic the average size of municipalities in total is 6250. In Slovakia, number ranges on 1650 inhabitants, in total of 2900 municipalities (List of municipalities in Slovakia, 2013) at 1870 inhabitants. [14] Czech Republic, like Slovakia can be considered as highly fragmented landscape in terms of their residential establishment. It means that the countries in central European area - Hungary, Czech Republic and Slovakia are considered as countries with a large number of small municipalities.

Obr. 1: Categorization of local authorities according to population size in Central Europe



Source: own graphic processing (data: Swianiewicz, P. 2003. Size of local self-governments and efficiency in providing of local services - the international context and theoretical background. In: Swianiewicz, P. et al.: Consolidation or fragmentation? Size of local self-governments in Central and Eastern Europe. Bratislava: MESA 10, 2003.

[3] In Hungary, at about the same population, there are of half municipalities in comparison to Czech Republic

As we can see from the graph, Slovakia is a country with many small municipalities, half of which (40%) consists of municipalities with a population size 500 inhabitants. In Czech Republic the situation is similar, with a large number of small villages, what emphasizes the fact that about half (60%) municipalities have fewer than 500 inhabitants. In Hungary, the situation is slightly better, where municipalities of 500 residents represent not even a quarter (15%) of their total number. The situation in Poland is exactly the opposite. There are no municipalities with population below 1000 inhabitants, while almost a third of municipalities are territorial units with 10000 inhabitants. In comparison of Central Europe countries, we can conclude that only Poland can be considered as a consolidated country, from which experiences we can take inspiration. In spite of the fact that the other CEE countries are classified from the view of settlement structure as fragmented, we can also take the positives from the Czech Republic. The solution is the categorization of municipalities on the first, second and third level, depending on the extent of transferred responsibilities.

Currently, there are 2933 municipalities in Slovakia [26] which is over more 50 municipalities than stated in Statistical Office of Slovak republic by the end of 2011. Total number of municipalities is about 5% (about 140) cities. [26] Based on the Law on Municipalities, a city can be considered a higher form of the municipality, which is in compliance with certain criteria[4]. As mentioned before, most of the municipalities are determined as "small", and this refers to municipality, which has small population. Generally, population is less than 1000 [7]; [27]. According this, the small municipalities in Slovak republic form in total nearly two-thirds.

Settlement structure fragmentation in Slovakia significantly affects the performance and functionality of local self-government, which often can not perform its basic functions, especially for small municipalities that form a significant part of municipalities. High rate of fragmentation causes significant burden for municipal budgets [7]. Municipalities, due to its size structure, are not able to cope with their own problems, in situation when smallest municipalities are not able to provide services required by legal framework. It is thought that settlement fragmentation affects economy of the region, which has an impact on "the unwillingness of investors to come to small municipalities. This results from insufficient level of local infrastructure, on which a small municipality does not have the necessary funds " [23]. We can therefore conclude that cities and regions, although later acquired excellent special status, however, but as indicated in its studies Ježek and Ježková "limiting factors autonomous behavior and negotiation of municipalities and cities are their size and also the system of financing municipalities and cities (so-called tax revenue), which is not very motivating " [12, p. 23]. It follows that municipalities "have only limited opportunities as their activity to increase its budgetary revenues, which largely derived from taxes levied by the central" [12, p. 23]. At the same time, there is ageing process of population, which has an impact on municipality income. Consequently, this affects the size and quality of the services performed by municipalities. Solution could be the effective implementation of the municipal reform.

[4] It includes following criteria: the economic, administrative and cultural center and tourist center or spa town; provides services for residents of neighboring municipalities; securing transport links with surrounding municipalities; at least has an urban nature; has at least 5,000 inhabitants (Act no. 369/1990 Coll., § 22).

4 Discussion

The current state of settlement structure in Slovakia is characterized by high levels of fragmentation, similarly to Central European countries, except Poland, where consolidation reform was done. One of the reasons why in Slovakia, Hungary or Czech Republic, which are perceived as a "countries of former socialist block" [15, p. 88], after the end of their non-democratic regimes in early nineties occurred rather opposite tendencies, can be the fact, that they has an experience with violent consolidation of network of municipalities from the socialism period. In this period, an object was not the economic efficiency of municipal services, but rather centralization of political power. In other CEE countries, after democratization process, started fragmentation of existing municipalities rather than formation of new ones. Based on these facts, it is necessary to solve the problem of fragmentation of municipal structure in Central Europe and also in Slovakia. In this context and from experience from different European countries, there exist several ways to solve the current unsatisfactory state.

As the first option, we can mention inter-municipal cooperation, which can be facultative, what means there are independent initiatives of individual municipalities (independent decision, state pressure). This process is used in some federal states in Germany. Positive aspect of this approach is the initiative of involved entities and consequent interest to be a part of various partnership activities. The negative aspect is the unevenness of cooperative activities and lack of interest which concerns some municipalities' intervention. On the other hand, cooperation can be coordinated by the state obligatory, as it is applied in France. Disadvantage of this procedure is pressure on municipalities, but on the other hand, municipalities are equally involved in cooperation. Municipal cooperation as a solution to excessive fragmentation of municipal structures is to some extent already applied in Slovakia, and exists as voluntary cooperation. Although some municipalities that fail to carry out certain functions separately form a so-called micro-regional associations or government-accepted common municipal offices [15]. Based on agreement, these offices are formed to carry out a particular activity, while their creation is based on the Law on Municipalities (§ 20). Common offices are mostly focused on education and construction, optionally on social services. Although it is positive, it still lacks the solution of the problem.

One of the basic assumptions of efficient public services on sub-national level was settlement structure merge, which lead to more competitive municipalities. For example we can choose Denmark, a country that is comparable to population of the Slovak Republic. Number of municipalities in Denmark is thirty-two times smaller than in Slovak Republic. Although the Denmark could be inspirational example, it could not be implemented in the short term. On the contrary, we can see the example of Denmark as a long process, lasting for decades. The first phase in amalgamation was the process, which began in 1970, merging more than 1380 communities in nearly 280 municipalities [23]. In this case was used special voluntary system, which was changed by the law and resulted in obligatory merging of municipalities. This process was specified by fixed criteria that municipalities had to follow closely (number of inhabitants in municipality). In 2007 started second phase of the reform, with changes at the regional level and also with a reduction in number of municipalities to 98. Again, initiative came from government, while local governments accepted it. Municipal reform together with geographic consolidation caused an adjustment of competences between individual government levels. The current state of settlement structure in Slovakia is characterized by high levels of fragmentation, similarly to Central

European countries, except Poland, where consolidation reform was done. One of the reasons why in Slovakia, Hungary or Czech Republic, which are perceived as a "countries of former socialist block" [15, p. 88], after the end of their non-democratic regimes in early nineties occurred rather opposite tendencies, can be the fact, that they has an experience with violent consolidation of network of municipalities from the socialism period. In this period, an object was not the economic efficiency of municipal services, but rather centralization of political power. In other CEE countries, after democratization process, started fragmentation of existing municipalities rather than formation of new ones. Based on these facts, it is necessary to solve the problem of fragmentation of municipal structure in Central Europe and also in Slovakia. In this context and from experience from different European countries, there exist several ways to solve the current unsatisfactory state.

Conclusion

Both of stated solutions to fragmented settlement structure could be applied in Slovak Republic. Cooperation of municipalities work in some extent and in certain area, however it is not able to solve deficiencies rising from current municipal structure. More reasonable solution is the process of merging, respectively amalgamation of municipalities. Within aspect of merging municipalities, it would be necessary to take into account several views, including geographic one. That means it is important to ensure coherence of municipalities and therefore areas in which they are linked in natural way. In addition, there is also necessary representatives' interest of local self-governments. However, they are not currently favored by this step. Municipalities are merged by government via regulation, as is clear from the Act of municipalities 369/1990, article 3, § 2. This decision is approved by municipality, which leave it on its citizens. This allows them to vote in a local referendum[5]. It is not exactly determined by the legislation what will happen if citizens reject this step in referendum. In this case, merge of municipalities could be reach by force, but this is contrary to the right of municipalities on self- government. Expected municipal reform should be realized in conditions of Slovak republic as soon as possible, while it is desirable to acquire support from general public, experts and especially from involved citizens.

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AN EMPIRICAL ANALYSIS OF SHARE PRICE DETERMINANTS IN NIGERIA: A DIVIDEND AND NET ASSET REPLICA

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Abstract: *In attempting to determine the factors that affect the prices of stocks generally in capital markets, two schools of thought exist. While a school of thought believes that accounting information are the major determinants of stock prices in capital markets, the other argues that the major determinants of stock prices are non-accounting information. This study therefore provides useful insights into resolving the contradicting arguments by analyzing some accounting measures (dividends and net assets) that Nigerian investors use in making investment decisions in order to take a standpoint whether or not, they significantly affect stock prices. Data obtained from the Nigerian Stock Exchange Fact Book and Annual Reports and Accounts of firms listed on the floor of the Nigerian Stock Exchange for the period 2001-2013 were obtained and analyzed using the Ordinary Least Square (OLS) technique. On the basis of the analyses, it was found among others that accounting information are the major determinants of stock prices in the Nigerian capital market. Based on the findings of this study, it was recommended among others that capital market regulators and accounting standard setters in Nigeria should properly educate investors on the attributes of accounting variables across the industries as these significantly have impact on the prices of stocks in the country.*

Keywords: *Stock Price, Stock Price Determinants, Dividends, Net Assets.*

JEL Classification: *D53, E43, E44.*

Introduction

Stock price determination remains an issue of concern in the capital market, especially in developing capital markets. In the capital market, various factors or instruments are used in the determination of stock prices. Among these determining instruments are accounting and non-accounting information. Accounting information refers to those statistics, facts, figures (often called 'accounting numbers') reported in the financial statement, statement of financial position and cash flows of firms while non-accounting information are those whose numbers are not reported in financial statements of firms but are good enough in determining the prices of stocks. Accounting information are net assets per share, dividend per share, earnings per share, book value per share, return on equity, profits among others while non-accounting information are rumour, inflation, exchange rates, forced of demand and supply, interest rates among others. Investors in the capital market make use of accounting and non-accounting information in choosing which firm they will invest or not. However, in this paper, we analyzed some useful measures of accounting information (dividends and net assets) that Nigerian investors use in making investment decisions in order to take a standpoint whether or not; they determine stock price movement in the capital market.

1 Statement of Problem

There are two schools of thought that have rocked the accounting literature as regards factors that determine prices of stocks in the capital market. Among these schools

of thought, one proposed that non-accounting information which emanates in the form of forced sales, rumour, speculation, monetary variables, gambling, company goodwill and so on are the formidable factors that determines prices of stocks in the capital market [13, 18, 22, 23]. Contrarily, the other school of thought proposed that accounting information which emanates in the form of earnings, book value, dividends, net assets, dividend cover, earnings yield and so on are important factors in stock price determination in the capital market [3, 4, 5, 7, 8, 14, 15, 21]. While there have been a number of studies on this topic in developed capital market [4, 7, 9, 12], to the best of our knowledge, there are relatively few studies on the subject of stock price determinants in emerging capital market like Nigeria. Negah [17] opined that it has not been expansively researched primarily because of problems with data availability. Thus the position above leaves much gap in the accounting literature in Nigeria for continuous research into the area so as to see whether accounting information are the formidable factors in stock price determination in the capital market.

Literature Review

As articulated in the preamble of this study, two factors have been identified to determine the prices of stocks in the capital market: accounting and non-accounting information. In line with this, earlier studies have examined the extent to which accounting or non-accounting information can be used to determine the prices of stock in capital markets. For instance, Udegbunam and Eriki [23] who examined the relationship between stock prices and inflation in Nigeria pointed that inflation had a significant negative influence on the behaviour of stock prices in the Nigerian capital markets. The study also revealed that the level of economic activity (usually measured by indices like GDP, money stock, interest rate, and financial deregulation) to a large extent drives stock prices in the Nigerian capital market. Interestingly, the study also found that oil price volatility has no significant effect on stock prices.

In another study, Jindrichovska and Kuo [10] investigated the influence of losses on the relation between returns and accounting earnings of 63 companies listed at the Prague Stock Exchange from 1993 to 1999. The study looked at similarities and differences between this transforming market and developed markets as well as the influence of losses on the informativeness of earnings. The results derived from an analysis of yearly data showed that earnings are less timely in reporting publicly available information, unlike in developed markets like the US. They attributed the different results of tests of their research, in comparison with results from developed capital markets, to non-standard properties typical of emerging markets such as irrational investment behaviour, lack of information, underdeveloped regulations and lack of transparency, which is partially due to lack of experience.

Ologunde, Elumilade and Asaolu [18] used an ordinary regression analysis to test the relationship between stock market capitalization and the prevailing interest rate in Nigeria and found that the prevailing interest rate in the country exerted positive influence on stock market capitalization. Similarly, in a study by Terfa [22] the error correction model was employed to examine the relationship between stock market and certain macroeconomic variables (interest rates and exchange rates) in Nigeria. In this study however, the all share index was used as a proxy for the stock market. The study found that in the short run, a significant negative relationship existed between stock market and the minimum rediscounting rate (MRR). This implies that in the short run, a decrease in the MRR, would improve the performance of the Nigerian stock market. The study also found that exchange

rate stability improved the performance of the stock market in the long run, while the rate of treasury bill as well as that of inflation were not significant; a suggestion that in the short run, they had a negative relationship with the stock market. This finding as Terfa [22] noted, implied that apart from maintaining a low rate of inflation in Nigeria, efforts must be made to keep the rate of Treasury Bills as low as possible so that the performance of the Nigerian stock market can be improved.

In a study by Mondal and Imran [15], the factors that influence share prices on some companies listed on Dhaka Stock Exchange was analyzed. In a bid to achieve the objective of their study, Mondal and Imran [15] analyzed the influence of selected variables on market price per common share. The variables studied by Mondal and Imran [15] included profitability, growth, liquidity, firm size, leverage, and the rate of dividend. The study however found that stock prices were affected by both qualitative and quantitative factors. While the qualitative factors included market sentiments, goodwill, Annual General Meetings (AGM), company announcements, technical influence, print and electronic media, unexpected circumstances, reports of analysts, etc, the quantitative factors on the other hand included dividend, EPS, capital, return on investment, price/earnings ratio, net income, retained earnings, inflation, exchange and interest rates respectively, etc. The study also stressed that price earnings ratio, speculations on stock price movements (stock price rumor), the demand for shares, changes in policies of government, in addition to the general economic conditions are the most influential factors that affects stock price.

Ghayoumi, et al. [6] examined the value-relevance of accounting information with evidence from Iranian emerging stock exchange from 1999 to 2006. The study used earnings per share and annual change of earnings per share as the income statement indices and book value of equity as the balance sheet index. Return and price models through regression analysis was deployed in their study and the results depicted that accounting information is value-relevance to domestic investors in Iran but however income statement information has more value-relevance than the balance sheet information. The study revealed that positive vs. negative earnings and firm size seems to have significant impact on value-relevance of accounting information.

Adejoh [2] examined the applicability of market efficiency to the Nigerian capital market. The study found that capital market responds to dividend, bonus announcement right issues and buyback. Thus, how quickly and correctly prices reflect these events can be seen as an indication of the level of efficiency of the stock market. Musyoki [16] explored the predictability of accounting earnings (Earnings per share, Dividend yield, Price to earnings ratio) and changes in share prices of companies listed on the Nairobi Stock Exchange during the period 2001 – 2005 using 11 firms and found positive relationship between accounting earnings and share price.

In analyzing a time series data obtained from the Central Bank of Nigeria during the period 1984 – 2010, Osisanwo and Atanda [20] who studied the determinants of stock market returns in Nigeria found among others that interest rate and exchange rate are the main determinants of stock returns in Nigeria. Osamwonyi and Asein [19] developed a model to assess the relationship between market returns and security returns in the Nigerian capital market. The model, as they noted, was tested with quarterly data that were obtained from capitalized firms in the Nigerian Capital market for the period 2001 – 2005. The study of Osamwonyi and Asein [19], however found a positive linear relationship between market returns (proxied by betas) and security returns for the sampled firms used in the study. Abdullahi, Lawal and Ibrahim [1] empirically evaluated the determinants of

average stock market return in the Nigerian Stock Market for the period of 2000-2004 and found that on the average, the estimated return on equity investment in the Nigerian Stock Market was low (about 7%). This low level of return observed in the Nigerian Stock Market seems to be a common feature among most emerging Stock Markets, the world over.

Kolapo and Adaramoloa [11] examined the impact of the Nigerian capital market on its economic growth from the period of 1990-2010. The study tried to ascertain whether the performance of the stock market has a link with economic growth (proxied by Gross Domestic Product - GDP) and development of the country. Capital market variables considered in the study of Kolapo and Adaramoloa [11] include Market Capitalization (MCAP), Total New Issues (TNI), Value of Transactions (VLT), and Total Listed Equities and Government Stocks (LEGS). Applying Johansen co-integration and Granger causality tests, the results showed that the Nigerian capital market and economic growth are co-integrated. In addition, Kolapo and Adaramoloa [11] found in their study that there was a bi-directional causation between GDP and the value of transactions (VLT). They also found an unidirectional causality from Market capitalization to GDP and not vice versa. Malik, Qureshi and Azeem [14] explored the determination of share price using the Ohlson Model. They used two forms of model; one is linear valuation model and second is the non-linear product model. The latter uses the product of earnings and book value as third independent variable, in addition to traditional linear valuation model. The study according to Malik, Qureshi and Azeem [14] used data with respect to book value per share (BVPS) and earnings per share (EPS) of 52 companies drawn from the Karachi Stock Exchange (KSE). By using the Fixed Effects Model (FEM), Malik, Qureshi and Azeem [14] posits among others that information on published financial statements are useful to shareholders.

In addition, the study of Malaolu, Ogbuabor and Orji [13] investigated the macroeconomic determinants of stock price movements in Nigeria. In this study, the Engle-Granger two-step co-integration test was adopted to analyze time series data spanning from 1985 – 2010. Accordingly, Malaolu, Ogbuabor and Orji [13] pointed that both the long-run and short run relationships between stock price movements and movements in macroeconomic variables were analyzed in their study. They however found no co-integration between the variables analyzed; an indication that there was no relationship in the long run. Results of the regression analysis conducted by Malaolu, Ogbuabor and Orji [13] also indicated that real exchange rate, money supply, real interest rate, in addition to political instability are not the determinants of stock price movements in Nigeria; though, inflation, as they noted further, was a major determinant of stock price movements in the country. Ejuvbekpokpo and Okoro [5] explored the determinants of stock price movements with evidence from the Nigerian Stock Exchange. The study employed three accounting measures: book value, earnings and dividend cover during the period 2001 – 2011 by applying the ordinary least square estimation technique. The results of the study indicated that earnings, book value and dividend cover which are accounting measures serve as factors in the determination of prices of stock in the capital market in Nigeria. The empirical review paints a picture that diverse techniques of investigation were used to investigate issues surrounding capital market and these studies have yielded dissimilar results, sometimes sharply dissimilar, sometimes modestly. More so, concerns over research design and conflicting findings have caused earlier researchers to fail in addressing the position regarding share price determinants in both developed and developing capital markets. Thus, it is possible to empirically examine in Nigeria, variables that

determines stock prices in the Nigerian capital market, whether they are accounting numbers or not.

2 Methods

This study was designed to follow an expost-facto design. This design was adopted because it seeks to establish the factors associated with certain occurrence or type of behaviour by analyzing past events of already existing condition. However, the data collection method emanated from secondary data. Data of dividends per share and net assets per share were obtained from the Nigerian Stock Exchange Fact Book and Annual Reports and Accounts of firms listed on the Nigerian Stock Exchange during the period 2001 through 2013. A multiple regression model was estimated by linking stock prices as a function of dividends and net assets.

$$LDSP = F(DPS, NAPS) \quad \textit{eq. 1}$$

$$LDSP_{it} = a + \beta_1 DPS + \beta_2 NAPS_{it} + e_{it} \quad \textit{eq. 2}$$

Where: $LDSP$ = Last Day Stock Price
DPS_{it} = Dividend per Share
$NAPS_{it}$ = Net Assets per Share
t = Time dimension
i = Individual firm

Where LDSP is the dependent variable; *β1, β2,* are regression coefficients with unknown values to be estimated; DPS, NAPS, are the independent variables. A-Priori Expectation is such that $\beta > 0$ (i =1-2). $LDSP_{it}$ is stock share price, and it is measured in the end of December at year *t+1*. DPS is dividends per share and NAPS is net assets per share at fiscal yearend computed in ratio. The error term (*eit*) is used as surrogate for all other variables not included in the model. The Ordinary Least Square (OLS) estimation technique was used in analyzing the data via the Statistical Package for Social Sciences (SPSS, 20.0).

3 Problem Solving/Discussion

The tests results were presented and analyzed in order of priority. The descriptive statistics came first, which was followed by the Analysis of Variance (ANOVA).

a. Descriptive Statistics

Tab. 1: Sensitivity of Dividends per Share to Stock Prices

Sample = 120	Mean	Minimum	Maximum
Sensitivity Coefficient (β_i):	0.355	-0.321	0.822
Sign of Sensitivity Coefficient (βi): Positive: 89(74.2%)			
Negative: 31(25.8%)			

Source: SPSS Output & Author's Compilation

Table 1 above presents the estimates of the sensitivity of dividends per share to stock prices in the Nigerian capital market. It was observed that dividends coefficient for the sampled firms ranged between -0.321 and 0.822 minimum and maximum values respectively with mean value of 0.355. Also, 89(74.2%) of the firms dividend per share were positively sensitive while 31(25.8%) were adversely (negatively) sensitive to stock prices. Thus, the results indicated that majority of the firms dividends per share are sensitive to stock prices with the large proportion being positively sensitive to stock prices.

Tab. 2: Sensitivity of Net Assets per Share to Stock Prices

Sample = 120	Mean	Minimum	Maximum
Sensitivity Coefficient (β_i):	0.274	-0.343	0.851
Sign of Sensitivity Coefficient (βi):	Positive: 109(90.8%)		
	Negative: 11(9.2%)		

Source: SPSS Output & Author's Compilation

Table 2 above presents the estimates of the sensitivity of net assets per share to stock prices in the Nigerian capital market. It was evident that net assets per share coefficient for the sampled firms ranged between -0.343 and 0.851 minimum and maximum values respectively with mean value of 0.274. Also, 109(90.8%) of the firms net asset per share were positively sensitive while 11(9.2%) were adversely (negatively) sensitive to stock prices. Thus, the results indicated that majority of the firms net assets per share are sensitive to stock prices with the large proportion being positively sensitive to stock prices.

b. Analysis of Variance, Regression Coefficients and T-Value

In this subsection, the goodness of fit statistics came first, followed by goodness of fit through r-square. The regression coefficients and t-value results concludes this aspect of the analysis.

Tab. 3: ANOVA Result (Goodness of Fit Statistics)

Model		Sum of Squares	Df	Mean Square	F.	Sig.
1	Regression	19.213	1	2.419	34.271	0.000[a]
	Residual	23.242	119	0.227		
	Total	42.455	120			

Source: SPSS Regression Output

a. Predictors: (Constant), DPS & NAPS
b. Dependent Variable: LDSP

Table 3 summarizes the information about the variation of the dependent variable explained by the existing model as well as the residual that indicates the variation of the dependent variable not captured in the model. The results suggest that the independent variables offer a significant effect on the dependent variable, where f-value is 34.271 with p-value less than 0.05 (i.e. $p<0.000$) suggesting that the model is significantly good enough in explaining the variation on the dependent variable.

Tab. 4: Goodness of fit through R Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.981[a]	0.851	0.751	0.535677

Source: SPSS Regression Output

a. Predictors: (Constant), DPS & NAPS

As shown in table 4 above, the value of adjusted R^2 is 0.751, indicating that the independent variables in the model are explaining 75% variation on the dependent variables with only 25% unexplained variation. Thus, we can understand that the model of the study is providing a good fit to the data.

Tab. 5: Regression Coefficient and t-value(s)

Variables	Coefficients	t-statistic	Prob.
Constant	45214	9.358	0.000
DPS	0.561	2.718	0.008
NAPS	0.753	3.193	0.010

Source: SPSS Regression Output

As indicated in table 5 above, the explanatory variables, dividends per share (p-value = 0.008) and net assets per share (p-value = 0.010) were statistically significant at 5 percent or lower. The result also suggests that there is a positive relationship between all the independent variables (dividends per share and net assets per share) and stock prices in the Nigerian capital market.

Conclusion

In the context of this present study, dividends per share, net assets per share (as measures of accounting information) and stock prices were examined for a sample of 120 listed firms on the Nigerian Stock Exchange during the period 2001 through 2013. The conclusion reached was that significant relationships exist between dividends, net assets and stock prices. In reality, dividends are the most widely used parameters for investment decisions in Nigeria. Therefore, dividends have large effects on stock prices as well as the net assets per share. Since the evidence indicated that dividends per share and net assets per share plays significant role in stock price determination, this paper takes on by proposing that accounting information are the major determinants of stock prices in Nigeria. This calls for recommendation that accounting preparers and standard setters should enhance the quality of information reported in financial statements by firms listed on the Nigerian Stock Exchange. The Financial Reporting Council of Nigeria (FRCN) and Securities and Exchange Commission (SEC) should urge listed firms to fully adopt and implement International Financial Reporting Standards (IFRSs) if evidential improvement in the quality of financial statements must be achieved. Finally, lot of hard work is required by capital market regulators and accounting standard setters to properly educate the Nigerian investors about differences in attribute accounting variables across the industries.

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MEZIREGIONÁLNÍ MIGRACE V ČESKÉ REPUBLICE

MIGRATION BETWEEN REGIONS IN THE CZECH REPUBLIC

Radka Knězáčková, Jolana Volejníková

Abstract: *The interregional migration in the Czech Republic is not so massive in comparison with other states (the USA, Germany). The Czech citizens are not used to migrate for work. But we can notice that the number of moved people has been increasing in the last ten years. It is also caused by the increasing differences between regions. The aim of the article is determined whether interregional migration in the Czech Republic is related with the economic level of the region. Although the decision to move is the individual decision of each person, it is influence by phenomena from economic, social and cultural life and they affect the final decision. The article deals with the determinants of interregional migration in the Czech Republic. It is based on the findings of migration theories that were formed during 20th century. It defines the main causes of human migration and examines their impact in the Czech Republic.*

Keywords: *Determinants of migration, Interregional migration, Theories of migration*

JEL Classification*: O15, R23.*

Úvod

Migrace je v odborné literatuře označována jako mechanický pohyb obyvatel, kteří se stěhují z jednoho místa na jiné. Od ostatních forem mobility lidí se odlišuje především tím, že je spojena se změnou trvalého bydliště. [14] Jedná se o složitý socioekonomický jev, který je na jedné straně podmíněn hospodářskou a společenskou situací jak zdrojového, tak cílového regionu, a který zpětně na vývoj oblastí působí. Na druhou stranu i sama migrace je důležitým ukazatelem, který vypovídá o charakteristice daného území.

Předmětem migrace je charakterizovat tok obyvatel mezi dvěma oblastmi, mezi zdrojovou a cílovou. Migrace je zkoumána na úrovni vnější, kdy jsou sledováni migrující jdoucí přes hranice daného území, nebo na úrovni vnitřní, kdy jsou sledovány migrační toky uvnitř daného celku. Migrace bývá často spojována s migrací práce a cílem by mělo být rozdělení pracovních sil, tak aby jejich využití bylo efektivní a bylo dosahováno co největší možné produkce.

Migraci lze zkoumat jak z kvantitativního, tak i z kvalitativního hlediska, nejen tedy z pohledu objemu migrace, ale také lze migrační tok blíže charakterizovat a analyzovat z pohledu důvodů, které migrující ke stěhování vedou.

Teoretický koncept, který by určoval veškeré faktory podmiňující daný proces, neexistuje a vzhledem k rozsáhlosti problematiky není možné jej ani definovat. Za hlavní motivaci lidí přestěhovat se je odborníky považována ekonomická situace, kdy se stěhují lidé z chudších regionů, ekonomicky méně vyspělých, do regionů, které jsou bohatší a kde pravděpodobnost nalezení práce je vyšší.

Cílem článku je potvrdit tento předpoklad pro prostředí České republiky. Článek se zabývá otázkou, zda ekonomické faktory významně ovlivňují migrační chování lidí v České

republice. Migrační tok bude zkoumán mezi kraji České republiky. Stanovení regionu, jako kraje vyplývá z regionální politiky, která za podstatu ekonomického rozvoje státu považuje rozvoj kraje.

Článek testuje hypotézu, která říká, že hlavními determinanty meziregionální migrace v České republice je výše průměrné mzdy v regionu a míra nezaměstnanosti. Dále bude zkoumána hypotéza testující závislost mezi ekonomickou výkonností regionu a mírou migrace, tedy zda kraj vykazující lepší ekonomické hodnocení je pro migranty atraktivnější. Data, která budou do statistické analýzy vstupovat, budou vycházet z údajů zpracovaných Českým statistickým úřadem.

1 Teoretické vymezení příčin migrace

Vysvětlit a popsat danou problematiku z hlediska příčin migrace, se pokoušelo mnoho zahraničních i českých autorů. Za zakladatele teorie migrace je považován Ravenstain [2], který zkoumal pravidelnost stěhování lidí do Londýna na konci 19. stol. V roce 1885 v článku *The Laws of Migration* stanovil sedm zákonů migrace, pomocí nichž se snažil vysvětlit trendy a toky migrace. Z Ravensteinových zákonů byly postupně odvozeny zákony nové a navázali na ně další autoři věnující se této problematice.

Sedm zákonů migrace podle Ravensteina [2]:

1. Většina lidí preferuje migraci na krátkou vzdálenost.
2. Tím, že lidé migrují do jiných regionů, nechávají za sebou volná místa, která mohou zaplnit jiní migranti. Spojováním migrací vznikají migrační toky.
3. Mezi velikostí migračního toku a vzdáleností cílové oblasti je inverzní vztah.
4. K migračnímu toku vždy existuje opačný migrační tok.
5. Migranti, kteří se rozhodnou migrovat do vzdálenější oblasti většinou směřují do větších průmyslových center.
6. Větší tendence k migraci mají lidé z venkovských oblastí než lidé žijící ve městě.
7. Více se stěhují ženy než muži.

Ravensteinova teorie migrace vychází z klasické ekonomické teorie, která hlavní příčiny migrace spatřuje v rozdílných příjmech a v odlišných podmínkách na trhu práce. Klasický model migrace zjednodušeně říká, že lidé z méně vyspělého regionu, kde je levná pracovní síla a kde nabídka práce převyšuje poptávku po práci, budou migrovat do regionu s vyšší poptávkou po práci a vyšší mzdovou sazbou. V důsledku pracovní migrace by mělo dojít k vyrovnání mzdových sazeb v obou regionech. V méně vyspělém regionu poklesne díky odlivu pracovníků nabídka po práci a vytvoří se tlak na růst mzdové sazby a naopak ve vyspělejším regionu vzroste nabídka práce, která vyvolá tlak na pokles mzdových sazeb. Proces migrace pokračuje až do té doby, dokud nedojde k vyrovnání mzdových sazeb.[1]

Na klasický přístup navázaly teorie neoklasické. Ty lze rozdělit na mikro teorie a makro teorie. *Makro teorie* zkoumají příčiny migrace z hlediska makroekonomických ukazatelů, tedy převážně z hlediska rozdílů příjmů v jednotlivých oblastech a rozdílů na trzích práce mezi dvěma oblastmi. Analýzou migrace mezi rozvojovými a vyspělými oblastmi se zabývali například Harris a Todaro v článku Migration, Unemployment and Development: Two Sector Analysis, ve kterém hledali příčiny vysoké migrace z rozvojových, venkovských oblastí do průmyslových center. [6] Sture Öberg označil teorii migrace založenou na rozdílných mzdových sazbách za základní zákon meziregionální

migrace, který vede k vyrovnání poptávky a nabídky na trzích práce v jednotlivých krajích. [10] Závislost migrace na mzdových rozdílech zkoumal ve svých pracech také Arthur W. Lewis.

Mikro teorie jsou založeny na situaci, kdy jedinec porovnává náklady na migraci s užitkem, který přestěhováním získá. Jako příklad uveďme tzv. model lidského kapitálu. Jedinec je ovlivněn vlastními zkušenostmi, prostředím, ve kterém žije, vlastnostmi osobnosti, a každý tak náklady na migraci a užitek z ní posuzuje individuálně. Teoretický základ modelu lidského kapitálu vytvořil v 60. letech 20. stol. Sjaastad, který za hlavní determinant migrace považoval možnost získání prospěchu z investic do lidského kapitálu. Jeho práce navazovala na teoretické závěry Hickse z 30. let 20. stol. Sjaastadův model byl následně rozšířen M. Todarem, došlo k navýšení počtu faktorů, které migraci ovlivňují o délku časového období, ve kterém migrant nalezne práci v novém regionu, tedy o ukazatel korelující s mírou nezaměstnanosti v regionu. [4]

Neoklasický model migrace vychází z mnoha předpokladů a jeho aplikace na reálné prostředí je velmi nízká. Armstrong a Taylor vidí příčinu odlišnosti modelu od reality v odpovědnosti člověka za rodinu, člověk se snaží zabezpečit příjem rodině, jistotu a nezabývá se tolik mzdovými rozdíly mezi regiony. Rozdíly v mzdových sazbách jsou důležité a lidé nad nimi více uvažují v případě, když už se rozhodli migrovat a vybírají nejlepší cílový region. Samotné rozhodnutí o migraci závisí na jiných ukazatelích. Lidé nemusí migrovat pouze za cílem zvýšit příjem či kariérní postup, ale důvodem může být kvalita životního prostředí, podnebí. [1]

Vedle modelů vycházejících z neoklasické teorie existuje řada přístupů alternativních, které vznikly v průběhu 20. stol. a které se snaží vysvětlit příčiny a podstatu této problematiky. Jednotlivé teorie se odlišují v předpokladech, ale také determinanty, které ovlivňují migrační chování lidí. Individuální přístupy jsou podmíněny dobou, ve které vznikaly či účelem, pro který byly určeny. Dle Bonase [13] je hlavním důvodem existence mnoha migračních teorií neschopnost žádného z modelů zodpovědět na tři základní problémy související s migrací. Migrační model by měl umět předpovědět velikost a směr migrace, měl by zohledňovat asimilační proces migrantů a měl by dokázat zhodnotit vliv migrantů na přijímací ekonomiku. Douglas S. Massey v příspěvku Theories of Internationa Migration naznačuje, že pro pochopení migračních trendů je třeba k problematice přistupovat komplexně a propojit myšlenky a závěry jednotlivých modelů, které se vyvíjely nezávisle na sobě. [9] Migrace je jev, který se neřídí obecnými pravidly a mechanismy. Vychází z chování, kdy každý člověk je individuální a je ovlivněn vnějším prostředím, ve kterém žije, nejen ekonomickým, ale také politickým či sociálním. Ekonomické modely je třeba doplnit o rozměr sociologický a psychologický.

2 Charakter meziregionální migrace v České republice

Trh práce v České republice prošel v 90. letech procesem transformace, což také ovlivnilo charakter meziregionální migrace. Transformační procesy byly doprovázeny rostoucí nezaměstnaností, rostoucí inflací, docházelo k sektorové restrukturalizaci a prohlubovaly se rozdíly mezi regiony. Jedním řešením, jak dosáhnout snížení meziregionálních disparit, je podpora regionálního trhu práce a podpora meziregionální migrace. Milan Žák vymezuje migraci jako nástroj regionální politiky, jehož prostřednictvím lze dosáhnout k obnovení rovnováhy na regionálním trhu práce. [15] Mělo by tedy dojít k přesunu obyvatel z oblastí s vyšší mírou nezaměstnanosti do oblastí

ekonomicky vyspělejších, kde je pravděpodobnost nalezení práce vyšší. Stát by se měl snažit rozmístit pracovníky v zemi tak, aby ekonomický růst země byl co nejvyšší.

Míra meziregionální migrace v tranzitivních ekonomikách je obecně nízká. Obdobně je tomu i v České republice. Danou problematikou se zabývala řada autorů, kteří se snažili určit hlavní příčiny nízké migrace v těchto zemích. Analýzou dat v České republice se například zabývala Erbenová, která potvrdila vztah mezi mírou migrace, mírou nezaměstnanosti v regionu a mzdou v 90. letech 20. stol. [5] Velký vliv na nízkou míru meziregionální migrace v 90. letech měla nejistota vyplývající z transformačních procesů. Na základě výzkumu Horvátha lze vysvětlit nízkou míru migrace při velkých meziregionálních rozdílech pomocí vysokých nákladů na migraci. Pro obyvatele z chudších regionů je problematické uhradit náklady spojené s migrací. [8] Dalším faktorem působícím na nižší míru a ochotu stěhovat se, je rodina. V cílovém regionu musí najít práci dva lidé, nejde o rozhodnutí jednotlivce. Migraci také potlačují poskytované sociální dávky. Dle Armstronda a Taylora na nízkou míru migrace mohou mít i malé rozdíly ve mzdách v jednotlivých regionech, kdy daná diference není dostatečným důvodem pro přestěhování. [1]

Dalšími autory, kteří zkoumali faktory ovlivňující vnitřní migraci v České republice, byli T. Paleta a M. Jandová. Ti upravili gravitační model migrace pro vnitrokrajské stěhování v České republice pro období let 1991 – 2008. Jejich analýza potvrdila závěry obecné teorie migrace, za nejsilnější faktor, který má vliv na daný proces, byla označena mzda. [12]

3 Vývoj meziregionální migrace v České republice

V České republice se zpracováním dat o migraci zabývá Český statistický úřad, statistiky jsou od roku 2005 založeny na datech o stěhování obyvatelstva z Ministerstva vnitra, které vede informační systém evidence obyvatelstva. Migrace je sledována na národní a krajské úrovni.

Objem migrace je dán stěhováním z jedné obce do druhé sledováním počtu přistěhovalých a vystěhovalých. Nevýhodou tohoto zaznamenávání je, že pokud dojde ke sloučení dvou obcí, přestěhování lidí mezi nimi není do statistik zahrnuto. Ke zkreslení statistických dat také dochází v případě, že se jeden člověk stěhuje vícekrát za rok, statistiky nezaznamenávají počet přestěhovaných lidí, ale počet stěhování, do statistik je pak tento člověk zahrnut vícekrát.

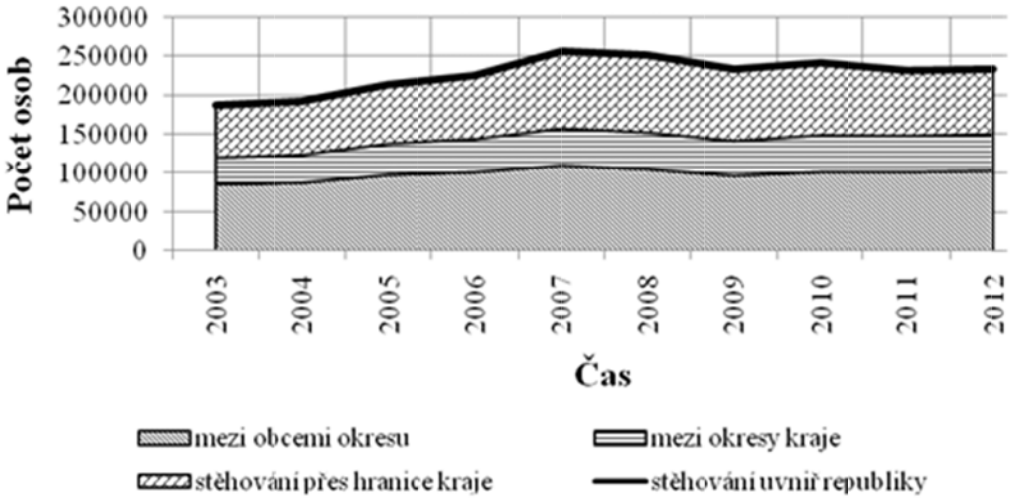
Vývoj vnitrostátní migrace v České republice lze rozdělit do tří fází. Do roku 1996 objem vnitřní migrace klesal. V roce 1996 se přestěhovalo okolo 170 000 lidí, což znamenalo 30% pokles objemu vnitřní migrace od roku 1990. Od té doby ale počet migrujících až do roku 2007 rostl. V tomto roce se v České republice přestěhovalo 255 690 lidí. Zlom nastal v roce 2008, kdy z důvodu světové krize objem stěhování prudce poklesl a od té doby se počet přestěhovaných pohybuje okolo 232 000 lidí. Vnitrostátní migraci v České republice lze sledovat ze dvou úhlů pohledu. První se zabývá počtem přistěhovalých a vystěhovalých v daném kraji. Ve statistikách není rozlišována národnost stěhujících. Počet přistěhovaných a vystěhovaných z daného kraje zahrnuje občany české národnosti s trvalým pobytem v České republice, ale také cizince, kteří mají povolení k trvalému či dlouhodobému pobytu v České republice.

Druhý úhel pohledu se zabývá stěhováním v rámci jednoho kraje, kdy vnitro krajské stěhování je členěno na stěhování mezi obcemi jednoho okresu a mezi okresy jednoho kraje.

Ze statistik vyplývá, že lidé preferují stěhování na kratší vzdálenost. Při porovnání hodnot počtu přestěhovaných přes hranice kraje a uvnitř jednoho kraje, více než 2/3 migrantů preferuje vnitrokrajské stěhování, přičemž téměř 70 % z nich se stěhuje mezi obcemi v rámci jednoho okresu.

Podrobnější informace o stěhování mezi jednotlivými oblastmi přináší následující Obr. 1. Stěhování uvnitř republiky je rozděleno na stěhování přes hranice kraje a na stěhování uvnitř kraje, které se dále dělí na stěhování mezi okresy kraje a mezi obcemi jednoho okresu.

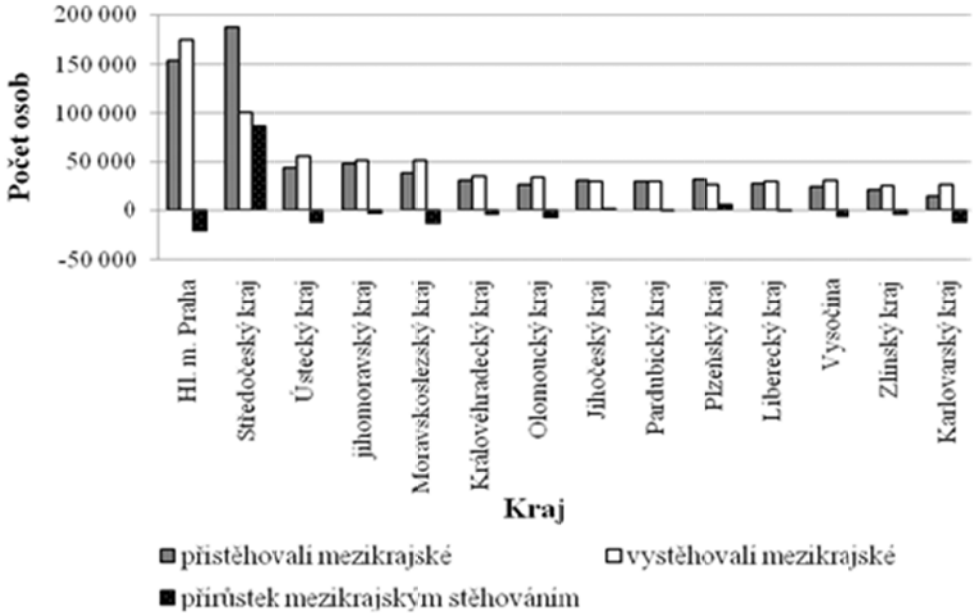
Obr. 1: Vývoj vnitřní migrace



Zdroj: vlastní zpracování autora dle [3]

Následující graf na Obr. 2 znázorňuje počet přistěhovaných, vystěhovaných a saldo migrace v jednotlivých krajích kumulované od roku 2004 – 2011. Kraje, ve kterých počet přistěhovaných převyšuje počet vystěhovaných, lze považovat za kraje atraktivní s vhodnými podmínkami pro život lidí. Z dlouhodobějšího hlediska nejatraktivnějším krajem pro lidi, kteří se rozhodnou migrovat je Středočeský kraj, v letech 2004 – 2011 se do tohoto regionu přistěhovalo téměř 190 000 lidí. Počet vystěhovalých v daném období byl 100 000. Jedná se tedy o kraj s největším migračním přírůstkem u nás. Kladné migrační saldo vykazovaly i kraje Plzeňský (5 495 lidí), Jihočeský (1 276 lidí) a Pardubický (312 lidí). Jsou to kraje, které vykazují 5% míru obecné nezaměstnanosti, HDP na 1 obyvatele je 650 000 Kč a čistý disponibilní důchod domácností na 1 obyvatele je 180 000 Kč. Velký počet přistěhovalých zaznamenal také kraj Hlavní město Praha. Za zkoumané období se sem přistěhovalo 154 000. Počet vystěhovalých byl ale vyšší, 175 000 lidí. Přičemž největší migrační úbytek byl vykázán v roce 2008 (-6 000 lidí).

Obr. 2: Meziregionální migrace



Zdroj: vlastní zpracování autora dle [3]

4 Analýza determinantů meziregionální migrace v České republice

Analýza determinantů vnitřní migrace v České republice bude provedena pomocí korelační analýzy a pomocí vícenásobné regresní analýzy. Statistické metody budou zpracovány ve statistickém softwaru Statistica 12. Statisticky budou zpracovány data od roku 2004 -2011, tedy od vstupu České republiky do Evropské unie po současnost.[6]

V první části analýzy bude zkoumána závislost migrace na výkonnosti daného regionu. Výkonnost regionu bude vyjádřena podílem regionu na národním HDP v letech 2004 -2011 a migrace podílem přistěhovaných do regionu na celkovém počtu přestěhovaných v zemi v jednotlivých letech 2004 – 2011.

V druhé části analýzy bude posuzována míra vlivu vybraných ukazatelů na vnitrokrajskou migraci v České republice. Za faktory, které budou vstupovat do daného modelu, byly zvoleny faktory popisující situaci na regionálním trhu práce a dále ukazatele, které hodnotí životní úroveň a bezpečnost v daném regionu. S ohledem na podmínku vícenásobné regrese, která předpokládá, že vstupní data nejsou multikolineární, do analýzy vstoupí následující faktory.

Faktory trhu práce:

1. Míra registrované nezaměstnanosti,
2. počet volných pracovních míst v kraji,
3. počet zaměstnaných osob v kraji,
4. počet registrovaných ekonomických subjektů (soukromí podnikatelé, obchodní společnosti, družstva, státní podniky, samostatně hospodařící rolníci).

[6] Pro rok 2012 nebyly zatím zveřejněny všechny hodnoty jednotlivých ukazatelů nebo jsou známy pouze předběžné výsledky.

Faktory vypovídající o životní úrovni a bezpečnosti:

5. Podíl disponibilního důchodu domácností na jednoho obyvatele v kraji,
6. hrubý domácí produkt regionu na jednoho zaměstnaného,
7. průměrná kupní cena bytu Kč/m^2,
8. počet spáchaných trestných činů v kraji.

Závisle proměnnou bude počet přistěhovalých osob. Do statistického zpracování dat budou zahrnuti pouze ti migrující, kteří se přestěhovali mezi kraji v letech 2004 – 2011. Z údajů jsou tedy vyjmuti ti, kteří se do daného kraje přistěhovali z ciziny, nebo ti, kteří se do ciziny vystěhovali. Statistiky ale nerozlišují, zda se mezi kraji přestěhoval Čech či občan jiné národnosti.

4.1 Analýza vztahu migrace a ekonomické úrovně regionu

Korelační analýza umožňuje kvantifikovat závislost dvou veličin. Cílem této analýzy je určit a popsat vztah mezi proměnnými. Analýza klade důraz na určení síly tohoto vztahu. Pro měření těsnosti vztahu bude použit Spearmanův koeficient korelace *(r)*, který zkoumá závislost mezi pořadími znaků a je dán vztahem (1): [7]

$$r_{i_x} r_{i_y} = 1 - \frac{6\sum(i_x - i_y)^2}{n(n^2-1)} \qquad (1)$$

Kde *i* vyjadřuje pořadové číslo proměnné v uspořádané řadě a *n* je počet případů.

Koeficient korelace nabývá hodnot -1 až +1, přičemž pokud je korelační koeficient roven +1 mezi proměnnými existuje silná závislost a veličiny jsou korelované. Pokud koeficient korelace nabývá hodnoty -1, pak jsou veličiny nezávislé. Veličiny jsou nekorelované, pokud koeficient korelace je roven 0. Platí tedy, že čím je absolutní hodnota výsledku koeficientu korelace větší a blíží se 1, tím je mezi veličinami silnější vztah.

Výsledky korelační analýzy jsou uvedeny v Tab. 1. Spearmanův korelační koeficient byl vypočítán pro jednotlivé roky v období 2004 – 2011. Statisticky významné vztahy mezi veličinami jsou vyznačeny tučným písmem.

Tab. 1: Výsledky korelační analýzy

Rok	2004	2005	2006	2007	2008	2009	2010	2011
Spearmanův korelační koeficient	**0,846**	**0,824**	**0,807**	**0,841**	**0,833**	**0,670**	**0,666**	**0,705**

Zdroj: vlastní zpracování autora dle [3]

Z analýzy vyplývá, že ve všech zkoumaných obdobích, mezi podílem přistěhovalých do kraje a podílem kraje na národním HDP existoval vztah, který byl vyhodnocen jako významný, tedy byla potvrzena hypotéza, že počet přistěhovalých do kraje souvisí s hrubým domácím produktem kraje. Míra těsnosti vztahu se až do roku 2008 pohybovala nad koeficientem korelace 0,8. V roce 2009 hodnota koeficientu poklesla, což bylo způsobeno světovou hospodářskou krizí, která zasáhla i domácnosti v České republice a ovlivnila jejich rozhodnutí přestěhovat se.

4.2 Analýza determinantů migrace

Závislost migrace na charakteristikách regionů byla zkoumána pomocí modelu vícenásobné lineární regrese, která umožňuje zkoumat vliv nezávislých proměnných veličin na závisle proměnnou veličinu. Daný vztah kvantifikuje a udává míru přesnosti sestaveného modelu.

Výsledkem vícenásobné regresní analýzy je stanovení ukazatelů, které mají statisticky významný vliv na změnu a vývoj závisle proměnné a zjištění míry vlivu jednotlivých ukazatelů. Analýza tedy testuje hypotézu H_0: ukazatel je statisticky významný pro vývoj závisle proměnné proti alternativní hypotéze H_1: ukazatel není statisticky významný. Rozhodnutí, zda nulová hypotéza bude přijata nebo zamítnuta, probíhá na základě porovnání p-hodnoty a hladiny spolehlivosti α. Ta byla pro tento model zvolena na úrovni 0,95.

Obecný model lineární vícenásobné regrese je dán rovnicí (2):[7]

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_p x_p + \varepsilon \qquad (2)$$

Kde y je závisle proměnná, $x_1, x_2, \ldots, x_p$ jsou nezávisle proměnné a parametry $\beta_0, \beta_1, \beta_2, \ldots, \beta_p$ jsou koeficienty dané regresní funkce a vyjadřují velikost vlivu příslušné proměnné x na závisle proměnnou, ε je reziduum.

Následující Tab. 2 shrnuje závěry vícenásobné regresní analýzy. Na základě výsledků vícenásobné regresní analýzy lze označit za nejvíce významné parametry: čistý disponibilní důchod domácnosti na 1 obyvatele a míru registrované nezaměstnanosti. Další významné ukazatele jsou počet registrovaných ekonomických subjektů, průměrná kupní cena bytu, počet volných pracovních míst a HDP na 1 obyvatele. Celkový počet zaměstnaných osob a kriminalita v regionu má na vývoj počtu přistěhovalých statisticky nevýznamný vliv. Nulová hypotéza, která testovala tvrzení, že mzda v regionu a míra nezaměstnanosti jsou nejvýznamnějšími faktory, které mají vliv na migraci, byla potvrzena.

Tab. 2: Výsledky vícenásobné regresní analýzy

	β_0	Parametr β	Hodnota testovacího kritéria	p-hodnota
Absolutní člen	1864.196		0,32917	
Počet registrovaných subjektů		**0,742130**	**2,07823**	**0,040174**
Čistý disponibilní důchod domácnosti na 1 obyvatele		**0,484026**	**4,48301**	**0,000019**
Průměrná kupní cena bytu Kč/m^2		**-0,495463**	**-2,85084**	**0,005268**
Míra registrované nezaměstnanosti		**-0,344310**	**-4,26563**	**0,000044**
Počet volných pracovních míst		**0,245602**	**2,49705**	**0,014108**
HDP na 1 zaměstnaného		**-0,435729**	**-2,30208**	**0,023343**
Počet zaměstnaných osob		0,148652	0,75570	0,451555
Kriminalita v regionu		0,104699	0,48101	0,631530

Zdroj: vlastní zpracování autora dle [3]

Z analýzy dále vyplynulo, že počet přistěhovaných osob do daného kraje se zvyšuje s nárůstem počtu registrovaných ekonomických subjektů v kraji, s růstem čistého disponibilního důchodu domácností na 1 obyvatele v kraji, se zvýšením počtu volných pracovních míst, s poklesem průměrné ceny bytu a s poklesem míry nezaměstnanosti v kraji. Nepřímý vztah mezi počtem přistěhovalých a HDP na 1 zaměstnaného může být dán skutečností, že s růstem počtu přistěhovalých se zvýší počet zaměstnaných na trhu práce, tedy průměrná výše HDP na jednoho zaměstnaného v kraji klesne.

Index determinance modelu je 0,755 a koeficient korelace 0,869. Důvodem mohou být regionální specifické faktory, které na migraci působí a v jednotlivých krajích se liší, například jde o kvalitu životního prostředí, specifická odvětví průmyslu, která jsou v daném regionu rozvinuta. Pro určení těchto specifických ukazatelů, které mají v daných regionech vliv na migraci, by bylo třeba zkoumat determinanty migrace na úrovni menších územně správných celků, okresů.

Vhodnost použití modelu pro popis migrace byl následně ověřen analýzou reziduí. Ta zkoumá normalitu rozdělení pravděpodobnosti reziduí. Pokud existuje normální rozdělení pravděpodobnosti, model lze považovat za spolehlivý a regresní analýzu je možné použít. Podmínka normality reziduí byla v této analýze potvrzena.

Závěr

V článku byly zkoumány hlavní faktory ovlivňující migrační chování lidí v České republice. Ekonomické teorie předpokládají, že se zvyšujícími se disparitami mezi regiony, míra migrace v zemi bude narůstat. Vztah mezi ekonomickou situací oblasti a mírou migrace byl v minulosti zkoumán a ověřen řadou autorů. Předkládaná analýza zkoumá tento vztah v prostředí České republiky za období let 2004 – 2011, tedy od vstupu do Evropské unie, a její výsledky také zahrnují dopad celosvětové hospodářské krize.

K určení hlavních determinantů migrace byly testovány dvě hypotézy. První hypotéza předpokládala závislost migrace na ekonomické úrovni kraje. Hypotéza byla ověřována pomocí korelační analýzy. Vstupními daty byly podíly HDP jednotlivých krajů na HDP celé republiky a podíly přistěhovaných osob do kraje na celkovém počtu přistěhovaných. Výsledky analýzy ukázaly silný vztah mezi oběma veličinami. Na základě těchto výsledků lze usuzovat, že počet přistěhovaných osob do kraje úzce souvisí s HDP dané oblasti, přičemž pro migranty nejatraktivnějším krajem je kraj Středočeský, naopak nejméně lidí se stěhuje do kraje Zlínského a Karlovarského. Hlavní město Praha v porovnání s ostatními kraji je krajem specifickým, jedná se o kraj s velkým počtem přistěhovaných, ale také vystěhovaných lidí.

Druhá hypotéza předpokládala, že hlavními determinanty vnitřní migrace v České republice je průměrná mzda a míra nezaměstnanosti v regionu. Průměrná mzda v analýze byla nahrazena ukazatelem čistý disponibilní důchod domácností na 1 obyvatele. Pro ověření či vyvrácení této hypotézy byl sestaven model vícenásobné regrese, do kterého vstupovaly proměnné zvolené na základě historického vývoje migračních teorií a splňovaly podmínky modelu. Na základě modelu vícenásobné regrese byly za statisticky významné označeny proměnné: čistý disponibilní důchod domácnosti na 1 obyvatele (který lépe vypovídá o volných prostředcích obyvatel v kraji a s průměrnou mzdou v regionu byl v silném korelačním vztahu), míra registrované nezaměstnanosti, počet registrovaných subjektů v kraji, průměrná kupní cena bytu, počet volných pracovních míst, HDP na 1 zaměstnaného. Přičemž statisticky nejvýznamnější jsou míra registrované nezaměstnanosti a čistý disponibilní důchod domácnosti na 1 obyvatele. Došlo tedy k potvrzení závěru Todarova modelu migrace, který předpokládá závislost migrace na těchto ukazatelích. Přestože se jedná o statisticky významné ukazatele, vybrané indikátory popisují míru migrace v krajích České republiky pouze ze 75 %. Pro přesnější popsání reality by bylo třeba analýzu provést detailněji za menší územně správné celky, kdy by bylo možné postihnout specifické charakteristiky krajů. Spolehlivost modelu také snižují vysoké transakční náklady, které jsou s migrací spojeny a které řadu lidí od rozhodnutí přestěhovat se odradí.

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ZNAMENÁ SAMOSTATNÝ ÚTVAR LOGISTIKY JINÝ DŮRAZ NA SPOLEHLIVOST, RYCHLOST NEBO NÁKLADY?

MEANS A SEPARATE LOGISTICS DEPARTMENT, OTHER EMPHASIS ON RELIABILITY, SPEED OR COST?

Stanislav Koutný

Abstract: *In preparation for the broader topic structure of logistics processes was research done. The dissertation describes the design of parameters of the logistic processes structure in a manufacturing company. Structure of logistic processes in a manufacturing company means the logistic processes and their relationships in a manufacturing company. The research for the dissertation was mixed one (quantitative and half-structured qualitative research) and was conducted in 70 manufacturing enterprises in the Czech Republic. The research was conducted in South and Pilsen region in May 2013. The research focused on finding the relationship of certain characteristics of the company (and its production) on the one hand and decision for centralized structure for managing logistics processes in the company on the second hand. One of the research questions was, if the choice of an independent central logistics department in a manufacturing company is in relation with emphasis on reliability, speed or cost. The aim of this paper is to present some results of this research. The result is: the decision for centralized structure for managing logistics processes in the company tends to be related to the effort of high reliability.*

Keywords: *Logistics, Logistics processes, Logistics design, Logistic structures, Manufacturing.*

JEL Classification*: L22, L23.*

Úvod

V rámci připravované disertační práce na téma Struktura logistických procesů byl autorem tohoto příspěvku proveden výzkum, který se zabýval některým aspekty řešené problematiky. Tématem disertační práce je struktura logistických procesů ve výrobním podniku.

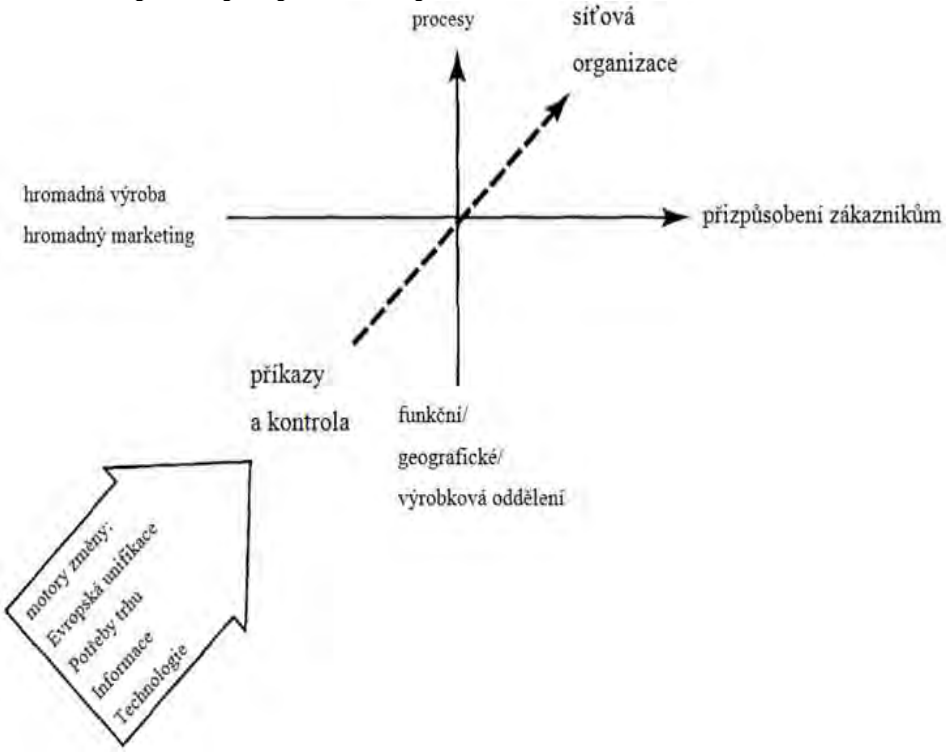
Waters [7] definuje logistickou strukturu jako infrastrukturu, která sestává z organizační struktury a lidských zdrojů, kultury a zdrojů na jejich podporu. Tato definice je však z hlediska procesního řízení ještě příliš obecná. V literatuře jsou pojmy týkající se struktury logistických procesů používány spíše volně. Lze se setkat s různými pojmy jako logistický design, logistické plánování, logistické modely, logistická řešení, logistická organizace, logistická infrastruktura, logistický servis, popř. stupeň integrace supply chain.

Strukturou logistických procesů ve výrobním podniku se v zmiňované práci rozumí logistické procesy a jejich vztahy ve výrobním podniku. Poznání a utváření struktury logistických procesů má význam pro plánování, kontrolu a řízení prvků logistického řetězce a ve své oblasti má tedy návaznost na strategii podniku a jeho logistického řetězce a na jejich konkurenceschopnost.

Jedním z nejčastěji pojednávaných aspektů struktury logistických procesů ve výrobním podniku je organizační začlenění řízení logistických procesů Schulte [5] uvádí následující formy organizační struktury: štábní, štábně-liniovou, centrální útvar, maticovou a výbory. Například Waters [7] uvádí organizaci funkční, produktovou, hybridní, maticovou a organizaci pomocí samořídících se skupin. Blanchard [1] navíc zmiňuje celkově logisticky orientovanou organizaci a organizaci zaměřenou na integraci produktu a vývoje.

V rámci podnikové strategie je možno říci, že volba typu organizační formy tendenčně souvisí s charakterem produktu v kombinaci s přizpůsobováním produktu zákaznickým potřebám. Tento vztah a zároveň související posun od řízení funkčního a lokálního k procesnímu vyjádřili Van Hoek, Commandeuer & Vos [6] následujícím obrázkem (Obr. 1).

Obr. 1: Tendenční vztah mezi organizační formou na jedné straně a stupněm přizpůsobení produktu na straně druhé



Zdroj: Van Hoek, Commandeuer & Vos [6]

Drews & Nebi [2, s. 223] k tématu podoby logistických procesů v organizaci navíc uvádějí, že na strukturu logistických procesů ve výrobním podniku v rámci ekonomických mezí má vliv typ produkce:

„Výrobní program společnosti definuje profil požadavku na výrobní procesy. Z tohoto důvodu se výrobní organizace potýkají s problémem, jak spojit organizační formy dílčích výrobních procesů se souvisejícími vnitřními logistickými procesy (doprava, skladování), které dohromady potřebují ekonomicky realizovat výrobní úkoly. Rozumné kombinace organizačních forem dílčích výrobních procesů, vnitřní dopravy a interního úložiště definují typy výrobní logistiky. Vhodná výrobní organizace je určitě ta, jež odpovídá profilu požadovaného výrobního programu s příslušným typem výrobní logistiky “

1 Formulace problematiky

Výzkum pro disertační práci se zaměřil na zjištění vztahu některých vlastností podniku a jeho výroby na jedné straně a rozhodnutí pro centralizovanou strukturu řídící logistické

procesy podniku na straně druhé. Cílem tohoto příspěvku je prezentovat některé výsledky výzkumu získané s využití metod induktivní statistiky.

1.1 Výzkumná otázka

Součástí vyhodnocení výzkumu byla i následující výzkumná otázka. Je volba samostatného centrálního útvaru logistika ve výrobním podniku ve vztahu s vysokým důrazem na spolehlivost, rychlost nebo náklady?

Stanovená hypotéza

Pro zodpovězení na výzkumnou otázku byla stanovena následující hypotéza: Podniky, které mají samostatný centrální útvar logistiky, kladou vysoký důraz na spolehlivost, rychlost nebo náklady významně odlišným podílem odpovědí než podniky, které samostatný centrální útvar logistiky nemají.

2 Metody

Provedený výzkum byl smíšený (kvantitativní a částečně polostrukturovaný kvalitativní) a probíhal v České republice v roce 2013. Výzkum proběhl u výrobních podniků z Jihočeského a Plzeňského kraje v květnu roku 2013. Celkový počet dotazovaných výrobních podniků byl 70. Dotazovaní byli vedoucí pracovníci v dotazovaných podnicích nebo pracovníci v administrativě logistické oblasti podniků. Bylo navrženo získání primárních dat za pomoci dotazníkového šetření.

Pro tento smíšený výzkum byl navržen dotazník. Na získání dat od výrobních podniků spolupracovali studenti Ekonomické fakulty, Jihočeské univerzity. Studentům byly dány k dispozici nevyplněné dotazníky a studenti měli samy zvolit výrobní podniky, u kterých data pro vyplnění dotazníku získají. Studenti měli omezený výběr tak, že mohli volit výrobní podnik od 10 zaměstnanců výše. Vyplnění dotazníků nebylo anonymní, avšak zaručeno bylo anonymní zpracování. Vyplnění probíhalo u dotazovaných nebo dotazovanými v podniku a na dotazníku bylo toto potvrzeno razítkem podniku nebo podpisem dotazovaného.

V smíšeném výzkumu byla získána primární data. Zodpovídány byly obsahové i kvantitativní otázky. Pokud v dané otázce nebyla poskytnuta odpověď, byl podnik z vyhodnocení otázky vyřazen (v případě otázek s očekávanou kvantitativní odpovědí) anebo byl zahrnut takový podnik uveden jako podnik bez odpovědi (v případě očekávaných obsahových vyjádření na kvalitativní otázku). U dat proběhly kontrola opakování zvolených podniků, kontrola a zařazení do odvětví z veřejně dostupných zdrojů a kontrola extrémů. Získaná data byla přepsána do MS Excel, následně zpracována a analyticky vyhodnocována. Pro účel testování hypotéz byla data vybraných otázek přepsána do programu Statistica 12 a data byla za pomocí Statistica 12 vyhodnocována.

Data z dotazníku byla následně zpracována zejména analýzou (členěním). Byla provedena následující členění:

1. Členění dle velikosti. Celý soubor podniků rozdělen podle velikosti na malé podniky (10-49 zaměstnanců), střední podniky (50-249 zaměstnanců) a velké podniky (250 a více zaměstnanců) z hlediska počtu zaměstnanců v souladu s Doporučením Komise 2003/361/ES ze dne 6. května 2003 o definici mikropodniků, malých a středních podniků (2003).

2. Členění výrobních podniků dle jejich odvětví. Zvoleno bylo členění na následující skupiny odvětví: strojírenský automobilový, elektrotechnický, potravinářství, spotřební zboží a strojírenský neautomobilový.
3. Členění dle existence samostatného centrálního útvaru logistiky. Soubor byl roztříděn na podniky, které samostatný centrální útvar logistiky mají, a podniky, které jej nemají. Pojem „Podnik, který nemá samostatný centrální útvar logistika" byl definován na základě dotazníkové otázky a příslušných odpovědí jako podnik, který na otázku „Existuje ve Vašem podniku jediné centrální místo pro řízení i výkon logistických procesů (logistika)?" uvedl odpověď „ne, ale procesy jsou řízeny centrálně" nebo „spíše ne" nebo „ne" nebo „jiné" nebo neuvedl odpověď. Pojem „Podnik, který má samostatný centrální útvar logistika" byl definován na základě dotazníkové otázky a příslušných odpovědí jako podnik, který na otázku „Existuje ve Vašem podniku jediné centrální místo pro řízení i výkon logistických procesů (logistika)?" uvedl odpověď „ano" nebo „spíše ano".

U jednotlivých takto získaných skupin podniků pak byl zjišťován faktický stav odpovědí a porovnatelné skupiny byly navzájem srovnávány metodami deskriptivní statistiky. Statistické testování hypotéz probíhalo s předpokladem, že porovnávaná data jsou nezávislými výběry, které se nepřekrývají a testy byly voleny bez vlivu pořadí.

Pro testování byla volena hladina významnosti pro testování odlišností mezi vybranými soubory. Pokud nebyla odlišnost zamítnuta na hladině významnosti $\alpha = 0{,}05$, je odlišnost považována za „významnou". Pokud nebyla odlišnost zamítnuta na hladině významnosti $\alpha' = 0{,}20$ a byla zamítnuta na hladině významnosti $\alpha = 0{,}05$, byla odlišnost považována alespoň za „tendenci" s možností H_0 v tomto smyslu reformulovat. Alternativní hypotéza bude přijata, pokud hypotéza H_0 bude zamítnuta i na hladině významnosti $\alpha' = 0{,}20$. Hypotézy byly proto formulovány v následující formě H_0: $p_1 <> p_2$ proti alternativě H_1: $p_1 = p_2$.

Testování proběhlo ve statistickém software Statistica 12, který vypočítal hodnotu testovacího kritéria a p-Value (p). Bylo požadováno ověřit odlišnost na zvolené hladině významnosti. Z formulace hypotéz vyplývá, že je-li $p < \alpha$, pak rozdíl mezi průměry je statisticky významně odlišný na zvolené hladině významnosti α. Nulová hypotéza byla zamítnuta, pokud $p \geq \alpha$. Alternativní hypotéza bude přijata, pokud nulová hypotéza H_0 bude zamítnuta i na hladině významnosti α'.

Testována byla nekvantitativní kategorická data testem na významnost rozdílů poměrů a testem nezávislosti kategorií. Postupováno bylo dle Zvárová [8]. Závislost požadujeme ověřit na zvolené hladině významnosti. Je-li závislost mezi kategorickými odpověďmi (např. odvětví) pro zvolené soubory (např. podniky s centrálním samostatným útvarem logistiky) významná, je interpretována jako „vztah".

Testování proběhlo ve statistickém software Statistica 12, který vypočítal hodnotu testovacího kritéria a p-Value (p). Pro získání významnosti rozdílu mezi dvěma poměry nabízí statistický software Statistica 12 test významnosti diference poměrů. Tento test poskytuje při zadání poměrů a velikosti odpovídajících vzorků p-hodnotu (p-Value). Testováno bylo oboustranně. Hodnoty byly testovány jako nezávislé. Stejná data byla v programu Statistica 12 testována testem na nezávislost kategoriálních proměnných pomocí Chí-kvadrát testu, který je vhodný pro porovnání závislosti dvou kategoriálních proměnných. Výsledky obou testů z hlediska p-Value byly kontrolovány porovnáním na blízkou shodu (max. přípustný absolutní rozdíl = 0,02 z důvodu zaokrouhlení).

Chí-kvadrát test poskytl navíc údaje o poměrech vzorků k celkovému počtu podniků a také výslednou hodnotu testového kritéria.

3 Rozbor problému

3.1 Charakteristika dotazovaných podniků

Pro podniky bylo vyhodnoceno rozložení dle velikosti podle počtu zaměstnanců, které je patrné z tabulky 1.

Tab. 1: Počet dotazovaných podniků podle počtu zaměstnanců

Podniky dle velikosti	Počet podniků ve výzkumu	Počet podniků celkem v ČR v roce 2013
Velký podnik (>249)	30	1463
Střední podnik (50-249)	22	6815
Malý podnik (>9 a <50)	18	34339
Celkem	70	42617

Zdroj: vlastní zpracování autora, Přehled údajů SBA 2013 [4]

Ve výzkumu byla zastoupena různá odvětví průmyslu a následující tabulka 2 ukazuje jejich početní rozložení ve vztahu k odvětví.

Tab. 2: Výrobní odvětví zastoupená ve výzkumu

Odvětví	Celkem	Podniky, které mají samostatný centrální útvar logistiky	Podíl uvedené kategorie
strojírenský automobilový	15	11	73,3333%
elektrotechnický	8	1	12,5000%
potravinářství	9	3	33,3333%
spotřební zboží	19	9	47,3684%
strojírenský neautomobilový	14	4	28,5714%

Zdroj: vlastní zpracování autora

3.2 Testování hypotéz

V této části jsou zapsány výsledky statistického testování stanovených hypotéz dle metodiky práce za účelem získání statistických ověření dílčích odpovědí na výzkumné otázky práce.

Testovaná hypotéza H_0: Podniky, které mají samostatný centrální útvar logistiky, kladou vysoký důraz na spolehlivost, rychlost nebo náklady významně odlišným podílem odpovědí než podniky, které samostatný centrální útvar logistiky nemají.

Testování proběhlo dle metodiky práce pro každou z testovaných hodnot zvlášť a následnou logickou disjunkcí výsledků testování. Za tímto účelem byly pro zkoumané hodnoty formulovány pomocné hypotézy H_0k, H_0l, H_0m.

První tři nejčastěji označené hodnoty u podniků se samostatným centrálním útvarem logistiky jsou v pořadí shora: spolehlivost a stejným počtem rychlost a náklady. Počty odpovědí dle různých kategorií hodnot jsou patrné z následující tabulky 3.

Tab. 3: Počet odpovědí na otázku: Na co je kladen z hlediska logistických procesů ve Vašem podniku vysoký důraz u podniků, které mají samostatný centrální útvar logistiky

Podniky, které mají samostatný centrální útvar logistiky	**Počet odpovědí**
rychlost	26
spolehlivost	29
náklady	26
servis	9
přesnost	16
jiné	0
logistické procesy nehrají významnou roli	0
výkon	9
pružnost	19
šetření životního prostředí	7

Zdroj: vlastní zpracování autora

První tři nejčastěji označené hodnoty u podniků, které samostatný centrální útvar logistiky nemají, jsou v pořadí shora: náklady, spolehlivost a stejným počtem odpovědí rychlost a pružnost. Počty odpovědí dle různých kategorií hodnot jsou patrné z následující tabulky 4.

Tab. 4: Počet odpovědí na otázku: Na co je kladen z hlediska logistických procesů ve Vašem podniku vysoký důraz? u podniků, které nemají samostatný centrální útvar logistiky

Podniky, které nemají samostatný centrální útvar logistiky	**Počet odpovědí**
rychlost	23
spolehlivost	30
náklady	31
servis	9
přesnost	23
jiné	0
logistické procesy nehrají významnou roli	1
výkon	13
pružnost	22
šetření životního prostředí	10

Zdroj: vlastní zpracování autora

3.2.1 Testování pomocné hypotézy 1

Pomocná hypotéza H_0k: Podíl podniků, které mají samostatný centrální útvar logistiky a kladou vysoký důraz na spolehlivost, se významně odlišuje oproti podnikům, které samostatný centrální útvar logistiky nemají.

Testování proběhlo dle metodiky práce pro nekvantitativní kategorická data.V následující tabulce jsou uvedeny základní charakteristiky vstupující do statistického vyhodnocení.

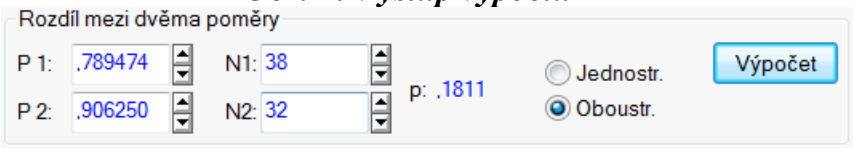
Tab. 5: Základní charakteristiky

Podniky	**Počet podniků**	**Počet podniků, které kladou vysoký důraz na spolehlivost**	**Podíl uvedené kategorie**
Počet odpovědí pro podniky, které nemají samostatný centrální útvar logistiky	38	30	78,9474 %
Počet odpovědí pro podniky, které mají samostatný centrální útvar logistiky	32	29	90,6250 %

Zdroj: vlastní zpracování autora

Výsledná hodnota testovacího kritéria = 1,79.
Výsledná hodnota p = 0,1811.

Obr. 2: Výstup výpočtů



	Tabulka 2x2 (Chi_kvadrat_test_STA_12		
	Sloupec1	Sloupec2	Rádek celkem
Pocet, rádek 1	30	8	38
Procent z celku	42,857%	11,429%	54,286%
Pocet, rádek 2	29	3	32
Procent z celku	41,429%	4,286%	45,714%
Sloupec celkem	59	11	70
Procent z celku	84,286%	15,714%	
Chí-kvadrát (sv=1)	1,79	p= ,1811	

Zdroj: výpočty v programu STATISTICA 12 CZ

Výsledná p-Value > α, závěrem je tedy zamítnutí testované hypotézy H_0k. Výsledná p-Value < α´, závěrem na základě metodiky práce je tedy také nezamítnutí tendence ke vztahu a možnosti reformulace testované hypotézy.

3.2.2 Testování pomocné hypotézy 2

Pomocná hypotéza H_0l: Podíl podniků, které mají samostatný centrální útvar logistiky a kladou vysoký důraz na rychlost, se významně odlišuje oproti podnikům, které samostatný centrální útvar logistiky nemají.

Testování proběhlo dle metodiky práce pro nekvantitativní kategorická data. V následující tabulce jsou uvedeny základní charakteristiky vstupující do statistického vyhodnocení.

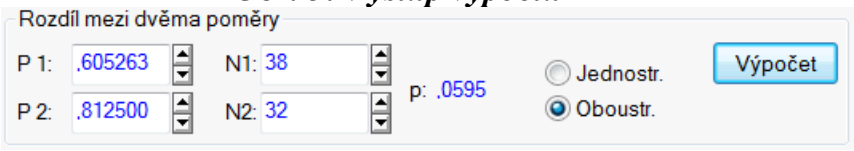
Tab. 6: Základní charakteristiky

Podniky	**Počet podniků**	**Počet podniků, které kladou vysoký důraz na rychlost**	**Podíl uvedené kategorie**
Počet odpovědí pro podniky, které nemají samostatný centrální útvar logistiky	38	23	60,5263 %
Počet odpovědí pro podniky, které mají samostatný centrální útvar logistiky	32	26	81,2500 %

Zdroj: vlastní zpracování autora

Výsledná hodnota testovacího kritéria = 3,55.
Výsledná hodnota p = 0,0595.

Obr. 3: Výstup výpočtů



	Tabulka 2x2 (Chi_kvadrat_test_STA_12		
	Sloupec1	Sloupec2	Rádek celkem
Pocet, rádek 1	23	15	38
Procent z celku	32,857%	21,429%	54,286%
Pocet, rádek 2	26	6	32
Procent z celku	37,143%	8,571%	45,714%
Sloupec celkem	49	21	70
Procent z celku	70,000%	30,000%	
Chí-kvadrát (sv=1)	3,55	p= ,0595	

Zdroj: výpočty v programu STATISTICA 12 CZ

Výsledná p-Value > α, závěrem je tedy zamítnutí testované hypotézy H_0l. Výsledná p-Value < α´, závěrem na základě metodiky práce je tedy také nezamítnutí tendence ke vztahu a možnosti reformulace testované hypotézy.

3.2.3 Testování pomocné hypotézy 3

Pomocná hypotéza H_0m: Podíl podniků, které mají samostatný centrální útvar logistiky a kladou vysoký důraz na náklady, se významně odlišuje oproti podnikům, které samostatný centrální útvar logistiky nemají.

Testování proběhlo dle metodiky práce pro nekvantitativní kategorická data. V následující tabulce jsou uvedeny základní charakteristiky vstupující do statistického vyhodnocení.

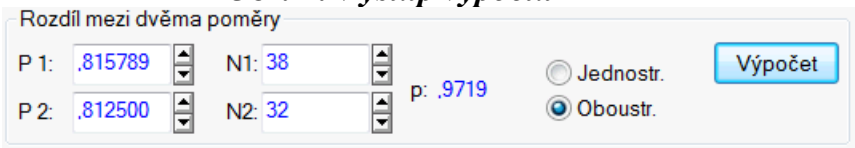
Tab. 7: Základní charakteristiky

Podniky	**Počet podniků**	**Počet podniků, které kladou vysoký důraz na náklady**	**Podíl uvedené kategorie**
Počet odpovědí pro podniky, které nemají samostatný centrální útvar logistiky	38	31	81,5789 %
Počet odpovědí pro podniky, které mají samostatný centrální útvar logistiky	32	26	81,2500 %

Zdroj: vlastní zpracování autora

Výsledná hodnota testovacího kritéria = 0,00.
Výsledná hodnota p = 0,9719.

Obr. 4: Výstup výpočtů



	Tabulka 2x2 (Chi_kvadrat_test_STA_12		
	Sloupec1	Sloupec2	Rádek celkem
Pocet, rádek 1	31	7	38
Procent z celku	44,286%	10,000%	54,286%
Pocet, rádek 2	26	6	32
Procent z celku	37,143%	8,571%	45,714%
Sloupec celkem	57	13	70
Procent z celku	81,429%	18,571%	
Chí-kvadrát (sv=1)	,00	p= ,9719	

Zdroj: výpočty v programu STATISTICA 12 CZ

Výsledná p-Value > α, závěrem je tedy zamítnutí testované hypotézy H_0m. Výsledná p-Value > α´, závěrem na základě metodiky práce je tedy také zamítnutí tendence ke vztahu a možnosti reformulace testované hypotézy. Naopak si lze všimnout, že na hladině významnosti 0,05 by bylo možné nezamítnout případnou hypotézu o shodě míry vysokého důrazu na náklady.

Celkovým závěrem je tedy zamítnutí celé hypotézy H_0 (na základě logické disjunkce výsledků tří dále prezentovaných pomocných hypotéz), protože všechny z pomocných hypotéz byly zamítnuty. Avšak právě jen v oblasti důrazu na spolehlivost existuje (na základě logické disjunkce výsledků pomocných hypotéz) tendence k vysokému důrazu na spolehlivost významně odlišným podílem u podniků, které mají samostatný centrální útvar logistiky.

4 Diskuze

Partida [3] dokládá rozdílnost efektů centralizované struktury při efektech řízení logistických procesů. Efekty určuje zejména v oblasti výsledků řízení a správy zásob. Doporučuje při rozhodování o centralizované struktuře pro řízení logistických procesů identifikování strategických priorit.

„Nicméně, centralizovaná struktura, zdá se, podněcuje efektivnější plánování a řízení příchozích materiálů a řízení zásob. Organizace s centralizovanými logistickými strukturami zejména méně utrácejí při správě příchozích materiálů, mají méně ztrát a drží nižší hodnoty zásob. Volba mezi centralizovanou a decentralizovanou logistickou strukturou do značné míry závisí na individuálních okolnostech organizace. Pokud je lepší řízení zásob nebo příchozích materiálů prioritou, pak centralizovaná logistická struktura může být tou nejlepší volbou. […] Klíčem pro každou organizaci je identifikovat strategické priority své logistické funkce a zjistit, zda potenciální výhody určité logistické struktury kompenzují případné negativní účinky“ Partida [3, s. 72].

Výsledky zde prezentovaného výzkumu ukazují, že rozhodnutí volit ve struktuře výrobního podniku centralizovanou strukturu pro řízení logistických procesů tendečně souvisí se snahou o vysokou spolehlivost. Průzkum a disertační práce se zaměřily také na jiné možné vlivů jako jsou velikost výrobních dávek anebo vliv odvětví. Zejména u odvětví se přístup k centralizaci rovněž liší, ať již se tak děje přes strategické rozhodování nebo například vnějším vlivem (např. řízením dodavatelského řetězce zákazníkem).

Závěr

Jako odpověď na výzkumnou otázku lze říci, že samostatného centrálního útvaru logistika ve výrobním podniku nemá vztah s vysokým důrazem na spolehlivost, rychlost nebo náklady. Avšak v oblasti důrazu na spolehlivost existuje tendence k vysokému důrazu na spolehlivost významně odlišným podílem u podniků, které mají samostatný centrální útvar logistiky.

Reference

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THE ECONOMIC INTEGRATION AS A DETERMINANT OF INTRA-INDUSTRY TRADE: THE CASE OF POLAND

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Abstract: *The present study has investigated determinants of intra-industry trade between Poland and its European Union trading partners. The analysis of the factors determining Polish bilateral intra-industry trade employed an econometric model for panel data. This paper is focused on one of the most important factors in the development of this type of exchange, namely on economic integration. The survey results confirm that in the case of Poland, integration with the European Union turned out to be a factor influencing favourably the development of intra-industry turnover. The development of intra-industry trade was also facilitated by the fact that Poland's trade partners use a similar language, which belongs to the group of the Slavic languages as well as by a considerable intensity of trade with EU countries. The negative impact on the development of intra-industry trade was exerted by trade barriers and the degree of the imbalance of trade between Poland and its trading partners. The outcome of the research conducted confirms that the impact of all of the identified determinants of intra-industry trade is consistent with the assumptions of the theory.*

Keywords: *Intra-industry trade, Economic integration, European Union, Poland.*

JEL Classification: *F14, F15.*

Introduction

Trade cooperation between European Union member states is based mainly on the *intra-industry* exchange, which involves the simultaneous export and import of products (semi-finished products, subassemblies and components). These products originate from the same industry and are close substitutes in the sphere of consumption, production, or in both of these areas [13].

The interest in the phenomenon of intra-industry trade was arisen in the early nineteen sixties of the twentieth century, when estimating the effects of the creation of the European Economic Community and the Benelux Union. It turned out that 50% tariff reduction in the area of EEC in 1963, led to the creation of new streams, which primarily took the form of intra-industry trade [1]. The outcome of other empirical studies conducted in the years 1959–1967 was consistent. It revealed that the increase in the trade turnover of goods between the European Economic Community countries concerned mainly (over 70%) intra-industry trade. [13] Similar findings were obtained by analysing the effects of the Benelux Union [26]. Also in that case what was noted was primarily the intensified intra-industry trade.

The identification of the intra-industry trade phenomenon has become the basis for abundant theoretical and empirical analysis, leading to the formation of the intra-industry trade theory, which is nowadays considered to be significant complementation to the traditional theory of international trade.

The objective of this study is to verify the main research hypothesis, according to which economic integration has a significant impact on the intensity of intra-industry turnover in Poland's foreign trade with European Union member states.

1 Economic integration and intra-industry trade – literature review

As follows from the theoretical models, a prerequisite for the emergence of intra-industry trade is the existence of a specific and usually an imperfectly competitive market structure, where the subject of trade are varied products. Significant is also the presence of increasing economies of scale in production. However, it is a number of factors that decides whether intra-industry trade between countries develops, or not. These factors are most frequently divided into two groups. There are macroeconomic factors, *i.e.*, properties (attributes) of the countries participating in the exchange process and microeconomic factors, *i.e.*, characteristics of industries and of products traded.

A crucial factor in the development of intra-industry trade in the macroeconomic dimension are integration processes occurring in the world. Their manifestation is the reduction of restrictions on trade exchange as well as intensification of cooperation. As a result of these integration processes, and more specifically, as a result of the trade policy carried out within the framework of the integration group, two classic effects emerge: trade creation and shift. The first means the emergence of new trade flows between countries liberalizing their trade in goods as a result of the replacement of the existing more expensive domestic production by cheaper imports from the partner country. The other effect – the trade shift is the result of the replacement of imports from third countries with supplies from the countries being members of the integration group. This effect can be achieved when external duties of the countries forming the preferential trade area are at least equal to the differences in production costs between manufacturers producing more expensive goods but originating from member states and cheaper manufacturers from third countries.

Trade liberalization is an extremely important factor in the development of intra-industry turnover and is inseparable from integration processes. Tariff and non-tariff barriers by limiting access to foreign markets affect both intra-industry and inter-industry streams. However, as proved by the theory of intra-trade, strengthening trade protection affects relatively lowering intra-industry turnover to a larger degree than inter-industry turnover. This is so because goods exchanged within intra-industry trade are close substitutes. In consequence, they are characterized by a rather high price elasticity of demand.

The impact of trade liberalization on the intensity of intra-industry turnover is the subject of numerous empirical studies. Many of them confirmed that intra-industry trade becomes more intense along with the reduction of trade protection and the opening up of economies [see also: 12, 20, 21]. Authors of empirical studies use different measures of trade barriers. The nominal level of tariffs is the measure most frequently applied [4, 23]. Veeramani [25] also takes into account the quantitative restrictions on imports. Loertscher and Wolter [16] take the unit composed of the level of tariffs and the distance between the countries as a measure of trade barriers, and Chang [3] simplifies the measurement and introduces a zero-one variable that takes the value 1, if in the trade between the two countries, there are limitations in the form of trade barriers (tariff and non-tariff) and 0 if there are no restrictions.

In empirical research in a situation where it is difficult to estimate the level of trade barriers due to the lack of reliable data, a variable is constructed that describes the so-called

degree of trade orientation, or in other words, the openness of the economy. This variable is the result of estimating the following equation [14]:

$$log\frac{X_j}{P_j} = \beta_0 + \beta_1 log\frac{Y_j}{P_j} + \beta_2 logP_j + \beta_3\frac{X_j^m}{Y_j} + \varepsilon_j\,, \qquad (1)$$

where:

X_j – the value of exports of the country *i*
Y_j – the gross domestic product of the country *j*,
P_j – the population of the country *j*,
X_j^m – the value of exports of mineral resources of the country *j*,
ε_j – the random component.

The estimation of the equation (1) allows specifying a hypothetical value of exports *per capita*, which is compared with the actual value. If the difference between the actual and the hypothetical values of exports *per capita* is positive, the implication is that the level of trade barriers is relatively low. And this, in turn, strengthens the development of intra-industry trade.

The impact of economic integration on the development of intra-industry trade can also be analysed as a result of changes that occur in countries in the area of supplying these countries in production factors as well as in the area of changes in prices of these factors as a result of combining the economies [7]. Creating integration groups fosters the equalization of prices of production factors. This phenomenon is clearly visible in the case of a common market whose creation is associated with a free flow of production. The strength of the impact of the mobility of production factors on the size and structure of trade depends primarily on the production factors resources possessed initially by business partners. If the differences in the production factors possessed by countries are significant, then the liberalization of the flow of these factors, in particular of capital, reduces them, which contributes to the intensification of intra-industry turnover. In this context the impact of integration processes on the development of various forms of intra-industry trade (horizontal and vertical)[7] appears to be interesting.

If we assume that the quality of specific types of differentiated goods depends on the amount of capital employed in the production process, then liberalization of trade means that countries that are more abundant in capital specialise in manufacturing and exporting more capital-intensive types of goods and at the same time of higher quality. Meanwhile, countries better equipped in labour provide the variety of goods of lower quality and relatively time-consuming. Therefore, what develops is the intra-industry trade in vertically differentiated products. The volume of this trade decreases along with the equalization of income of the societies of the trading countries. More advanced forms of regional economic integration (*e.g.,* a common market), lead to quicker levelling of prices of production factors. In consequence, real wages in countries that specialize in labour-intensive production rise, which denotes the equalization of income of inhabitants of the trading countries. As a result, the structure of intra-industry trade gets modified and the exchange of horizontally differentiated products (*i.e*., ones that are similar in terms of quality) grows in importance.

[7]The main criterion for the division of intra-industry trade into horizontal and vertical is the way of differentiating tradable commodities. When traded products are similar in quality but differ in other features, often referred to as visible (*e.g*., colour, shape), or ones that can be sensed (*e.g*., taste, smell), then we can talk about the horizontal trade. If the exchanged goods vary in quality, then it is the vertical type of intra-industry trade.

The impact of economic integration processes on increasing the intensity of intra-industry trade has been the subject of numerous empirical studies. The earliest analyses focused primarily on the calculation of the size of changes in the intra-industry trade volume in different time periods. Also, the intra-industry trade volume realised within the group and in the exchange with third countries was being compared [see, for instance: 1, 8, 13]. In later works usually econometric models were being constructed to attempt to quantify the impact of the factors related to integration processes on the intensity of intra-industry trade volume. Most frequently a binary variable was introduced. The variable takes the value 1, if the trading countries belong to the same integration group, and 0 if they do not [see: 3, 18, 24]. The importance of integration processes in enhancing the intensity of intra-industry trade is confirmed by numerous empirical studies [see, for instance: 9, 10, 22, 27].

The subject literature [see, for instance: 6, 15, 17] also mentions other factors promoting the development of intra-industry trade. These are significant intensity of commercial links between the countries (usually measured by the share of trade of a particular partner in the total foreign trade of the country) and a large share of processed goods in the trade exchange of a pair of countries. The degree of the intensity of trade is also significantly impacted by the geographical proximity of the trading partners. Due to the possibility of reducing transport costs, it is a factor contributing to the development of both intra-industry trade and inter-industry trade.

It seems, however, that the geographical proximity (distance) has a stronger influence on the intensity of intra-industry trade than on the intensity of inter-industry trade. The differentiated products are characterized by a high price elasticity of demand, and, therefore, respond to changes in costs and prices relatively more than goods exchanged within inter-industry trade. A factor supporting the development of intra-industry trade is also the cultural community of partners, and in particular their common language. Cultural ties, mainly due to the low barriers to conducting marketing activities on foreign markets (a common language facilitates communication), facilitate significantly exchange within intra-industry trade.

2 Materials and methods

In order to identify the factors determining Poland's intra-industry trade with EU member states an econometric model for panel data was constructed. The values of the Grubel-Lloyd index [13] were taken for the dependent variable and were calculated according to the following formula:

$$IIT = \frac{\sum_{i=1}^{n}(x_i+m_i)-\sum_{i=1}^{n}|x_i-m_i|}{\sum_{i=1}^{n}(x_i+m_i)}, \tag{2}$$

where:

x_i – the value of exports of the industry *i,*
m_i – the value of imports of the industry *i.*

Bilateral intra-industry trade indices were calculated for Poland's trade with individual countries of the European Union in the years 2002–2011, and for the three-digit product groups they were categorized according to the Standard International Trade Classification.

The dependent variable *IIT* is an index taking on values from the interval [0; 1]. The higher the value, the greater the share of intra-industry trade in trade volume. A logit

transformation of the dependent variable was performed. In that way we obtained a dependent variable in the form of the ln(*IIT*/1−*IIT*), and this dependent variable's values are contained in the interval (−∞; ∞). This eliminated the possibility of obtaining theoretical values of the Grubel-Lloyd index beyond the acceptable interval [0; 1].

The set of explanatory variables included two dummy variables (*EU* and *LANG*). One of them describes EU membership, the other expresses the cultural ties which are expressed by the fact that Poland's trade partners use as their main language a language belonging to the Slavic languages. Also, the impact of the intensity of trade between Poland and its trading partners on the development of intra-trade volume (the variable *TI*) was examined as well as the influence of the degree of the imbalance of bilateral trade flows (the variable *TIMB*). The impact of the trade barriers (the variable *ATR*) and the geographical distance between Poland and its trading partners (the variable *DIST*) were taken into account, too. All independent variables apart from the binary one were logarithmised.

The study covered 26 of Poland's trade partners who were member states of the European Union in 2011.

3 Theoretical Hypotheses

The following main research hypothesis and additional hypotheses concerning the intensity of intra-industry trade between Poland and European Union member states were subject to verification:

The main research hypothesis:

H1: Poland's membership in the European Union significantly increases the intensity of intra-industry trade exchange between Poland and EU countries.

Additional hypotheses:

H2: The trade barriers that exist in the trade relations between Poland and its trading partners significantly weaken the intensity of intra-industry trade.

H3: Intensive trade relations with trading partners measured by the participation of a particular country in Poland's total trade volume impact significantly the increase in mutual intra-industry trade.

H4: A similar language, which is an official language in the countries that trade with Poland, belonging to the group of Slavic languages, significantly increases the intensity of mutual intra-industry trade.

H5: There is a negative correlation between the geographical distance between Poland and its trading partners and the intensity of their mutual intra-industry trade.

H6: The degree of trade imbalance between trading partners weakens the intensity of their mutual intra-industry trade.

4 Model Estimation

The theoretical hypotheses allowed the model specification for panel data to be obtained:

$$IIT_{jt} = \alpha_0 + \alpha_1 UE_{jt} + \alpha_2 ATR_{jt} + \alpha_3 TI_{jt} + \alpha_4 LANG_j + \alpha_5 DIST_j + \alpha_6 TIMB_{jt} + v_{jt} \quad (3)$$

$$v_{jt} = e_t + u_j + \varepsilon_{jt}, \quad (4)$$

The description of the variables and the sources of data used are shown in Table 1.

Tab. 1: Variables used in empirical investigation

Variables	Variables description
IIT_{jt}	The intensity of intra-industry trade between Poland and the country j, in the time period t, measured by the Grubel-Lloyd index. Data source: [5].
ATR_{jt}	The size of the trade barriers which occurred in the trade exchange with the trading partner j in the year t. The measure of the trade barriers is the average tariff rate used by the countries being Poland's trade partners. Data source: [28].
EU_{jt}	The dummy variable takes on the value 1, if in the year t, Poland and its trading partner j were European Union member states, and takes the value 0, if the two countries, or one of them, did not belong to the European Union.
$TIMB_{jt}$	The degree of trade imbalance of trade exchange between Poland and the country j, in the year t. The variable was designated as the share of the trade balance with the partner j in total turnover. Data source: [5].
TI_{jt}	The share of the country j in Poland's total trade turnover, in the year t. Data source: [5].
$LANG_j$	The dummy variable takes on the value 1, when the language of Poland's trading partner belongs to the group of the Slavic languages, and equals 0, when it does not belong to the group of the Slavic languages.
$DIST_j$	The geographical distance between the capitals of Poland and its trading partner j. Data source: [11].
v_{jt}	The random error in the object j, in the time period t, which consists of the following components: e_t – impulses affecting all observations in the time period t, u_j – impulses affecting all the observations in the object j, ε_{jt} –impulses affecting only observations in the object j, in the time period t.

Source: elaborated by the author.

5 Results and Discussion

The estimation of the panel data model, designated with formula (3) was made with the use of the *Gretl* (*GNU Regression Econometrics Time-Series Library*) software. There were no *a priori* assumptions made for the occurrence and significance of individual effects, as well as for the character of the individual effects (fixed or random). The choice of the

estimation methods (*pooled OLS, fixed effects, random effects*) was made with the use of a decision procedure [see, for instance: 2, 19] from the field of econometrics advocated in the literature. The model was estimated with the use of a classical least squares method and diagnostic tests were performed and as a result the following values of the test statistics were obtained: the *Wald* test (F=6.667; p-*value*<0.00001) the *Breusch-Pagan* test (LM=80.872; p-*value*<0.00001) and the *Hausman* test (H=30.4; p-*value*<0.00001).

Based on the diagnostic tests conducted, it was found that a suitable model to study the impact of the macroeconomic determinants of the intensity of intra-industry trade is the fixed effects model (*FE*). Therefore, the parameters of the fixed effects model were estimated. However, the phenomenon of heteroscedasticity occurred, that is the non-homogeneity of the random components variance within the sample. Heteroscedasticity affects inappropriate estimations of standard errors for individual parameters and the revaluation of the determination coefficient, which may distort the conclusions regarding the significance of variables. Therefore, to estimate the parameters ultimately, the weighted least-squares method was applied (*WLS*).

Statistical values of significant parameters of the model described by formula (3) are shown in Table 2.

Tab. 2: The results of the estimation of the model describing Poland's intra-industry trade with EU countries

Dependent variable $\ln(IIT_{jt}/1-IIT_{jt})$					
Independent variables	Coefficient	Std. Error	*t*-ratio	*p-value*	Significance[a)]
Constant	0,4885	0,0961	5,081	<0,00001	***
$TIMB_{jt}$	−0,0553	0,0115	−4,825	<0,00001	***
TI_{jt}	0,2695	0,0139	19,390	<0,00001	***
ATR_{jt}	−0,3626	0,0881	−4,118	<0,00001	***
$LANG_j$	0,3032	0,0498	6,093	<0,00001	***
UE_{jt}	0,1212	0,0378	3,209	0,0015	***
Observations		260			
Standard error of residuals		0,948316			
R^2		0,731620			
Adjusted R^2		0,726337			
F (5, 254) = 138,4837		p-*value* for test F <0,00001			

[a)]*** The statistically significant variable at the level of 1%.

Source: the author's own calculations.

The model is statistically correct. Five out of the six potential explanatory variables proved to be significant. In the model all of the obtained signs for the parameter estimates for a particular explanatory variable are consistent with the predictions of the theory.

When interpreting the results obtained in relation to the variables that were previously logarithmised, the following interpretation method can be used: the increase in the explanatory variable by 1%, causes *ceteris paribus* an increase or decrease (depending on the sign of the parameter) in the dependent variable of α% (the parameter for a specific explanatory variable). In this case, the dependent variable is the logit, which means that the relation $IIT_{jt}/1-IIT_{jt}$ changes by α%, which is the relation of intra-industry trade (IIT_{jt}) and inter-industry trade ($1-IIT_{jt}$).

The results of the research confirm that the factor that significantly and also negatively affected the development of the indicators of Poland's intra-industry trade were trade barriers. However, the impact of this factor was not considerable. The resulting value of the parameter α for the variable ATR_{jt} was −0.36. It shows that the average increase in the average tariff rate of Poland's partner countries in trade by 1%, results in the decrease in the relation $IIT_{jt}/1-IIT_{jt}$ (the relation of intra-industry trade to inter-industry trade) of 0.4%. The research hypothesis H2 was verified positively.

The intensity of trade between Poland and its trading partners (the variable TI_{jt}) proved to be a statistically significant factor. The intensity of trade was expressed by the share of individual trading partners in Poland's total trade volume. This factor has a positive effect on the development of intra-industry trade, but the strength of the impact is even smaller, as indicated by the parameter α for the variable TI_{jt}, which is 0.27. The research hypothesis H3 was verified positively.

The factor that significantly but also adversely affects the intensity of intra-industry trade is the degree of trade imbalance between Poland and EU countries. The parameter α for the variable $TIMB_{jt}$ was −0.06. Therefore, the research hypothesis H6 was verified positively.

The estimated model had two dummy variables that were statistically significant. One of them (EU_{jt}) is related to Poland's and its trading partners' membership in the European Union. The second variable ($LANG_j$) describes the cultural ties of trading partners expressed by the fact that a trading partner's language belongs to the group of Slavic languages. In the case of the binary variables UE_{jt} and $LANG_j$, on the basis of the evaluation of the parameter sign for a particular explanatory variable, one can determine the direction of the impact of this variable on the dependent variable. The results obtained indicate a positive relationship between trading partners belonging to the European Union and the intensity of intra-industry trade between them. Positive relationship also occurs when the population of the country being Poland's trading partner speaks a language (the main language) that belongs to the group of Slavic languages. The results are consistent with the predictions of the theory and allow the research hypotheses H1 and H4 to be verified positively.

The variables $DIST_{jt}$ proved not to be statistically significant. Therefore it was not possible to verify the research hypothesis H5 concerning the impact of the geographical distance between Poland and its EU partners on the intensity of intra-industry trade.

Conclusion

Intra-industry trade that consists in simultaneous importing and exporting similar products belonging to the same branch plays an increasingly important role in Poland's trade with European Union member states. This type of exchange is conditioned by numerous and various factors.

The economic integration of the countries plays a particularly important role. Integration groups set the direction and forms of cooperation that serve to strengthen the ties between the member states. The strengthening of internal cooperation is also manifested through the intensification of mutual trade. Empirical studies hitherto have shown that under conditions of imperfect competition and product differentiation integration processes contribute to the intensification of primarily intra-industry trade.

As follows from the analyses conducted in this study, in the case of Poland, European integration has proved to be a factor contributing to the development of intra-industry trade. The factors that are significant and exert a positive impact include the intensity of trade

between Poland and its trading partners, the cultural ties expressed by the fact that a trading partner's language belongs to the group of Slavic language. However, the trade barriers and the degree of and the trade imbalance in Poland's bilateral trade volume had a negative impact on the development of intra-industry trade. The direction of the impact of all factors that determine the Poland's intra-industry trade with EU countries was consistent with the assumptions of the theory.

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THE PERFORMANCE EFFICIENCY OF THE VIRTUAL HADOOP USING OPEN BIG DATA

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Abstract: *Public sector institutions nowadays maintain a large amount of data from various domains. This data represents a potential resource that businesses and citizens can use to enhance their own datasets or which can be used to develop new products and public services. Open data support the emergence and realization of the big data potential. While it enhances the volume and velocity of available data, its main impact is on the variety of data sources. This paper deals with the deployment of the Virtual Hadoop for the processing of the open big data idea in the public sector. The first part of this paper is based on the literature review of the cloud computing, the distributed processing of data, big / open / linked data and theirs sources on the web. The primary aim of the Virtual Hadoop deployment is to test the performance efficiency using open big data in order to obtain the direction of the future research. The last part then introduces the most important findings and recommendations.*

Keywords: *Open big data, Virtual Hadoop, Data processing, Performance efficiency, Cloud computing, Public sector.*

JEL Classification: *C55, C63, H83, L86.*

Introduction

The volume of data being made publicly available increases every year. The emergence of big and open data use is yet another phase of the ongoing Information and Communication Technologies (ICT) revolution which resembles the previous technology-driven economic transitions [3]. However, public sector and governments are not the only possible sources of the open data. Others include businesses, research institutions and citizens. Thus, the open data can be distinguished into four categories: Open Government Data (OGD), Open Business Data (OBD), Open Citizen Data (OCD) and Open Science Data (OSD). In the age of Web 2.0 and social media new big data flows have emerged, those provided by the businesses, citizens as well as public sector institutions, themselves into the open big data era. Resulting adaptability and efficiency of this era the new opportunities and also threats for the public sector institutions are raised, forcing them to adapt to the new reality and adopt the open big data flows. In practice, gaining access to raw data, placing it into a meaningful context, processing the data and extracting valuable information from them is often extremely difficult. As a result, during the last couple of years different solutions have been developed to support the whole lifecycle of the open big data reuse i.e. data discovery, cleaning, integration, browsing and visualization [9], [12].

Open data are an important part of the transparent public administration. Collection and dissemination of information and data are key tools of government. Governments gather large amounts of data and hold significant national datasets. The public sector is charged with the responsibility of offering and providing effective and efficient services and maintaining infrastructure for citizens as well as businesses.

Large-scale data-intensive cloud computing with the MapReduce framework is becoming increasingly popular of many academic, government, and mostly industrial organizations. Apache Hadoop and its deployment model Virtual Hadoop, an open source project, is by far the most successful realization of MapReduce framework. While MapReduce is efficient and reliable for data-intensive computations, the excessive configuration parameters in Apache Hadoop impose unexpected challenges on running various workloads with a cluster effectively [25].

1 Problem formulation and the tools used

Public sector institutions have collected large amounts of data long before the age of digitization, e.g. during censuses, tax collection or welfare provision. ICT helps to handle these vast amounts of information and use them to find inefficiencies in public sector as well as to provide adequate evidence for policymakers. The concepts of open and linked data also have led to the necessity to process these large amounts of data very quickly to retrieve valuable information. With cheaper computational power and storage available in the form of scalable cloud solutions and large scale computational clusters, it has become possible to extend the techniques developed in the open big data processing to empower businesses and citizens and cost savings by developing innovations and solutions that improve the quality of public services.

The main goal of this paper is to introduce the benefits and risks of the open big data era and describe a solution to process these data with the use only open-source solutions, so they could be used in the public sector without additional fees and licenses. The aim of this paper is two-fold: firstly a review of the related works of different types of computational models and techniques for the data processing will be discussed. Finally, a case study in which will be proposed, implemented and evaluated the optimal performance of the Virtual Hadoop cluster to help process the open big data will be presented.

The research is mostly based on literature review of foreign and domestic resources which should lead to make recommendations on the definition and development of the open big data processing on the basis of study of the scientific publications in the field of the public sector, data processing, Apache Hadoop and performance evaluation. The case study consists of the deployment of a virtual cluster using MapReduce paradigm with the framework Apache Hadoop for the processing of the open big data using the standard WordCount algorithm which is used in most tutorials to MapReduce – e.g. in [10]. It reads text files and counts how often words occur. The last part then contains results and recommendations for the further research. The main tools used are Apache Hadoop 2.2.0, VirtualBox 4.3.8, Ubuntu Server 12.04 and Java 7.

2 Related work and background

The growth of data sources and the ease of access that ICT affords, also brings new challenges on data acquisition, storage, management and analysis. Traditional data management platforms, analysis systems and tools are still based on the Relational Database Management System (RDBMS). However, such RDBMSs only apply to structured data, other than semi or unstructured data, and are increasingly utilizing more and more expensive hardware. It is apparently that the traditional RDBMSs could not handle the huge volume and heterogeneity of the big data [7]. Tien in [22] compares major differences between the big data approach and the traditional data management approach with the four

stages (acquisition, access, analytics, application) and three elements (focus, emphasis, scope).

Data held by the public sector institutions has a great reuse potential. Buchholtz et al. [3] in their study estimates that aggregate direct and indirect economic impacts from use of the open big data across the whole EU28 economy are of the order of billions EUR annually. The resulting economic gains can be put into three broad categories: resource efficiency improvements through reducing the information concerning resource waste in production, distribution and marketing activities, product and process improvements through innovation based on R&D activities, day-to-day process monitoring and consumer feedback, management improvements through evidence based, data-driven decision making.

Kucera and Chlapek [13] then present a set of benefits that can be achieved by publishing OGD and a set of risks that should be assessed when a dataset is considered for opening up. They introduce these benefits of OGD: increased transparency, improved public relations and attitudes toward government, increased reputation of a public sector instituion, transparent way of informing the general public about infringement of legislation, improved government services, improved government data and processes, better understanding and management of data within public sector bodies, supporting reuse, increasing value of the data, stimulating economic growth, minimizing errors when working with government data, easier translations and less requests for data. A set of possible risks to OGD publication contains: publication of data against the law, trade secret protection infringement, privacy infringement, risk to the security of the infrastructure, publication of improper data or information, publication of inaccurate data, misinterpretation of the data, absence of data consumers, subjects less willing to cooperate, overlapping of data and increased number of requests for data. Kalampokis et al. [12] in their paper from 2013 claim that the real value of OGD will unveil from performing data analytics on top of combined statistical datasets that were previously closed in disparate sources and can now be linked to provide unexpected and unexplored insights. To support this claim, authors described the OGD analytics concept along with its technical requirements, which can be later extended with Apache Hadoop.

The most recent survey about the term big data is well conducted by [7], where authors present the general background of big data and review related technologies, such as distributed approach, Internet of Things, data centres, and Apache Hadoop. They also introduce the terms big data generation and acquisition, big data storage and big data applications including big data analysis, which are closely related to the topic of this paper. The main work by Dean and Ghemawat [8] describes the file system implemented by Google called the Google File System (GFS), which handles the big data operations behind the Google services. Also Vilas's findings lend support to the claim that the high performance computing platforms are required, which impose systematic designs to unleash the full power of the big data [23]. Along similar lines, Lin et al. [17] develop the idea that processing amounts of data requires computational power far beyond the capability of an individual personal computer; it requires a more powerful resource such as a cluster supercomputer.

A comparison of approaches to large-scale data analysis can be found in Pavlo et al. [19] or Chen et al. [7]. The evidence supporting the use of the big data for analytics and the improvement of the decision-making process may lie in the findings of Power [20], who proposes to identify use cases and user examples related to analysing large volumes of semi and unstructured data.

Since Apache Hadoop is an open source project, many optimizations have been applied to improve its performance. The work by Li et al. [16] on optimally tuning MapReduce platforms contributed an analytical model of I/O overheads for MapReduce jobs performing incremental one-pass analytics. Although their model does not predict total execution time, it is useful in identifying three key performance parameters: chunk size (amount of work assigned to each map task); external sort-merge behaviour and number of reducers. Yang et al. [25] then concentrated on the relationships between workload characteristics and corresponding performance under different Apache Hadoop configurations. They selected a suite of benchmarks representing a large range of important applications and derived several configuration metrics that influence the workload performance. They identified critical metrics using principal component analysis, which significantly reduce the complexity of performance modelling. Some of them will be used later in this paper.

Furthermore, there are also researches on identifying design factors of specific application or areas that can improve the performance of Apache Hadoop, e. g. Jiang et al. [11] have conducted an in-depth performance study of MapReduce and as an outcome of this study, they identified some factors that can have significant performance effect on the MapReduce framework. Almeer in [2] considered the trend in time consumption with the increase in the volume of data, and tried to show the difference in run time between a single PC implementation and the parallel Apache Hadoop implementation. More precisely, the author tested the performance of some parallel image filtering algorithms, which ran well when the size of the input image was not large in the comparison of the default value of block size in Apache Hadoop.

Lai et al. [15] introduced how cloud computing can make a breakthrough by proposing a multimedia social network dataset on Apache Hadoop platform and compared and verified the performance efficiency of this platform with the different hardware parameters. The impact of network speed in the cluster computations is discussed in [24]. Other related work of Schätzle et al. [21] investigated the efficiency of Apache Pig and Hadoop for large Resource Description Framework (RDF) datasets. More information about the quality of service attributes and performance metrics for evaluation of cluster and cloud architectures and services can be found in the work of Garg et al. [6].

3 Cloud computing and the distributed data processing

Cloud computing techniques take the form of distributed computing by utilizing multiple computers to execute computing simultaneously on the service side over the Internet. Businesses and citizens no longer require large capital outlays in hardware to deploy their service. Instead they access the hardware and system software provisioned by data centres in a pay-as-you go manner [25]. It is a viable alternative to improve the scalability and high availability of applications. Cloud-based applications typically feature elasticity mechanisms, namely the ability to scale-up or down their resource use depending on user demand [26].

The MapReduce framework fits well this model since it is highly parameterized and can be configured to use as many resources as an administrator deems cost-effective for a particular job [15]. GFS, a scalable and reliable distributed file system for large data sets and BigTable, a scalable and reliable distributed storage system for sparse structured data were the first pioneers [26]. MapReduce parallel programming model and its open-source clone Apache Hadoop, a computing cluster formed by low-priced hardware, have attracted the interest of both industrial and public sector environments in implementing

scalable and fault-tolerant data-intensive applications. The Apache Hadoop framework is aligned with the transparency citizens expect from good government.

A number of storage abstractions and models are being proposed in the context of cloud computing. Microsoft Azure, for example, provides abstractions such as Table, Blob, and Queue. Amazon provides the Simple Storage Service, Elastic Block Storage, and a key/blob store. MapReduce itself depends on the GFS and the corresponding Hadoop implementation uses the Hadoop Distributed File System (HDFS). More detailed information about cloud computing and software services can be found in [1].

Distributed data processing is a method of organizing data processing that uses networked computers in which data processing capabilities are spread across the network. In this kind of processing, specific jobs are performed by specialized computers which may be far removed from the user and/or from other such computers. It provides greater scalability, allows greater flexibility in structure, more autonomy, however, it requires more network administration resources, incompatibility of components, difficulty of controlling information resources and more redundancy. This method is increasing because dramatically reduced hardware costs, improved user interfaces and new frameworks like MapReduce [4], [10].

4 Open big data and the data catalogs

Open data are a piece of content or data if anyone is free to use, reuse, and also redistribute it – subject only, at most, to the requirement to attribute and share-alike. Most of the open data are actually in raw form [9], [13]. Linked data describes a method of publishing structured data so that it can be interlinked and become more useful. It requires a standard mechanism for specifying the existence and meaning of connections between items described in this data using web technologies such as HTTP, RDF and Uniform resource identifiers (URIs) [9]. The concept of big data is usually defined by the volume, velocity and variety. In many areas volumes of available facts are higher than before, they are also expanding quicker than ever, come from many more sources and materialize in many different forms than small, well-structured datasets from the past [3].

Open big data have a great potential for reuse but in order to turn this potential into actual benefits it is necessary for potential users to be able to easily find the data of their interest. Thus, the open big data catalog is a tool that can significantly improve discoverability of the free available datasets. Data catalogs can be divided into the following groups [14]:

- Local – data catalog owned by cities/towns or with only city/town coverage,
- regional – data catalogs owned by a regional authority (county government or federal state government) or with regional coverage,
- national – data catalog owned by a central government institution or with nationwide coverage,
- international – data catalog owned by an international institution or with the international coverage.

Classification of the selected sources of the open big data can be seen in the Tab. 1. It extends the results of Heath and Bizer in [9], where authors divided these sources of data into the categories of geographic data, media data, government data, libraries and education,

life sciences data, retail and commerce, user generated content and social media. As well as the official public and private sector sponsored portals, there are numerous unofficial sources of the open big data, usually compiled by citizens, communities or aggregators. To facilitate interoperability between data catalogs published on the web, the World Wide Web Consortium (W3C) published an RDF vocabulary named Data Catalog Vocabulary (DCAT). By using DCAT to describe datasets in data catalogs, publishers increase discoverability and enable applications easily to consume metadata from multiple catalogs [5].

Tab. 1: Classification of the selected open data catalogs

Category	Example of the selected catalog
data aggregators	http://datacatalogs.org/, http://knoema.com/, Google Public data explorer, Junar, DataMarket etc.
OGD and international governmental organization's data	USA - http://www.data.gov/, UK - http://data.gov.uk/, DE - https://www.govdata.de/ etc. EU - http://publicdata.eu/, UN - http://data.un.org/, WBG - http://datacatalog.worldbank.org/ etc.
OSD	https://www.opensciencedatacloud.org/publicdata/, http://statistics.ucla.edu/
news data	API's of The New York Times, The Guardian Data Blog, iDnes.cz etc.
sports data	http://www.pro-football-reference.com/, http://sportsdatabase.com/, http://developer.espn.com/
social data	The best place to get social data for an API is the site itself: Instagram, Facebook, Twitter, GetGlue, Foursquare, pretty much all social media sites have their own API's.
weather data	http://www.wunderground.com/, http://www.weatherbase.com/, http://openweathermap.org/
spatial data	http://www.openstreetmap.org/, http://www.iscgm.org/, http://www.geonames.org/, http://gcmd.nasa.gov/, https://www.sharegeo.ac.uk/
digitized data from libraries and e-books	http://arxiv.org/, http://www.lib.powerdata.ir/, https://www.bookshare.org/, https://openlibrary.org/, http://www.widernet.org/egranary/ etc.

Source: Authors

5 Case study

For this case study was used Apache Hadoop in the fully-distributed mode created on the virtual machine as the Virtual Hadoop cluster, because it is easier to deploy for the testing purposes of the performance efficiency. Authors could use a pseudo-distributed mode, however, this feature is rather useful for the basic development and testing (writing some code (script) that uses the services and check if it runs correctly). VirtualBox 4.3.8 was used to setup the Virtual Hadoop cluster. Ubuntu Server 12.04 was the main operating system of the cluster's members. Since the main machine had a 6-core

processor, the virtual cluster with the maximum of 4-nodes was created. The hardware and software used can be seen from the Tab. 2.

Firstly a virtual machine in VirtualBox had to be created and configured with the required hardware parameters and settings to act as a cluster node (specially the network settings). This virtual machine was then cloned as many times as there will be nodes in the Virtual Hadoop cluster. Only a limited set of changes were needed to finalize the node to be operational (the hostname and IP address had to be defined).

Tab. 2: The default configuration of the main machine

Hardware	Processor	AMD FX-6300 VISHERA
	Number of Cores	6
	Threads per Core	1
	Memory Capacity	8 GB
	Disk Capacity	1 TB
	Network	100 Mbps
Software	Virtual Machine	VirtualBox 4.3.8
	Operating System	Ubuntu Server 12.04
	Java Virtual Machine	Java 7
	Hadoop Release	Hadoop 2.2.0

Source: Authors

The input data file had 750 MB in total and it was the text data file in csv format. More open big data for the testing purposes can be found in the data catalogs in Tab 1. Open big data can be also distinguished into categories such as transport, education, environment, public finances, geospatial etc. and selected data mining or text mining methods and statistical analyses are performed on these data. The size of these data files is then typically in tens to hundreds of GBs, which is more suitable to choose the Apache Hadoop platform for the open big data processing using commodity PCs. This will be presented in the authors' future papers. However, for this case study is the file size of 750 MB sufficient.

The input data file was then divided into the data files of 50, 100, 200 and 500 MB. Every test for the required configuration was repeated 15 times. Tab. 3 presents the comparison of the performance efficiency (as processing times) of the WordCount algorithm using one to four computers in the Virtual Hadoop cluster with different levels of computer hardware specifications. As the table indicates, while processing 200 a 500 MB files, the cluster made up of three and four nodes is almost twice faster compared to the single or two nodes cluster. While large files are processed, the cluster made up of multiple nodes fulfils its utility with the co-operation of these nodes. The factor which has the greatest influence on the performance efficiency is the memory capacity. On the other hand, the disk capacity has an inconclusive effect on the processing times as well as the network.

Tab. 3: The hardware performance efficiency of the Virtual Hadoop cluster – the analysis of 50,100, 200, 500 MB files 1/2

The hardware configuration of a single member in the virtual cluster	**Number of the nodes in the virtual cluster** (one is always a Master, the other ones are Slaves)															
	1				**2**				**3**				**4**			
Memory Capacity (512 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100 GB), Network (100 Mbps).	41,5 s	56,7 s	73,6 s	125,2 s	32,8 s	43,2 s	56,6 s	94,1 s	26,4 s	34,3 s	44,5 s	71,7 s	20,2 s	25,1 s	41,2 s	66,7 s
Memory Capacity (256 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100 GB), Network (100 Mbps).	56,1 s	77,7 s	103,2 s	200,3 s	42,3 s	57,1 s	77,2 s	143,1 s	32,5 s	43,6 s	58,7 s	103,2 s	24,2 s	31,4 s	53,6 s	93,4 s
Memory Capacity (128 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100 GB), Network (100 Mbps).	58,5 s	82,2 s	109,7 s	212,7 s	44,3 s	60,4 s	81,7 s	151,4 s	33,8 s	46,3 s	62,6 s	109,8 s	25,3 s	33 s	56,9 s	99,3 s
Memory Capacity (512 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100 GB), Network (10 Mbps).	51 s	70,3 s	88,3 s	149 s	40,7 s	54,4 s	68,5 s	112 s	33,3 s	43,6 s	55,2 s	88,2 s	25,9 s	32,1 s	53,1 s	86 s
Memory Capacity (256 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100 GB), Network (10 Mbps).	68,9 s	96,4 s	123,5 s	238,1 s	52,5 s	71,9 s	93,1 s	170,2 s	40,9 s	55,3 s	72,8 s	126 s	30,9 s	40,4 s	69,1 s	120,5 s
Memory Capacity (128 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (100GB), Network (10 Mbps).	72,1 s	101,9 s	131,6 s	253,1 s	54,5 s	75,7 s	98,6 s	180,2 s	42,6 s	58,4 s	77,3 s	134,8 s	32,3 s	42,4 s	73,3 s	128,1 s
Memory Capacity (512 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (100 Mbps).	50,7 s	65,3 s	78,2 s	129,4 s	39,7 s	49,2 s	59,4 s	96 s	31,7 s	39,3 s	46,8 s	73,5 s	24,2 s	27,1 s	43,3 s	68 s
Memory Capacity (256 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (100 Mbps).	66,5 s	88,7 s	109 s	207,5 s	49,3 s	63,1 s	80,8 s	145,7 s	37,1 s	47,7 s	60,1 s	105 s	27,3 s	32,9 s	55,1 s	94,9 s
Memory Capacity (128 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (100 Mbps).	67,9 s	89,5 s	111 s	209 s	44,3 s	65,6 s	83,1 s	152,8 s	39,8 s	50,1 s	64,5 s	111,9 s	29,1 s	36,5 s	59,1 s	100,8 s

Source: Authors

Tab. 3: The hardware performance efficiency of the Virtual Hadoop cluster – the analysis of 50,100, 200, 500 MB files 2/2

The hardware configuration of a single member in the virtual cluster	**Number of the nodes in the virtual cluster** (one is always a Master, the other ones are Slaves)															
	1				**2**				**3**				**4**			
Memory Capacity (512 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (10 Mbps).	57,7 s	78,7 s	95,4 s	157, 9 s	45,1 s	59,9 s	74,6 s	120, 9 s	36,9 s	48,4 s	59 s	92,6 s	28,4 s	35 s	57,4 s	90,3 s
Memory Capacity (256 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (10 Mbps).	77,9 s	107, 9 s	133, 5 s	252, 7 s	58,2 s	79 s	101, 5 s	183, 8 s	45,4 s	61,4 s	77,9 s	133, 3 s	34,1 s	43,8 s	74,6 s	126, 5 s
Memory Capacity (128 MB),	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB	50 MB	100 MB	200 MB	500 MB
Disk Capacity (10 GB), Network (10 Mbps).	81,3 s	114, 2 s	142, 1 s	268, 3 s	60,5 s	83,2 s	107, 5 s	194, 6 s	47,3 s	64,8 s	82,7 s	141, 6 s	35,6 s	46,2 s	79,2 s	134, 5 s

Source: Authors

The most efficient hardware configuration in the meaning of the processing time was chosen from the Tab. 3 and the different Apache Hadoop configuration metrics were set for the following models as can be seen in the Tab. 4. The default value of the concrete metric is bold and these values have already been measured in the Tab. 3. To simplify this goal, the 200 MB size file was selected as an example. The corresponding configuration metrics of Apache Hadoop are located in hdfs-site.xml (dfs.blocksize, dfs.replication) and mapred-site.xml (maximum.map.tasks, maximum.reduce.tasks). More information about these metrics and how they affect the performance efficiency can be found in [10] or [25].

Tab. 4: The software performance efficiency of the Virtual Hadoop cluster – the analysis of 200 MB file

The software configuration of Apache Hadoop	**The hardware configuration of a single member in the virtual cluster**											
The range for Apache Hadoop configuration metrics (default value is bold)	Disk Capacity 100 GB											
	Network 100 Mbps											
	Memory 128 MB				Memory 256 MB				Memory 512 MB			
dfs.blocksize	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs
32 MB	126,1 s	92,3 s	70,1 s	62,6 s	127,9 s	94,1 s	71 s	63,3 s	92 s	69,6 s	53,4 s	48,9 s
64 MB	109,7 s	81,7 s	62,6 s	56,9 s	103,2 s	77,2 s	58,7 s	53,6 s	73,6 s	56,6 s	44,5 s	41,2 s
128 MB	105,1 s	79,1 s	60,5 s	55,3 s	100,5 s	74,3 s	55,2 s	49,1 s	69,3 s	52,5 s	41,1 s	37,7 s
dfs.replication	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs
1	97,6 s	72,7 s	53,2 s	46,7 s	87,8 s	65,6 s	48,5 s	44,4 s	61,8 s	47,5 s	36,9 s	34,2 s
2	105,2 s	78,6 s	59,8 s	53,9 s	94 s	70,3 s	52,8 s	48,2 s	67,5 s	51 s	39,6 s	36,5 s
3	109,7 s	81,7 s	62,6 s	56,9 s	103,2 s	77,2 s	58,7 s	53,6 s	73,6 s	56,6 s	44,5 s	41,2 s
maximum.map.tasks	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs
2	109,7 s	81,7 s	62,6 s	56,9 s	103,2 s	77,2 s	58,7 s	53,6 s	73,6 s	56,6 s	44,5 s	41,2 s
3	106,2 s	82 s	60,1 s	54 s	95,8 s	77 s	55,4 s	50,1 s	67,7 s	55,2 s	41,8 s	38,9 s
4	99,8 s	82,3 s	60,9 s	52,8 s	93 s	75,9 s	56 s	48,4 s	66,9 s	55 s	42 s	37,5 s
maximum.reduce.tasks	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs	1 PC	2 PCs	3 PCs	4 PCs
2	109,7 s	81,7 s	62,6 s	56,9 s	103,2 s	77,2 s	58,7 s	53,6 s	73,6 s	56,6 s	44,5 s	41,2 s
3	104,2 s	82 s	61,1 s	55,7 s	98 s	79,1 s	55,9 s	51,6 s	70,2 s	57 s	42,9 s	39,8 s
4	115,3 s	88,3 s	62,4 s	58,5 s	101,5 s	81 s	56,8 s	50,5 s	70 s	58,2 s	41,8 s	38,6 s

Source: Authors

6 Results and discussion

The main findings show, that the processing with the block size of 32 MB is about 15-20% slower than the default value. However, the processing with the block size of 128 MB is only 3-7% faster than the default value. With the memory capacity of 512 MB it is about 10% faster. These results also provide confirmatory evidence that the memory capacity has the greatest influence on the performance efficiency. The default setting for the replication factor means, that 3 copies of all data would be distributed around the file system. However, this level of redundancy is necessary only in the case to prevent loss of data in the event of failures. In this case study, the processing only with one copy of the open big data is about 20% faster than 3 copies of all data. The effect of the number of map and reduce tasks in the Virtual Hadoop cluster is more or less inconclusive. Nevertheless, based on the literature review, it is closely related to the number of processor's cores and the number of nodes (PCs) in the cluster.

This case study demonstrates that Apache Hadoop platform has a potential for the processing of the open big data and solving complex analytics problems. It helps programmers to concentrate on the essence of their problems. The practical value for further innovations in global society for better cooperation and continually increasing development lies in the open big data analytics. On the other hand, Apache Hadoop requires to be tuned for optimal performance according to the problem and the data available. Therefore, it is important to focus on the Apache Hadoop's programming model and the use of the appropriate algorithms (scripts), which can be used with these types of the open big data. Some of them can be already found e. g. in [10]. However, the performance efficiency of the Virtual Hadoop cluster may also vary from the previous requests. This can be due to processor differences, or the other workloads.

Conclusion and future work

The availability of the open big data enabled by the recent hardware and software advances and complemented by the shift towards more openness of the public sector provides yet another example of the ICT revolution persistence. In this paper, authors used the sources of the Virtual Hadoop cluster to simplify the description of the performance model of a small cluster, which can be used for the open big data analytics in the public sector. The next step will be the deployment of these findings in the fully-distributed mode with the commodity PC hardware. The other option of the future research should be the MapReduce implementation on top of a cloud operating system. Liu and Orban in [18] studied this issue and showed that their implementation of MapReduce in cloud run faster the Apache Hadoop. Also the use of more complex algorithms already implemented on this platform such Apache Mahout may be a way.

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QUATERNARY SECTOR AND ECONOMIC DEVELOPMENT IN JAPAN: A CAUSAL ANALYSIS

Jagannath Mallick

Abstract: *There is no study on the linkage between the quaternary sector and economic development. The present study contributes to the existing literature by analysing the patterns of development of quaternary sector and its implication to the economic development and growth in Japan over the periods 1970-2008. The study uses disaggregated data from Japanese Industrial Productivity database, and multivariate VAR method for the empirical analysis. The findings show a significant role of quaternary activities in the development of Japan economy. The evolution of development of quaternary sector is mainly due to the development of activities of security and care. Also there is bidirectional causality between the quaternary sector and the economic development in Japan. Quaternary sector is very crucial for the economic development and growth. Hence, the practicable measures should be taken to accelerate the development of quaternary sector.*

Keywords: *Quaternary services, Economic development, Causal effect, Multivariate VAR.*

JEL Classification: *O11, F63, C32.*

Introduction

The development level of service industry is an important indicator that measures the overall economic competitiveness of a nation and region. The included activities in the service sector are heterogenous in nature. The modern social services have become a new impetus for regional economic development in the developed countries. The recent emergence of service sector in advanced countries is due to several factors based on the socioeconomic and demographic behaviours, and technological and organizational change, and shift in the international patterns of comparative advantage [10]. There is a comparatively new and fast growing branches of knowledge-based and informational services in this globalisation era [10]. These branches of knowledge-based and informational services are called quaternary sector. Therefore, it is very necessary to make an empirical research on the intrinsic relations between the development levels of quaternary services and economy as a whole. The existing literatures have focused on the issue of service sector and economic growth. However there is no study that examines the linkage of quaternary activities with the economic development. The issue is very important in case of the Japanese economy, as it is predominated by the service sector. Particularly, due to the socioeconomic and demographic structure, there has been increasing demand for the care security, education and other development activities in Japan. Hence, the paper attempts to make an empirical analysis of the relations between the quaternary sector and economic development during the periods in 1970-2008 in Japan by using multivariate vector autoregressive (VAR) and Granger causality test.

1 Statement of Problem

Despite the increasing importance of services in national economies, its contribution to national productivity and economic development remains a debatable issue. Services lie

at the heart of any economic process and no material goods could be manufactured without the combination of various services. The increasing demand for services along with technological and organizational change, and shift in the international patterns of comparative advantage are the sources of recent structural changes [10]. The activities included in the service sector are extremely heterogeneous. The general shift of economic activities away from the primary and secondary sectors, in favour of the service sector, has not occurred uniformly across the service industries.

The recent emergence of service sector in advanced countries is due to several factors based on the economic, social and demographic behaviours. For instance, the demographic behavior of Japan shows that, the total dependency ratio and old age dependency ratio is highest in the world. Hence, due to the large number of old age people, the demand for services including pension, social and health insurance increases. Recently, the developed economies are dominated by the knowledge intensive services (KIS) and informational services, which required skilled labour. Particularly, the increasing role of high and medium high tech sectors in the modern economy generates demand for KIS and informational services. Even, the demand for skilled labour is sourced from the traditional sector due to the increasing incorporation of knowledge and some new sub-sectors, which are formed by the innovative fast growing firms [10]. There is the particular group of knowledge-based services, which has benefited most from technological change and general increases in demand. The growth of the recent service sector is due to the growth of the comparatively new and fast growing sectors of knowledge-based and informational services, which are called quaternary sector [10]. In other words, the recent dominant pattern of structural development in the 20th century, is characterised by the steady rise of information and knowledge-based services. The general rationale behind this process is the information society, or the knowledge-based economy.

The knowledge-based and informational services can contribute directly to economic development through their own growth in employment and income. Also they can additionally have the potential to improve performance in the economic system via knowledge transfer and progressive specialisation, which are capable of stimulating various kinds of competitive advantage and productivity growth: (i) technological innovation, (ii) organisation, corporate finance and strategy and (iii) marketing. Hence, the quaternary sector is the complementary factor of production and raises general prospects for entrepreneurial discovery and productivity growth. The quaternary sector has increased its importance in terms of social and economic development in the advanced countries mainly due to the recent demographic behavior and changing life style, technological change and hence increasing demand for new services etc.

There exist some studies that address the relationship of service sector with the economic growth development. For instance, the relationships among KIS sector, the changing nature of the innovation process, and the globalising learning economy are discussed by [1], [3], [6], [7], [8], [12], [13]. Also, the relation between services and manufacturing in the post-industrial society is examined by [2] and [4]**.** [2] suggested that, consumers expand their basket of purchases beyond basic material goods to a whole new realm of services corresponding to the increase in wealth. In contrast, [4] emphasised on the manufacturing base. Further, [9] argued that, there is shift of services as production and consumption 'sectors' to services as 'functions'. This change stems from new insights into the role of knowledge production and distribution in the economy, particularly with respect to new knowledge based services and the reshaping of existing service activities. [13], for example

highlights the role of strategic services in shaping competition and comparative advantages, while [12] draws attention to the role of technological services and competencies in shaping new industrial structure and organizational patterns. [7] extends the analysis further, stating the location of advanced business services as a key factor of growth. But, there is no detailed empirical study on the relationship of quaternary sector with the economic development. In this context, this is important to understand the linkage of quaternary activities with economic growth and development, which will have policy implication to achieve high growth and development. Hence, the main objectives of the study are:

a. To examine the causal relationship between the development of quaternary sector and economic development.

b. To suggest policy for sustainability of economic growth through the development of quaternary activities.

2 Methodology and Data

The objective of the study is to examine the patterns of quaternary activities and to examine its linkage with economic development and growth in the Japan during the periods in 1970-2008. The study chooses Japan for the empirical analysis, due to the relevance of quaternary activities in Japanese economy for its socioeconomic and demographic characters. The rising of the aging population and changing society, needs the development of security and care. Currently, the changing society is characterized as weakened communities increase in small-sized families, and increase of working women, financial and psychological burden of family facing the care for the elderly has become unbearably large, which demand for care and health security. Further, Japanese economy is a service sector based and IT intensive economy, which requires skilled labour, due to which high quality of education is very important.

The Japanese Industrial Productivity (JIP) data base provides information on input and output at the disaggregate level for 108 sector [14]. The concordance of JIP data base and ISIC Rev 4 has been constructed, and accordingly the quaternary activities have been identified and measured. Based on the ISIC Rev 4 classifications, the activities of quaternary sector include the activities of security & care and development. The security & care includes public administration and defence; compulsory social security (O84), human health activities (Q86), residential care activities (Q87) and social work activities without accommodation (Q88). The activities of scientific research and development (M72), other professional, scientific and technical activities (M74), education (P85), creative, arts and entertainment activities (R90), sports activities and amusement and recreation activities (R93) and libraries, archives, museums and other cultural activities (R91) are considered as the development activities of quaternary activities. The estimated gross output and valued added of quaternary activities based on JIP data has been used for the analysis[8]. The real value of output and value added of quaternary sector is measured at 2000 prices in JPY.

The patterns of quaternary activities have been examined by using the simple algebraic calculations. However, the core of the analysis of the study i.e., the linkage of quaternary sector and economic development has been examined by using the time series technique, particularly multivariate VAR method. This methodology assesses the cumulative effects, which is accounted into the dynamic response between quaternary sector and the other

[8] Based on the concordance of ISIC Rev4 and JIP, in terms of JIP codes, the security and care includes 70, 72, 82, 83, 89, 96, 97, 100, 101, 102, 104 and 105, and development includes 80, 81, 94, 95, 98, 99, 100 and 106.

variables of interest [11]. As the tertiary sector is an important component of service sector, the empirical analysis considers it, while examining the causal relation between quaternary sector and economic development. The three variables are measured as real value added at constant prices 2000 in the economy, tertiary sector and quaternary sector. The analysis used annual data covering the period 1970-2008. The first step of the time series is the understanding of data generating process of the variables. That means the testing of stationary is very crucial in the time series data, because, the use of non-stationary data in the regression, gives spurious and inefficient relations. There are various methods of testing of stationary of variables, which are called unit root test as well. Based on the data generating process, the appropriate method has been used for estimating the relations.

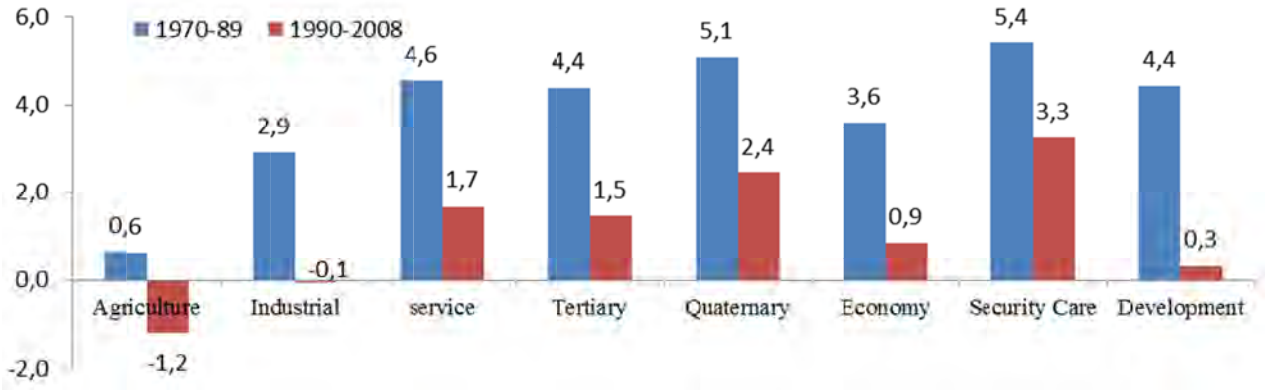
3 The problem solving and Discussion

The study examines the patterns of development of quaternary activities by its components, and then it examines the relation between the quaternary activities and economic development. The patterns of development have been examined by classifying the economy into agriculture, industrial, tertiary and quaternary sectors.

3.1 Patterns of Economic Growth and Quaternary sector

The pattern of quaternary sector is examined during the period 1970-2008 using the gross output series at constant prices 2000. The trend growth rate and annual average share of sectors in the output as a whole economy is presented for the two sub-periods i.e. 1970-89 and 1990-2008 in figures 1 and 2, respectively. The service sector has registered higher growth (4.6) than the agriculture (0.6) and industrial sector (2.9) in the first period (1970-89). This is important to observe that, the quaternary sector has grown at the rate of 5.1 per cent, which is higher than the growth of tertiary sector at 4.4 per cent. In the recent period, there is no such economic growth in Japanese economy as it is revealed from the Fig. 1. The growth rate of economy declined from 3.6 per cent in the first period to a sluggish growth rate of 0.9 per cent in the second period. Nevertheless, the growth of quaternary sector is continued to dominate over the other three sectors i.e. agriculture, industrial and tertiary sector. Further, coming to the components of quaternary sector, the growth of Care and security is much stronger than the development sector in the two sub-periods. Therefore, the quaternary sector is emerged as the important sources of growth of service sector in Japan.

Fig. 1: Sectoral growth of output (in %)

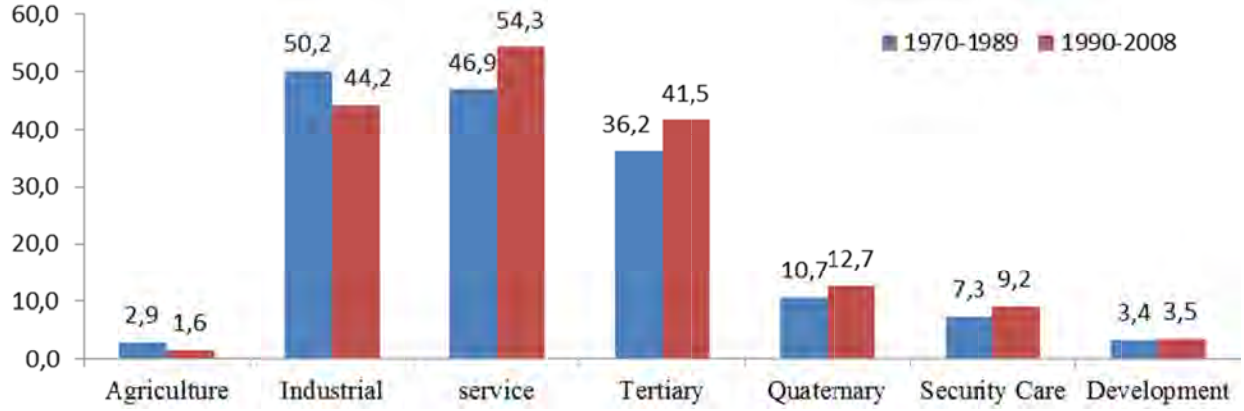


Sources: [14]

The sectoral shares in terms of output or income represent the structure of economy, which has been provided in Fig. 2. Japan is smoothly progressing towards economy

with an increasing weight in the services sectors and a corresponding decrease in the non-service sectors. This trend is visible when one compares the changes in the sectoral shares of the output in 1970-89 and in 1990-2008. This fact lies in the higher growth of both the sub-sectors of service sectors than the other non-service activities. The annual average of share of tertiary sector was 36.2 per cent in 1970-89, which has increased to 41.5 percent in 1990-2008. Similarly, the share of quaternary activity has increased from 10.7 per cent in 1970-89 to 12.7 per cent in 1990-2008. The rise of service sector particularly the quaternary activities are due to the changing pattern of consumption behaviour, population structure and socio-economic behaviours. The fundamental widespread change of the economic structure can be influenced by policy decisions, by permanent changes in the resources, or by changes in the education and skills profile of the population of a region/country. Particularly, the rising of quaternary sector in Japan could be due to its structure and system of care, security and education & development. This is evident from the figures 1 & 2 that, the security and care activities have been dominating over the development activities within the quaternary sector.

Fig. 2: Sectoral share in output (in %)



Sources: [14]

3.2 Quaternary sector and Economic development

The core objective of the study is to examine the inter linkage between the quaternary sector and economic development. As mentioned in the previous section, the Japan is smoothly progressing towards services sectors though the growth in its two components i.e., quaternary and tertiary sectors. Hence, it is important to empirically understand, how these components of services and economic development are interrelated to each other. This is important to be noted that, the testing of data generating process is very essential, before proceeding to explore such type of relations in the time series data. The non-stationary data gives us the spurious and ineffiecnt estimates. Hence, the results of unit test is conducted and results for the three variables are presented in Tab.1.The results suggest that the null hypothesis of a unit root in the time series can be rejected at a 1% level of significance in variable levels. Therefore, all the variables are appeared to be stationary at their levels.

Tab. 1: Unit root test

Variables	ADF test
Economy	-4.19*
Tertiary	-5.5*
Quaternary	-6.4*

Source: Author

Tab. 2: Lag selection

Lag order	LL	LR	FPE	AIC	HQIC	SBIC
0	140.9	NA	0	-7.6	-7.83	-7.74
1	302.02	322.2	1.3e-11	-16.6	-16.4*	-16.04*
2	312.5	21*	1.2e-11*	-16.7*	-16.3	-15.7
3	318.5	12.3	1.5e-11	-16.5	-16.0	-15.1

Note: LL=log likelihood, AIC= Akaik information criteria, HQIC= Hannan quinn criteria, SBC= Schwarz Bayesian criteria

Source: Author

The stationary nature of data generating process of the three variables of interest i.e., the value added in quaternary sector, tertiary sector and the economy as a whole, directs us to estimate the simultaneous equations of the three variables by using VAR. Because, economic development may also affect the growth and development of services activities [2], which indicates that, there is the possibility of simultaneous relations among the variables. One difficulty, which a researcher faces with the estimation of an autoregressive VAR model, is the appropriate specification of the model. Specially, the researcher has to decide which deterministic components should be included and which number of lags should be used as well. Since arbitrarily selected specifications of the autoregressive VAR model may produce unreliable results. We use the lag selection criterion of a database model in order to specify the autoregressive VAR model for Japanese economy. There are different criteria for the selection of lag, as presented in Tab. 2. Based on HQIC and SBIC criteria, the number of lags should be chosen is 1. However, the majority of criteria suggest to considering the lags at 2. Therefore, VAR (2) is specified and estimated.

Tab. 3: Estimated Results of VAR

Variables	Economy	Tertiary	Quaternary
C	2.3 (1.11)**	0.82 (0.99)	1.94 (0.76)**
Economy			
L1	1.3 (0.29)*	0.64 (0.28)**	0.43 (0.2) **
L2	-0.7 (0.3)**	-0.67 (0.3)**	-0.31 (0.2)
Tertiary			
L1	0.24 (0.34)	0.7 (0.4)**	-0.45 (0.23)
L2	0.44 (0.49)**	0.29 (0.29)	0.6 (0.2)*
Quaternary			
L1	-0.24 (0.23)	-0.06 (0.23)	0.86 (0.16)*
L2	0.5 (0.23)**	0.08 (0.22)	0.07 (0.15)
R-sq	0.91*	0.91*	0.92*
n	37	37	37

Source: Author

The estimated result of VAR with three variables is provided in Tab. 3. The R-square in all the three models are significant in explaining measurement of goodness of fit of the regression models. As the variables are in terms of log. values, the coefficient of the independent variables can be interpreted as the elasticity's of independent variable with respect to the dependent variable. The results show that, the quaternary sector and tertiary sector are significant in explaining the development of economy in Japan. Services activities affect economic development by its own growth and development. Also, there could be the spillover effects from services innovation, and hence stronger flows of useful knowledge and information from services to other economic activities [15]. These

two sub-sectors of services are affecting the Japanese economy at their second lags. These two coefficients are statistically significant at the 5 per cent level. This is important to observe that, the coefficient of quaternary sector (0.5) is higher than the tertiary sector (0.44), which suggests that, the elasticity of quaternary sector is higher than the tertiary sector. We can infer that an increase of 1% on valued added of tertiary sector, lead to an increase of 0.44% on the value added of the economy, an increase of 1% on quaternary sector will lead to an increase of 0.5% on the value added of the economy. However, the tertiary sector is caused by its own in the one year lag and the economy. But it is not caused by the quaternary sector. Similarly, the quaternary sector is caused by the development of the economy as a whole and the tertiary sector. The economy causes the quaternary sector at its one year lag, while the tertiary sector causes at its two year lag period.

Tab.4: Diagnostic test

Test	H0	Test statistic	Probability	Conclusion
LM	No auto correlation at lag 1	8.5	0.48	No auto correlation
	No auto correlation at lag 2	9.1	0.43	No auto correlation
Jarque–Bera	Normally distributed	7.52	0.28	Normally distributed

Source: Author

Tab. 5: Granger Causality Test

Dependent variable : Economy			
Excluded	**Chi-sq**	**Df.**	**Probability**
Tertiary	3.26	2	0.05
Quaternary	4.28	2	0.04
All	8.86	4	0.05
Dependent variable : Tertiary			
Excluded	**Chi-sq**	**Df.**	**Probability**
Economy	3.23	2	0.05
Quaternary	2.11	2	0.56
All	9.08	4	0.05
Dependent variable: Quaternary			
Excluded	**Chi-sq**	**Df.**	**Probability**
Economy	3.22	2	0.05
Tertiary	4.7	2	0.02
All	9.8	4	0.05

Source: Author

Further, the study has employed various diagnostic tests for the residuals' of the model viz., Jarque Bera normality test and LM test to examine the validity and reliability of the regression model. Jarque Bera test statistic (Tab. 4) is used for testing whether the residuals of the series are normally distributed. The results on the value of diagnostic tests indicate that, the estimated model satisfies all diagnostic tests. The null hypothesis is of a normal distribution – a small probability value leads to the rejection of the null

hypothesis. Here the null hypothesis cannot be rejected (p value=0.28). So it can be concluded that the residual series is normally distributed. Similarly, the LM test examines for null hypothesis of no autocorrelation. The probability value of LM statistics directs not to reject the null hypothesis. Hence, there is no autocorrelation in the system of equations. The estimated VAR model satisfies the diagnostic tests, and hence it is valid and reliable.

The results of the relationship of these three variables from the VAR model can be summarized by using the Granger causal relationships. As a testing criterion the F statistic was used. With the F statistic the hypothesis of statistical significance of specific groups of explanatory variables was tested for each separate function. The results relating to the existence of Granger causal relationships among the development of quaternary sector, tertiary sector and the economy as a whole is presented in Tab. 5. The result confirms some important findings of the study, such as; (a) the development of quaternary sector and tertiary sector leads to the development of economy as a whole, (b) the development of tertiary sector is caused by the development of economy, but not be the quaternary sector and (c) also the development of quaternary activities is caused by the development of economy and tertiary sector. That means, there are a bi-directional causality from economy to tertiary and quaternary sectors, and a unidirectional causality from tertiary to quaternary only.

Conclusions

This paper tries to examine the patterns of development of quaternary activities, and analyse the relationship among the development of quaternary sector, tertiary sector and the entire economy, by using annual data over the period 1970-2008 in Japan. The empirical analysis suggested that the examined variables are stationary. On this basis the methodology of multivariate VAR model was applied to estimate the relationships. Then the Granger causality test is used to summarise and confirm the relationship among the variables. The results suggest that the development of quaternary sector like the tertiary sector is very crucial for the development of Japanese economy during the last 4 decades. The development of quaternary sector causes the economic development, and is also caused by the latter. The study provides important message is that, the quaternary sector along with the tertiary sector is crucial for the economic growth and development. Hence, appropriate measures should be taken for the development of quaternary activities to achieve high economic growth and development.

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VYTVOŘENÍ MODELU KOMPETENCÍ KRIZOVÉHO MANAŽERA MALÉHO PODNIKU ZA POUŽITÍ SAATYHO METODY

CREATING OF A COMPETENCE MODEL OF SMALL ENTERPRISE CRISIS MANAGER USING SAATY´S METHOD

Marie Mikušová, Andrea Čopíková

Abstract: *The article presents a model of crisis manager competencies. It was created in cooperation with the owners of small businesses. Based on brainwriting the competencies required for a crisis manager were generated. Decision-making method AHP was used for competencies decomposition into two levels. On the first level three groups were placed. The are called managerial competence, interpersonal and technical. At the second level, these groups were further decomposed, e.g. on competencies like leadership, strategic thinking, time management, financial management, resilience, independence in solving problems, team work etc. The respondents performed quantitative pairwise comparisons by Saaty's method. Respondents evaluated competencies at both levels. After evaluating Saaty's matrices modified on the basis of comprehensive results of all respondents the competency model of crisis manager was created. The authors do not claim the permanence of presented model and also accept the possibility of derogation of the competencies required for the function of a crisis manager for large enterprises.*

Keywords: *AHP, Brainwriting, Competency model, Crisis manager, Saaty's method, Small enterprise.*

JEL Classification*: M12, C10.*

Úvod

V praxi se většinou lze setkat s názory, že krizové řízení mohou zvládnout jen velké podniky, které mají specialisty v jednotlivých odborných oblastech. Majitelé a manažeři malých organizací jsou skeptičtí vůči svým možnostem připravit se na krizovou situaci a krizi zvládnout. Kvůli existující mezeře ve výzkumu vztahu krizí a malých organizací, a protože jsou malé organizace vůči krizím velmi zranitelné nejen finančně, ale i nedostatečnými znalostmi a představami o jejich vývoji a zvládání, autorky článku se na ně zaměřily ve svém výzkumu. Tento článek je jedním z výstupů.

1 Formulace problematiky

Dnešní krizové situace jsou mnohotvárné ve věcné i jevové podobě. Tato skutečnost se odráží i ve variabilitě funkcí krizového manažera. Sjednocujícím prvkem krizových manažerů je úsilí o efektivní řešení krize, ať už s výsledkem vyvedení podniku z tísnivé situace, nebo ukončení činnosti podniku. Pokud má podnik výraznou manažerskou osobnost se zkušenostmi, může na pozici krizového manažera dosadit svého zaměstnance. Jestli však není schopen zvládnout situaci sám, měl by zvážit přizvání poradenské firmy, která by jej při řešení krize vedla, případně externího krizového manažera. Na druhé straně, podnik

v akutní fázi krize obvykle nedisponuje finančními prostředky a externího poradce ani krizového manažera si nemůže dovolit.

1.1 Cíl článku

Cílem článku je prezentovat model kompetencí krizového manažera – specialisty pro řízení vzniklé krizové situace. Model byl vytvořen ve spolupráci s majiteli malých podniků. Na základě brainwritingu byl vygenerován přehled kompetencí vyžadovaných u krizového manažera. Rozhodovací metodou AHP byl proveden rozklad kompetencí do dvou úrovní. Saatyho metodou provedli respondenti kvantitativní párové srovnání. Po vyhodnocení Saatyho matice modifikované na základě komplexních výsledků všech respondentů byl sestaven kompetenční model krizového manažera. Autorky netvrdí neměnnost prezentovaného modelu a rovněž připouštějí možnost odchylek u kompetencí požadovaných pro výkon funkce krizového manažera u podniků velkých.

1.2 Teoretická základna řešené problematiky – kompetence krizového manažera

Krizový manažer musí mít silnou vnitřní motivaci, schopnost předvídat a reagovat na změnu situace [1]. Ztotožnění se s rolí krizového manažera předpokládá znalost podniku a jeho okolí, hrozeb a příležitostí, možností a zdrojů použitelných pro záchranu a rovněž odborné a životní zkušenosti s řízením mimořádných situací [11]. Vedení odbornými znalostmi a účelné využívání a podpora znalostí zaměstnanců je dalším požadavkem [23]. Monopolizace znalostí, jejich nesdílení nebo nezájem o nové se může ukázat ve vypjatých situacích jako velmi nebezpečné [6]. Výkonnost manažera i jeho týmu závisí i na schopnosti ujasnit problémy [21]. Krizový manažer musí znát metody a techniky zejména z oblasti strategického řízení, projektového řízení, řízení změny, procesního řízení, time managementu, řešení konfliktů, zvyšování výkonnosti, organizačního řízení, vedení lidí apod. [5]. Vedle dalšího odborného vzdělávání se stávají stále významnějšími znalosti překračující rámec specializace, kterými jsou znalosti sociální, plánovací a rozhodovací [25]. Krizový manažer musí mít i generalizační schopnosti, musí se naučit komplexní problémy strukturovat, využívat dedukce, musí umět využívat synergických efektů [17]. Racionální a intelektuální schopnosti krizového manažera musí být kombinovány se zvládáním citové složky lidského jednání [13]. To se dotýká schopnosti vytvořit emočně příznivé prostředí, uklidnit rozbouřené nálady a city, ovládat vlastní negativní pocity. Přes spolupráci s ostatními se manažer nesmí bát samostatného rozhodnutí. Krizovému manažeru nesmí chybět tvůrčí nápady a sociálně komunikativní zkušenosti [4]. Zaměstnanci následují manažera, na kterého se mohou spolehnout [24]. Pravdivost, názorová stálost a hodnověrnost jsou důležitými hodnotami, které jsou u manažera očekávány [16]. Z výše uvedeného je zřejmé, že k vlastnostem krizového manažera by měla patřit loajalita, vedle vysoké odbornosti i naprostá korektnost [18]. Uvedený nástin požadavků koresponduje s užitím čtyř bodů definovaných v syntéze požadavků vytvořené Millerem [20]. Těmito jsou strategie, vůdcovství, schopnost strukturovat problémy a znalost prostředí. Psychická odolnost je pro práci krizového manažera nezbytná [7]. Margolis a Stoltz [19] identifikovali hlediska, která mohou manažeři využít pro analýzu krizové události s cílem posunout se vpřed. Těmito hledisky jsou kontrola nad děním, vliv na průběh událostí, rozsah škod, trvání obtíží. Wooten a James [26] ukazují na významnou úlohu rozvoje lidských zdrojů pro tvorbu schopností podniku zvládat činnosti krizového managementu. Pomocí kvalitativního výzkumu zkoumali kompetence managementu v každé fázi krize. Zjistili, že většina manažerů si je vědoma negativních důsledků spojených s organizační krizí a chápe důležitost komunikace jako součásti reaktivní krizové strategie. Pro vybudování vysoce výkonného krizového týmu shrnuje Hálek [9] schopnosti krizového manažera jako

schopnost sestavit vhodný tým, citlivě tým vést, poskytovat týmu podporu, stanovit a dodržovat pravidla práce týmu, dbát o dodržování vysoké pracovní úrovně v týmu s plným pracovním nasazením.

2 Metody

Na základě literárního výzkumu byla sestavena báze požadavků na krizového manažera. Současně se zpracováním této báze bylo na podzim roku 2014 uskutečněno dotazníkové šetření. Respondenty byli majitelé podnikatelských subjektů o počtu maximálně deseti zaměstnanců a zároveň s ročním obratem do deseti milionů korun, působící v rámci Moravskoslezského kraje. K získání údajů o respondentech byla využita databáze Hospodářské komory. Vzorky respondentů byly vybrány náhodně prostým výběrem. Pro pilotní šetření bylo zajištěno 50 respondentů. Všichni respondenti uvedli, že jejich podnik již řešil velmi závažné problémy, ale za existenci ohrožující je neoznačili.

Cílem této části výzkumu bylo zjistit, jaké kompetence krizového manažera – specialisty pro řešení vzniklé krizové situace, vyžadují majitelé malých podniků. Ke splnění cíle bylo nutno provést empirický výzkum na reprezentativním souboru podnikatelských subjektů, statisticky zpracovat data a provést jejich interpretaci. Indukcí výsledků literárního výzkumu a expertního šetření byl navržen model kompetencí krizového manažera zaměřeného na malý podnik.

2.1 Brainwriting

Pro identifikaci kompetencí druhé úrovně byla dána přednost metodě brainwritingu před brainstormingem. Základní pravidla jsou stejná. Byla použita základní verze brainwritingu, kdy pracuje každý sám. Důvod pro výběr této metody nebyl pouze organizační, ale rovněž obava, že brainstorming nebude účinný z důvodu ostýchavosti účastníků mluvit, dále z důvodu struktury účastníků a jejich osobnostního nastavení.

Nástroj zúročuje poznatky z výzkumu, který naznačuje, že stále více a lepších nápadů může být generováno pomocí Silent Tools, než pomocí více tradičních brainstormingových otevřených setkání [8]. Existuje několik důvodů, proč je brainstorming považován za neúčinný. Někteří členové skupiny zůstávají kreativně pasivní, zatímco jiní produkují nápady. Tento jev je nazýván sociálním zahálením. Jiní členové skupiny se obávají, že jejich myšlenky budou přitahovat negativní komentář, což je vede k tomu, že mlčí. Tento jev je nazýván hodnocením vnímání. První nápady při brainstormingu mají tendenci mít nepřiměřený vliv na zbytek diskuse. Účastníci diskuse je podvědomě asimilují do svých představ jako vhodný příklad nebo potenciální řešení problému [10]. Sdílení nápadů ve skupinách tak paradoxně vede ke skupinovému myšlení namísto ke generování unikátních nápadů. Brainwriting vytvoří více neutrální prostředí a výsledkem je získání kreativních myšlenek.

2.2 Saatyho metoda stanovení vah

Při výzkumu byla použita Saatyho metoda. Při této metodě jsou srovnávány všechny páry kritérií a hodnocení se ukládá do tzv. Saatyho matice $\mathbf{S} = (s_{ij})$, kdy $i, j = 1,2, \ldots, k$. Prvky matice jsou interpretovány jako odhady podílu vah i-tého (w_i) a j-tého (w_j) kritéria [3]:

$$s_{ij} \approx \frac{w_i}{w_j} ; i, j = 1, 2, \ldots, k \quad (1)$$

$s_{ij} \in \{1/9 ; 9\}$

Porovnání kritérií udává velikost preference, která se vyjadřuje určitým počtem bodů ze zvolené stupnice. Při porovnávání se určuje, zda je jedno kritérium preferováno před druhým, ale také to, o kolik je lepší. Saaty doporučuje využít devítibodovou stupnici, jejíž liché stupně jsou opatřeny deskriptory: jeden bod znamená, že kritéria jsou stejně významná, tři body znamenají, že první kritérium je slabě významnější než druhé atd. až devět bodů znamená, že první kritérium je absolutně významnější než druhé [3].

Saatyho matice **S** je čtvercová matice řádu $n \times n$, pro jejíž prvky platí:

$$s_{ij} = \frac{1}{s_{ij}};\ i,j = 1,2,\ldots,k \tag{2}$$

tedy matice **S** je reciproční. Před výpočtem vah jednotlivých kritérií je nutné ověřit, zda je zadaná matice párových porovnávání konzistentní. Míru konzistence lze hodnotit různými způsoby, jedním z nich je index konzistence definovaný takto:

$$CI = \frac{(X_{max} - n)}{(n-1)} \tag{3}$$

Kde X_{max} (λ_{max}) je největší vlastní číslo matice **S** a n je počet kritérií. Matice **S** je dostatečně konzistentní, jestliže $CI < 0{,}1$ [22].

Výpočet vah ze Saatyho matice je možné provést několika způsoby. Výchozí (Saatyho) postup je založen na výpočtu vlastního vektoru matice v dle vzorce:

$$S \times v = X_{max} \times v \tag{4}$$

Jednou z jednodušších, aproximativních a často používaných metod je stanovení vah s využitím váženého geometrického průměru řádků rozhodovací matice **S.** Normalizací těchto průměrů získáme přibližné váhy kritérií w_i:

$$w_i = \frac{\left[\prod_{j=1}^{k} s_{ij}\right]^{1/k}}{\sum_{i=1}^{k}\left[\prod_{j=1}^{k} s_{ij}\right]^{1/k}} \quad pro\ i=1,\ldots k. \tag{5}$$

2.3 Metoda AHP

Saatyho metoda stanovení vah je základem rozhodovací metody AHP (analytický hierarchický proces). Hierarchická struktura procesu AHP je lineární struktura obsahující několik úrovní, přičemž každá z nich obsahuje několik prvků. Jednotlivé úrovně hierarchické struktury odpovídají uspořádání od obecného ke konkrétnímu. Čím obecnější jsou prvky ve vztahu k danému rozhodovacímu problému, tím zaujímají ve struktuře vyšší úroveň a naopak. Nejvyšší úroveň hierarchie obsahuje vždy pouze jeden prvek, kterým je cíl vyhodnocování, naopak nejnižší úroveň představuje jednotlivé varianty (alternativy) řešení.

2.4 Kompetence a kompetenční modely

Kompetence jsou definovány jako soubor požadovaných vlastností, zkušeností, znalostí, schopností, dovedností, motivace, postojů a osobnostních charakteristik pro danou činnost nebo pozici. Jde tedy o širší význam než pojem kvalifikace, který je více zaměřen na formální osvědčení dosažených výstupů z učení a vzdělávání. Kompetence lze sledovat podle různých hledisek. Zde jsou uvedeny pouze vybrané. Hroník, Vedralová a Horváth [12] kompetence člení ze sociálně-psychologického hlediska na kompetence řešení problému, interpersonální kompetence a kompetence sebeřízení. Další pohled na dělení

kompetencí je založen na typu práce a na něj navázaných potřebných dovednostech. Výsledný profil konkrétní pozice vzniká jako kombinace dovedností z kategorií: manažerské kompetence (dovednosti a schopnosti, které přispívají k vynikajícímu výkonu v roli manažera, např. řešení konfliktů, strategické myšlení, koučování a další), interpersonální kompetence (nezbytné pro efektivní komunikaci a budování pozitivních vztahů s ostatními, např. empatie, vyjednávání, prezentační dovednosti a další) a technické kompetence (dovednosti vztahující se ke konkrétní pracovní pozici, např. programování, sběr dat a jejich analýza, sestavování rozpočtu a další). Kompetence lze rozdělit i na základě toho, pro kterou skupinu zaměstnanců jsou určeny [15].

Jak uvádí Kovács [14], kompetenční modely popisují konkrétní kombinace znalostí, dovedností a dalších charakteristik, které jsou potřebné k efektivnímu plnění úkolů v organizaci. Tyto kombinace jsou strukturovány do různě velkých celků. Jaký kompetenční model a s jakou mírou konkretizace jednotlivých kompetencí nakonec vznikne, závisí na záměrech každé organizace. Kompetenční modely poskytují dobrý základ pro vytvoření integrovaného systému řízení lidských zdrojů [14].

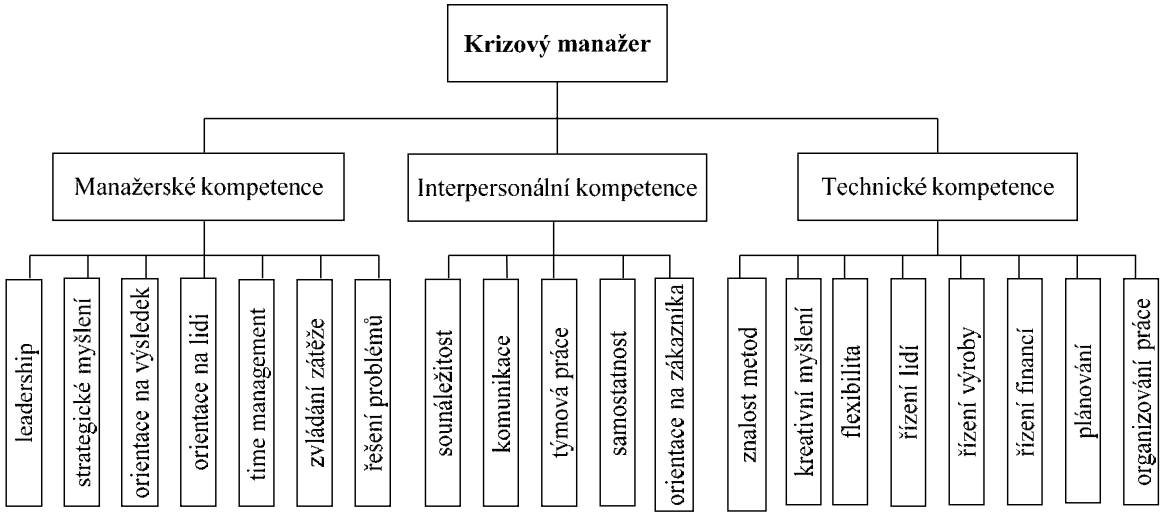
3 Výzkum a jeho výstupy

Na základě brainwritingu byly identifikovány kompetence nutné pro výkon pozice krizového manažera. Brainwritingu se zúčastnilo patnáct majitelů malých podniků, kteří nemají teoretické poznatky z krizového managementu, a tedy ani nebyli seznámeni s požadavky na dovednosti a znalosti krizového manažera, které jsou prezentovány v úvodu tohoto článku.

Respondenti elektronicky poslali facilitátorovi souhrn svých nápadů – názorů na kompetence krizového manažera. Relevance každého podnětu byla filtrována ve spolupráci s manažery vrcholové úrovně a s odborníky z řízení lidských zdrojů. Názory byly agregovány do tří skupin: manažerské, interpersonální a technické kompetence (dle subkapitoly 2.4). Vytvořený seznam byl předložen všem účastníkům brainwritingu k vyjádření. Na základě jejich připomínek byla zpřesněna formulace stěžejních kompetencí a jejich popis. K popisu byla částečně využita databáze kompetencí [2].

Rozklad kompetencí s využitím metody AHP je znázorněn v Obr. 1.

Obr. 1: Rozklad kompetencí s využitím metody AHP



Zdroj: vlastní zpracování

Následující části výzkumu se zúčastnilo 50 respondentů. Skupiny kompetencí na první i druhé úrovni respondenti hodnotili použitím Saatyho metody s cílem zjistit, které kompetence mají největší hodnotu pro úspěšný výkon funkce krizového manažera. Za pomoci mediánu byly vytvořeny z jednotlivých ohodnocení závěrečné matice prezentující celou skupinu padesáti respondentů.

3.1 Zjištěné výsledky a jejich komentář

Následující text se zaměřuje na výsledky zjištěné z modifikovaných Saatyho matic prezentované v grafické podobě. Vzhledem k omezenému rozsahu článku je prezentována Saatyho matice pouze pro kompetence první úrovně.

3.1.1 Párové srovnání kompetencí první úrovně

Vytvořená Saatyho matice (Tab. 1):

Tab. 1: Saatyho matice pro srovnání kompetencí první úrovně

matice S	manažerské	interpersonální	technické	geomean	váhy w	S x w	$(S \times w)_i/w_i$
manažerské	1	4	9	3,3019	**70,09%**	2,1782	3,1078
interpersonální	1/4	1	6	1,1447	**24,30%**	0,7551	3,1078
technické	1/9	1/6	1	0,2646	**5,62%**	0,1745	3,1078
				4,7112	100,00%	λ_{max}=	3,1078
				RI=	0,580	CI=	0,0539
				N=	3	CR=CI/RI	**0,0930**

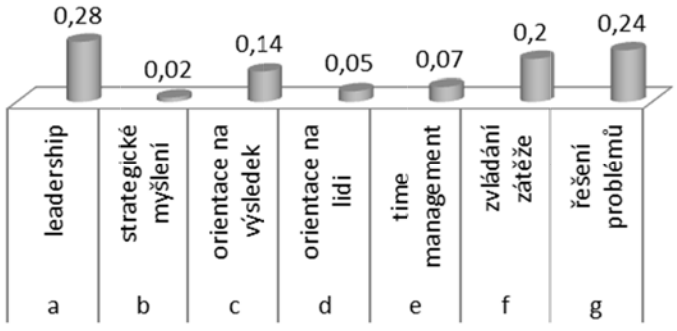
Zdroj: vlastní zpracování

Je zřejmé, že respondenti vysoce hodnotí manažerské kompetence (dovednosti a schopnosti, které přispívají k vynikajícímu výkonu v roli manažera), kterým přiřadili váhu 0,7 (70,09%). Zarážející je malé ohodnocení technických kompetencí (tj. dovedností vztahujících se ke konkrétní pracovní pozici) s váhou 0,056 (5,62%).

3.1.2 Párové srovnání kompetencí druhé úrovně

Hodnocení kompetencí na druhé úrovni jsou zachyceny v následujících obrázcích.

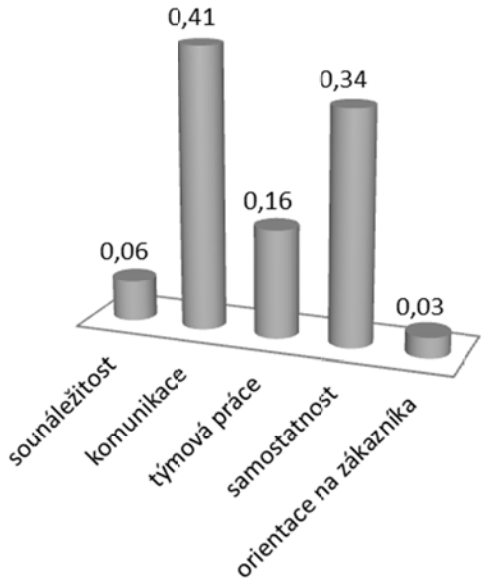
Obr. 2: Párové srovnání manažerských kompetencí



Zdroj: vlastní zpracování

Respondenti si uvědomují, že charismatický vůdce je v době krize nepostradatelný, stejně jako schopnost řešit problémy (Obr. 2). Zároveň si uvědomují potřebu psychické odolnosti. Schopnost strategického myšlení byla ohodnocena velmi nízko. Zřejmě je to dáno skutečností, že v době krize je třeba v prvé řadě přijmout rychlá, krátkodobá rozhodnutí. Avšak ani v této době se nevyplatí podceňovat nebo ignorovat strategická rozhodnutí s dlouhodobým dosahem. Při tvorbě kompetenčního modelu bylo této kompetenci na základě diskuse s odborníky z managementu přiděleno vyšší ohodnocení jejího významu.

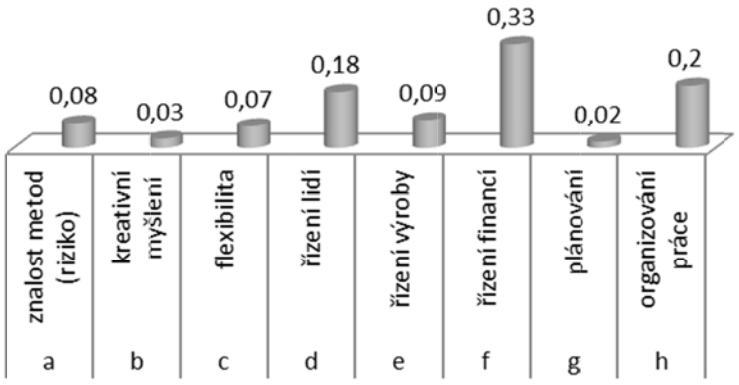
Obr. 3: Párové srovnání interpersonálních kompetencí



Zdroj: vlastní zpracování

Komunikovat, nebát se přijmout a nést odpovědnost za samostatné rozhodování považují respondenti za nejdůležitější interpersonální kompetence (Obr. 3). Rovněž si uvědomují, že záchrana podniku je v rukou nikoli jedince, ale týmu. Krizový manažer musí být schopen a ochoten vytvořit tým odborníků pro záchranu podniku a využívat a podporovat jejich schopnosti.

Obr. 4: Párové srovnání technických kompetencí



Zdroj: vlastní zpracování

Řízení financí je viditelně na prvním místě technických kompetencí (Obr. 4). Lidský faktor, tj. řízení lidí a organizování práce je na druhém místě důležitosti. Malá důležitost přisuzovaná plánování může mít stejnou příčinu jako ohodnocení strategického myšlení ve skupině manažerských kompetencí. Nízké ohodnocení schopnosti kreativního přístupu je překvapující. Jakoby se majitelé zaměřili na reakci na vzniklou situaci a její vývoj (flexibilita), ale nehledali dopředu, jak kreativně této situaci předejít. Dovednosti a znalosti z oblasti rizikového managementu byly překvapivě taktéž nízko hodnoceny. Při tvorbě kompetenčního modelu bylo na základě další diskuse s respondenty a odborníky z oblasti managementu přiděleno uvedeným kompetencím vyšší ohodnocení významnosti.

4 Kompetenční model

Po zjištění preferencí jednotlivých kompetencí, jak je popsáno v předchozí kapitole, bylo přistoupeno ke stanovení stupňů významnosti jednotlivých kompetencí. Byla použita ordinální škála.

Stupeň jedna znamená, že kompetence má pro dosažení excelentní úrovně výkonnosti práce krizového manažera pouze marginální význam, stupeň čtyři signalizuje, že kompetence má pro dosažení excelentní úrovně výkonnosti rozhodující význam.

Dále bylo nutno nadefinovat úrovně kompetencí. Znamená to popsat projevy kompetence podle úrovně jejího rozvoje. Úrovně kompetencí obecně slouží k tomu, aby bylo možno posoudit rozvoj kompetence jednotlivých zaměstnanců. Pro účely výzkumu bylo stanoveno pět úrovní. Úroveň jedna charakterizuje slabou úroveň kompetencí, úroveň tři střední, úroveň pět excelentní hodnotu. Opět byla použita ordinální škála.

Jednotlivým kompetencím byly následně přiděleny cílové hodnoty, které udávají očekávanou úroveň kompetence pro pozici krizového manažera malého podniku. Cílové hodnoty nemusí dosahovat u každé kompetence maximální výši. Vždy záleží na charakteristice dané kompetence.

Stanovení náplní jednotlivých úrovní kompetencí bylo časově náročné a vyžadovalo úzkou spolupráci s manažery. V tomto případě byla inspirativní databáze kompetencí [2].

Přidělení stupňů důležitosti jednotlivým kompetencím a stanovení cílových hodnot očekávané úrovně jednotlivých kompetencí bylo provedeno opět elektronicky použitím metody brainwritingu. Do brainwritingu byli zapojeni respondenti a také odborníci z oblasti řízení lidských zdrojů a krizového managementu. Pro konečné přidělení stupňů a úrovní byl použit medián.

Navržený kompetenční model je znázorněn v Příloze 1. Z důvodu obsáhlosti kompetenčního modelu jsou zde uvedeny příklady pozorovatelného chování pouze u manažerských kompetencí, a to pro stanovenou cílovou hodnotu. Jako příklad popisu jednotlivých úrovní kompetence jedna až pět byla vybrána kompetence „strategické myšlení“.

Závěr

S tak mnoha problémy, kterým čelí malé podniky, se zdá nepravděpodobné, že by jejich manažeři zaměřili omezené prostředky na potýkání se s potenciálními krizovými událostmi, byť se jich obávají. Kladou stále relativně malý důraz na krizové plánování. Jediným podnětem k obavám se zdá být reálný výskyt krize. Podniky, které krizí dosud neprošly, se prevencí zabývají málokdy. Provedený výzkum, jehož částečný výstup je zde prezentován, ukázal, že majitelé malých podniků nevědí, jak se začít na krizi připravovat, ale mají představu, jaké požadavky by měl krizový manažer splňovat. Prezentovaný kompetenční model krizového manažera vychází z jejich reálných požadavků.

Zde uplatňované pojetí kompetencí zdůrazňuje vnitřní kvalitu člověka, která je výsledkem jeho rozvoje, víceméně nezávislou na vnějším okolí, která mu umožňuje dosáhnout očekávaný výsledek práce. Pro definici či posouzení kompetencí je nutné použít kromě výčtu kvalifikace také rozsah zkušeností, znalostí, schopností, dovedností, postojů a osobnostních charakteristik.

Poděkování

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Příloha 1: Část kompetenčního modelu pro pozici krizového manažera: manažerské kompetence (zkráceno)

Kompetenční model pro krizového manažera malého podniku				
Kompetence		**Příklady pozorovatelného chování pro danou cílovou hodnotu**	**Cílová hodnota (1 – 5)**	**Důležitost kompetence (1 – 4)**
Manažerské kompetence	**Leadership**	Přebírá zodpovědnost za skupinový výkon i v případě neúspěchu; analyzuje úspěšný i neúspěšný výkon a navrhuje opatření; snaží se, aby všichni členové týmu pochopili a ztotožnili se se skupinovým cílem; je vynikajícím příkladem pro druhé; chová se jako vůdce, nevyhýbá se komplikovaným situacím, je věrohodný a spolehlivý; dokáže podřízeným dát prostor a možnost převzít zodpovědnost za dílčí úkoly skupinového výsledku.	**4**	**3**
	Strategické myšlení	Je schopen spolupracovat při tvorbě strategie. Myslí dopředu. Je schopen dopředu odhadnout možné vnitřní a vnější faktory ovlivňující podnikatelské aktivity. Schopnost uvažovat v širších souvislostech je omezena.	**3**	**3**
	Orientace na výsledek	Udržuje disciplínu v týmu; nevyhýbá se kritice; dosažený výsledek je důležitější než pohoda lidí.	**3**	**3**
	Orientace na lidi	Jeho činnost neovlivňuje to, co si o něm spolupracovníci myslí; nebojí se konstruktivního konfliktu; chápe obavy zaměstnanců, ale neovlivňuje to jeho činnost.	**2**	**2**
	Time management	Umí stanovit priority; umí delegovat činnosti; umí říci ne; dovede si zajistit včasné a správné informace; brání se rušivým vlivům.	**2**	**2**
	Zvládání zátěže	Odvádí velmi dobrý výkon i v extrémně složitých podmínkách; realistický přístup k zátěžovým situacím, mu umožňuje získat nadhled a odstup; vyvolává změny za účelem efektivnějšího dosažení výsledku; při překonání překážek analyzuje situaci, hledá alternativy a volí nejvhodnější řešení; v zátěžových situacích je oporou druhým; je schopen i v silně vypjatých situacích kontrolovat své pocity, dokáže pracovat s emocemi druhých; má vysokou sebedůvěru a pocit plné zdatnosti.	**5**	**4**
	Řešení problémů	Jak samostatné, tak týmové řešení problémů je mu zcela vlastní; je schopen vést řešitelské týmy; na základě svých zkušeností se spoléhá na svou intuici, využívá kreativní myšlení; vytváří motivující prostředí pro řešení problémů; je schopen vytvářet nebo se podílet na tvorbě standardů, kterými předchází vzniku problémů; dokáže překonávat předsudky a stereotypy myšlení.	**5**	**4**

Zdroj: vlastní zpracování

Příloha 2: Kompetence strategické myšlení - popis úrovní 1 až 5 (zkráceně)

1	Nemá strategické myšlení. Není schopen dopředu odhadnout možné vnitřní a vnější faktory ovlivňující podnikatelské aktivity. Plánuje pouze operativně.
2	Při spolupráci na tvorbě strategie potřebuje kontrolu a dohled. V jednoduchých situacích je schopen dopředu odhadnout možné vnitřní a vnější faktory ovlivňující podnikatelské aktivity.
3	Je schopen spolupracovat při tvorbě strategie. Myslí dopředu. Je schopen dopředu odhadnout možné vnitřní a vnější faktory ovlivňující podnikatelské aktivity. Schopnost uvažovat v širších souvislostech je omezena.
4	Myslí strategicky. Předvídá a zvažuje širší souvislosti. Je schopen samostatně se podílet na tvorbě strategie. Projevuje podnikatelského ducha.
5	Myslí strategicky. Vytváří a sděluje ostatním jasnou vizi a strategii. Předvídá a uvažuje v širokém rámci napříč jednotlivými specializacemi a chápe složité vzájemné vazby. Zavádí a udržuje v chodu systémy, nástroje a opatření podporující příslušnou strategii.

Zdroj: vlastní zpracování

TRENDS IN THE CHANGES ON THE INTERNATIONAL ART MARKET

Ewelina Sokołowska

Abstract: *The main goal of the article is to present investing in art as contemporary financial innovation. Investing in artifacts, compared to traditional forms of capital allocation, is an alternative form of investment. The art market is an attractive form of investment, because it combines economic aspects of capital allocation with aesthetic sensations. Enrichment of the society significantly stimulates development of the art market. For nearly a decade, international art market has been characterized by a dynamic growth rate. Up until the outbreak of the financial crisis in 2008, the growth rate ranged from 30% to 60% annually. The value of the global art market in 2013 was 63 billion dollars, while the sale of artifacts between the years 2009 and 2013 increased by 60%. It indicates the prospects for further development of this segment of the international alternative investments market. As such, analysis of the changing trends on the international art market seems to be of interest. To lead such analysis, the method of induction and deduction have been use.*

Keywords: *Financial innovation, Art investment, Alternative investments, Analysis of the market, Wealth management.*

JEL Classification: *G11, G19, Z11.*

Introduction

Alternative investments belong to contemporary financial innovations. This category of investments has resulted from continuously evolving international financial market and is a consequence of the changes on that market [23]. Investing in artifacts, compared to traditional forms of capital allocation, is an alternative form of investment. For nearly a decade, international art market has been characterized by a dynamic growth rate. Up until the outbreak of the financial crisis in 2008, the growth rate ranged from 30% to 60% annually[9]. The value of the global art market in 2013 was 63 billion dollars, while the sale of artifacts between the years 2009 and 2013 increased by 60%. This indicates the prospects for further development of this segment of the international alternative investments market. As such, analysis of the changing trends on the international art market seems to be of interest.

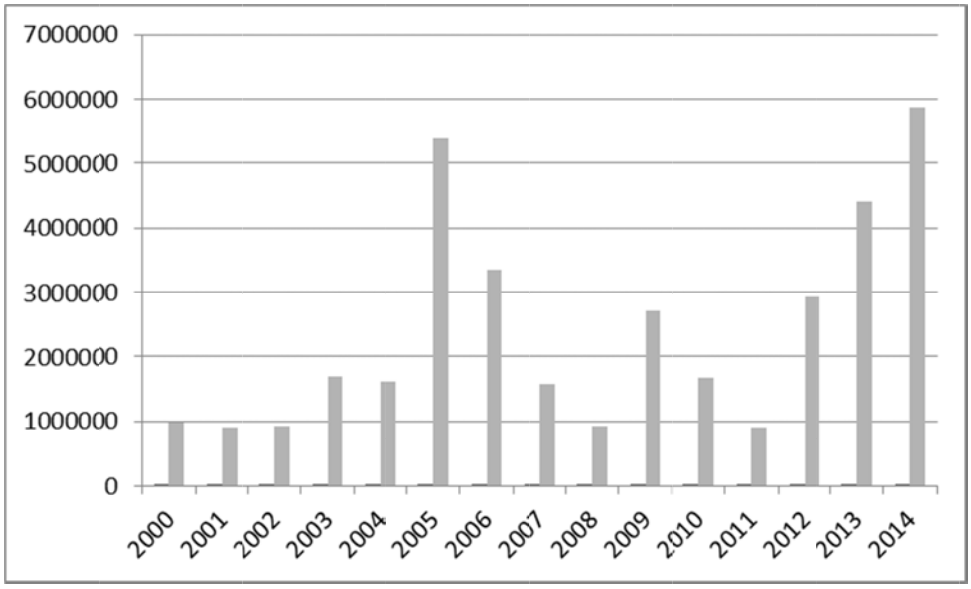
1 Statement of a problem

Worldwide enrichment of the society and the spread of knowledge regarding the markets of collectibles has resulted in more people being interested in collecting and/or investing in artifacts [20]. Specificity of the art market lies in its unique nature, which prevents creation of standardization patterns for the majority of artifacts. The art market is characterized by a high degree of decentralization. This means, that art markets in particular countries worldwide are characterized by different specificity, various magnitude as well as by varying impact of the factors affecting their functioning. Transactions on the art

[9] The best investments in art, which allowed earnings in millions.

market are individual in character, while the prices of the artifacts being sold are known only the parties in a given transaction (excluding the data from auction listings)[4]. Assessment of the global art market's size is done through summarizing auction sales. There is not any official data on the sales of artifacts through galleries and private dealers. International art market is dominated by two major auction houses, that is, Christie's and Sotheby's. Their subsidiaries function in many countries worldwide. In this context, certain degree of integration of the auction market can be noticed, which is more a manifestation of the globalization process at the enterprise level [12]. The sales thorough auction houses constitute 70% of the overall global sales [2]. For many years, these houses have been trying to gain a leading position on the international auction market. In 2011, Christie's announced its annual sales at the level of 5.7 billion USD [28], while Sotheby's obtained a result of 5.8 billion USD [29]. Other auction houses, which also play a significant role on the international art market, include: Phillips de Pury, Bonhams & Butterfields, Dorotheum, Lyon & Turnbull as well as Freeman's. It is, however, difficult to determine the actual share of the sales conducted by auction houses in the total value of the global art market. R. Campbell states, that the share of auction sales in the overall global sales range from 40% to 60% [6]. M. Maneker, on the other hand, believes that the value of the global art market is much higher, while the share of the auction sales oscillates between 20% to 25% [14]. The report published annually by *The European Fine Art Foundation*- TEFAF, is a resource which contains data about artifact transactions conducted by private dealers in auction houses. TEAFAF also organizes the annual art and antiques fair in Maastricht. The crisis on the international financial market also has caused a decrease in the value of artifacts. During the years 2008 – 2009, the value of the market fell to 20 billion EUR. In 2010, another increase in the number of transactions and their value occurred. According to the data in the report on participation in the public sector (auction houses) and in the private sector (including private dealers, galleries, art fairs), in 2010 it was equal to 49% and 51% [24]. The global art market reached its record value in 2013. In the first semester, the art market increased by about 17% in comparison to the same period in 2013, and exceeded 7 billion dollars [27]. During the first six months of 2013, the product of public artifacts auctions worldwide was equal to 7.12 billion dollars (5.22 billion euro), excluding the expenses, while during the same period of the previous year it was equal to 6.11 billion dollars (4.66 billion Euro) [27]. In the first mid-2014 the United States, the sale on art auctions (i.e. paintings, sculptures, drawings, photographs, engravings) was equal to 2.3 billion dollars (1.73 billion euro), which constitutes an increase of over 28%. Chronological progression of the art market turnover shows figure nr 1.

Fig. 1: Chronological progression of the art market turnover in 2000-2014

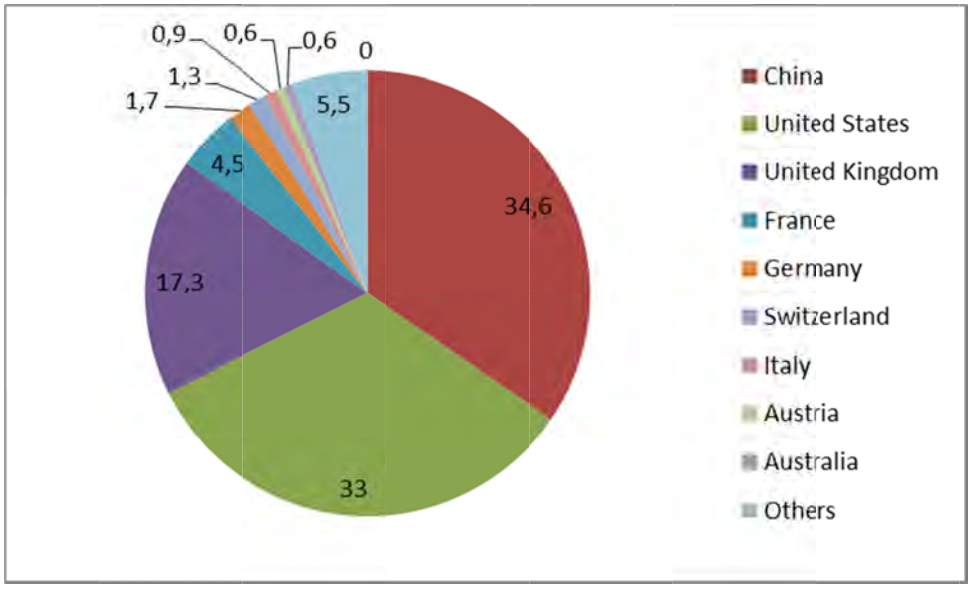


Source: own elaboration on the data of artprice.com

The US share in the global market was 33.4%. China reached sales at the level of 1.9 billion dollars (1.44 billion euro) and an increase of 6.9%. The share of China in the global art market was 27.7%. The market success of Asian artists, mostly Chinese, but also Hindu, is a 21st century phenomenon. The works of those artists massively began to appear at the beginning of the century, while in 2006 the demand for their works rapidly increased. In 2007, for the first time in history, China overtook France in the field of art trade and was ranked at the third place. This dynamically developing country, having the highest percentage of young millionaires (that is of the average age of 39 years old), needed only three years to become world leader in art trade, overtaking the United States and Great Britain. Currently, over one third of the global artifact transactions takes place in China, while 70% of the artifacts sold there have not left the Asian content. The year 2010 was considered as a symbolic transfer date of the art center to Hongkong. Western museum institutions, curators and critics have lost their absolute powers and currently have to seriously consider what is happening on the Asian continent, even if, as they often complain, the new art collectors lack taste and knowledge of contemporary art.

In 2013, the third place in artifacts trade belonged to Great Britain, where the sale of artifacts was equal 1.8 billion dollars (1.23 billion euro) and as such it increased by over 25%. A similar value obtained British participation in the art market – 25.2%. The art market in France obtained weaker results, with sales worth 284 billion dollars (207.8 billion euro), positioning France at the fourth place in the ranking, while its share in the market was 3.98%. The fifth place belonged to Switzerland, where the sale of artifacts was equal to 106 billion dollars (77.9 billion euro), that is 10% more than in the previous year. Germany took the sixth place with the sale of 103 billion dollars (76 billion euro) – 3.7% more. According to Artprice data (published in February), during 2013 the value of the global sale of artifacts exceeded 12.05 billion dollars (8.8 billion euro), while China was the major buyer, maintaining its position fourth year in the row. The figure 2 shows the distribution of the global fine art auction sales revenue by country in 2013. 34.6 percent of the total sales revenue was generated in China in 2013.

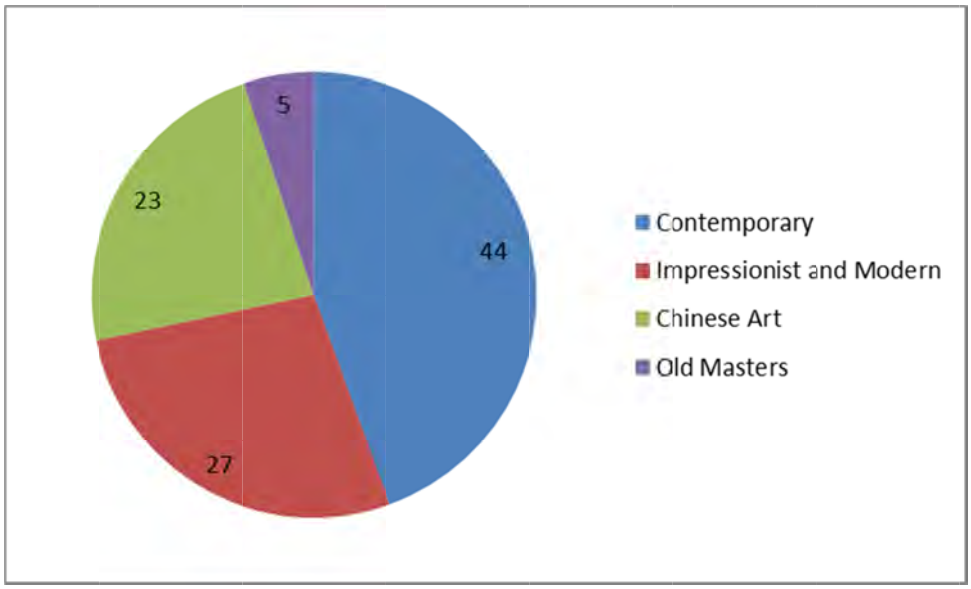
Fig. 2: Distribution of fine art auction sales revenue worldwide in 2013, by country



Source: own elaboration on the data of artprice.com

The year 2013 was also a record year for Christie's auction house, which increased its sales income by 16%, due to an unprecedented increase of the buyers. The auction sales of artifacts at Christie's in the previous year amounted to 7.48 billion dollars. It is an absolute record in the history of the art market and auction houses as well as the second record in the history of this company. During the last year Christie's also broke the record in the sales of luxury articles and jewelry, which reached the total of 714 billion dollars – by 20% more than in 2012. Distribution of Christie's and Sotheby's auction sales worldwide in 2013, by category presents figure nr 3.

Fig. 3: Distribution of Christie's and Sotheby's auction sales worldwide in 2013, by category



Source: own elaboration on the data of artprice.com

While analyzing the trends on the international art market, it is worth to indicate the changes which took place during the years 2008 – 2009. The changes in the generic structure of the artifacts sold during the period of the financial crisis, between the years 2008 – 2009, provide important information for investors. It can be inferred that antique art constitutes good means of capital thesaurization during a downturn in the economic

situation. While planning an investment into art, it is worth to consider the conclusions drawn from the analysis of the structure changes on the market during a given time. Commonly, investing in antique art is treated as more stable and safer capital allocation. Investing in art often is compared to investing in bonds, because it entails works of the artists who are dead. Contemporary art constitutes more risky means of capital allocation. The supply of contemporary art is characterized by a tendency to increase, while the prices of the artifacts being sold often are lower [9].

Contemporary art, during recent years, has been a category characterized by growing interest of investors, which is confirmed by the data indicating that contemporary art auction turnover has increased almost tenfold during 2000 – 2008. Clearly, an increase of the sales of contemporary art can be noticed. Artifact sales during 2006 – 2008 was characterized by its high growth dynamics. The highest level of auction turnover was noted during the first half of 2008. Observation of the art market provides additional information. While the segment of contemporary art during the last years has been dominating in terms of the sale dynamics, the highest losses resultant from global recession were noted in this sector. During 2009 there was a decrease of the turnover in auction houses, in terms of quantity and quality, equal to almost 60%. Fairs is a market channel developing very rapidly during recent years and it has become a platform for promoting and exchanging information on the sales and purchases. For art galleries and private dealers art fairs are a chance of gaining potential buyers from all over the world as well as of finding new talents. Fairs foster international distribution of the artists' work. Participation in such events, although very expensive, is definitely profitable for the exhibitors, since it demonstrates their importance and influential position on the art market [1]. Growth tendency of this sort of events is also visible during recent years [25]. Most prestigious fairs, which present modern and contemporary art, take place in Basel. Art Bases Miami Beach Fair, which mainly presents art from American continents, also seems to be important. London FRIEZE Fair is another event, which mainly offer the latest art. It is also worth to mention Paris Art Fair FIAC, which mostly cares for participation of important galleries outside of Paris and maintain high artistic standards and appropriate proportions between contemporary art and modern art [22]. ARCO Fair in Madrid, the newly established Abu Dhabi fair or the fairs organized in the financial and geographic center of Asia, that is Hong Kong, cannot be forgotten either. It is worth noting that the Far East has huge financial potential and ambitions for creating an alternative to the world's greatest contemporary art fairs taking place in the United States and Europe [25].

International fairs undoubtedly are professionally organized events with financial participation of such organizations as: UBS Bank or Art Basel and Art Basel Miami Beach. Deutsche Bank, in turn, financially supports the London Frieze Fair and the Hong Kong fair [25]. The virtual VIP (viewing in private) art fair initiated in January 2011 by two art dealers from New York is a novelty. During its first edition almost 140 galleries from over 30 countries worldwide participated in this fair. Virtual fair was very popular, therefore its organizers intend to continue organization of this event in the following years, despite some technical errors they encountered [3].

2 Tendencies in the changes on the international art market

Development of the art market is largely conditioned by macroeconomic changes. Analysis of the global art market's evolution also indicates impact of other social and technological factors. A global increase in prosperity, especially in the countries

described as the emerging markets, is the most important factor impacting the growth of the demand for artifacts. This demand for artifacts has been increasing along with population growth in the high-net-worth individual sector. It should be noted, that in 2003, the biggest buyers in Sotheby's auction house came from 36 different countries. Four years later, the wealthiest buyers entailed 54 countries. The fact that the total number of those purchasing artifacts tripled in just four years is also significant [20]. This tendency can be explained by the argument, that during the times of economic uncertainty, investors seek such assets, which will maintain their value over long term. It thus can be assumed, that the share of the spendings on art in the expenses associated with luxury goods will keep increasing. Research and studies conducted on the field of the finances related to art market have increased transparency and popularized knowledge on this category of investments. It should also be underlined that the supply of the best artifacts is limited, while their value generally increases over time. This increasing tendency refers to art of deceased artists. Their paintings often are missing or are bought by museums and collectors. Art markets stay efficient, despite the changing market conditions. It is worth noting that about 80% of auction transactions are below 10000 EUR. This means, that the art market is becoming more accessible for a wider range of investors. Development of the art market has also been influenced by social factors. Currently, cultural life is strongly marked by globalization, while numerous international art fairs draw the interest of collectors and investors. The current state on the art market has also been influenced by technological factors. Highly progressive technical and technological development have caused the investments in art to be perceived as the means of cash allocation in a separate category of assets. What is more, emergence of auction houses and of Internet databases has caused the market to become more transparent and widely available for the investors worldwide. Considering the tendencies occurring on the international market as well as the increase in the number of wealthy investors in the private banking sector, it is worthwhile to determine the perspectives for the development of this segment of alternative investments. Currently, more and more people are becoming interested in investing in art.

Investing in artifacts, particularly in those of deceased artists, is associated with a risk purchasing a forgery. Development on the art investment market also requires overcoming many obstacles associated with its development. W. Niewiarowski believes that the factors which can limit the demand of potential artifact buyers include [19]:

1. Lack of legal regulations concerning appointment and the operating mode of an expert in the field of art. The role of an expert usually is undertaken by an incompetent person, often the artist's relative. As family members, such experts want to have the priority in the judgment on authenticity of the work by a given artist. This raises uncertainty of the collectors on the Polish art market.
2. Obligation for the galleries and auction houses to report all transactions over 15 thousand EUR to the Chief Inspector of Financial Information. In practice, this means transfer of private data of the person making a given purchase to an institution, where this data can easily leak from, reduce confidence and trust of the investors.
3. High taxes: VAT and *droit de suite*. *Droit de suite* is the right of the artist and his/her heirs to receive a percentage from the price of a given artifact being sold to another owner.

Conclusion

The art market is an attractive form of alternative investment. Investing in art combines economic aspects of capital allocation with aesthetic sensations. Enrichment of the society significantly stimulates development of the art market. Both, the prices and the supply of artifacts during the times of economic crisis decrease, similarly as in the case of the prices of stocks. In contrast, investments in artifacts are an alternative for stock market investments, similarly as raw materials or real estate. As history has shown, artifacts are one of the best media of material value, while investments in them belong to the most reliable ones, particularly during the time of financial crashes and insecurity. Historically, an increasing trend can be observed on the art market, while appearance of a new group of wealthy people in the countries with large populations, such as China, allows an assumption that the market will continue to increase.

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THE POSSIBILITIES OF DETERMINING ENVIRONMENTAL IMPACTS OF ECONOMIC ACTIVITIES IN A REGION

Karel Šatera, Ilona Obršálová

Abstract: *The paper deals with the increasing demand for high-quality information for management decisions about the consequences of economic activities in the territory. Emphasis is placed on monitoring the environmental externalities in focus on the aspects of the polluter and the links with the consequences of economic activity. Analyzes current approaches to the creation of administrative units and functional regions and their advantages and disadvantages are included. It discussed the possibility of creating special-purpose regions to better identify the causes and consequences mainly for the purpose of monitoring the impact of the air pollution. The paper also deals in detail with the availability of regionally structured data and indication of the pollution impact. Advantages of this process can be seen in the generally greater awareness of the spatial impact of economic activities in the administrative region of origin and the impact on the quality of the environment. The combination of qualitative and quantitative estimation of the extent analysis of the relationship of economic activities and environmental quality of the region are looking to new strategies aimed at the region as a flexible, dynamic space that emphasizes cooperation between regions and individual actors.*

Keywords: *Region, Functional region, Polluter*, *Environmental impacts, Negative externalities.*

JEL Classification: *Q56, R12.*

Introduction

When investigating the impact of economic activities on the environment, it is a significant problem to cope with very various symptoms of these effects in the area and the possibilities of their description using indicators which would be constructed from standard monitored information. Negative externalities caused by industrial activities are still better identified and also included into the results of the polluter's activities. This is done using different tools, both administrative and economic but in the recent years also more and more by voluntary responsibility of the polluter, such as corporate social responsibility, environmental management systems and other activities. It is also becoming a necessity for the public administration short-term as well as strategic management to know the relation between the activities within the region and their impact on the environment. Therefore, it is necessary to broaden and increase the quality of perceiving the creation and impact of negative externalities. Availability of such information enables prediction and planning of further development as well as operational intervention and control activities. This fact is connected to the increasing demand for comparison not only between regions but also their particular units which might have administrative or nonadministrative character.

The article aims to analyze the possibilities that could better identify the extent of impacts caused by a particular polluter. One such option is the creation of functional regions, for which further describes the methodology and possible usage.

1 Problem formulation

The actual need to solve these relations is supported by a whole list of documents on international as well as national level. The most important include e.g. Stiglitz – Sen – Fitoussi Report and Barca Report (Agenda for a Reformed Cohesion Policy) [23, 2]. The efforts for a reformed cohesion policy go in the direction characterized by the key term "place-based development model" (e.g. Barca Report). The execution of regional public administration should involve creation of own strategic sustainable development plans, development of region, municipality or integrated development plans of cities in accordance with particular policies and with regards to the available financial tools. This article puts emphasis on the aspect of the originator (polluter) and connection with the impact of the activity. This approach requires delimitation of the activity impacts by the polluter within the region. However accurate e.g. cartographic representation of the pollution situation cannot provide information about the polluter (e.g. maps highlighting areas exceeding pollution limits) and therefore, do not bear necessary information for decision making.

The key national strategic document is the Regional Development Strategy of the Czech Republic 2014 – 2020 [15]. It calculates with support of balanced development of regions that is with the conception of sustainable development so that the balance between the social, economic and environmental development pillars is kept. This article analyzes the problem with regards to other goals, especially pro-growth and disparity and such that prevent risks of future development. The goal is to broaden the view on regionalization of the economic performance by environmental context including the relation to the externality originator (polluter). It is a similar approach to the trend of social and environmental responsibility in the corporate sector. Responsible regional development must be based also on decision making at such situations when impact of activities outside the region needs to be reflected. The range of the impact from economic activities including transport within the region does not copy the administrative organization and so far it is not possible to delimit a theoretically defined region of economic activities impact on the environment and causing harm to the environment.

1.1 Region classification with regards to the term of functional region

Statistic classification of regions is represented by hierarchically sorted division of particular areas which sorts and divides a particular territory to individual levels where a higher grade of area unit is divided into more detailed lower. There is a hierarchical logical order of the particular superior and inferior levels of classification

The main principles of classification include stabilization of their elements in time and area which has a positive impact on comparability of indicators within time series of the regional statistics and also unification of the principles of creation and alphanumerical labeling of the regional units in the EU. The classification has a large methodical significance within the frame of outlining, collection, processing and dissemination of statistic information both at the national and European Union level. It is also connected to the preparation, realization and evaluation of various policies.

The current classification CZ-NUTS arranges regional units in the Czech Republic to the level of NUTS 3 where it is possible to differentiate administrative and nonadministrative regions.

Regional policy is connected especially to realization of programs at the level of administrative regions within the authority of the relevant institutes of executive power.

However it is not possible to exclude potential requirements of the users of the regionally structured data to characterize nonadministrative regions, or functional regions, based on statistic data. In relation to the above written facts, these requirements meet many limitations with mostly objective character.

Understanding of the definition of regions and their classification is not perceived unitedly in the literature and is accompanied by ambiguity. Administrative units are understood as such units which were created as a result of political will. They are defined with regards to the goals of the territorial community in harmony with the number of inhabitants necessary for effective and economical reaching of the goals and also with regards to historical, cultural or other factors. The literature offers a large number of various classification factors. They correspond to political, sociographic and other conditions of each country [3,4,7, 9,10,14,24,25 and other]. We recommend the used literature for details.

Administrative regions are defined for the needs of execution of the public administration and regional governments. There are two basic relations between particular levels: composition, which means that a region of a higher level consists of several units of lower levels and the relation of superiority and subordination which expresses the obligation of the norms adopted at the higher level for all subordinate regions. Certain time stability is needed. Administrative regions tend to be understood as hard, irreversible structures. Many authors [19, 24 and others] point at certain limitations given by the demarcation of regions. There might be distortions given e.g. by not respecting the historic development, socioeconomic situation etc. This problem is significant especially in the of monitoring and managing the changes in the environment quality caused by economic activities within the region. These changes can be monitored in all parts of the environment – air, water, soil, ecosystems etc. Thereby we get to so far not often explored problematic areas and their overlapping.

The Regional Development Strategy of the Czech Republic (RDS CR) says that the topic of regions and periphery areas supported by the state requires effective cooperation by the regions as this is where the problems are most often accumulated. The weakest part mentioned by the document is “poor cooperation by the regions in solving problems of the inner peripheries”.

The RDS CR sets the typology of regions for the purpose of program substitution based on detailed analysis of the regional development key factors. The purpose of this typology is to reflect differentiated conditions of area development and in relation to the type of regions to define priorities, measures and direction of the funds and so increase the objectivity and efficiency of the regional policy within the development of the Czech Republic [15].

The functional regions are determined for solving concrete problems, such as solving economic underdevelopment or environmental problems. A functional region ceases to exist after solving the problem or fulfilling the purpose it was determined for. The determination of the functional region territory is not limited by the borders of administrative regions. Therefore, the determination might include grouping of regional units or regions which are on the lowest level, e.g. districts in the Czech Republic.

Based on the studies and following expert discussions of the last several year, it is possible to see the effort to define new priorities and principles of future European cooperation in the new program period 2014 – 2020. It is probable that in these conditions there will be increasing need to direct politicians in higher rate to the functional regions on the local level.

These changes are related to the development opportunities as well as to competition between regional units at all levels. This requires operational monitoring of the situation on the level of regions so that responsible organs of the decision making sphere may evaluate the growth or decrease of intensity of individual occurrences, to take – within their authority – measures and estimate development for the nearest periods. In dynamic environment the level of management quality is dependent on the system of its information support. The regional statistics at the regional level is a necessary tool for making strategic as well as operational decisions.

The theory of spatial external effects [22] can be used for the conception of creating functional regions. If the benefit from measures taken for environment protection, eventually cost for pollution, are not borne only by the inhabitants of the particular administrative region but also third subjects, we speak about positive or negative spacial external effects. The utility from the acts of other administrative unit reduce the motivation to take the cost for environment protection. The public good environment quality has different spacial dimensions; the differences are expressed in a different way (e.g. utilities from a clean lake or greenhouse gas reduction). At the given time moment the externalities are dependent especially on industry structure in the particular region.

The spacial externalities lead to the effort to create purpose (functional) regions. Such a region is determined by the area determination of the environmental problem. Today's multipurpose regions (the same regional government fulfills more tasks) are solved by one-purpose administrative units. Often the regions touched by a particular environmental problem are not equipped with corresponding competencies to solve the problem. This is being even more accented by centralization of environmental policy.

The relation between functional arrangement and administrative determination of a region is important for solving the social and economic development. Administrative regions are set up with the goal to reach their maximum balance (area, population etc.) so that administrative activities could be ensured. The most efficient areas for solving development problems are functional regions; however, the solution is processed for logical administrative reasons within the frame of administrative regions [14].

1.2 Sources of information, their limitations and problem analysis

Description of functional regions based on regional data can currently be usually described as the state of lack of data. In such cases it is necessary to take into account that the workplaces of the state statistical service are oriented especially on international requirements related to the legislation of the EU and the Czech Republic. In this context, the regional data are almost exclusively designed to be compatible with the NUTS classification (regions and areas of cohesion generally understood as local level). Other factors which form the objective limits for possibilities to create indicators in the regional level include the effort of the state statistical service workplaces to decrease administrative burden of the statistical survey respondents, especially in the enterprise sector, and also budgetary and capacity limits of their work.

Another restriction of the regionally oriented data availability is the applied method of statistic data collection. The regional accounts come from the yearly national accounts composed for the Czech Republic. In harmony with the ESA (European System of Integrated Economic Accounts) methodology the factors are inquired using enterprise method which is connected to the allocation of the indicators to regions based on the real place of activity of the units. In the majority of cases this assumes creation of functional

units by composing lower area units than a region (and also here for many indicators it is not possible to find regional estimates for some areas). In current conditions and acceptance of exceptional measures which influence above all budgetary and capacity abilities of the state, it is not possible to realize detailed estimates of all parts of the environment to determine the functional regions.

There are different information sources, databases etc. to ensure the needed data. Apart from the significant role of the Czech Statistical Office (CSO) in obtaining the information for the data from the regional area, there is also the Regional Information Service (RIS) and other component environment information systems.

The portal of regional information services was founded based on the Government Resolution 682/2000 about the Regional Development Strategy of the Czech Republic for the needs of information support for the area of individual regions of the Czech Republic. Its operations and coordination is ensured by the Center for Regional Development of the Czech Republic, a contribution organization of the Ministry of Regional Development of the Czech Republic (it methodically manages, directs the creation, construction and operations). The RIS portal maintains unified and clear information structure of regions. This open system offers information sorted by regions, cohesion regions (NUTS II), districts and municipalities with extended competencies. It makes accessible mostly regional data focused on data characterizing economic environment, the environment, social environment, administrative organization, self-governance, public administration, subsidies etc.

All regional RIS have been processed in a unified structure which enables the user easy orientation across the regions and effective access to specific information for any region of the Czech Republic. In connection to RIS, the Center for Regional Development of the Czech Republic also built Map Server RDS CR in order to display specific data on development and activities in particular regions of the Czech Republic in higher quality. It offers raster and vector maps in different scales down to the level of town plans, including vector data across the border – SABE 2004.

RIS – Source Database KROK (regional and district statistics) is taken from the Czech Statistical Office without the possibility to modify the database. Using the basic indicators from this database and their combination in the calculation enables to display a large quantity of so called determined indicators.

The source information for the category environment quality is available in more information systems. Those are especially information systems administrated by Cenia (www.cenia.cz) – Integrated pollution registry, IS OH, ISPOP, HEIS, ISSaR, http://geoportal.gov.cz/ and other map servers, (www.chmi.cz) – ISKO, (www.czso.cz) and many others. Further it is possible to use analyses prepared by the regions – especially in PZKO (Programs to reduce emissions and improve air quality regions] - including dispersion studies, administrative decisions etc. [21]), GIS run by the regions and others.

Based on above listed facts it is possible to consider the estimates for indicators of functional regions only in the form of estimates based on expert evaluation or special methods of data mining. These methods enable gross approximate estimates of the required indicators for such areas. It is not possible to expect the range of geographic-branch or sector structures to be comparable with the range provided by conventional statistics on the national level. This fact significantly reduces the information value of the regional information produced based on aggregation or disaggregation or by use of modeling.

2 Methods and suggestions

A functional region in the connection to the impacts of economic activities on the environment (region of impact of economic activity on the environment) is such a region which corresponds to the area location of the problem burdening the environment (e.g. smog situations, exceeding concentration of health harming pollutants in the air etc.).

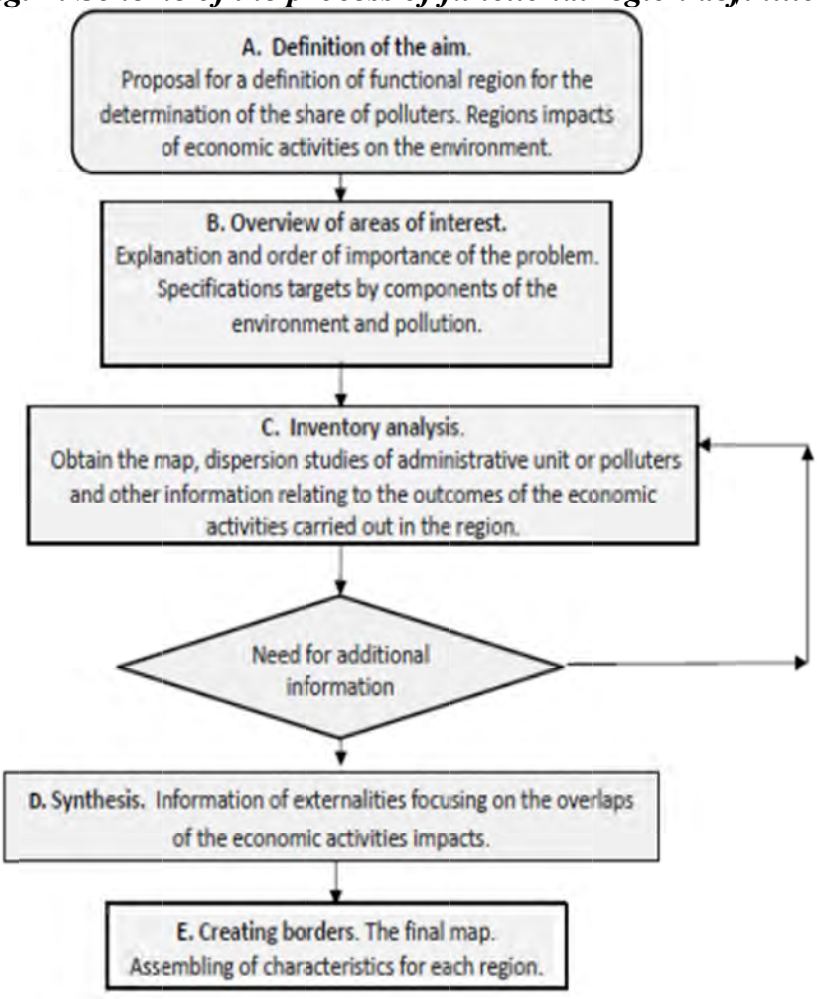
In the current situation the creation of such a region is accompanied by many problems. The recommendation is, therefore, limited only to successive steps to create the basic idea about the spacial effects of the economic activity within the region with focus on air quality.

The approach may be different based on the analysis related either to the result of the effect of individual pollutants or to the final problem. The selection of the second option will make the decision making easier (clearer relation to the inhabitants' preference, elimination of the problematic relation between emissions and imissions). The result will be material for further internalization strategies which must be environmentally and alocationally effective.

The determination of the region may be based on quantitative or qualitative evaluation. Quantitative approach forms a statistic frame for analysis selection and data classification for region creation. Qualitative approach means expert determination of selected analyses and classified data for region definition.

When defining such regions, it is necessary to take these steps (Fig.1):

Fig. 1: Scheme of the process of functional region definition



Source: Authors

Processing inventarisation analysis of influences on the environment assumes to classify to groups based on impact (caused problems). These problems are classified as potential start of acidification (SO_2, NO_x), harming health of inhabitants (such as PM_{10}, $PM_{2,5}$, VOC and others), climate changes (greenhouse gases), potential creation of ground-level ozone (precursors O_3).

Collection of the maps, description and collection of data, identification of future region characteristics (map revision – they concern only a very narrow problem and might lead to misinterpretation). Although the relative significance of environmental characteristic remains constant, the described quality of information used on the map for the area of spread of the region, it often changes and may request changes in the drawing. The level of data generalization differs among the different maps of the same scale, but also in individual maps. The evaluation of the current air pollution in the region needs to be based on the tabular and map overviews published by CHMU [6].

The maps for area representation of the imission characteristics and atmosphere deposition are created based on the connection and integration of the GIS system, relation database of measured imissions and chemical composition of atmospheric precipitation ISKO and model calculations based mostly on emissions. An important role is also played by adding and correcting the objective calculations on the basis of expert estimate [6]. These maps of imissions with exceeding imission limits do not inform about the polluter, therefore, it is necessary to analyze cause separation in the area (of economic activity) which should be characterized by these described functional regions.

The method which will be used for modeling of the economy activities impact on air quality will be especially dispersion studies (reference methods for processing studies SYMOS 97, ATEM a AEOLIUS). The content requirements for dispersion studies are defined by appendix 15 to the Decree 415/2012 Coll. [18], as well as the Journal of the Ministry of the Environment CR XIII, August 2012, part 8.

In order to recognize the impact of the economic activities from neighboring regions it is necessary to monitor the frontier areas. The main source for finding the range of economic activity impact is represented especially by the dispersion studies. These have a long tradition in the Czech Republic; they have been prepared for various situations, stationary as well as linear sources, area sources and also for some cities and regions of the Czech Republic (Programs for decreasing emissions and increasing air quality)[21]. The method has some limitations. The evaluation of polluted air impact uses especially dispersion studies which are a model calculation, not measured values. Based on the Decree of the Ministry of Environment 330/ 2012 Coll., [17] the methodology of dispersion studies is applicable for air pollution calculation for urban agglomeration above the level of building roofs and country areas. Another restriction is the range of calculation area limited to 100 km from the source of pollution. The dispersion studies exist for other regions, e.g. in the interest area of the Pardubice Region, also in the Liberec Region, Hradec Kralove, Vysocina, South Moravian and Vysocina regions. Unfortunately, the studies are not compatible [21]. They were prepared using the SYMOS and ATEM methodology.

They were also created for different pollutants. This limits their further use. The most important are the identifications of overlapping to other regions. Unfortunately, this cannot be read from the existing dispersion studies – in most times the published data are limited only within the borders of the particular region. Also the graphical outputs and choice of pollutants differ among the studies (apart from the main emitted substances). The time

compatibility is not ensured, too. It would be very beneficial to publish binding instructions for study elaboration, with regards to the time restrictions and funds requested. In further details to dispersion studies and air pollution in the Czech Republic we refer to the currently running public order for the Ministry of Environment. The procedure for measuring and imission limits is included in the appendix to the Law 201/2012 Coll. on air protection [5].

3 Discussion

The estimate of region of economic activity impact on the environment, border definition and their description are not discrete, it needs to be counted with the transition zones – fuzzy borders. The draft of the functional region borders is defined based on expert evaluation.

This procedure has certain logic in obtaining the information about the causal relation between economic activity and spatial representation of impact from product pollution. At the current state of cognition, especially available information, the spatial delimitation cannot be accurately identified but the borders can be set using expert estimate.

One of the supporting program tools for purpose region creation may be geographic information systems. Their utilization is further only drafted as they were not used within the project due to limited data sources. The problem is their insufficient compatibility and partly limited accessibility for the general public. The data are owned by various institutions and available in different scales and formats.

Conclusion

The advantage of this approach can be seen in the generally higher awareness of spatial impact of economic activities on the area of an administrative region and the origin of the impacts on the environment quality. The combination of qualitative estimate of the extent and quantitative analysis of the relation between economic activities and environment quality are a new approach focused on regional strategies. In accordance with the current theories of regionalistics the concept of region as flexible and dynamic space is accented which puts emphasis on cooperation between regions and the particular actors. Responsibility of the regional strategy is understood in the meaning of extended responsibility of corporate activities.

The form of a purpose region is essentially virtual and enables to better describe the root cause of the problem and solve it more flexibly. However, some information needs for successful definition of purpose regions remain unfulfilled in the details. They concern especially excessive administration workload in searching both, dispersion of emitted substances in the area as well as indicators of economic performance monitored in the structure of administrative regions.

Similar procedures regarding region classification, approaches to regions definition etc. are devoted mostly to economic and social parameters; a deeper analysis of environment quality is not included.

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ECONOMIC ACTIVITIES OF THE SLOVAK CO-OPERATIVES IN THE YEARS 2010 TO 2014

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Abstract: *On 9th February 2015, 170 years passed since the first co-operative enterprise had been established in Slovakia. Co-operatives were developing through many stages and their importance at present is different than it used to be in the past. However, the mission of co-operatives has not changed: it is a long- term everyday care of both their members and employees. Currently, over a quarter of million of the Slovak population are either members or workers in one or more co-operatives. The housing and consumers' co-operatives have the most numerous memberships while various small producer co-operatives have the fewest members. For a successful future of Slovak co-operatives, it is inevitable to propose such solutions in the economic and social areas, that will meet needs of their members while taking into consideration customers' requirements. In the current fierce competition, the international collaboration is even more important than it has been before, because local markets are too small for profitable co-operatives. This contribution pays attention to the assessment of economic activities of the Slovak co-operatives in years 2010 to 2014.*

Keywords: *Entrepreneurship, Enterprises, Employees, Members, Co-operatives, Indicators, SWOT analysis.*

JEL Classification: *M13, M21.*

Introduction

The economic and non-economic activities of co-operatives are of a great benefit to economic and social development of both regions and national economy of the country. Slovak co-operatives face even more important tasks nowadays than they did in the past as they have to adapt to continuous changes faster not only on the local markets but also on the international ones. They also have to fulfil all their primary functions as they have been doing until now - its social function as employers in the region, stabilizing role, or educational function, thereby helping to secure sustainable economic and social environment in the region.

1 Statement of a problem

There is only a modest representation of co-operatives among all enterprises in Slovakia, and their number is continually decreasing since transformation in 1993. According to the recent data of the Statistical Office of the Slovak Republic, as of 31th January 2014 there were 1542 co-operatives, of which as many as 795, i.e. 51.56 per cent were microenterprises with maximum staff size of 9 employees. Most of them provided services. At the same time, there were 461 small enterprises, mainly producer co-operatives with the workers size between 10 and 49 employees. The medium sized enterprises with the staff from 50 to 249 employees were agricultural co-operatives. There were about 147 such entities.

On the contrary, building and consumers' co-operatives have increased in size, and now they normally rank among large enterprises. At the present time as much as 5 per cent of the

population in Slovakia are members of one or more co-operatives. Their members take advantage of - or they should take full advantage of - those things which co-operatives have been established for. The activities of successful co-operatives can be a good example of how things can be implemented for other ones. The flexibility of co-operative management and members can mobilize the regional potential, increase employment, improve services, and unprofitable co-operatives can be turned into effective entrepreneurial co-operatives, or interesting social co-operatives with benefits to their members. It is important that employees and members collaborate not only to stabilize the co-operative but also for its economic and social development.

2 Methods

The main goal of this paper is to show economic activities of the Slovak co-operatives, analyze their strengths and weaknesses in the period from year 2010 to year 2014 and to suggest such solutions for future which should lead to market competitiveness.

We also used the database of the Statistical Office of the Slovak Republic and the Cooperative Union of the Slovak Republic based on the fact sheets from the 2010 to the 2014 as our primary data for identification of the present financial situation in the Slovak cooperatives. The database contains the data from 100 per cent cooperative enterprises which have a status of legal entities in the SR.

For our analyses, we are using the standard methods of research work, such as analysis and synthesis, comparison, induction, deduction, and generalization.

3 Problem solving

The main problem of Slovak co-operatives is undercapitalization, low production efficiency and quality of services for members. The problem was addressed on theoretical level by Slovak authors, e. g. Bielik [1], Šúbertová [9], Czech authors, e. g. Helešic [2], Němcová [6], Novotný [7, 8], and international teams of authors, e.g. Hesková, Pícha, Šúbertová [3]. They proposed solutions for maintaining cooperative functionality towards members and consumers alike on a high level of standards. Everyday work must prove that this type of entrepreneurship is acceptable and implementable in almost all branches of social activities.

It will be important to return to flexible types in a new, modern quality and to utilize existing human potential, Slovak and international experience and possibilities to distribute products not only on local markets, but also on broader European or world markets. For their success in future, it is inevitable to suggest such solutions in economic and social sphere for co-operatives in Slovakia, which would satisfy needs of their members and simultaneously respect requirements of their consumers.

3.1 Branch structure of the co-operatives in Slovakia

The branch structure is based on tradition of co-operatives in Slovakia where there are four main types of co-operatives:

- Agricultural co-operatives aimed at crop and livestock production with 46.6% ratio of total average number in 2010-2014,
- housing co-operatives aimed at sale or lease of properties with 16.6% ratio of total average number in 2010-2014,

- consumers' co-operatives dealing with wholesaling and retailing with 15.4 % ratio of total average number in 2010-2014,
- production co-operatives dealing with both manufacturing of goods and providing services, including business services with 6.9 % ratio of total average number in 2010-2014.

The other activities represent only 14.5 per cent share of the all number of co-operatives. Traditionally, the predominant activity in Slovakia is agriculture. Table 1 gives more details of co-operatives activities in 2010-2014.

Tab. 1: Branch structure of co-operatives in the Slovak Republic in the year 2010 - 2014

Branch structure according to SK NACE	**Year 2010**	**Year 2011**	**Year 2012**	**Year 2013**	**Year 2014**	**Growth Index 2014/ 2010**
Agriculture, forestry and fishing	739	737	720	718	712	96.3
Sale and lease of properties	256	255	255	261	264	103.1
Wholesaling and retailing	240	240	238	240	238	99.2
Manufacturing	117	115	108	100	97	82.9
Professional, scientific and technical activities	64	68	69	73	77	120.3
Construction	70	68	61	58	55	78.6
Administrative and support services	34	34	36	41	43	126.5
Information and communication	19	18	17	16	17	89.5
Finance and insurance	8	9	9	9	9	112.5
Accommodation and food services	7	6	6	6	7	100.0
Art, entertainment and leisure time activities	7	6	5	5	5	71.4
Transport and storage	5	5	6	7	6	120.0
Education	4	4	4	4	4	100.0
Water supply; wastewater treatment	3	3	3	3	3	100.0
Health care and social assistance	3	2	2	2	2	66.7
Electricity, gas, steam and air conditioning supply	2	2	2	2	2	100.0
Mining and quarrying	2	1	1	1	1	50.0
Slovak co-operatives in total	**1,580**	**1,573**	**1,542**	**1,546**	**1,542**	**97.6**

Source:[11], the author's own calculations

Since the crisis began, the number of co-operatives has been decreasing, however, only by about 0.5 per cent a year on average.

There was great differentiation in years 2010-2014: a considerable increase in numbers of co-operatives in the areas of administrative and support services by as much as 26.5 per cent; on the contrary, in the building industry there was a decrease by 21.4 per cent.

3.2 Selected indicators for Slovak co-operatives in comparison with other enterprises from 2010 to 2013

The co-operatives in Slovakia have been developing in a number of various ways over the past five years. In comparison to the other types of companies, however, it shows worse economic results in almost all indicators.

The indicators of liquidity show the solvency of enterprises. The situation has not changed as regards the second grade liquidity where all figures are lower for co-operatives with their inability to cover their current liabilities by current assets.

The third grade liquidity shows better figures in years 2010 and 2011 for other types of companies (not cooperatives), and it is different in years 2012 and 2013. The difference is caused by the differentiated stock which often represents the least liquid assets which are held mainly by agricultural co-operatives.

Tab. 2: The selected activity indicators for Slovak co-operatives in comparison with other enterprises from 2010 to 2013 ("C" indicates co-operatives; "OS" indicates other types of companies - legal persons) 1/2

Indicator (median)	**Year**			
	2010	**2011**	**2012**	**2013**
Second grade liquidity – co-operatives (hereinafter C)	1.04	1.03	1.06	1.07
Second grade liquidity / other subjects (hereinafter OS)	1.12	1.32	2.01	1.73
Differences in second grade liquidity C – OS	**-0.08**	**-0.29**	**-0.95**	**-0.66**
Third grade liquidity – C	1.51	1.54	1.64	1.66
Third grade liquidity - OS	1.18	1.40	2.11	1.84
Differences in third grade liquidity C – OS	**0.33**	**0.14**	**-0.47**	**-0.18**
Maturity of liabilities – C	201.53	189.79	180.21	202.87
Maturity of liabilities - OS	156.46	133.06	121.77	146.82
Differences in maturity of liabilities C - OS	**45.07**	**56.73**	**58.44**	**56.05**
Maturity of debts - C	97.90	82.75	73.83	84.76
Maturity of debts - OS	105.97	86.95	77.66	88.37
Differences in maturity of debts C - OS	**-8.07**	**-4.20**	**-3.83**	**-3,61**
Debt/asset ratio - C	43.87	47.69	44.79	43.82
Debt/asset ratio - OS	78.32	67.57	49.55	55.13
Differences in debt/asset ratio C - OS	**-34,45**	**-19,88**	**-4,76**	**-11,31**
Return on equity - C	0.08	0.42	0.06	0.01
Return on equity - OS	4.40	11.52	6.72	5.06

Source: [4], own calculation

Tab. 2: The selected activity indicators for Slovak co-operatives in comparison with other enterprises from 2010 to 2013 ("C" indicates co-operatives; "OS" indicates other types of companies - legal persons) 2/2

Indicator (median)	**Year**			
	2010	**2011**	**2012**	**2013**
Differences in return on equity C - OS	**-4,32**	**-11,10**	**-6,66**	**-5,05**
Return on sales - C	1.08	1.46	0.78	0.17
Return on sales - OC	5.12	7.67	8.00	6.71
Differences in return on sales C-OC	**-4,04**	**-6,21**	**-7,22**	**-6,54**
Pre-tax return on assets (gross return)- C	0.06	0.15	0.02	0.00
Pre-tax return on assets - OS	1.88	3.98	3.92	3.91
Differences in return on assets C-OC	**-1,82**	**-3,83**	**-3,90**	**-3,91**
The ratio of value added to sales - C	17.07	20.62	20.28	16.90
The ratio of value added to sales - OC	21.10	26.55	28.67	27.83
Differences in the ratio of value added to sales C-OC	**-4,03**	**-5,93**	**-8,39**	**-10,93**

Source: [4], own calculation

Among **the activity indicators**, the maturity of debts of co-operatives is the worst one in the whole period in comparison to the other forms of ownership because many co-operatives also hold the long-term liabilities to their owners arising from transformation, which can cause a lot of problems due to a seasonal character of their production. However, the differences in maturity periods are being reduced, and they have become almost the same for all forms of business ownership.

The indicators of indebtedness show clearly that most co-operatives are financed from their own resources while the other forms of ownership use external resources. Paradoxically, in the period when interest rates were falling, the co-operatives were not raising external financial resources as they could not afford to get new loans due to their long-term financial problems. On the contrary, the newly established smaller companies, mainly limited liability companies, had a better access to the financial resources from the EU funds.

The co-operatives indebtedness is one-fifth higher calculated per hectare of farmland due to their loss-making livestock production, the costs of large cattle unit are considerably higher in breeding pigs as well as cattle. At the same time, the cooperatives invest less financial resources in intensification of crop production which is more efficient. There is also a different structure of subsidies for cooperatives and for other types of companies.

These long-term problems were reflected also in **all indicators of return**, **such as return on equity, or return on sales.** The differences are multiple and permanent. Until the system of financial support of agriculture is changed within the common agricultural policy, the results will not change either.

In other types of cooperative enterprises, there was an unfavourable financial situation also in the building and construction industry and in some other industries as well. The situation in small and medium sized enterprises and/or in cooperatives is evaluated in other publications, e.g. Myšková [5], Šúbertová [10].

The ratio of value added to sales had every year bigger differences between co-operatives and other subjects.

However, the problem of all types of co-operatives is their "bad reputation". The various deformations of co-operatives between years 1948 and 1989 have lead to low credibility also in the new types of co-operatives in services, or to development of well-established profitable co-operatives.

The assessment of Slovak co-operatives can be briefly characterized in the form of SWOT analysis as follows.

The differentiation is given by variability of activities of co-operatives, their different objectives and conditions.

Tab. 3: The SWOT analysis of Slovak co-operatives

Factors	**S (Strengths)** • Interest in joining the membership and managerial activities because of self-realization • Enough information and communication technologies • enough potential members and workers (human resources)	**W (Weaknesses)** • Differentiation in approach to cooperative enterprises, lack of interest in this form of ownership, negative past experiences, • Disinterest in cooperative entrepreneurship due to lack of finance
O (Opportunities) • top managers' mobility • knowledge and experience of senior employees and members, • graduates' flexibility and knowledge of IT , language competence	**SO approach (maxi-maxi): Use of all opportunities by an offensive approach:** setting up a company while studying ❑ collaboration of cooperatives with organization supporting businesses	**WO approach (mini-maxi): More careful use of opportunities:** ❑ development of collaboration the cooperative's neighbourhood, ❑ raising finance from various grants, and external sources
T (Threats) • fierce competition in the market • frequent changes of legislation referring to business environment, • outstanding liabilities from the past in some cooperatives	**ST approach (maxi-mini): Using a position of strength to stop danger** ❑ updating the knowledge through foreign and domestic cooperative organizations ❑ implementing motivation tools for good workers	**WT approach (mini-mini): Considerations of compromises** ❑ manager consider a slow start of collaboration due to various ❑ blurred visions of cooperative's future activities

Source: author's materials

Potential young workers, as well as members, are leaving co-operatives for better paid jobs due to lack of funds. The remuneration of co-operative workers is still below average, which is a serious social problem especially in case of graduates.

4 Discussion

At the moment, the producer co-operative industry is being restructured and job opportunities are being created in the form of sheltered workshops for physically or mentally disabled people. There are over 20 sheltered workshops within the Slovak co-operatives, and more than 30 sheltered workplaces. These sheltered workshops and workplaces are of great importance in the process of inclusion of disabled people into the labour market and working teams. Only a few people know that co-operatives –especially the producer ones - have always been performing very well, usually above average, in export. That is due to their atypical, small series products which are not manufactured abroad. However, the foreign market for small series products from the Slovak producer co-operatives is beginning to be saturated at the moment, for example the pottery from Modra, crystal from Valašská Belá etc.

On the contrary, the consumers' co-operatives aimed at trading were doing much better when their retail sales went up by almost 2 per cent every year.

The consumers' cooperatives have been integrated into COOP Jednota, a cooperative chain store (hereinafter CJS), which was established in 2002. Because of rapid development of information and communication technologies, and later also social networks, the management of consumers' cooperatives in Slovakia changed and enlarged the existing marketing information system by a social marketing with clear integrity of all its parts. It can be concluded that 13 years ago, the new stage of development of Slovak co-operative social marketing began. Marketing started using communication technologies; Slovak cooperatives have been using e-business since then as well. Simultaneously, cooperatives launched their first websites, improved electronic communication with their suppliers (B2B), as well as with their customers (B2C). Since 2004 a new system of customer loyalty cards has been implemented. They switched from sticking stamps into "booklets" to loyalty cards with chips. By the beginning of March 2014, the number of loyalty cards had increased dramatically to over 965,000 in the COOP Jednota system. That represented 55 per cent of purchases on cards, i.e. 500 Euros per card yearly.

The customer loyalty cards play also an important role in managing chain stores. They enable to track the information on individual customers' purchases (and their families) which can be further used for analysis of related products and prediction of probable purchases, segmentation of clients in individual points of sale, setting price levels in time and space – temporary price changes, salvation of clients "endangered" by competition – usually this refers to the customers who live in rural areas, or those who commute to work to cities where they can do shopping, cost reduction with repeated purchases by customers offered by suppliers, motivating specific customers – e.g. by promotions on their special days such as birthdays, etc. CJS communicate with its customers via Facebook, and promotes its products through various competitions, including the ones organized by other companies.

The COOP Jednota brand has already won the Slovak Superbrands Award twice, in 2013 and 2014. Its continuous modernization is increasing sale efficiency. In 2013, COOP Jednota introduced as the first company in Slovakia system of electronic price tags

in many towns and cities. Electronic price tags are highly efficient as they enable to display and change simultaneously and wireless prices of more than 12 000 items.

Currently, CJS brings together more than 170,000 members. CJS gives jobs to over 13,000 employees in nine logistic centres and in 31 regional consumers' cooperatives. CJS is the third biggest employer in Slovakia, 85 per cent of its employees are women. Therefore co-operatives enable flexible working hours for women with small children to reconcile both their duties as employees and mothers.

COOP Jednota Group is also the biggest food seller in Slovakia. The consumers' cooperatives have confirmed their leading position over several years when they have gained 20 per cent share in the domestic food market. Domestic food products represent 74 per cent on the shelves. The retail sales were developing between 2010 and 2013 as follows: year 2010 - 1,456mil. Euros; year 2012 - 1,171 mil. Euros; and in 2013 almost 1,211 Euros. This means an increase by 17 per cent in 4 years.

In the past five years Jednota launched successfully as many as 741 products of its own brand. Although the number of new products is not increasing anymore, their popularity is going up. Currently, they have a 19 per cent market share.

The co-operatives that fulfil mainly social functions are housing co-operatives. These co-operatives administer 290,000 co-operative apartments. They take care of maintenance and repairs of housing stock and are oriented to quality of services provided. As the prices of older flats in co-operative apartment houses are considerably lower than those of newer ones, after 1992 the ownership has been transferred from co-operatives to users, especially in bigger cities, where there is a higher demand for flats. After some co-operative apartments had been transferred to their users, there originated hybrid, or heterogeneous co-operative apartment buildings with mixed ownership. The plurality of ownership in these buildings is a reason of many problems in everyday lives of their members so the managements are trying to find an optimal solution.

On 2nd February 2010 the government of the Slovak Republic approved by its resolution No 96 the State Housing Policy by 2015. According to this material, there were 1,768 million permanently occupied dwellings, i.e. 327 dwellings per 1000 inhabitants, while 14.9 per cent were owned by housing co-operatives. The role of housing co-operatives is in accordance with the objectives of state housing policy to increase housing standard so that the housing can be affordable and every household can ensure adequate housing for themselves.

The housing co-operatives, in accordance with their capabilities, fulfil important tasks regarding ensuring decent housing for residents. As regards the quality of housing the co-operatives should improve the technical condition of the existing housing stock and contribute to extension of its lifetime and decrease of its energy consumption.

At the moment, the State Housing Policy by 2020 is being prepared, and the Strategy of Renovation of Housing and Non-housing Buildings has been worked out in accordance to Directive of the European Parliament and the Council No 2012/27/EU. According to this directive, effective 1 January 2014 all EU member states have to ensure renovation of 3 per cent of floor area of heated or cooled state-owned buildings. Similarly, the housing co-operatives have already started to renovate housing and non-housing stock in order to save energies for example by thermal insulation of older buildings. The housing co-operatives administer buildings that suffer from a number of technical problems which

are being removed upon request of members, owners and users. One of the barriers to more efficient administration of these buildings seems to be owners´ lack of legal and energy awareness, hybrid ownership and tenders.

Conclusion

The consumers' cooperatives achieved the best results comparing to other types of co-operative entrepreneurship, their economic position in the domestic market was strengthened and the trend towards international collaboration - in particular with the Czech Republic and Hungary, but also with Bulgaria - continued. The collaboration, not only within small co-operatives in the regional level, but especially within large integrated co-operatives on national, or international levels should be based on the values of self-assistance.

Systematic support of co-operative enterprises would be of great benefit to their further development, for example various grants to finance technological innovations, improvement of infrastructure and services for co-operatives, changes in legislation in favour of co-operatives development etc.

One of the main strategic objectives for the co-operatives in Slovakia is to operate in high quality standards for benefits to their members and customers. It is necessary to show that co-operative enterprises are acceptable and applicable almost in every field of social activities.

Beside well-known types of co-operatives (consumers, producer, agricultural, housing) it is needed to look for new possibilities and create suitable conditions for establishing other types of co-operatives, the so called "new types", such as social, medical, health care, cultural, etc. There used to exist some of them in the past in our country as well as abroad. We should return to those cooperatives, however, in a new, modern form, and take advantage of the existing labour force potential, domestic and foreign experience and possibilities to launch products not only in regional, but also in the enlarged European, or global markets.

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RECENZE

PODNIKATEĽSKÉ PROSTREDIE V EURÓPSKEJ ÚNII
AUTORKA: DOC. ING. ELENA ŠÚBERTOVÁ, PHD.

Vydavatelství KARTPRINT Bratislava, 2014. 127 s. ISBN 978-80-89553-24-2

Kniha Podnikatel'ské prostredie v Európskej únii doc. Ing. Eleny Šúbertové, PhD. přináší ucelený pohled na podnikatelské prostředí ve Slovenské republice v posledním desetiletí, tedy v období, kdy se Slovensko stalo členem Evropské unie. Jednotný vnitřní trh poskytl podnikatelům řadu příležitostí, ovšem současně vyžaduje orientaci v nových podmínkách, vzniklých na základě členství v Evropské unii.

Čtenář se může seznámit s dokumenty, které souvisejí se vznikem a vývojem Evropské unie, i s jejími právními základy. Pozornost je věnována také institucím a orgánům EU – Evropskému parlamentu, Radě Evropské unie, Evropské radě, Evropské komisi a dalším. Kapitola o Evropské měnové unii umožňuje získat nové poznatky nejen o jejím vzniku, ale i o cíli jednotné měnové politiky, kterým je udržování cenové stability. V této souvislosti je popsán také přechod na Euro v jednotlivých zemích Evropské unie. Kniha skutečně poskytuje přehled o evropském podnikatelském prostředí v komplexním pojetí, takže čtenář může prostudovat vybrané společné politiky v Evropské unii a vytvořit si představu o hospodářských politikách v cestovním ruchu, průmyslu a v dalších oblastech. Není opominuta ani problematika životního prostředí a jeho ochrany s odkazem na Environmentální akční program do roku 2020. Bezesporu zajímavým a pro podnikatele, studenty i odbornou veřejnost důležitým tématem je daňová politika. Hlavní priority spojené s touto oblastí by se měly odrážet v daňových politikách jednotlivých členských zemí, ovšem existuje zde řada problémů spojených s daňovými systémy v různých státech. I proto jsou v knize zmíněny důsledky daňové diferenciace. Neméně významnými a často diskutovanými tématy jsou rozpočet Evropské unie a jeho financování a také společná zahraniční a bezpečnostní politika.

Vzhledem ke své dlouholeté práci vysokoškolského pedagoga zařadila p. doc. Šúbertová na závěr své knihy také kapitolu věnovanou vzdělávání v zemích Evropské unie, ve které se lze seznámit i s možnostmi mezinárodní spolupráce nabízenými v jednotlivých mezinárodních programech.

Kniha poskytuje řadu zajímavých námětů a umožňuje např. porovnání uvedených poznatků s podmínkami v České republice i v dalších zemích. Obohacuje současnou odbornou literaturu a lze ji doporučit celé odborné veřejnosti.

Renáta Myšková

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