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OPTIMALIZACIJA ULAGANJA SREDSTAVA BANAKA U VRIJEDNOSNE PAPIRE

OPTIMIZING BANK INVESTMENTS IN SECURITIES

ABSTRACT

The share of investment in property and debt short-term and long-term securities (securities portfolio) in the last couple of years accounts for 12% - 15% of the total asset of Croatian banks. It is therefore of extreme importance for the banks to shape an optimal securities portfolio. This paper shows the measurement of individual, specific and the systemic risk of securities and the risk of portfolio as well as the determination of a set of effective portfolios with the aim of maximizing the return and decreasing the risk with a diversification of investment. The banks should choose an optimal portfolio as one of the portfolios on the limit of effectiveness, which achieves the maximum results along with an acceptable risk, but also some positive multiplying effects on the business operations of the bank.

***Key words**: bank, securities, systemic and non-systemic risks, securities risk measurment, securities portfolio risk measurement, funds investment optimization*

1. Uvod

Poslovne banke prikupljene depozite i pribavljena sredstva usmjeravaju u razne oblike kreditnih i nekreditnih plasmana. Ulaganje sredstava u kupovinu vrijednosnih papira je najvažniji oblik nekreditnih plasmana banaka i vrlo razvijen posao, pogotovo u gospodarski razvijenim zemljama gdje država, banke, poduzeća i ostale pravne osobe izdavanjem dužničkih vrijednosnica, jeftinije nego što bi bilo kreditno zaduživanje, pribavljaju kratkoročna i dugoročna sredstva potrebna za tekuće poslovanje i financiranje razvoja, a poduzeća i banke emisijom dionica – vlasničkih vrijednosnica pribavljaju trajni kapital.

Udio ulaganja sredstava banaka u razne oblike vrijednosnih papira kreće se u zadnjih nekoliko godina od 12% do 15% ukupne aktive hrvatskih banaka[1].

Ulaganjem sredstava u vrijednosne papire banke ostvaruju prinos u obliku dividende na dionice, odnosno kamate na dužničke vrijednosnice, zaradu na eventualnom rastu tržišne vrijednosti portfelja vrijednosnica te razne pogodnosti koje kupcima vrijednosnih papira daju njihovi izdavatelji. Za banke je iznimno važna likvidnost, odnosno unovčivost vrijednosnih papira i prije roka dospijeća, kao i eventualna mogućnost dobivanja lombardnih kredita na temelju založenih vrijednosnica što im, za razliku od kreditnih plasmana, omogućava jednostavnije provođenje politike likvidnosti.

Optimalizaciju ulaganja sredstava banke trebaju provoditi diversifikacijom vrijednosnica u cilju postizanja maksimalnih pozitivnih učinaka na poslovanje, uz minimalne rizike.

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Opća načela ili opći kriteriji kojih se treba pridržavati bilo koji investitor u odabiru vrijednosnica prije namjeravanog ulaganja sredstava u njihovu kupovinu su: (1) sigurnost, (2) likvidnost, odnosno unovčivost i (3) profitabilnost (Brigham, Gapenski, 1991., Marković, 2000.). Ovim uobičajenim kriterijima treba dodati i specifične, iznimno važne, koji daju odgovore hoće li kupovina vrijednosnih papira od nekog klijenta, izdavatelja ili imatelja, mikromultiplikacijom kredita i depozita prouzročiti jačanje financijskog i kreditnog potencijala banke te dodatnu zaradu, kao i hoće li će takva kupovina vrijednosnih papira značiti uspostavljanje i jačanje poslovnih odnosa između banke i klijenta ili ne.

U ovom radu (1) ukazano je na potrebu diversifikacije ulaganja sredstava, (2) prikazano je mjerenje rizika vrijednosnica i rizičnosti portfelja, posebno mjerenje sistemskih i nesistemskih rizika, (3) predloženo je oblikovanje optimalnog portfelja s ciljem maksimiranja prinosa i disperzije rizika i naposljetku, (4) u zaključku su rezimirani rezultati istraživanja..

2. Optimalizacija ulaganja sredstava

Da bi banka ostvarila prihode na osnovi naplate aktivne kamate potrebne za podmirenje troškova pasivne kamate na prikupljene depozite i pribavljene kredite ona ulaže sredstva u razne oblike kreditnih i nekreditnih plasmana i na taj način formira portfelj kredita, portfelj vrijednosnih papira, portfelj stranih valuta ili deviznih potraživanja itd. U razmatranju politike formiranja optimalne politike ulaganja potrebno je odgovoriti na više pitanja: (1) zašto ulaganja treba diversificirati, (2) kako mjeriti rizičnost ulaganja u vrijednosnice, a kako rizik portfelja, (3) na koji način izvršiti odabir između dviju ili više vrijednosnica i (4) kako formirati optimalni portfelj vrijednosnih papira, odnosno kako postići optimalnu strukturu diversifikacije ulaganja.

2.1. Diversifikacija ulaganja

Bez obzira da li banka odobrava kredit, kupuje vrijednosnicu, otvara akreditiv s odloženim polaganjem pokrića, daje aval, izdaje garanciju ili jamstvo ili preuzima drugu obvezu uvijek postoji vjerojatnost da će klijent banke (dužnik, izdavatelj vrijednosnog papira, nalogodavac i sl.) doći u poslovne teškoće koje će biti razlogom veće ili manje stvarne ili potencijalne neurednosti u podmirivanju obveza prema banci, odnosno smanjenja kreditnog rejtinga klijenta. Stoga sve banke redovito, i više puta godišnje, procjenjuje bonitet i kreditnu sposobnost svih dužnika, kvalitetu instrumenata osiguranja naplate bankovnih potraživanja i urednost podmirivanja obveza po svakom pojedinačnom potraživanju. Ukoliko banka ocijeni da postoji rizik neplateži ispravit će vrijednost takvog potraživanja i formirati rezerve za identificirane ili poznate gubitke, i to ne po dužniku, već po pojedinom potraživanju, bez obzira što stvarni gubici još nisu nastali. Rezerve za identificirane potencijalne gubitke formiraju se na teret računa dobiti gubitka, dakle čine rashode banci, a ukoliko prihodi nisu dovoljni za njihovo pokriće, gubitak će smanjiti kapital banke.

Radi toga je za banke iznimno važna politika usmjeravanja sredstava u kreditne i nekreditne plasmane, odnosno politika formiranja optimalne strukture portfelja kreditnih i nekreditnih ulaganja.

Ako bi banka sveukupna ulaganja usmjerila samo jednom klijentu, primjerice za otkup vrijednosnica koje je on izdao u visini 100 mln. i ako bi se sa visokim stupnjem vjerojatnosti, npr. 90%, procijenilo da su potencijalni identificirani rizici 25% od visine ulaganja, tada bi posebne rezerve za identificirane rizike bile: 100 mln. x 25% = 25 mln. i gotovo sa sigurnošću bi se moglo reći da će banka izgubiti 90% od 25 mln., a to je 22,5 mln. Pod pretpostavkom da su sredstva usmjerena u otkup vrijednosnica od dva izdavatelja, pa se također s 90%

vjerojatnosti procjenjuje da će jedan i drugi imati poteškoće u poslovanju, onda bi vjerojatnost da će istovremeno jedan i drugi postati neuredni u podmirivanju obveza prema banci bila jednaka umnošku pojedinačnih vjerojatnosti, što je takozvana složena vjerojatnost (Čaval, 1992.). U ovom primjeru to bi bilo: 0,90 x 0,90 = 0,81 ili 81%, a primijenjeno na iznos od 25 mln. posebnih rezervi za identificirane rizike gubitak bi sada bio 20,25 mln., a ne 22,5 mln. Ako bi u portfelju bile vrijednosnice od tri izdavatelja, vjerojatnost nastanka gubitka istovremeno za sva tri izdavatelja bila bi još manja: 0,90 x 0,90 x 0,90 = 0,729 ili 72,9%.

Iz navedenog proizlazi da će ulaganja banke disperzirana prema mnoštvu manjih klijenata iz različitih djelatnosti, prema klijentima koji djeluju na različitim područjima i koji dobivena kratkoročna i dugoročna sredstva koriste za razne namjene, smanjiti sveukupni rizik banke jer je vjerojatnost da će svi ti klijenti istovremeno doći u poslovne teškoće znatno manja nego što je vjerojatnost da će samo jedan od njih postati neuredan. Diversifikacija plasmana je ključna pretpostavka smanjenja rizika ulaganja.

2.2. Mjerenje rizičnosti vrijednosnica

Ukoliko se banka nađe u poziciji da treba odabrati jednu od više vrijednosnica tada će, promatrajući sa stajališta profitabilnosti, prednost dati vrijednosnici za koju se procjenjuje da će u budućem razdoblju donijeti veći prinos. Ako dva ili više vrijednosnih papira imaju jednak prinos, banka će za svaku vrijednosnicu ocijeniti da li postoji i kolika je neizvjesnost ili rizičnost u ostvarivanju budućih prinosa. Neizvjesnost u ostvarivanju budućih prinosa mjeri se varijancom, odnosno standardnom devijacijom i koeficijentom varijacije (Madura, 2003.). Izračunavanje prosječnih očekivanih vrijednosti prinosa i rizičnosti ili neizvjesnosti njihovog ostvarivanja za dvije vrijednosnice prikazano je na primjerima u Tablici 1. i 2. (Orsag, 1997.). Procjena budućih prinosa izvršena je na temelju ocjene da će gospodarstvo u promatranom razdoblju biti u stanju (1) recesije (25%), (2) normalnoj situaciji (50%) i (3) u uzletu, odnosno ekspanziji (25%).

Tablica 1.

Izračunavanje prosječnog očekivanog prinosa i rizičnosti vrijednosnice A

Stanje gospodarstva	Prinos (u %) Ri	Vjerojatnost nastupanja Yi	Ponderirane vrijednosti $(Ri \times Yi)$	$(Ri - \overline{R})$	$(Ri - \overline{R})^2 \times Yi$
- Recesija	0	0,25	0	0 - 10 = -10	25
- Normalno	10	0,50	5	10 - 10 = 0	0
- Uzlet	20	0,25	5	20 - 10 = 10	25
Ukupno		1,00	10		50

- **Prosječni očekivani prinos** ($\overline{R}$) vrijednosnice A izračunat je kao vagana aritmetička sredina procijenjenih budućih prinosa u pojedinom stanju gospodarstva gdje su kao ponderi uzete vjerojatnosti da će pojedino stanje gospodarstva nastupiti, odnosno da će se planirani prinos ostvariti. Za vrijednosnicu A prosječni očekivani prinos u budućem razdoblju je: $\overline{R} = \sum (Ri \times Yi) =$ **10.**

- **Varijanca prinosa** (σ^2) vrijednosnice izračunata je kao zbroj ponderiranih kvadrata odstupanja pojedinačnih prinosa od očekivanog prosječnog prinosa. Za vrijednosnicu A varijanca je: $\sigma^2 = \sum (Ri - \overline{R})^2 \times Yi =$ **50.**

- **Standardna devijacija** (σ) kao mjera rizičnosti pojedine vrijednosnice izračunava se kao drugi korijen iz varijance i pokazuje prosječno odstupanje pojedinačnog prinosa od očekivanog prosječnog prinosa vrijednosnice. Za vrijednosnicu A standardna devijacija je: $\sigma = \sqrt{\sum (Ri - \overline{R})^2 \times Yi} = \sqrt{50} =$ **7,1**.

- **Koeficijent varijacije** (V) je relativna mjera raspršenosti budućih prinosa, služi za usporedbu disperzije različitih distribucija, a izračunava se kao postotak između standardne devijacije i aritmetičke sredine. Za vrijednosnicu A koeficijent varijacije je: $V = \sigma / \overline{R} \times 100$ = 7,1/10 x 100 = **71%.**

Tablica 2.

Izračunavanje prosječnog očekivanog prinosa i rizičnosti vrijednosnice B

Stanje gospodarstva	Prinos (u %) Ri	Vjerojatnost nastupanja Yi	Ponderirane vrijednosti $(Ri \times Yi)$	$(Ri - \overline{R})$	$(Ri - \overline{R})^2 \times Yi$
- Recesija	-5	0,25	-1,25	-5 - 10 = -15	56,25
- Normalno	10	0,50	5,00	10 - 10 = 0	0
- Uzlet	25	0,25	6,25	25 - 10 = 15	56,25
Ukupno		1,00	10		112,50

- Prosječni prinos na vrijednosnicu B je: $\overline{R} = \sum (Ri \times Yi) =$ **10**
- Varijanca prinosa vrijednosnice B je: $\sigma^2 = \sum (Ri - \overline{R})^2 \times Yi =$ **112,50**
- Standardna devijacija prinosa vrijednosnice B je: $\sigma = \sqrt{112,5} =$ **10,6**
- Koeficijent varijacije vrijednosnice B je: V = 10,6 / 10 x 100 = **106%**

Izračunati pokazatelji za vrijednosnicu A i vrijednosnicu B ukazuju:

- da je prosječni prinos očekivan u budućem razdoblju od vrijednosnice A i vrijednosnice B jednak i iznosi **10%;**
- da je standardna devijacija kao mjera neizvjesnosti ostvarenja očekivanog prosječnog prinosa za vrijednosnicu A **7,1** a za vrijednosnicu B **10,6**, što znači da je neizvjesnost ostvarivanja očekivanog prinosa za vrijednosnicu B veća nego za vrijednosnicu A;
- da je koeficijent varijacije kao relativna mjera rizičnosti za vrijednosnicu B **106%,** a za vrijednosnicu A **71%,** što također potvrđuje znatno veću neizvjesnost ostvarenja očekivanog prinosa od vrijednosnice B nego od vrijednosnice A.

Iz navedenog proizlazi, da će banka od ponuđenih dviju vrijednosnica s jednakim očekivanim prosječnim prinosom odabrati vrijednosnicu A radi manje rizičnosti, odnosno neizvjesnosti ostvarenja budućeg prinosa.

2.3. Rizik portfelja

Kupovinom vrijednosnih papira od više izdavatelja banka će oblikovati portfelj različitih vrijednosnica. Ako se pretpostavi da će prinosi od vrijednosnica biti različiti, ali i da će rizik od naglih promjena prinosa po svim vrijednosnicama u portfelju biti manji od rizika promjena prinosa po pojedinom vrijednosnom papiru. Bez obzira na varijacije prinosa po pojedinim vrijednosnim papirima, uzimanjem dovoljnog broja vrijednosnica u portfelj banka će stabilizirati prinos i smanjiti rizičnost portfelja u odnosu na prinose i rizičnost pojedinih vrijednosnica.

U tablicama 3. i 4. prikazano je izračunavanje očekivanog prinosa i rizičnosti pojedinačnih vrijednosnih papira, a u Tablici 5. izračunavanje prinosa i rizičnosti portfelja sastavljenog od tih vrijednosnica (Šutalo, 1993., Orsag, 1997.).

Tablica 3.

Izračunavanje prosječnog očekivanog prinosa i rizičnosti vrijednosnice C

Stanje gospodarstva	Vjerojatnost Y_i	Prinos R_i	$Y_i \times R_i$	$(R_i - \overline{R})^2 \times Y_i$
- Recesija	0,25	-2	0,5	$(-2 - 14)^2 \times 0,25 = 64,0$
- Normalno	0,50	15	7,5	$(15 - 14)^2 \times 0,50 = 0,5$
- Uzlet	0,25	28	7,0	$(28 - 14)^2 \times 0,25 = 49,0$
	1,00		14,0	113,5

- Očekivani (prosječni) prinos ($\overline{R}$) u budućem razdoblju od vrijednosnice C je:
$\overline{R} = \sum (Ri \times Yi) =$ **14**

- Varijanca prinosa (σ^2) za vrijednosnicu C je: $\sigma^2 = \sum (Ri - \overline{R})^2 \times Yi =$ **113,5**

- Standardna devijacija (σ) je: $\sigma = \sqrt{\sum (Ri - \overline{R})^2 \times Yi} = \sqrt{113,5} =$ **10,7**

Tablica 4.

Izračunavanje prosječnog očekivanog prinosa i rizičnosti vrijednosnice D

Stanje gospodarstva	Vjerojatnost Y_i	Prinos R_i	$Y_i \times R_i$	$(R_i - \overline{R})^2 \times Y_i$
Recesija	0,25	10	2,5	$(10 - 11,5)^2 \times 0,25 = 0,5625$
Normalno	0,50	13	6,5	$(13 - 11,5)^2 \times 0,50 = 1,1250$
Uzlet	0,25	10	2,5	$(10 - 11,5)^2 \times 0,25 = 0,5625$
	1,00		11,5	2,2500

- Očekivani prosječni prinos od vrijednosnice D je: $\overline{R} = \sum (Ri \times Yi) =$ **11,5**

- Varijanca prinosa za vrijednosnicu D je: $\sigma^2 = \sum (Ri - \overline{R})^2 \times Yi =$ **2,25**

- Standardna devijacija prinosa za vrijednosnicu D je: $\sigma = \sqrt{2,25} =$ **1,5**

Pod pretpostavkom da banka isti iznos sredstava uloži u kupovinu vrijednosnice C i vrijednosnice D i tako oblikuje portfelj od dvaju vrijednosnih papira, očekivani prinos portfelja, izračunat kao vagana aritmetička sredina očekivanih prinosa pojedinih vrijednosnica, gdje su za pondere uzeti udjeli pojedinih vrijednosnica u portfelju, bio bi: 14 x (0,5) + 11,5 x (0,5) = **12,75**

Ako bi se na isti način, dakle vaganom aritmetičkom sredinom, izračunala očekivana standardna devijacija kao prosječna rizičnost portfelja, tada bi rezultat bio: 10,7 x (0,5) + 1,5 x (0,5) = **6,1.** Ispravnost dobivenih rezultata (očekivani prinos i standardana devijacija) izračunatih ponderiranom aritmetičkom sredinom treba provjeriti na podacima portfelja.

U Tablici 5. prikazano je izračunavanje prosječnog prinosa i varijance, odnosno standardne devijacije portfelja sastavljenog od 50% vrijednosnica C i 50% vrijednosnica D kako bi se utvrdile razlike u izračunu rizičnosti portfelja u odnosu na pojedinačne rizičnosti vrijednosnih papira.

Tablica 5.

Izračunavanje očekivanog prinosa i rizičnosti portfelja vrijednosnica C i D

Stanje gospo-darstva	Vjero-jatnost Y_i	Prinos portfelja R_i	$Y_i \times R_i$	$(R_i - \overline{R})^2 \times Y_i$
- Recesija	0,25	4	$0,25 \times 19 = 4,75$	$(4-12,75)^2 \times 0,25=19,14$
- Normalno	0,50	14	$0,50 \times 14 = 7,00$	$(14-12,75)^2 \times 0,50=0,78$
- Uzlet	0,25	19	$0,25 \times 4 = 1,00$	$(19-12,75)^2 \times 0,25=9,77$
			12,75	29,69

Napomena: Prinos portfelja za pojedino stanje gospodarstva izračunat je kao vagana sredina prinosa od pojedine vrijednosnice gdje su za pondere uzeti udjeli vrijednosnica u portfelju. Tako je prinos portfelja za stanje gospodarstva "recesija": -2 x (0,5) + 10 x (0,5) = **4**, a za stanje "normalno": 15 x (0,5) + 13 x (0,5) = **14**

Dobiveni rezultati ukazuju:

- da je **prosječni prinos portfelja 12,75** jednak ranije izračunatoj ponderiranoj sredini očekivanih prinosa od pojedinih vrijednosnica, ali

- da je **standardna devijacija portfelja** $\sqrt{29,69} = \mathbf{5,4}$ manja od vagane sredine standardnih devijacija vrijednosnih papira C i D (**6,1**), što znači da je rizičnost portfelja smanjena u odnosu na sveukupnu rizičnost pojedinih vrijednosnica.

Smanjenje rizičnosti portfelja u odnosu na ponderiranu rizičnost pojedinih vrijednosnica posljedica je različitosti koje postoje između vrijednosnih papira, ali i njihovih međusobnih veza. Veza između dviju ili više vrijednosnica mjeri se kovarijancom i koeficijentom korelacije (Čaval, 1992.). **Kovarijanca** između dviju vrijednosnica pokazuje do kojeg se stupnja od njih očekuje da variraju zajedno jedna s drugom, umjesto da to čine zasebno, odnosno, da li prinosi tih vrijednosnica zajedno rastu ili padaju i kolika je ta promjena. **Koeficijent korelacije** kao relativna mjera zavisnosti prinosa dviju vrijednosnica može imati vrijednost od minus jedan do plus jedan i pokazuje jakost i smjer veze. Kakav je prinos i međusobni utjecaj jake negativne i jake pozitivne veze između dviju vrijednosnica prikazano je na primjerima u tablicama 6., 7. i 8. za vrijednosnice E i F, a u tablicama 9., 10. i 11. za vrijednosnice G i H.

2.3.1. Negativna korelacija između vrijednosnica

U Tablici 6. prikazano je izračunavanje prosječnog prinosa od dviju vrijednosnica i očekivanog prinosa portfelja (50% vrijednosnice E i 50% vrijednosnice F) za petogodišnje razdoblje pod pretpostavkom potpune negativne koreliranosti njihovih prinosa (Šutalo, 1993.).

Tablica 6.

Izračunavanje očekivanog prosječnog prinosa od vrijednosnice E i vrijednosnice F te prinosa portfelja vrijednosnica E i F

Godina	Prinos vrijednosnice E	Prinos vrijednosnice F	Prinos portfelja	Prinos u godini minus prosječni prinos
1.	-2	16	7	$(7 - 7)^2 = 0$
2.	2	12	7	$(7 - 7)^2 = 0$
3.	5	9	7	$(7 - 7)^2 = 0$
4.	3	11	7	$(7 - 7)^2 = 0$
5.	-1	15	7	$(7 - 7)^2 = 0$
Ukupno	7	63	35	0

Za petogodišnje razdoblje rezultati su:

- prosječni prinos ($\overline{R}_E$) od vrijednosnice E je: 7/5 = **1,4.**
- prosječni prinos ($\overline{R}_F$) od vrijednosnice F je: 63/5 = **12,6.**
- prosječni prinos od portfelja sastavljenog od vrijednosnica E i F je: 35/7 =**7**
- varijanca prinosa od portfelja (σ^2) je: 0/5 = **0**

Stopa prinosa od portfelja je **7** i stabilna je tijekom petogodišnjeg razdoblja unatoč oscilacijama stopa prinosa vrijednosnica E i F u pojedinim godinama. Varijanca i standardna devijacija jednake su nuli što znači da je portfelj stabilan, odnosno nerizičan, a provedena diversifikacija uspješna. To se može potvrditi izračunavanjem varijance i standardne devijacije za vrijednosnice E i F kada se one ne bi nalazile zajedno u portfelju banke (Tablica 7.).

Tablica 7.

Izračunavanje standardne devijacije za vrijednosnice E i F

Standardna devijacija za vrijednosnicu E

Godina	$(R_i - \overline{R}_E)^2$
1.	$(-2 - 1,4)^2 = 11,56$
2.	$(2 - 1,4)^2 = 0,36$
3.	$(5 - 1,4)^2 = 12,96$
4.	$(3 - 1,4)^2 = 2,56$
5.	$(-1 - 1,4)^2 = 5,76$
Ukupno	33,20

Standardna devijacija za vrijednosnicu F

Godina	$(R_i - \overline{R}_F)^2$
1.	$(16 - 12,6)^2 = 11,56$
2.	$(12 - 12,6)^2 = 0,36$
3.	$(9 - 12,6)^2 = 12,96$
4.	$(11 - 12,6)^2 = 2,56$
5.	$(15 - 12,6)^2 = 5,76$
Ukupno	33,20

$$\sigma_E^2 = \frac{33,20}{5} = 6,64$$

$$\sigma_E = \sqrt{6,64} = 2,5768\%$$

$$\sigma_F^2 = \frac{33,20}{5} = 6,64$$

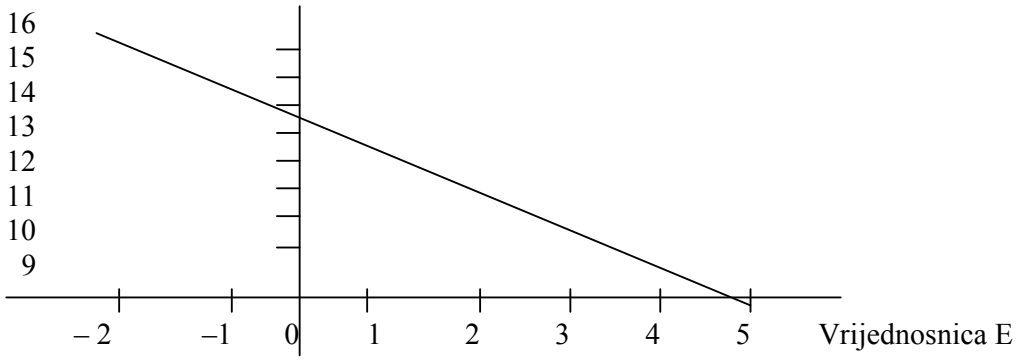
$$\sigma_F = \sqrt{6,64} = 2,5768\%$$

Prosječna standardna devijacija prinosa izračunata kao ponderirana aritmetička sredina standardnih devijacija prinosa tih dviju vrsta vrijednosnih papira bila bi: 2,2768 x (0,5) + 2,5768 x (0,5) = 2,5768. Međutim, kako je standardna devijacija portfelja tih dviju vrijednosnica jednaka nuli, znači da je rizičnost portfelja smanjena, odnosno potpuno reducirana, zato što postoji korelacija ili zavisnost prinosa između ovih dviju vrijednosnica.

U Grafikonu 1. prikazan je dijagram rasipanja stopa prinosa na vrijednosnice, a u Tablici 8. prikazano je izračunavanje kovarijance i koeficijenta korelacije između vrijednosnice E i vrijednosnice F.

Grafikon 1.

Dijagram rasipanja stopa prinosa vrijednosnica E i F



Dijagram rasipanja ukazuje da je rast stope prinosa na vrijednosnicu E praćen padom stope prinosa na vrijednosnicu F i obrnuto, što upućuje na njihovu negativnu korelaciju. Smjer i jakost korelacije utvrdit će se koeficijentom koji se izračunava relacijom:

$$\text{Koeficijent korelacije} = \frac{\text{Kovarijanca}}{\text{Standardna devijacija vrijednosnice E} \times \text{Standardna devijacija vrijednosnice F}}$$

odnosno

$$\text{Kovarijanca} = \text{Koeficijent korelacije} \times \text{Standardna devijacija vrijednosnice E} \times \text{Standardna devijacija vrijednosnice F}$$

Za vrijednosnice E i F kovarijanca (COV) izračunat će se pomoću sljedeće relacije (Tablica 8.):

$$\text{COV (EF)} = \frac{\sum (R_{Ei} - \overline{R}_E) \text{ x } (R_{Fi} - \overline{R}_F)}{n}$$

gdje je:

R_i - stopa prinosa od neke vrijednosnice u pojedinoj godini

$\overline{R}$ - stopa prosječnog prinosa od neke vrijednosnice u petogodišnjem razdoblju

n - broj godina

Tablica 8.

Izračunavanje kovarijance prinosa vrijednosnica E i F

$(R_{Ei} - \overline{R}_E)$	×	$(R_{Fi} - \overline{R}_F)$		
(-2 - 1,4)	×	(16 - 12,6)	=	- 11,56
(2 - 1,4)	×	(12 - 12,6)	=	- 0,36
(5 - 1,4)	×	(9 - 12,6)	=	- 12,96
(3 - 1,4)	×	(11 - 12,6)	=	- 2,56
(-1 - 1,4)	×	(15 - 12,6)	=	- 5,76
				- 33,20

COV (EF) = -33,20 / 5 = - 6,64

Kovarijanca pokazuje ne/usklađenost prinosa dviju vrijednosnica, odnosno ona ukazuje kako se zajedno kreću prinosi dvaju vrijednosna papira i koja je veličina njihovih promjena. Kovarijancu je teško interpretirati, pogotovo za različite distribucije, pa se zato u praksi za usporedbu prinosa dviju vrijednosnica izračunava koeficijent korelacije. Koeficijent korelacije računa se kao odnos korelacije između prinosa dviju vrijednosnica i umnoška standardnih devijacija njihovih prinosa. Za vrijednosnice E i F koeficijent korelacije je:

$$r = \frac{-6,64}{2,5768 \times 2,5768} = -1$$

Koeficijent korelacije je negativan i jednak jedinici što znači da su stope prinosa od vrijednosnice E i vrijednosnice F potpuno negativno korelirane. Odabirom takvih vrijednosnih papira u portfelj u potpunosti se eliminira pojedinačni rizik vrijednosnica.

2.3.2. Pozitivna korelacija između vrijednosnica

Ukoliko postoji pozitivna korelacija između prinosa dviju vrijednosnica tada će reduciranje rizika biti posve drugačije i ovisit će o jakosti njihove međusobne veze.

U Tablici 9. prikazano je izračunavanje prosječnog prinosa dviju vrijednosnica i očekivanog prinosa portfelja (50% vrijednosnica G i 50% vrijednosnica H) za petogodišnje razdoblje pod pretpostavkom potpune pozitivne koreliranosti njihovih prinosa (Šutalo, 1993.).

Tablica 9.

Izračunavanje prosječnog očekivanog prinosa od vrijednosnice G i vrijednosnice H te prinosa od portfelja vrijednosnica G i H

Godina	Prinos vrijednosnice G	Prinos vrijednosnice H	Prinos portfelja	Prinos u godini minus prosječni prinos
1.	5,0	15,0	10,0	$(10,0 - 7,76)^2 = 5,0176$
2.	4,0	12,0	8,0	$(8,0 - 7,76)^2 = 0,0576$
3.	3,0	9,0	6,0	$(6,0 - 7,76)^2 = 3,0976$
4.	3,1	9,3	6,2	$(6,2 - 7,76)^2 = 2,4336$
5.	4,3	12,9	38,8	$(8,6 - 7,76)^2 = 0,7056$
Ukupno	19,4	58,2	38,8	11,3120

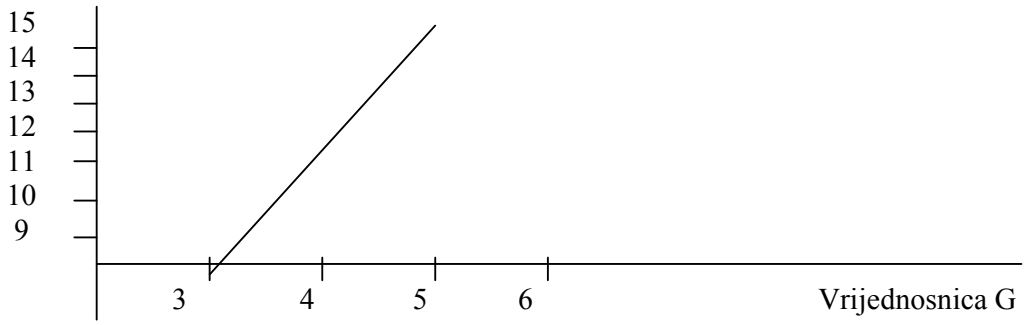
Za petogodišnje razdoblje rezultati su:

- prosječni prinos vrijednosnice G je: $\overline{R}_G = 19,4 / 5 =$ **3,88**
- prosječni prinos vrijednosnice H je: $\overline{R}_H = 58,2 / 5 =$ **11,64**
- prosječni prinos portfelja vrijednosnica G i H je:
  3,88 x (0,5) + 11,64 x (0,5) = **7,76** ili 38,8 / 5 = **7,76**
- varijanca prinosa portfelja vrijednosnica G i H je: 11,3120 / 5 = **2,2624**
- standardna devijacija prinosa portfelja je: $\sqrt{2,2624}$ = **1,5041**

Dijagram rasipanja upućuje na moguću jaku linearnu vezu prinosa vrijednosnica G i H.

Grafikon 4.

Dijagram rasipanja stopa prinosa vrijednosnice G i vrijednosnice H



Dijagram rasipanja ukazuje da je rast stope prinosa vrijednosnice H praćen rastom stope prinosa vrijednosnice G i obratno.

U Tablici 10. prikazano je izračunavanje rizičnosti za pojedine vrijednosnice radi usporedbe s rizikom portfelja tih vrijednosnica.

Tablica 10.

Izračunavanje standardne devijacije za vrijednosnice G i H

Standardna devijacija za vrijednosnicu G		Standardna devijacija za vrijednosnicu H	
Godina	$(R_{Gi} - \overline{R}_G)^2$	Godina	$(R_{Hi} - \overline{R}_H)^2$
1.	$(5,0 - 3,88)^2 = 1,2544$	1.	$(15,0 - 11,64)^2 = 11,2896$
2.	$(4,0 - 3,88)^2 = 0,0144$	2.	$(12,0 - 11,64)^2 = 0,1296$
3.	$(3,0 - 3,88)^2 = 9,7744$	3.	$(9,0 - 11,64)^2 = 6,9696$
4.	$(3,1 - 3,88)^2 = 0,6084$	4.	$(9,3 - 11,64)^2 = 5,4756$
5.	$(4,3 - 3,88)^2 = 0,1764$	5.	$(12,9 - 11,64)^2 = 1,5876$
Ukupno	2,8228	Ukupno	25,4520

$$\sigma_G^2 = \frac{2,8228}{5} = 0,5656 \qquad \sigma_H^2 = \frac{25,4520}{5} = 5,0904$$

$$\sigma_G = \sqrt{0,5656} = 0,7521 \qquad \sigma_H = \sqrt{5,0904} = 2,2562$$

Standardna devijacija prinosa portfelja za petogodišnje razdoblje je **1,5041** i jednaka je ponderiranoj standardnoj devijaciji prinosa vrijednosnice G i vrijednosnice H: 0,7521 x (0,5) + 2,2562 x (0,5) = **1,5041**.

Standardna devijacija, odnosno rizičnost portfelja, nije smanjena u odnosu na pojedinačne standardne devijacije vrijednosnica. Razlog tome je pretpostavljena vrlo visoka koreliranost prinosa vrijednosnica G i H. Koeficijent korelacije izračunat je pomoću kovarijance u Tablici 11.

Tablica 11.

Izračunavanje kovarijance između vrijednosnica G i H

Godina	$(R_{Gi} - \overline{R}_G)$	×	$(R_{Hi} - \overline{R}_H)$		
1.	(5,0 - 3,88)	×	(15,0 - 11,64)	=	3,7632
2.	(4,0 - 3,88)	×	(12,0 - 11,64)	=	0,0432
3.	(3,0 - 3,88)	×	(9,0 - 11,64)	=	2,3232
4.	(3,1 - 3,88)	×	(9,3 - 11,64)	=	1,8252
5.	(4,3 - 3,88)	×	(12,9 - 11,64)	=	0,5292
Ukupno					8,4840

COV (GH) = 8,4840 / 5 = 1,6968

Koeficijent korelacije je:

$$r = \frac{1,6968}{0,7521 \times 2,2562} = 1$$

Na temelju dobivenih rezultata može se zaključiti:

- da između prinosa na vrijednosnicu G i prinosa na vrijednosnicu H postoji funkcionalna, odnosno potpuna zavisnost (koeficijent korelacije =+1) te
- da diversifikacija portfelja, radi potpune pozitivne koreliranosti, ne smanjuje rizičnost portfelja u odnosu na ponderiranu rizičnost pojedinih vrijednosnica.

Ispitivanje utjecaja korelacije između dviju vrijednosnica na smanjenje rizika portfelja ukazuje da uspješna diversifikacija portfelja zavisi o sposobnosti pronalaženja raznovrsnih vrijednosnih papira, ali koja imaju posebna obilježja.

Prvo, rizičnost portfelja smanjit će se ukoliko je kovarijanca između dviju vrijednosnica manja, odnosno ako je koeficijent korelacije pozitivan, ali manji od jedan.

Drugo, rizičnost portfelja također će se bitno smanjiti ako vrijednosnice imaju koeficijent korelacije jednak približno nuli, jer to znači da su prinosi takvih vrijednosnica nezavisni.

Treće, do najveće redukcije rizika portfelja dolazi izborom vrijednosnih papira kod kojih je iskazana negativna korelacija, odnosno kod kojih koeficijent korelacije teži prema minus jedan.

U praksi je teško pronaći vrijednosnice koje imaju negativnu kovarijancu. To bi primjerice mogle biti dionice zrakoplovnih i dionice naftnih poduzeća kod kojih više cijene nafte znače povećane profite naftnih poduzeća, ali i povećane troškove i slabije financijske rezultate zrakoplovnih poduzeća. Isto tako prinosi od ulaganja u turistička poduzeća u nestabilnim političkim ili ratnim uvjetima biti će zasigurno slabiji, a prinosi od ulaganja u vojnu industriju znatno veći. U stabilnim političkim i mirnodopskim uvjetima situacija će biti obrnuta. Isto tako tržišna vrijednost zlata i prinos od vrijednosnica temeljenih na zlatnoj klauzuli često ima negativnu kovarijancu s prinosima od držanja drugih vrijednosnica, zato što cijena zlata u politički nestabilnim i ratnim uvjetima raste, a ostali se prinosi većinom smanjuju.

2.4. BETA kao mjera sistemskog rizika

Varijabilnost prinosa neke vrijednosnice kao i varijabilnost prinosa, odnosno rizičnost portfelja vrijednosnih papira posljedica je:

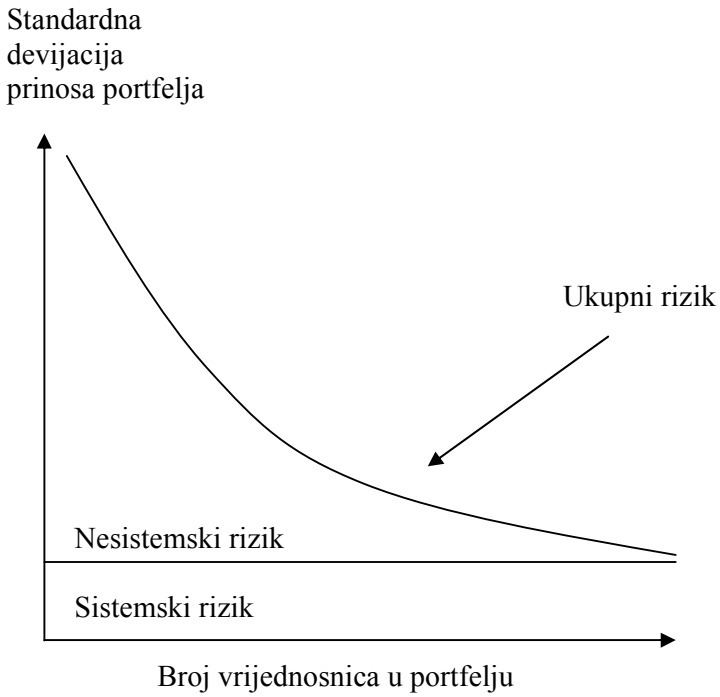
a) promjena čimbenika koji su zajednički za sva poduzeća kao primjerice veći ili manji rast bruto domaćeg proizvoda, kretanje stope inflacije, promjene kamatnih stopa i sl., odnosno općenito gospodarskih kretanja, dakle čimbenika koje se može nazvati **sistemskim utjecajima ili sistemskim rizicima;**

b) promjena čimbenika koji su specifični i odnose se na izdavatelje vrijednosnih papira kao što su bonitet i kreditna sposobnost poduzeća, poslovanje poduzeća itd., a smatraju se **nesistemskim ili specifičnim rizicima.**

Sistemske rizike nije moguće ukloniti svjesnim akcijama gospodarskih subjekata, dok se nesistemske ili specifične rizike, ako je riječ o vrijednosnicama, može u znatnijoj mjeri reducirati odabirom većeg broja vrijednosnih papira različitih izdavatelja, pogotovo ako između prinosa na te vrijednosnice nema korelacije ili je ona negativna (Grafikon 3.).

Grafikon 3.

Smanjenje nesistemskog i ukupnog rizika uključivanjem većeg broja vrijednosnica u portfelj



Grafikon 3. ukazuje da je rizik od nagle promjene prosječnog prinosa od portfelja znatno niži nego u slučaju posjedovanja pojedinačnih vrijednosnica. Prvo, zato što je mala vjerojatnost da će prinosi baš sviju vrijednosnica u portfelju zajedno rasti ili padati i drugo, veća je vjerojatnost da će prinosi od nekih vrijednosnica rasti, a od drugih padati te će se u takvoj situaciji stabilizirati prinos od portfelja u odnosu na prinose pojedinih vrijednosnica. Odabirom dovoljno velikog broja raznovrsnih vrijednosnica dobiva se takozvani **tržišni portfelj** koji u zadovoljavajućoj mjeri reprezentira tržište.

Veza između volatilnosti prinosa svake pojedine vrijednosnice i volatilnosti tržišnog portfelja iskazuje se **BETA koeficijentom.** BETA koeficijent mjeri uvjetovanost varijacija (obično mjerenih njihovim stopama rasta/pada) prinosa od svake vrijednosnice varijacijama prinosa tržišnog portfelja. Faktor BETA je indeks tržišne osjetljivosti i ukazuje koliko je osjetljiv prinos vrijednosnice na promjene na tržištu. Koeficijent BETA računa se kao odnos kovarijance prinosa na neku dionicu i prinosa na cjelokupno tržište (tržišni portfelj) prema varijanci prinosa tržišnog portfelja (Šutalo, 1993.):

$$BETA = \frac{COV(R_i, R_m)}{\sigma^2}$$

gdje je:

R_i – očekivana stopa prinosa od neke vrijednosnice

R_m – očekivana stopa prinosa od tržišnog portfelja

σ_m^2 – Varijanca tržišnog portfelja

Za tržište kao cjelinu koeficijent BETA jednak je jedinici. Vrijednosnice s **manjim sistemskim rizikom**, odnosno manjom volatilnošću očekivane stope prinosa, imaju koeficijent BETA manji od 1, a vrijednosnice s **višim stupnjem rizika** imaju koeficijent BETA veći od 1. Ako

je koeficijent BETA **negativan** prinos na neku vrijednosnicu kreće se u suprotnom smjeru od kretanja prinosa na cjelokupno tržište vrijednosnih papira.

U Tablici 12. prikazano je izračunavanje prosječnog prinosa od vrijednosnice i tržišnog portfelja, a u Tablici 13. izračunavanje BETA koeficijenta. U primjeru je pretpostavljeno da je vjerojatnost stanja tržišta, odnosno stanja gospodarstva: "kriza" 20%, "recesija" 30%, "normalno" 30% i "uzlet" 20% (Šutalo, 1993.).

Tablica 12.

Izračunavanje prosječnih stopa prinosa od vrijednosnice i tržišnog portfelja

Stanje tržišta	Vjero-jatnost Y_i	Stopa prinosa od vrijednosnica R_i	Stopa prinosa od tržišnog portfelja R_m	Prosječni prinos vrijednosnice (2) x (3)	Prosječni prinos tržišnog portfelja (2) x (4)
(1)	(2)	(3)	(4)	(5)	(6)
Kriza	0,2	-20	-10	-4,0	-2,0
Recesija	0,3	-10	- 5	-3,0	-1,5
Normalno	0,3	0	10	0,0	3,0
Uzlet	0,3	40	20	8,0	4,0
Ukupno	1,0			1,0	3,5

Na temelju podataka izračunata je:

- prosječna stopa prinosa vrijednosnice: $\overline{R}_i = \frac{1,0}{1,0} = 1\%$
- prosječna stopa prinosa tržišnog portfelja: $\overline{R}_m = \frac{3,5}{1,0} = 3,5\%$

Tablica 13.

Izračunavanje BETA koeficijenta

Stanje tržišta	Vjero-jatnost stanja (Y_i)	Razlika između stvarne i prosječne stope prinosa za vrijednosnicu ($R_i - \overline{R}_i$)	Razlika između stvarne i prosječne stope prinosa za tržišni portfelj ($R_m - \overline{R}_m$)	Umnožak (2) × (3) × (4)	Kvadrat razlike između stvarne i prosječne stope prinosa za tržišni portfelj	Umnožak (2) × (6) $Yi \times (R_m - \overline{R}_m)^2$
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kriza	0,2	-20 - 1 = -21	– 13,5	56,70	182,25	36,450
Recesija	0,3	-10 - 1 = -11	– 8,5	28,05	72,25	21,675
Normalno	0,3	0 - 1 = -1	6,5	-1,95	42,25	12,675
Uzlet	0,3	40 – 1 = 39	16,5	128,70	272,25	54,450
Ukupno				211,50		125,250

$$COV = \sum Y_i \times \left(R_i - \overline{R}_i\right) \times \left(R_m - \overline{R}_m\right) = 211{,}50$$

Varijanca tržišnog portfelja je: $\sigma_m^2 = \sum \left(R_m - \overline{R}_m\right) \times Y_i = 125{,}250$

Za prethodni primjer koeficijent BETA jednak je:

$$BETA = \frac{COV\left(R_i, R_m\right)}{\sigma^2} = \frac{211{,}500}{125{,}250} = 1{,}69$$

Koeficijent BETA = 1,69 pokazuje da će, primjerice, povećanje prinosa na tržišni portfelj za 10%, radi poboljšanja opće gospodarske situacije, djelovati na sistemsko povećanje prinosa od neke vrijednosnice za 16,9%. Tome bi trebalo dodati i eventualno povećanje prinosa radi specifičnih ili nesistemskih razloga kako bi se dobilo očekivano ukupno povećanje prinosa promatrane vrijednosnice.

Primjena koeficijenta BETA u praksi ima stanovitih teškoća. **Prvo**, za izračunavanje treba odabrati dovoljan broj reprezentativnih vrijednosnih papira raznih izdavatelja. Smatra se da taj broj treba biti najmanje 30, budući da se uzorci veći od 30 elemenata ponašaju po zakonu normalne razdiobe ili Gaussove krivulje, a uzorci manji od 30 elemenata ili takozvani "mali uzorci" po zakonu Studentove ili t-razdiobe (Šošić, Serdar, 2002.). **Drugo**, za izračunavanje koeficijenta treba imati odgovarajuće statističke podatke jer od kvalitete ulaznih podataka ovisi i kvaliteta dobivenog rezultata. **Treće**, koeficijent BETA izračunava se na temelju ostvarenih kretanja, odnosno podataka iz prošlosti, a služi za donošenje budućih odluka. Kako se na tržištu prošlost nikada u potpunosti ne ponavlja, nego više ili manje vlada neizvjesnost, procjene na bazi BETA koeficijenta treba uzimati sa stanovitom zadrškom. Bez obzira na te nedostatke koeficijent BETA može biti dobra podloga i jedan od pokazatelja o kojem treba voditi računa prilikom donošenja odluke o odabiru vrijednosnica koje banka namjerava kupiti.

2.6. Optimalni portfelj

Ulaganje sredstava u kupovinu vrijednosnih papira imatelju vrijednosnice donosi stanoviti prinos, ali i rizičnost ili neizvjesnost ostvarivanja tog prinosa. Da bi neizvjesnost u najvećoj mjeri smanjio, investitor će odabrati više vrijednosnica i pritom oblikovati portfelj kombinacijom njihovih udjela kako bi postigao najvišu profitabilnost, uz bilo koji stupanj rizika, odnosno najniži rizik ulaganja, uz bilo koju očekivanu profitabilnost. Takav se portfelj naziva **efikasnim portfeljem**. Svaki efikasan portfelj dominira pred drugima ili sa stajališta prinosa ili sa stajališta rizika (Van Horne, 1993.).

Utvrđivanje mogućih portfelja kao i definiranje efikasnog portfelja dviju vrijednosnica prikazano je na primjeru. Pretpostavlja se da banka ima mogućnost formirati više portfelja od dviju vrijednosnica za koje su izračunati očekivani prinosi i standardne devijacije:

Vrijednosnica A:	Vrijednosnica B:
- očekivani prinos: 12,0%	- očekivani prinos: 18,0%
- standardna devijacija: 11	- standardna devijacija: 19

Banka može oblikovati portfelj u bilo kojoj kombinaciji vrijednosnica A i B. Kombinirajući udjele vrijednosnica u portfelju dobivaju se različiti prinosi od portfelja. Tako je npr. prinos prvog portfelja (100% vrijednosnica A i 0% vrijednosnica B) izračunat kao ponderirana aritmetička sredina, jednak: 12 x (1,0) + 18 x (0,0) = 12%, a prinos drugog portfelja (80% vrijednosnica A i 20% vrijednosnica B) je: 12 x (0,8) + 18 x (0,2) = 13,2%.

Prinosi portfelja variraju od minimalno 12% do maksimalno 18% i ovise o kombinaciji udjela vrijednosnica A i B u portfelju. Kombinacije različitih portfelja vrijednosnica s ciljem postizanja maksimalnih prinosa i reduciranja rizika diversifikacijom prikazane su u Tablici 14. (Van Horne, 1993.).

Tablica 14.

Izračunavanje prinosa i rizičnosti portfelja uz različiti stupanj korelacije vrijednosnica A i B

Portfelj	Udio A	Udio B	Prinos portfelja (u %)	Standardna devijacija portfelja	
				Korelacija = 1	Korelacija= 0,20
Prvi	1,0	0,0	12,0	11,00	11,00
Drugi	0,8	0,2	13,2	12,60	10,26
Treći	0,6	0,4	14,4	14,80	11,02
Četvrti	0,4	0,6	15,6	16,20	13,01
Peti	0,2	0,8	16,8	17,60	15,79
Šesti	0,0	1,0	18,0	19,00	19,00

U primjeru su pretpostavljene dvije kombinacije korelacije prinosa između vrijednosnica A i B i to jaka pozitivna veza (koeficijent = +1) i slaba pozitivna veza (koeficijent = +0,20). Radi pozitivnih učinaka diversifikacije manja korelacija djeluje na veće, smanjenje rizičnosti portfelja iskazane su putem standardne devijacije. Standardna devijacija portfelja, uz različite kombinacije udjela vrijednosnica i različite koeficijente korelacije, izračunava se pomoću sljedeće relacije (Van Horne, 1993.):

COV(AB) = Korelacija × Standardna devijacija A × Standardna devijacija B

Standardna devijacija portfelja =

$$\sqrt{\text{varijanca A} \times (\text{udio A})^2 + 2\,\text{COV} \times \text{udio A} \times \text{udio B} + \text{varijanca B} \times (\text{udio B})^2}$$

Tako će, primjerice, za drugi portfelj (80% vrijednosnica A i 20% vrijednosnica B) standardna devijacija biti:

a) pod pretpostavkom **potpune zavisnosti prinosa** vrijednosnice A i B (koeficijent korelacije = 1)

COV (AB) = 1,0 × 0,11 × 0,19 = 0,0209

Standardna devijacija portfelja =

$$\sqrt{(0{,}11)^2 \times (0{,}8)^2 + 2 \times 0{,}0209 \times 0{,}8 \times 0{,}2 + (0{,}19)^2 \times (0{,}2)^2} = 12{,}60\%$$

b) pod pretpostavkom **djelomične zavisnosti prinosa** vrijednosnica A i B (koeficijent korelacije = 0,20)

COV (AB) = 0,20 × 0,11 × 0,19 = 0,00418

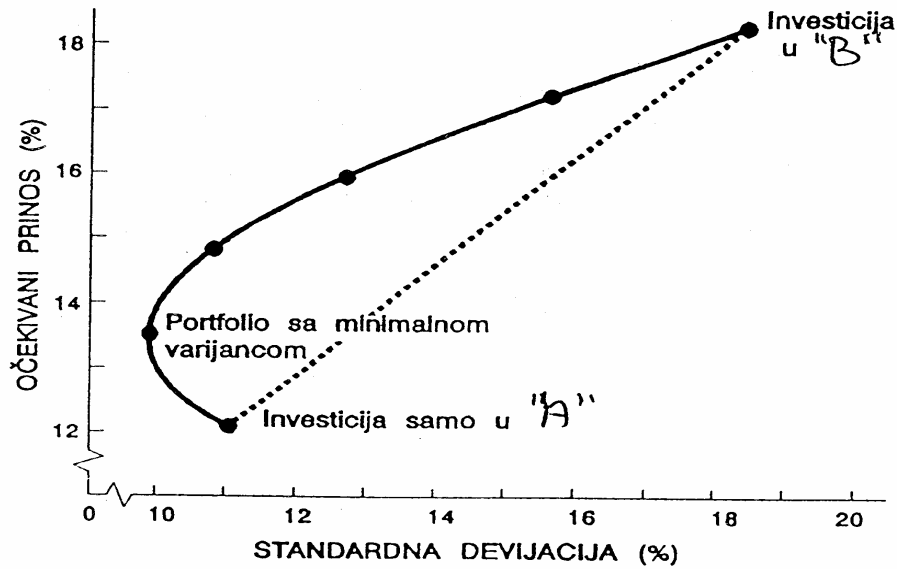
Standardna devijacija portfelja =

$$\sqrt{(0,11)^2 \times (0,8)^2 + 2 \times 0,00418 \times 0,8 \times 0,2 + (0,19)^2 \times (0,2)^2} = 10,26\%$$

U Grafikonu 4. prikazani su mogući prinosi portfelja i standardne devijacije, uz pretpostavljene koeficijente korelacije +1 i + 0,20.

Grafikon 4.

Skupovi mogućih portfelja u slučaju ulaganja sredstava u portfelj od dva vrijednosna papira



U grafikonu je **isprekidanom crtom** prikazano kretanje prinosa portfelja i rizičnost različitih kombinacija vrijednosnica u portfelju pod pretpostavkom savršene pozitivne korelacije (koeficijent = +1).

Na temelju grafičkog prikaza i podataka u Tablici 13. može se reći da se prinosi od različitih portfelja povećavaju od 12% uz rizičnost 11 kod prvog portfelja, pa sve do 18% uz rizičnost 19 kod šestog portfelja. Zato što je koeficijent korelacije pozitivan i jednak jedan, nema nikakve redukcije rizika u portfelju. Ulagač zna da će ostvariti minimalni prinos uz minimalni rizik, ili veći prinos uz veći rizik te da se kombiniranjem udjela pojedinih vrijednosnica u portfelju ne može postići bolja kombinacija rizika i prinosa.

U grafikonu je **tamnom krivuljom** prikazano kretanje prinosa i rizičnosti različitih kombinacija udjela vrijednosnica u portfelju pod pretpostavkom djelomične pozitivne korelacije prinosa (koeficijent = +0,20). Krivulja ukazuje na moguće reduciranje rizika kombiniranjem različitih udjela vrijednosnica u portfelju.

Prvi portfelj (100% vrijednosnica A i 0% vrijednosnica B) ima očekivani prinos 12% i standardnu devijaciju 11,00. **Drugi portfelj** (80% vrijednosnica A i 20% vrijednosnica B) ima očekivani prinos 12,6%, uz standardnu devijaciju 10,26. Dodajući u prvi portfelj vrijednosnicu B koja ima rizičnost 19, dakle veću od rizičnosti vrijednosnice A čija je standardna devijacija 11,00, smanjila se sveukupna rizičnost portfelja s 11,00 na 10,26. Reduciranje rizičnosti posljedica je manje koreliranosti prinosa između dviju vrijednosnica u portfelju. Pritom treba naglasiti da se učinak diversifikacije mjeri udaljenošću zakrivljene crte od isprekidane crte. Što je koeficijent korelacije manji, udaljenost je veća i diversifikacija je bolja, odnosno učinkovitija. Dakle, drugi portfelj ima veći prinos i manju standardnu devijaciju od prvog portfelja. Kod **trećeg, četvrtog, petog i šestog portfelja** povećava se prinos, ali i neizvjesnost ostvarenja prinosa ili rizičnost iskazana standardnom devijacijom portfelja.

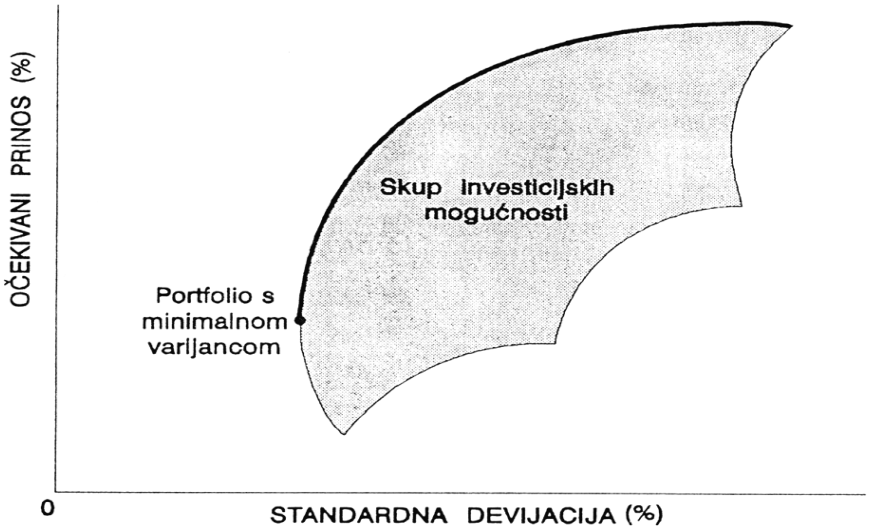
Na temelju ovih rezultata može se reći:

- da je portfelj s minimalnom standardnom devijacijom drugi portfelj koji sadrži 80% vrijednosnica A i 20% vrijednosnica B;
- da niti jedan investitor neće poželjeti portfelj s nižim očekivanim prinosom od prinosa koji se ostvaruje posjedovanjem portfelja s minimalnom varijancom, odnosno standardnom devijacijom (drugi portfelj);
- da efikasan skup čini dio krivulje između portfelja s minimalnom varijancom (drugi portfelj) i portfelja s maksimalnim očekivanim prinosom (šesti portfelj);
- da će ulagač izabrati portfelj na efikasnoj granici ili granici efikasnosti i taj portfelj za njega predstavlja optimalnu kombinaciju očekivane stope prinosa i standardne devijacije prema zadanoj prihvatljivosti rizika u odnosu na željenu stopu prinosa te
- ako se portfelj sastoji od samo dvaju vrijednosnih papira gibanje (variranje) udjela mijenja poziciju investitora isključivo uzduž ove krivulje.

Ako bi se portfelji formirali od triju i više vrijednosnih papira, skup investicijskih mogućnosti kretao bi se u određenom području (Grafikon 5.).

Grafikon 5.

Proizvoljni skup više mogućih investicija



Ista načela koja vrijede za portfelj sastavljen od dviju vrijednosnica mogu se primijeniti i na portfelje sastavljene od više vrijednosnih papira. Skup mogućih portfelja prikazan je površinom, ali portfelj s minimalnom varijancom, odnosno standardnom devijacijom, je portfelj pomaknut najdalje prema lijevoj strani i nalazi se na granici efikasnosti. Efikasan skup portfelja ili granica efikasnosti, prikazan je tamnijom krivuljom na vrhu skupa mogućih portfelja, i to od portfelja s minimalnom varijancom do portfelja s maksimalnim očekivanim prinosom, ali i maksimalnom rizičnošću.

Prema Markowitzevoj koncepciji bilo koji investitor težit će odabiru portfelja koji se nalazi u efikasnom skupu (Markowitz, 1959.). Neki portfelj nije efikasan ako postoji ijedan drugi portfelj koji ima veći očekivani prinos i manju standardnu devijaciju ili jednak očekivani prinos, ali manju standardnu devijaciju. Pritom treba naglasiti da investitor neće odabrati portfelj koji nije efikasan zato što se takvom portfelju dodavanjem vrijednosnica može povećati prinos bez povećanja rizičnosti, ili sniziti rizičnost bez smanjenja prinosa. Bez obzira je li riječ o portfelju sastavljenom od dviju ili više vrijednosnica, investitor će odabrati neki od portfelja na granici efikasnosti, odnosno jedan od dominantnih portfelja.

Iz navedenog proizlazi da zapravo ne postoji jedna jedina kombinacija vrijednosnica za koju bi se moglo reći da čini optimalni portfelj za sve investitore, već se može govoriti o većem ili manjem broju efikasnih portfelja, od kojih će ulagač izabrati onaj za koji on smatra da je najbolji za njega.

Pritom treba naglasiti da postoje različiti ulagači. Prva skupina su takozvani **"agresivni investitori"** koji izborom vrijednosnica i ulaganjem sredstava nastoje ostvariti maksimalne prinose zanemarujući na neki način činjenicu da su takva ulaganja, u pravilu, povezana s povećanim rizicima, odnosno ostvarivanje prinosa ima veću neizvjesnost. Agresivni

investitori daju prednost profitabilnosti ulaganja sredstava. Druga skupina su **"konzervativni investitori"** koji u prvom redu određuju gornje granice rizika kojeg su spremni prihvatiti, a zatim unutar tih granica kombiniranjem ulaganja sredstava u razne vrijednosnice nastoje postići maksimalne prinose. Konzervativni investitori daju prednost sigurnosti ulaganja sredstava. Prva i druga krajnost (agresivni i konzervativni pristup) nisu u potpunosti prihvatljivi i zato je potrebno naći primjeren odnos između poželjnog prinosa i prihvatljivog rizika ulaganja.

Banke, kao financijske institucije u vlasništvu većeg ili manjeg broja dioničara, posluju s približno 10% vlastitih izvora (dionički kapital i razni oblici rezervi) i 90% s prikupljenim depozitima i pribavljenim kreditima, dakle tuđim izvorima koje trebaju u ugovorenom rokovima vratiti deponentima i kreditorima[2]. To je osnovi razlog, odnosno argument u prilog tezi da uprava svake banke prilikom donošenja odluka treba voditi računa u prvom redu o sigurnosti plasmana, a zatim o profitabilnosti ulaganja da bi se očuvala vrijednost sredstava kojima banka upravlja.

U praksi se može ponekad dogoditi da su banke u vlasništvu manjeg broja većih dioničara putem nadzornog odbora i uprave sklone provoditi politiku agresivnog ulaganja sredstava s ciljem postizanja maksimalnih profita. Međutim, bankovnom regulativom, odnosno ograničavanjem ulaganja u zavisnosti od veličine jamstvenog kapitala kao i odgovarajućom politikom rezerviranja za potencijalne rizike po kreditnim i nekreditnim plasmanima takvu politiku banaka potrebno je svesti u granice prihvatljivosti, kako agresivna politika pojedine banke ne bi postala uzrokom nestabilnosti bankovnog sustava kao cjeline. Uprave većih banaka, koje su najčešće u vlasništvu mnoštva manjih dioničara, pravnih i fizičkih osoba, sklone su ipak više voditi računa o sigurnosti, a tek potom o profitabilnosti ulaganja sredstava kako bi osigurale stabilan rast i razvoj banke te odgovarajući prinos svojim dioničarima. Bez obzira na veličinu, vlasničku strukturu ili neka druga obilježja i specifičnosti pojedine banke, može se reći da je za banke u provođenju politike plasmana više prihvatljiv konzervativniji nego agresivni pristup, odnosno, budući da rizike u poslovanju nije moguće izbjeći potrebno ih je identificirati, kvantificirati i njima optimalno upravljati.

3. Multiplikacija kredita i depozita kao korektivni činitelj optimalizacije ulaganja sredstava banaka

U oblikovanju optimalnog portfelja vrijednosnih papira banke trebaju voditi računa o još jednom, iznimno važnom čimbeniku, a to je multiplikacija kredita i depozita koji je zapravo korektivni činitelj optimalizacije ulaganja sredstava (Jurman, 2005.).

Ako banka kupuje vrijednosne papire izravno od izdavatelja ili pak od imatelja koji inače novčana sredstva drže na računima uključenim u njezin depozitni sustav i koji poslovanje u većoj mjeri obavljaju s klijentima čija se sredstva vode na depozitnim računima te banke, kupovinom vrijednosnica neće u cijelosti doći do odljeva sredstava, već će se dio zadržati u sustavu i poslužiti za odobravanje dodatnih kredita i kreiranje dodatnih depozita te će se na taj način jačati financijski i kreditni potencijal banke. Jednako se tako može pretpostaviti da će prodavatelji vrijednosnih papira dobivena sredstva uložiti u poslovanje i da će pozitivni učinci iz tog poslovanja snažiti financijski potencijal banke. Kupovina vrijednosnih papira od izdavatelja ili imatelja koji svoja

[2] HNB, (2006.), Bilten, broj 112, str. 23.

kunska i devizna sredstva vode izvan depozitnog sustava banke znači odljev novčanih sredstava izvan banke i započinjanje procesa negativne multiplikacije kredita i depozita (Saunders, 2000., Sinkey, 2000.). To se može ilustrirati primjerom (Jurman, 2005.).

Pretpostavlja se da banka prikupi inicijalni iznos depozita u visini 100 mln. kuna s rokom povrata jednokratno nakon pet godina uz godišnju kamatnu stopu od 4,65%. Banka će od prikupljenih 100 mln. izdvojiti obveznu pričuvu po stopi od 18% (18 mln.) i rezervu likvidnosti, primjerice po stopi od 2% (2 mln.), a preostalih 80 mln. sredstava uložila bi u kupovinu vrijednosnih papira koji nose 6% kamate godišnje i čiji su izdavatelji njezini klijenti - deponenti koji se u poslovanju maksimalno pridržavaju poslovne politike banke usmjerene učinkovitoj multiplikaciji kredita i depozita.

Od plasiranih 80 mln. sredstava u kupnju vrijednosnica pretpostavlja se da bi približno 70% sredstava (56 mln. kuna) bio odljev u gotovinu, plaćanje poreza, doprinosa, carina i drugih isplata koje bi značile odljev sredstava iz depozitnog sustava banke, a 30% sredstava ili 24 mln. bilo bi zadržano u depozitnom sustavu banke i poslužilo bi za daljnje odobravanje kredita, odnosno multiplikaciju kredita i depozita.

Ako je obvezna pričuva 18% ($r_1 = 0,18$), rezerva likvidnosti 2% ($r_2 = 0,02$) i ako se 70% plasiranih sredstava odljeva, a 30% sredstava zadržava u depozitnom sustavu ($h = 0,30$) banka bi nakon završenog procesa multiplikacije kredita i depozita temeljem inicijalnog priljeva od 100 mln. kreirala dodatne depozite i odobrila nove kredite (Jurman, 1996.).

Depozitni multiplikator:

$$Md = \frac{1}{1 - (1 - 0,18 - 0,02) \times 0,30} = 1,31579$$

- Inicijalni priljev – inicijalni depozit .....…… 100,000 mln.

- Kreirani dodatni depoziti ..……..... 100 x 0,31579 = 31,579 mln.

Kreditni multiplikator:

Mk = Md x (1 - 0,18 - 0,02) = 1,31579 x 0,80 = 1,05263

- Ukupno plasirana sredstva …….....…..... 100 x 1,05263 = 105,263 mln. (80,000 mln. u vrijednosnice i 25,263 mln. u dodatne kredite)

- Izdvojena obvezna pričuva….....(100 + 31,529) x 18% = 23,684 mln.

- Ukupne rezerve likvidnosti ..... (100 + 31,529) x 2% = 2,631 mln.

- Ukupno izdvojena sredstva izvan depozitnog sustava banke ..... 131,579 x 70% = 92,105 mln.

Pod pretpostavkom da banka naplaćuje 6% kamate na kupljene vrijednosnice i 7,71% kamate na dane kratkoročne kredite i prima 0,75% na izdvojenu obveznu pričuvu, te plaća

4,12% kamate na inicijalna sredstva - dugoročni depozit i 0,61% na depozite po viđenju na žiro-računima svojih deponenata, a to su upravo bile prosječne kamatne stope u hrvatskim bankama u prosincu 2005. godine, tada bi **učinci na računu dobiti i gubitka izračunati na godišnjoj razini** bili:

Prihodi:

- kamate na vrijednosnice ..... 80,000 x 6,00% = 4,800 mln.
- kamate na dodatne kredite ..... 25,263 x 7,71% = 1,948 mln.
- kamate na obveznu pričuvu ……..... 23,684 x 0,75% = 0,178 mln.

6,926 mln.

Rashodi:

- kamate na inicijalni depozit ...……..... 100,000 x 4,12% = 4,120 mln.
- kamate na kreirane (dodatne) depozite po viđenju ...……...…..... 31,579 x 0,61% = 0,193 mln.

4,312 mln.

Pozitivna razlika .…….....……..... 2,613 mln.

Pozitivna razlika - zarada samo na razlici kamatnih prihoda i rashoda je 2,613 mln. kuna računajući na godišnjoj razini i za razdoblje od jedne godine i nju bi trebalo uvećati za razne naknade koje banka naplaćuje na odobrene kredite, primjerice za obradu kreditnog zahtjeva, za evidentiranje plasmana itd.

Ako bi banka od prikupljenog inicijalnog depozita u visini 100 mln. kuna izdvojila obveznu pričuvu i rezervu likvidnosti 20 mln., a preostalih 80 mln. uložila u kupnju vrijednosnih papira koji također nose 6% kamate godišnje, ali izdavatelji vrijednosnica su država ili poduzeća koja nisu klijenti te banke, već depozite i poslovanje vode kod drugih banaka, tada bi učinci na godišnjoj razini bili posve drugačiji.

Prihodi:

- kamata na vrijednosnice ……..... 80,000 x 6,00% = 4,800 mln.
- kamata na obveznu pričuvu .....……..... 18,000 x 0,75% = 0,135 mln.

4,935 mln.

Rashodi:

- kamata na inicijalni depozit .....…….. 100,000 x 4,12% = 4,120 mln.

Pozitivna razlika .....……..... 0,815 mln.

Bez obzira što se može raspravljati o visini primijenjenih kamatnih stopa na prikupljeni inicijalni depozit, odobrene kredite i kreirane depozite, o brzini multiplikacije te o sposobnosti da gospodarski subjekti - izdavatelji vrijednosnica provode poslovnu politiku banke usmjerenu prema učinkovitoj multiplikaciji, nedvojbeno je da već obračun na razini jedne godine ukazuje na značajne razlike u pozitivnim učincima koje ima ulaganje sredstava banke u kupnju vrijednosnica od svojih klijenata u odnosu na kupovinu vrijednosnica od države ili gospodarskih subjekata koji poslovanje vode u drugim bankama.

To se može potvrditi i podacima da bi banka u prethodnom primjeru, upravo zahvaljujući multiplikativnim učincima na poslovanje, mogla prihvatiti kupovinu

vrijednosnih papira od svojih klijenata, čak i u slučaju da po tim vrijednosnicama ostvaruje prinos po stopi od minimalno 3,8%. Pritom bi ostvarila sveukupnu zaradu na godišnjoj razini jednaku kao da je kupila vrijednosnice s prinosom od 6% od države ili drugih izdavatelja koji nisu njezini klijenti.

Kada je riječ o multiplikativnim učincima ulaganja sredstava banaka u vrijednosne papire potrebno je naglasiti da kupovina blagajničkih zapisa HNB-a znači poništavanje novca, započinjanje procesa negativne multiplikacije kredita i depozita u banci koja kupuje zapise, ali i započinjanje procesa negativne makromultiplikacije depozita i kredita cjelokupnog bankovnog sustava.

Također treba imati u vidu da kupovinom vrijednosnih papira od gospodarskih subjekata - svojih klijenata banka uspostavlja, odnosno održava poslovni odnos s njima. Za očekivati je da će klijenti banke držati kunske i devizne depozite na računima matične banke, da će putem nje obavljati domaći i međunarodni platni promet, da će koristiti kratkoročne i dugoročne kredite, garancije, avale i ostale bankovne usluge, da će zaposlenici poduzeća – izdavatelja vrijednosnica obavljati isplatu plaća putem tekućih računa kod te banke, koristiti stambene, potrošačke i druge kredite te razne bankovne usluge, što će sve pozitivno djelovati na potpunije korištenje kapaciteta banke, jačanje njezinog potencijala, jednostavnije održavanje likvidnosti i bolju profitabilnost poslovanja (Jurman, 1996.).

Uvažavajući Markowitzevu koncepciju, odnosno teoriju portfelja koja upućuje investitore da optimalni portfelj odaberu kao jedan od mogućih portfelja koji se nalaze na granici efikasnosti, te činjenicu da se politikom učinkovite multiplikacije uloženih sredstava može ostvariti dodatni rast financijskog i kreditnog potencijala i povećati zarada banke, može se reći, da bi banka u odabiru portfelja trebala postupiti na jedan od sljedećih načina.

Prvo, u odabiru portfelja koji se nalaze na granici efikasnosti prednost treba dati onoj kombinaciji vrijednosnica čijom se kupovinom ostvaruju maksimalni multiplikativni učinci na njezino poslovanje, uz minimalnu rizičnost.

Drugo, ako na granici efikasnosti nema portfelja čijim se formiranjem ostvaruju multiplikativni učinci na rast potencijala i dodatnu zaradu, tada ga treba potražiti kao prvi mogući do granice efikasnosti, ali s rizičnošću u prihvatljivim relacijama za banku.

Treće, ukoliko uopće nema efikasnog portfelja vrijednosnica čiji su izdavatelji inače klijenti banke, pa se ne ostvaruju pozitivni učinci multiplikacije ulaganja sredstava, banka treba dati prednost onoj kombinaciji vrijednosnica koja zadovoljava rizični apetit banke. Rizični apetit treba shvatiti kao spremnost banke za ulaganjem sredstava u razne oblike kreditnih i nekreditnih plasmana i preuzimanje rizika ulaganja u za nju prihvatljivim relacijama u odnosu na jamstveni kapital.

U najopćenitijem smislu može se reći da će svaka banka pojedinačno oblikovati svoj portfelj u skladu s mogućnostima. Pritom su ograničenja (1) raspoloživi izvori odgovarajuće ročnosti i alocirani dio jamstvenog kapitala namijenjen pokriću eventualnih rizika za takva ulaganja na strani banke te (2) raspoloživi broj i iznos vrijednosnih papira ponuđenih na tržištu. Svaka će banka za sebe oblikovati optimalni portfelj vrijednosnica u nastojanju da u granicama rizičnog apetita postigne najveće izravne prinose vrijednosnica, ali i maksimalne multiplikativne učinke na rast financijskog i kreditnog potencijala i dodatnu zaradu iz povećanog poslovanja.

Optimalizaciju portfelja vrijednosnih papira banke će provoditi u okviru tržišnih ograničenja (raspoloživih vrijednosnica) i vlastitih ograničenja (sredstva i alocirani dio jamstvenog kapitala) (1) kupovinom i dodavanjem novih vrijednosnica u portfelj - povećanje portfelja, (2) prodajom vrijednosnica iz portfelja - smanjenjem portfelja i (3) istovremenom prodajom i kupnjom različitih vrijednosnica - promjenom strukture portfelja.

4. Zaključak

(1) Poslovne banke prikupljena i pribavljena kunska i devizna sredstva usmjeravaju u razne oblike kreditnih i nekreditnih plasmana. Najznačajniji oblik nekreditnih plasmana su ulaganja u vlasničke i dužničke vrijednosne papire, kao što su dionice, obveznice, blagajnički zapisi, trezorski zapisi, certifikati o depozitu, komercijalni zapisi i sl..

(2) U odabiru vrijednosnica banka se treba držati općih i posebnih načela, odnosno kriterija**. Prvo**, vrijednosnice koje banka kupuje trebaju biti sigurne. **Drugo**, vrijednosnice trebaju biti likvidne, što znači da se mogu relativno brzo i bez značajnijeg gubitka unovčiti. **Treće**, vrijednosnice trebaju donositi banci primjereni prinos. **Četvrto**, za banku su vrlo važni i učinci multiplikacije kredita i depozita od uloženih sredstava što će ih ostvariti ako kupuje vrijednosne papire od svojih klijenata (deponenata i korisnika kredita). Na taj način banka može ostvariti rast financijskog i kreditnog potencijala i dodatnu zaradu, tako da s tog stajališta, ulaganje sredstava u vrijednosnicu koja nosi i nižu nominalnu kamatnu stopu može za banku biti isplativije od ulaganja u vrijednosnicu koja ima višu kamatnu stopu**. Peto**, za očekivati je da će banka kupovinom vrijednosnica od nekog subjekta uspostaviti novi ili poboljšati već postojeći poslovni odnos s klijentom i na taj način povećati opseg svog poslovanja.

(3) Uvažavajući opće i posebne kriterije optimalizacije ulaganja sredstava banka treba provoditi politiku diversifikacije ulaganja u razne vrste vrijednosnica više izdavatelja iz različitih djelatnosti koji djeluju na različitim područjima i sredstva ulažu u razne namjene kako bi maksimalno reducirala moguću rizičnost vrijednosnica.

(4) U izboru optimalnog portfelja banka treba težiti da to bude portfelj sa što manjom rizičnošću ulaganja i što većim prinosom, ali i portfelj čijom će se kupovinom ostvariti maksimalni pozitivni multiplikativni učinci na poslovanje.

(5) Kako su banke financijske institucije koje posluju uglavnom s tuđim izvorima, a znatno manje s vlastitim sredstvima (približno 10%) prilikom donošenja odluka o ulaganju sredstava trebaju voditi računa o optimalnom odnosu prinosa i rizika. Za banke bi to trebalo biti ostvarivanje maksimalnih prinosa uz minimalnu rizičnost, što znači da daju prednost sigurnosti ulaganja ispred mogućeg ostvarenja visokih zarada.

(6) Popularizacijom i većom afirmacijom kratkoročnih i dugoročnih vrijednosnih papira u hrvatskom gospodarstvu, odnosno na hrvatskom financijskom tržištu, može se očekivati povećanje portfelja, diversifikacija vrijednosnica i veći udio poslovanja s vrijednosnim papirima u sveukupnom poslovanju banaka, kako u segmentu pribavljanja tako i u segmentu ulaganja sredstava.

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OPTIMALIZACIJA ULAGANJA SREDSTAVA BANAKA U VRIJEDNOSNE PAPIRE

SAŽETAK

Udio ulaganja sredstava u vlasničke i dužničke kratkoročne i dugoročne vrijednosne papire (portfelj vrijednosnica) zadnjih nekoliko godina čini između 12% i 15% ukupne aktive hrvatskih banaka. Zato je za banke iznimno važno oblikovati optimalni portfelj vrijednosnica. U ovom radu prikazano je mjerenje pojedinačnih ili specifičnih i sistemskog rizika vrijednosnica i rizika portfelja te utvrđivanje skupa efikasnih portfelja s ciljem maksimiranja prinosa i smanjenja rizičnosti diversifikacijom ulaganja. Bankama se predlaže izbor optimalnog portfelja kao jednog od portfelja na granici efikasnosti kojim se ostvaruju maksimalni prinosi uz prihvatljivu rizičnost, ali i pozitivni multiplikativni učinci na poslovanje banke.

Ključne riječi: *banka, vrijednosni papiri, sistemski i nesistemski rizici, mjerenje rizičnosti vrijednosnica, mjerenje rizičnosti portfelja vrijednosnica, optimalizacija ulaganja sredstava*

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GLOBALIZATION, COMPETITIVENESS AND ENVIRONMENT

ABSTRACT

Our goal in this paper is to highlight the role and significance of the environment and natural resources in the process of creation of competitive advantages in a globaly connected world. It is possible to define the process of globalization on different levels: worldwide, specific country, specific industry and specific company. Globalization on different levels leads toward continuous requests for increased competitiveness. We would like to show the mechanism through which economic growth in a globalized world leads to environmental degradation and overexploitation of natural resources. Most developed countries admited significant environmental quality deterioration and natural resources overexploitation as a consequence of high rates of economic growth. In other words, the economic growth pattern was recognized as unsustainable in the long run. We shall make a critical review of particular indicators of competitiveness and sustainability, primarily of the Growth Competitiveness Index and Environmentaly Sustainability Index. We would like firstly to show important shortfalls of each of them, and secondly would like to propose certain improvements in the form of the creation of a entirely new synthetic indicator – Sustainable Development Competitiveness Index. That index (however still imperfect) might serve as a much better and reliable guidance for all the countries on their road toward genuine sustainability.

***Key words**: globalization, competitiveness, economic growth, environment, sustainability.*

1. Introduction

Globalization can be defined in several different ways depending on the level we choose to focus on: *At a worldwide level*, globalization refers to the growing economic interdependence among countries reflected in increasing cross-border flows of goods, services, capital and know-how. *At the level of a specific country*, globalization refers to the extent of inter-linkages between a country's economy and the rest of the world. *At the level of a specific industry* globalization refers to the degree to which a company's competitive position within that industry in one country is interdependent with that in another country. *At the level of a specific company*, globalization refers to the extent to which a company has expanded its revenue and asset base across countries and engages in cross-border flows of capital, goods and know-how

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across subsidiaries. Hence, one could say that globalization represents the process of increasing convergence and interdependence of national economies and of the international scope and availability of markets, distribution systems, capital, labor, and technology. The trend towards globalization has been clear in the pattern of sustained growth in the world trade and investment flows. Growth in the world economy has become more trade-intensive.

Our interest in this article will be focused on the globalization effects in the form of the continuous requests for increased competitiveness on all levels, from the company to the national economy. We would like to show the role of the environment and natural resources in the process of creation of competitive advantages in a globally connected world. Since the growth in the world economy has become more trade-intensive it means that different forms of traffic and transportation show the tendency of constant increase. Having in mind various negative effects that transport activities have on the environment, we would like to stress the fact that globalization in the long run leads to increased environmental pollution and more intense natural resources usage. In that sense we shall emphasize the importance of different environmental policy measures and indicators like environmental sustainability index (ESI) and ecological footprint. We shall compare these indicators with one indicator which obtained worldwide acceptance and relevance – Growth Competitiveness Index (GCI), which is determined for more than hundred countries and presented in the Global Competitiveness Report for 2004-2005, and Global Competitiveness Report for 2006. We would like to stress some shortfalls of GCI relating to natural resources and environment that might have far reaching and long term consequences on the process of environmental policy creation worldwide. Having in mind the evident need for a more effective environmental policy worldwide we would like to propose the creation of a new synthetic indicator combining GCI and ESI.

Economic growth is an important goal highly ranked on the agenda of all the countries in the world. But since 1970s most developed countries admited significant environmental quality deterioration and natural resources overexploitation. In other words, the economic growth pattern was recognized as unsustainable in the long run. The main response of all countries was mainly in the form of technological progress. That way significant results have been achieved in reducing the consumption of material and energy per unit of commodity or service produced. Hence, technological progress has been considered as a factor that will enable „decoupling“ environment and natural resources use from economic growth. We bring into question such a belief, analysing the difference between concepts of relative and absolute scarcity and relative and absolute decoupling of environmental and natural resources use from economic growth.

Using the estimates of the EU we would like to show that the absolute consumption of natural resources (total number of units multiplied with per unit consumption of environmental services, material and energy) will further increase, not decrease, in the world in the next twenty to thirty years. Regardless of some evident results that primarily information communication technologies (ICT) have achieved in the sense of increasing productivity and dematerialization of the whole economy, constantly increasing GDP and material production have reversed the overall positive trends. The neoclassical economics approach toward the economic growth is still very influental. One can realize that while reading a worldwide influental document entitled „Global Competitiveness Report for 2004-2005“ prepared by the

World Economic Forum (WEF 2004). The Report serves particular countries to compare their practices with the best ranked countries, seen as a model of desirable behavior. Professor Michael Porter, as the main author of the methodlogical framework and the theoretical background of the Report, based his approach to competitivenes on the premises of the neoclassical economy underestimating the role of natural resources and neglecting practically the concept and ideas of environmentaly sustainable development. We use the Report as a basis for discusion on different factors of productivity and competitiveness, primarily on advanced technology which, according to many authors is the prime enabler of the process of decoupling of environment and natural resources from economic growth. So called relative decoupling has been presented as a universal and sufficient sollution to numerous problems relating to environment and natural resources overexploitation. On the contrary, our opinion is that absolute decoupling is what is really needed if the mentioned problems are to be resolved in the long run. The emphasis is on the long run. Since absolute decoupling has been very rarely accomplished, we think that emphasis of achievement of only relative decoupling is counterproductive and even dangerous. Saying that the relative decoupling is the final solution to environmental and natural resources problems leads to the situtation in which incentives for further efforts aiming at absolute decrease of quality of limited resources used do not exist.

2. Economic growth, global competitiveness and the environment

The Report on Global Competitiveness for the year 2005 has ranked 117 countries according to the value of two indexes: Economic Growth Competitiveness Index, and Business Sector Competitiveness Index. The calculation of these indexes represents a significant contribution to the attempts to better define and analyze concrete factors that contribute to building of competitive advantages of individual countries, as well as to quantify their impact on economic growth. But, in addition to the obvious advantages of these synthetic indicators, we think that certain mistakes and shortcomings in the methodology have occurred, primarily due to the wish of the authors to apply the same common methodological framework to very different countries. These countries are different according to the level of economic development, or the stage of competitive development, to use the term of professor Porter. Yet, some shortcomings are equally applied to all countries and they represent shortcomings based on the broadest view of the philosophy of economic growth and development, as well as the importance of particular factors and the character and dynamics of their mutual interactions. We primarily have in mind the environment and natural resources (material and energy inputs).

From the very name of the Index it is evident that the authors, while deciding on the dominant concept and the broadest methodological framework, gave preference to economic growth and not to the economic development. Also it is obvious that they based their theoretical attitude to the greatest extent, if not entirely, on the postulates of the neoclassical economic thought. This basic orientation has resulted in an approach toward the environment and natural resources which, according to our opinion, is very disputable, both from the theoretic and practical standpoint, in the sense of the goals of economic policy and its concrete results. The authors of the Report entirely ignore clearly defined principles of sustainable development. It seems that professor Porter is interested in the environment primarily because he is convinced that appropriately stringent and adequately structured environmental legislation and policy act as a source of the classical competitive advantages, and not because he is convinced that the

environment by itself should be really protected and that we should radically change our attitude toward the environment. However, only the second would represent a significant step forward toward the transformation of a policy predominantly focused on economic growth to a policy of sustainable development. As for natural resources, the orthodox economic thought has been used which treats the natural resources simply as a given, or as a supposition which will in one way or the other, somewhere and in some form always be available to entrepreneurs, and their technology used in the production processes.

As for the way of calculation of different indexes of competitiveness, the first of them, Economic Growth Competitiveness Index is composed of the three component indexes; technological index, public institutions index and macroeconomic environment index. Detailed analysis of the content and the structure of these component indexes show that neither of them takes into account the element of the environment. In the process of calculation of the Business Sector Competitiveness two basic segments were taken into account: functioning and the strategy of companies, and the business environment in the country, which is by itself, composed of four parts: (1) Conditions with regard to inputs-factors, where the subcomponents (physical infrastructure, administrative infrastructure, human resources, technological infrastructure, and capital markets) were taken into account; (2) Demand conditions; (3) Industries that are interlinked and support mutual development; (4) Context for the strategy and rivalry among companies. In the mentioned components the environment found its modest place in the segment of demand conditions, although, honestly speaking, it is not quite clear why, in the form of the expression „stringency of environmental regulation“, it is placed in that particular segment. Natural resources are in an even worse position. Among the factors having influence on the business competitiveness natural resources were not even mentioned. Porter again treats them simply as an assumption, as something that is out of the question and always available. In the Report (WEF 2004, p. 21) Porter said: „Companies in a nation must upgrade their ways of competition if successful economic development is to occur. Broadly, companies must shift from competing on inherent endowments (comparative advantages such as low-cost labor or natural resources) to competing on competitive advantages arising form efficient and distinctive products and process“. And further (WEF 2004, p. 23): “National endowments such as natural resources play a declining role in competitiveness as the resource intensity of the economy fails and as technology substitutes for resources or opens up new resource locations. ... It is the productivity with which natural resources can be utilized, not the resources themselves, that normally have the strongest influence on prosperity. Finally, Porter concludes (WEF 2004, p. 44): „Countries with lower levels of productivity are more dependent on natural resources export“. This way Porter clearly recognizes and admits the role that natural resources have as a mean of competitive battle on the world market. It is an entirely different matter how we see them in that role – as more or less valuable, as efficient or inefficient, as desirable or less desirable. It is more than obvious that natural resources have been and still are, for the large number of countries, the predominant mean in the competitive battle on the world market and the dominant mean by which they realize their economic growth, but probably not economic development, and surely not sustainable development, envisaged as a complex goal realized through a balanced development on four fields simultaneously: economic, environmental, social and cultural.

Stating that technology replaces natural resources Porter evidently declares himself as a technological optimist who believes that technology alone can resolve all the problems and insure desirable continuous economic growth at high rates. We are not going to use this opportunity to offer full argumentation in order to dispute with such an approach, but it is evident that Porter does not take into account numerous findings and insights of economic theorists regarding the limits to growth through an ever increasing usage of technology in the form of social and natural laws.[1] Implicitly, professor Robert Sollow's approach has been adopted, according to which the concept of sustainability has been defined in the form of the sustaining of the total amount of assets, or capital at the disposal of a society, at the unchanged level. However, Sollow said that the ratios of particular components in the structure of assets (human capital, man made capital, financial capital, natural capital) can be changed over time. Obviously professor Sollow assumes unlimited substitutability among particular components of the total assets, which numerous theorists, not only ecologists but economists too, justifiably bring into question.[2]

Stating that technology finds new resources on new locations, Porter only shows that he entirely neglects the important distinguishing between absolute and relative scarcity of resources, and that he based his approach on the ideas of Stanford University professor Nathan Rosenberg elaborated in the book „Perspectives on Technology". Rosenberg considers only economic scarcity as a relevant one, but not absolute scarcity imposed by the first and the second thermodynamic laws, as well as the concept of entropy. That concept clearly shows that the absolute quantity of resources with low entropy (as a measure of their usefulness), unrestrainedly decrease due to the way the economic system is functioning in its attempt to insure continuous economic growth measured by the consumption of an ever increasing quantity of goods and services. According to Rosenberg: „Economic scarcity of a particular resource is not determined by the natural spread of the resource but by the level of development of science and technology which enables or disables economically viable exploitation of that resource" (Rosenberg 1976, p. 280).

The traditional economic theory (the postulates of which are obviously accepted by Porter) accepts the so called relative scarcity as the only relevant scarcity, for its proponents hold that technology is a sufficiently powerful mean for overcoming almost every scarcity human beings might encounter in the process of social development (or economic growth with which the proponents of the traditional economic theory are obviously predominantly occupied). Technological progress and almost infinite faith in technology lie in the very basis of the concept of relative scarcity. According to that concept technological solutions will always, without limits, be able to find a proper way of efficient replacement of scarce materials and the sources of energy with those more spread and previously unused. Hence, according to professor Rosenberg economic scarcity is the only one relevant for economic science and the society as a whole. Economic scarcity, according to Rosenberg, and obviously according to Porter, has no relations with clearly determined and properly defined ecological or geological scarcity, which actually, in the beginning, initiated sporadic debates about growth limits and unsustainability of a theory and practice putting emphasis predominantly on the economic

[1] Like Fred Hirsch: „Social limits to growth"; William Ophuls: „Ecology and the Policy of Scarcity".
[2] Like David W. Pearce in his book „Economic Values and the Natural World".

growth, and finally led to a clearly shaped philosophy and principles of sustainable development.
Stating that developed countries turn increasingly to the service sector, because their material component is limited, Dahl implicitly advocates that the relevance of natural resources that way is diminished and that their importance in the future would be ever decreasing. We would like to remind that according to the Report (WEF 2004, p. 44) the countries that lead in the export (measured in the absolute physical amount **not** as a size relative to their overall export) of minimally processed natural resources are the most developed countries: United States, Canada, Russia, Australia and Norway. On the other hand, we would like to remind that 20 % of population of the developed countries produces 80% of the world GDP. We do not believe that the whole 80% represents only services. ***Developed countries, like Japan, which is among the most important producers of steel despite the fact that it does not possess its own metal ore at all, enormously use natural resources of other countries and to a significant extent base their competitiveness on them. But the Index known as the Ecological Footprint clearly and unambiguously points to that fact and stresses the unsustainability of such a practice of economic growth of developed countries and the world as a whole.*** The Ecological Footprint Index converts a country's total resource consumption into the equivalent of hectares of biologically productive land, and then divides this population to obtain a final value of hectares per capita. The term "Ecological footprint" represents the corresponding surface of productive land and water ecosystems that are necessary in order to produce raw materials and assimilate produced waste, by the defined population on the specified level of the material standard of living, **regardless where on the planet that land is located**. It is really warning that the ecological footprint of London – with 12 % of the total Great Britain population and physically located on 170.000 hectares – amounts to 21 million hectares or 121 times more than the real surface of the very London, which is the equivalent of the whole productive land in Great Britain. Any comment is unnecessary.

In the process of consolidation of two mentioned indexes and calculation of the Global Competitiveness Index (WEF 2004, p. 74), on the list of twelve pillars of competitiveness, environment was simply lost and joined natural resources already lost in the previous iteration. In the repeated segment entitled Consumers (Demand Conditions) in the process of consolidation only three sub segments were stated explicitly: government procurement of advanced technology products, sophistication of the buyers and degree of customer orientation. The previously used term „stringency of environmental regulation" simply is not there. All this probably for the reason stated by Porter in one sentence (WEF 2004, p. 44): „Natural resources result from endowments, not economic competitiveness". But, from the previously mentioned arguments it is clear that Porter has acknowledged that particular countries (concretely those with low productivity) use natural resources as a base of their competitiveness, which means that competitiveness stems from natural resources available within the boundaries of those countries or within the boundaries of other countries. We deliberately say "of **other** countries" because even the most developed countries base their development either on natural resources located in other countries (Japan – metal ore) or on an exaggerated usage of the common environmental goods (U.S.A. currently use 36% of atmosphere as a place for disposal of CO_2 and CFC).

U.S.A. has not signed the Kyoto agreement. Explanation – it would result in an enormous increase of the costs of manufacturing. Of course, it would lead to significantly lower

competitiveness of US companies, or better to say competitiveness would be finally brought to a more realistic measure. Does one need more obvious proof that even the most developed countries base their competitiveness and their overall prosperity to a great extent on the overuse of natural resources? Conclusion: by exaggerated insistence on product differentiation as a strategic direction for obtaining competitive advantages, Porter entirely ignores the cost aspect of competitiveness. Low costs of the products in developed countries to a great extent have been insured either by natural resources from other countries or by overuse of common environmental resources. Had these costs been taken into account, the overall picture of competitive advantages and ranking of countries would be quite different.

Transnational corporations from the most developed countries, in spite of the most advanced technology in their possession, constantly search for locations worldwide characterized by comparative advantages in the form of cheap natural resources and labor force. It is another proof supporting the statement that not only low developed countries used natural resources as a basis of their competitiveness but also the most developed countries. They use their higher productivity simply to achieve larger production and easier distribution of their products all over the world. Hence, not to include natural resources in any way as a factor in the process of calculation of competitiveness index (justifying their exclusion by the statement that natural resources represent the gift of God and not the result of the conscious efforts), simply does not have real justification. We think that ***globalization, which supports previously mentioned patterns of behavior, represents the best way to practically keep alive otherwise unsustainable competitive advantages. It is even worse, they are constantly recommended as a desirable model of behavior.***

3. Absolute and relative decoupling of economic growth and natural resource consumption and environmental degradation

The term decoupling refers to breaking the link between "environmental bads" and "economic goods." Decoupling environmental pressures from economic growth is one of the main objectives of the OECD Environmental Strategy for the First Decade of the 21st Century, adopted by OECD Environment Ministers in 2001. Decoupling occurs when the growth rate of an environmental pressure is less than that of its economic driving force (e.g. GDP) over a given period. Decoupling can be either absolute or relative. *Absolute decoupling* is said to occur when the environmentally relevant variable is stable or decreasing while the economic driving force is growing. Decoupling is said to be *relative* when the growth rate of the environmentally relevant variable is positive, but less than the growth rate of the economic variable. According to Joke Waller-Hunter, former Director of the Environment Directorate of OECD, despite eco-efficiency improvements, overall environmental degradation has persisted in most cases. OECD countries reduced the energy intensity of their economies by 31% in the period 1973-1996, but they increased total energy consumption by 23% over the same period. Their total energy use is expected to grow by a further 30-50% to 2020. (Waller-Hunter 2000). The situation is similar with greenhouse gas emissions. While the output of GHG emissions relative to GDP has fallen for OECD countries in recent years, total absolute emissions have risen. Under current policies, OECD countries could increase GHG emissions by a further 30% to 2010, far from the overall Kyoto Protocol target of a 5% reduction from 1990 levels to 2008-2012. In some cases, there are no signs of any real improvement. This is true of *transportation*, where motor vehicle kilometers traveled in the OECD are expected to increase

by at least 65% in the period 1990-2020 and passenger air kilometers are expected almost to quadruple. Similarly, levels of OECD municipal waste generation in 2020 are expected to continue following GDP growth, approximately doubling from the 1980 levels. In the European Commission document entitled:" Towards a Thematic Strategy on the Sustainable Use of Natural Resources" there is a following statement: "Energy is a key resource for our economy. Overall demand is predicted to grow substantially over the coming decades, by 30% for the OECD countries and by 70% for the world as a whole in the next 30 years. For the EU, these increases are smaller than the targeted doubling of the economy over the same period; if efforts are maintained, the decoupling of energy use from economic growth will continue. However, energy consumption will still increase in absolute terms (European Commission 2003, 11).

It is obvious that in spite of increased productivity and more efficient usage of natural resources, in the form of smaller quantity of material and energy per unit of final goods, the key factor determining the total usage of natural resources is increasing the total quantity of final goods and services produced, which is significantly higher than achieved savings through a decrease of material and energy intensity per unit. When Porter talks of the decreasing role of natural resources in economy he obviously has in mind the decrease of material and energy intensity per unit of final output. But he does not recognize and does not accept trends clearly showing that the total quantity of natural resources used is increasing not decreasing. We are convinced their importance in the future will be higher not lower, as Porter believes.

An important shortfall of Porter's model of a competitive economy represents the fact that economic growth depends on **increasing usage of material and energy in absolute terms.** Unfortunately, increased productivity means increased efficiency with which natural resources have been transformed into the final products, since the basic definition of the productivity can be stripped to the statement that productivity represents the **quantity** of the goods produced in the unit of time. Porter overlooked the important fact elaborated clearly by the Directorate for the Environment: *„An annual economic growth of 3% leads to a doubling of the economy in 25 years* [3] *If this growth is realized within the production and consumption patterns of today, including the use of currently available technologies, the resource use will grow with a factor 2 as well. In this case there is a 1:1 coupling of economic growth and resource use. Fortunately, this scenario will not happen. The economic growth is not simply realized by doing more of the same. In other words, in the coming decades a considerable amount of value will be created, which material and energy intensity is less than today's products and services. The growing contribution of services to the economy is one reason for this. The ongoing improvement of technologies is another one. Nevertheless, the increase of energy and material use will be considerable, e.g. the energy use in OECD countries is expected to grow in the next 20 years by 35% and by 51% worldwide (OECD 2001). This means that economic growth and resource use are decoupled to some extent. In other words, resource use is growing, but less steep than the growth of the economy. This phenomenon is called relative decoupling. Absolute decoupling would take place if the growth of the resource use would be negative"* (European Commission 2002, 7). We think that additional comment is not necessary. Experts did take into account expected technological progress, but still envisage

[3] An annual growth of 3% leads to a cumulated growth in 25 years with a factor of (1.03)25 = 2. Hundred years of growth gives rise to a cumulated growth of (1.03)100 = 20.

significant increase of the quantity of natural resources used. Consequently, the assimilative capacity of the environment will be significantly endangered.

4. Measurement of competitiveness and sustainability: Sustainable Development Competitiveness Index - SDCI

The Environmental Sustainability Index (ESI) for the year 2005, prepared by the World Economic Forum (in cooperation with Yale and Columbia Universities) calculated for 146 countries, represents the measure of the overall progress toward environmental sustainability, as one of the components of the sustainable development. Environmental sustainability is measured through 20 indicators, each of which combines two to eight variables, for a total of 68 underlying data sets. The ESI tracks relative success for each country in five core components: Environmental Systems, Reducing Stresses, Reducing Human Vulnerability, Social and Institutional Capacity and Global Stewardship. The ESI demonstrates that it is possible to derive quantitative measures (however imperfect) of environmental sustainability that are comparable across a large number of countries. Comparative analysis supports efforts to identify critical environmental trends, track the success (or failure) of policy interventions, benchmark performance, and identify "best practices". The higher a country's ESI score, the better position it is in to maintain favorable environmental conditions into the future. It is interesting to see some of the results form the Report. With regard to the synthetic component (which is the most important one, according to our opinion), Reducing Environmental Stresses (with Indicators: Reducing Air Pollution, Reducing Water Stress, Reducing Ecosystem Stresses, Reducing waste and Consumption Pressures) and according to Growth Competitiveness Index the ranking of particular countries is given in the following table:

	Growth Competitivenes Index (GCI)	**Reducing Environmental Stresses as a main component of Environmental Sustainability Index (ESI)**
Belgium	31	145
Taiwan	15	144
USA	2	143
Neaderland	11	142
Great Britain	13	141
Denmark	4	140
Germany	15	135
Japan	12	128

Sources: WEF January 2005, p. 377 and WEF September 2005, p. 353

We think that figures speak for themselves. As of the component Social and Institutional Capacity, according to one indicator (Science and Technology) comprising of the three variables (Technology achievement index, Technology innovation index, and Mean years of education), USA is in the first place, leaving far behind all other countries. But, if one looks at the other indicator defined as Eco-Efficiency (comprising of two variables: Energy efficiency,

measured as total energy consumption per unit GDP; and Renewable energy production as a percentage of total energy consumption) USA is on the 107. place. As of the indicator Reducing Transboundary Environmental Pressures (CFC Consumption- total times percapita; SO_2 exports; Total marine fish catch), within the component Global Stewardship, it is also interesting to note the ranking of some of the most developed countries: USA-126, France-127, Great Britain-139, and Japan -144.

Having all this in mind, and the fact that all the countries have formally accepted sustainable development as a leading philosophy, it is clear and obvious (to everybody?) that the indicators from the Global Competitivenss Report send a completely wrong and counterproductive message. It is obvious that the rank of particular countries, and USA in the first place, would be drastically changed, even with regard to ESI, if mentioned components and indicators were given significance and weight they ***really deserve. And then if we combine, with proper weights, ESI and GCI into our proposed new synthetic index designated as Sustainable Development Competitiveness Index (SDCI), we would get a completely different and more realistic picture and ranking of particular countries. Competitiveness is not the goal for itself. It is supposed to lead to economic development, which is supposed by itself to lead to better life and increased overall welfare of the citizens of particular countries, and not to the increase of only one component – material consumption.*** **The calculation of a new synthetic SDCI index requires a decomposition of the GCI and ESI indexes and determination of the weights of all individual indicators, as well as a determination of the very models used for the calculation of these indexes. This is a necessary prerequisite for combining them into a synthetic, competely new index. Due to the compexity of such a task, the results of these activities in the form of a proposed concrete model for the calculation of SDCI and weights for each of the consisitng indexes will be presented in the near future in a new paper.**

If the idea of the sustainable development is really accepted, and not only formally, we are convinced that only one such synthetic indicator as Sustainable Development Competitiveness Index would be a proper indicator of the long–run success of a national economy.

5. Instead of conclusion

The achievement of reduction of environmental impacts requires an absolute decoupling of environmental impacts from economic growth. Relative decoupling tends to mean just resource efficiency, and resource efficiency measures alone will not deliver the objective of ensuring that "the consumption of renewable and non-renewable resources does not exceed the carrying capacity of the environment." Relative decoupling would not lead to reductions in environmental impacts, merely a slowing down of the increase in environmental impacts.

What is needed is absolute decoupling and not relative decoupling, as Porter with other technological optimists advocates. To achieve absolute decoupling significant changes are requested in the field of consumption, not only in the field of extraction and manufacturing. To achieve absolute decoupling between environmental impacts and economic growth, an overall reduction in resource use will be required. Technological fix and increased resource productivity, however important, are not sufficient. Real decoupling is absolute decoupling and the only one actually deserving that name. Relative decoupling is an illusion that we are

using to convince ourselves that we are going in the right direction, while we accumulate the problems. If we continue with that illusion I am afraid that Keynes might be right: "In the long run we are all dead".

Thinking about real competitive advantages that would lead to the really sustainable development should lead to a completely different definition and understanding of competitiveness in the globally connected world and hence leads to a completely different ranking of countries. We think that the ranking of countries according to GCI is not in accordance with the principles of environmentally sustainable development. A combination of GCI and ESI could offer a more realistic (although still not perfect) picture. Such a combined index – designated as Sustainable Development Competitiveness Index (SDCI)**,** might serve as a real guidance for all countries on the road toward sustainability. What is needed therefore is a redefinition of the very term social prosperity-progress and defining of different models of development, not only growth. The words of Peter Russell from his book "Awakening of the planet" might be appropriate for the end: "It is not enough to notice and convict only our strivings toward growth, but the limitation of our consciousness about possible ways of growth."

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GLOBALIZACIJA, KONKURENTNOST I OKOLIŠ

SAŽETAK

Cilj ovog rada je naglasiti ulogu i važnost okoliša i prirodnih resursa u procesu stvaranja konkurentne prednosti u globalno povezanom svijetu. Proces globalizacije možemo definirati na različitim nivoima: svjetskom, određene države, određene industrije i određene tvrtke. Globalizacija na različitim nivoima vodi ka neprestanim zahtjevima za povećanom konkurentnošću. Želimo pokazati mehanizam kojim ekonomski rast u globaliziranom svijetu vodi do degradacije okoliša i pretjeranog iskorištavanja prirodnih resursa. Većina razvijenih zemalja je priznala da dolazi do znatnog smanjenja kvalitete okoliša i pretjeranog iskorištavanja prirodnih resursa kao posljedice visokih stopa ekonomskog rasta. Drugim riječima, shema ekonomskog rasta je dugoročno prepoznata kao neodrživa. Donosimo kritički osvrt na specifične indikatore konkurentnosti i održivosti, prije svega na Indeks konkurentnosti rasta i Indeks održivosti okoliša. Želimo prije svega pokazati značajne mane u oboma, a zatim i predložiti poboljšanja u obliku stvaranja potpuno novog sintetskog indeksa – Indeksa konkurentnosti održivog razvoja. Taj indeks (ma koliko još nesavršen) može poslužiti kao mnogo bolja i pouzdanija vodilja za sve zemlje na njihovom putu ka istinskoj održivosti.

***Ključne riječi**: globalizacija, konkurentnost, ekonomski rast, okoliš, održivost.*

Mario Radovan*

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TOWARDS A SURVEILLANCE SOCIETY

Abstract

The paper deals with the issues of data gathering, surveillance and intense use of targeted messages in contemporary living space shaped by technology and by the capitalist view of the world. Those who possess a relevant knowledge about others, possess a power over them, and they can use and abuse this power in various ways. Intense data gathering, observations and surveillance facilitate the manipulation of people and allow the real holders of power to shape the social reality in the ways that serve their interests, but which can easily lead to a totalitarian society. Totalitarian systems used to be imposed by states and by religious organizations, and they were based on political ideologies or religious dogmas. Using the power of technology, contemporary capitalism has been creating a new business civilization which nominally promotes openness and freedom, but which shows clear totalitarian tendencies. The paper puts forward a series of critical reflections related to these issues.

***Key words**: data gathering, consumer profiles, observation, privacy, surveillance, targeting, business civilization, totalitarian society*

1. Observing and gathering

Information technology makes possible for ordinary people to record and make public various events, and to provide evidence of various abuses to which they have been exposed; in this way information technology helps the weaker to protect themselves from the oppression of the stronger. However, at the same time, information technology helps the stronger - holders of economic power and various institutions - to introduce efficient systems of a complete surveillance and control of the weaker. In other words, the Information Society shows a tendency to move towards the Surveillance Society, which actually means towards a *totalitarian society*. Data gathering and surveillance tend to be secretive, so that the professionals in this field could be the only one who know exactly what means and methods are used in these activities. However, technical details are not essential here because this discourse deals primarily with the *psychological and social effects* of the intense observation of the people and of their intrusive targeting with specific messages, regardless of the means and methods used, by whom and for what purposes it is done.

Holders of power and various institutions have always gathered data about their subjects and observed their behaviour. However, contemporary information technology has radically increased the possibilities of observation and data gathering, as well as of processing of the data gathered in various ways, places, times, and forms. People are increasingly observed at their workplace; companies normally observe the Internet and telephone communication of their employees (cf. Castells 2001; Barney 2000). However, information technology allows observation of the people virtually at every step. Every gate that a person

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passes through and all spaces she enters can register some data about her and about her activities. Various devices we use or pass by can do the same. A device can take fingerprints of the one who uses it; another can check the presence of various ingredients in his breath, such as alcohol or drugs. Cameras that record passers by can send the images directly to a central system which checks in its database if some of the recorded faces is a suspected criminal, a terrorist, or wanted for some other reason. These possibilities are not only hypothetical; according to various reports, all these methods of observation and data gathering, as well as many others, have been tried or practiced. There are probably numerous activities of that kind going on around us, which are not known to ordinary citizens.

Data gathering, observation and surveillance are nominally practiced mainly for business and security purposes, but the data and knowledge acquired for these purposes can be used and abused for various other purposes. These activities and their results can be used for manipulation and exploitation of the people; they can allow the holders of power to shape people and social reality in the ways that serve the aims of the holders of power. It has been said that knowledge is power, and that power corrupts people. Those who can know virtually everything about others, possess power over them and they can use this power in many ways, some of which may be abusive, harmful and destructive.

Issues related to data gathering, observation and surveillance of the people have been given a notable attention in academic research as well as in public discourse (cf. Regan 2002; Ball 2002; Ploeg 2003; Koops 2003; Viseu, Clement, Aspinall 2004). However, these analyses and discussions deal primarily with the issue of privacy; in the present paper we argue that *mistakes* in the processes of data gathering, observation and surveillance, and *abuses* of the results of these processes, can have much wider and more dramatic social consequences than the (mere) loss of privacy normally has.

2. Profiling the people

By our daily activities we constantly create data which can be recorded by various devices. For example, when we pay with a credit card, we create data which show on what we spend our money, and what amount of money we spend. Each such piece of data by itself does usually not tell much; however, on the basis of a collection of such pieces of data gathered together, it is possible to form a "portrait" of a person; such portraits are usually called "profiles". In the techno-economically stronger countries, data gathering for commercial purposes has become a normal business activity. There are companies which collect commercially relevant data about individuals and communities; they obtain such data from various sources such as shops, agencies, and other services. On the basis of these data, companies form consumer profiles of the individuals and of communities. Companies which produce such profiles, sell them to businesses which are interested in contacting people with some specific interests. On the basis of such consumer profiles, marketing and service companies can offer their commodities and services to those people whose profiles show that they could be interested in their offers.

Political profiles have also been produced for individuals and communities, and sold to electoral candidates who use them in their electoral campaign. For example, Castells reports that on occasion of the 2000 elections in the USA, political profiles were created for 150 millions USA citizens, and sold to the campaign offices of the candidates (cf. Castells 2001, p. 176). On the basis of such profiles, candidates can tell each community precisely what that community wants to hear, with an aim to win the support of its members. Such practice compels candidates to advocate opposite positions on different occasions, but in the

present age of noisy disinfotainment, nobody notices such inconsistencies. And even if rare individuals do notice them, this does not have much effect.

The Internet has opened new opportunities for data gathering. There are companies which copy and elaborate every message posted on the Usenet newsgroups; such messages normally contain some personal data, email addresses, and a content relevant for the profiles of their authors (written by themselves). The Usenet newsgroups are suitable for profiling as well as for targeting customers, since each of the newsgroups normally deals with a specific issue which shows a specific interest of the members of a specific newsgroup. Offers related to that subject of interest can be posted to the newsgroup, or sent as individual messages to the members of the newsgroup. Web sites also collect data about those who visit them, implicitly (by software means), and often also explicitly, especially from the less skilled or less cautious users. This data can also be used for various purposes, not all of which are innocuous.

In sum, various forms of data gathering allow creating various kinds of profiles of the individuals and communities, which can then be used for various purposes. The basic problem related to massive data gathering and observation of the people is that the results of these activities can be used not only for commercial, security and political purposes (which are considered acceptable), but also for abusing and harming people in various ways. A larger problem is that also the accepted and legal practice of observation of the people, data gathering, and targeting of the people with specific messages, can have bad psychological effects and lead to a totalitarian society if practiced in excessive forms and extensions. More about these perils will be said later.

3. Following and recording

It has been said that virtually all the Internet communication has been recorded for security reasons. These records can be stored for years, searched and processed in many ways and for various purposes. For example, it is possible to gather together all the activities of a specific person or all the communication in which some specific words appear. Data can be searched and elaborated in many ways. The huge quantity of data may pose a problem, but with the present data storing devices of incredibly large capacities and with processors of incredible speeds, this is probably not a big problem. A bigger problem may be the understanding of the recorded contents. Very many languages are used in communication, messages can be encrypted in various ways, and they can be hidden (encoded) in digital records of pictures and sounds. There is no need to deal with these problems here; I wanted only to point out how pervasive the surveillance has become and how incredibly large amount of data have been constantly recorded and stored. I cannot tell how useful this endless mass of data actually is from the security point of view; professionals in the field of security could tell us more about this, but they will probably not do it, for security reasons, of course.

Regardless of the real use and effects of the massive recording of the Internet activities, I am impressed with two basic things in this regard. Firstly, with the incredibly large amount of data that have been stored with this kind of surveillance of the Internet activities. Secondly, with the fact that my innocuous email messages are stored and kept in some obscure place, possibly for many years. This latter fact has spoiled for me the pleasure of writing emails. The fact that my emails are recorded by somebody (just in case) and that they can be retrieved and processed in a way that uses their content out of the context in which they were written, has changed the way I write emails. The awareness that whatever personal thing or a stupidity I wrote to a friend in some moment, could later be used by a third side, whoever it be, out of the original context and possibly with an aim to harm me, have

spoiled for me the satisfaction of writing in an open, vigorous, and sincere way; and I do not feel a satisfaction in writing private messages in a diplomatic way.

When they are turned on, mobile telephones are connected to an antenna (access point), normally the closest one which they can hear the best. When a mobile telephone moves away from the antenna to which it is connected, and approaches another one from which it can hear stronger signal than from the one to which it is connected, the mobile telephone switches from the previous antenna to the new one. It has been said that mobile telephone companies permanently keep records for all antennas about all connections of mobile telephones to them and about their leaving the antennas; in this way mobile telephone companies create (and possess) the evidence about the movements of all mobile telephones, and with this also of their owners. Such data are made available to the police and to various security agencies when they ask them, but they can be used also for other purposes. In any event, the very existence of a database which contains data about the movement of almost all the citizens (or of their mobile telephones) during the last few years, is amazing. It has been said that people could regard *invasive* such a systematic gathering and storing of data about their movement (cf. May 2002, p. 110). They could, indeed; but this is only one of the forms of invasiveness which people will be compelled to get used to; other forms could be much more invasive. One could turn the mobile telephone off sometimes and in this way escape the monitoring; but this would make him suspicious. The fact that a mobile telephone was not connected to any antenna for a certain period of time, would raise the question why was the telephone turned off, and where had its owner been during that time; why was he hiding, and so on. When the Big Eye watches you, an attempt to hide even for a moment makes you suspicious!

Regarding the issue of recording the *contents* of telephone conversations, the situation is rather secretive and less clear. However, there are indications that telephone conversations are massively recorded. For example, on 11 May 2006, the BBC television reported that telephone calls of "tens of millions of ordinary citizens" in the USA were recorded for security purposes. It was also said that the National Security Agency "asked" telephone companies to record *every* telephone call made in the USA. Since some senators expressed concern about such practice, the President of the USA addressed the nation by a statement in which he said that the recording of telephone conversations does not mean invading privacy, and that "the privacy of ordinary Americans is fiercely protected" in all the activities related to data gathering and surveillance. He should know the best.

Will such a pervasive observation and data gathering turn out to be more beneficent than detrimental for the common citizens, only time will tell. Or perhaps it will not, because people get used to everything; new generations are replacing the old ones, so that the old times are gradually being forgotten, and with time everything new becomes normal.

4. A global Panopticon

Jeremy Bentham proposed a design of a building called Panopticon in which all the inmates can be observed all the time by a supervisor whom they cannot see. This structure consisted of the central tower and of many cells situated around it; the doors of the cells were such that a supervisor could see inside every cell from the tower; on the other hand, the windows of the tower were such that the inmates could not see the supervisor in the tower from their cells, so that they could not know if and when the supervisor was watching them. The impossibility of the supervised to see their supervisors is especially important, because this creates a sense of powerlessness in the supervised and gives an additional power to the supervisor. The basic aim of the specific design of the Panopticon was to "induce" in the

inmates the awareness of the "permanent visibility that assures the automatic functioning of power". In other words, the system of surveillance was designed and organized in the way that "the surveillance is permanent in its effects, even if it is discontinuous in action". The invisibility of the supervisors makes the Panopticon "a machine for creating and sustaining a power relation independent of the person who exercises it" (cf. Rheingold 2002, p. 189)

Bentham considered his Panopticon an appropriate architectural structure for prisons, asylums, schools, hospitals and factories. In the present age, the entire world has been transformed into a global Panopticon. It remains to be seen if this global Panopticon will turn out to be a perfect prison, a global insane asylum, a much needed compulsory school, a hospital for incurable diseases, or a total factory from which there is no escape. In any event, a system of total and invisible surveillance empowers the supervisors and intimidates the supervised. Even if people get used to the unpleasant feeling which surveillance creates, the "power relation" will remain and it could get increasingly problematic. Because power tends to corrupt, and absolute power tends to corrupt absolutely.

Information technology offers countless possibilities of surveillance. For example, according to a BBC television report (2001), in some cities, cameras have been installed into driver's cabs of the trucks that clean the streets and collect garbage. These cameras record the streets through which the trucks are moving, and send records directly to a central office. In this way, drivers are kept under a constant surveillance so that they cannot park their vehicles and go for a drink, or they cannot do it too often. Another way of observing people in their work environment is to require of them to carry devices which register their movement; such devices can register their passage through certain points (doors). Similar systems have been used in some hospitals with an aim to control the movements and the activities of the staff. However, it is possible to implement such a system also in a wider space, and to use it for the constant observation of all those who are considered suspicious by the holders of political and spiritual power in a society. For example, to observe those who warn of the oppressive power of information technology and who speak about the perils of the increasing observation and surveillance of the people.

A person who lives in a city, passes in front of a few hundreds cameras every day. These cameras record people and events and often also send records directly to various monitoring centres. There are systems that record faces of people who pass in front of them and check for every face if it is contained in the database of wanted persons. Such systems were allegedly installed long ago at the entrances of stadiums and probably also in other places (cf. Rheingold 2002, p. 185). The use of such systems can be considered a necessary form of protection of the citizens and of the self-protection of a society. However, such kind of surveillance is risky and it will probably lead to mistakes which will create troubles to innocent people. Computer processing of images can lead to mistakes. I do currently not follow the activities in this field, but I know that a few years ago software systems for image recognition were not very successful. A change of the position of head or of the expression of face were able to confuse such a system. Things may have improved in recent years but I am not sure they have, because many methods were tried long ago, with a rather modest success.

In any event, cameras are around as and satellites are above us, and their eyes and ears are getting increasingly sharp. I do not have anything to hide, but I hate the fact that I *can* be watched by an Invisible and Unknown Somebody virtually at every step. I feel uneasy when I think that I am constantly watched, listened and fingered by invisible eyes, ears and fingers in front of which everybody is suspicious, possibly a criminal or a terrorist, and which observe and process him or her as such. Indeed, a prospective of the Surveillance Society seems almost equally frightening as the evils from which the system of total surveillance is supposed to protect us.

It is right to be known who is doing what, and to award or punish each individual according to his or her merits. However, if people are unreliable creatures, the same holds for the supervisors, whom a system of surveillance could give excessive power upon those whom they supervise. They could abuse this power. Gods used to be the only ones who had the ability and right to keep under surveillance everybody and everything. Those among the people who gain this capacity could start to consider themselves gods and to behave like this.

5. Privacy and business

One of the important issues related to data gathering and observation regards the question of privacy. There are claims that in the Information Age privacy has been lost and that there is nothing to be talked about in this regard. On the other hand, there are claims that privacy belongs among the basic human rights, and that society must protect this basic right of its citizens (cf. Radovan 2000; 2001; 2003). Some constructive proposals regarding this issue have been put forward long ago, but it is not sure if they can ever be successfully implemented. These proposals are based on some basic principles like the following ones. (1) Activities related to data gathering must not be secret. (2) A person must have a possibility to know what data are gathered and kept about her, and for what purposes are they used. (3) Data obtained for one purpose must not be used for other purposes without the consent of the persons they regard. (4) A person must have a possibility to correct erroneous data records about her. (5) Subjects dealing with gathering, processing and using data must prevent the misuse of these data (cf. Shenk 1997, p. 209; Rheingold 2000, pp. 314-315).

These principles are general but they could serve as a basis for the development of a legislative regulation which would protect citizens from various kinds of abuses to which data gathering can lead. However, in the present techno-economic society - called also the *business civilization* - business interests have priority and for the sake of them everything else is easily sacrificed. This makes virtually impossible to implement an efficient legislative regulation which protects the privacy and other rights of the citizens related to gathering and use of data, since such protection could obstruct some business activities. The other supreme priority regards national security; this is an argument which a state administration can use whenever it wants, and which easily prevails over everything else. There are also technical and organizational problems which make difficult the implementation of an efficient system of legislative control of the activities related to data gathering and the use of these data. The activities related to data gathering are dispersed and difficult to control; the ways that the gathered data are processed and used is even more difficult to control. Companies involved in data gathering and their use, are smart enough to formally satisfy some specific legal request in some tricky ways which do not limit their activities. A basic trick consists in offering to an individual a possibility to *forbid* some things related to gathering and using data about him or her; however, people do normally not notice such possibilities (options), and their omission to forbid something, is then interpreted as their consent that this can be done. Finally, people have learned that it is hopeless to resist business interests and administrative power, so that they simply accept whatever these two supreme gods bestow upon them. This is nothing new in the history of the relationships between the mighty and the weak. What is peculiar to contemporary age is that the weak are being told that with the development of technology they are getting stronger, while in reality they might be getting weaker, possibly much weaker.

There are claims that the complaints about the loss of privacy are exaggerated and not justified, because people have actually never had much privacy. Life in a traditional family and community did not offer virtually any privacy. All regimes and rulers throughout history

supervised people and usually destroyed those whom they did not like. In other words, there is no sense to complain that people have lost something they have hardly ever had. Such claims are largely correct; however, the issue of the present data gathering and surveillance nevertheless do deserve a special attention for a few reasons. First of all, it is bad to justify some dubious present practice by the fact that in the past ages the situation was not better. Secondly, data gathering has become a business activity which uses people and their privacy as a raw material; this is a relevant novelty in comparison with the past ages. Thirdly, contemporary information technology has such operative capacities that uncontrolled practicing of data gathering and surveillance could turn the world into such a madhouse that is difficult to imagine.

A society could not function successfully without gathering certain data about its members and without a certain forms of surveillance. However, social institutions should do their best to keep these activities under a strict control and inside some limits. It may be that the intense spread and use of information technology has actually not brought about a really new age; however, an intense data gathering, profiling of the people and aggressive targeting them for various purposes, together with an ubiquitous surveillance, could do it. This would probably be an age of fear and persecution, corruption and stupidity.

In the business civilization, data gathering and surveillance serve the aims of those who have the power, so that the attempts to limit this practice could hardly achieve much. Struggles against the interests of the holders of power are seldom won, but they keep the awareness of an issue and of its relevance. Also lost battles are sometimes worth fighting. In any event, the right to privacy should be considered one of the basic human rights, not only because privacy is a value by itself, but also because the lack of it is the first step to other forms of devaluation, abuse and oppression.

6. Processing the people

Technology by itself does not determine the way of man and history; it creates possibilities of the realisation of various individual and collective inclinations, but it does not determine which of the possibilities will be chosen by an individual, a community or the humankind. People are the ones that chose and decide. Data gathering and aggressive targeting of the people with specific messages, as well as massive surveillance of the people, do not mean that *technology* has run out of control, as it has often been said. It rather shows that *corporate business* has run out of social control, and that the *state administration* normally tends to do the same. These two dominant social forces normally struggle with each other for prevalence, but they also need and support each other. Both of them aim to keep people under control and to shape them in accordance with the needs and aims of these forces. The increase of technological power strengthens such tendencies as well as the possibilities of their realization. Although technology does not determine the aims and tendencies of corporate business and state administration, it offers them increasingly efficient means by which they mould people and their reality according to the aims of these two supreme forces. In the capitalist society, business shapes public discourse and dominates politics; this then means that the growing power of technology gives an increasing power to the present ruthless capitalism to shape the world on its own image. This image may not be nice; it may be frightening and repulsive.

Data gathering, observation and targeting of the people should be practiced in reasonable ways and to a reasonable extent. Excessive practicing of these activities should be considered disturbing and harmful. Except for some peculiar people, it is unpleasant to feel constantly observed, and even more unpleasant to be constantly targeted. The awareness that

people are (or may be) constantly observed, may radically change the feeling and behaviour of the people. The awareness that every my activity creates data which somebody may be recording and processing, and which will then be used for *targeting* me for whatever purposes, makes me feel like a rat moving along a maze of a proverbial mad scientist. An excessive scrutinizing of the people and of their behaviour, for whatever purposes, is actually insane and unpleasant. A constant exposure to data gathering, surveillance and targeting is not only irritating and exhaustive, but is also humiliating and dehumanising. Data gartering and profiling turns a person into an object of observation and processing the aim of which is to compel her to buy some commodities or services. The process of data gathering, of profiling the people and of targeting them with specific messages, reduces people to raw material which is elaborated, shaped and used for business purposes. The very idea of making consumer profiles is repulsive to me. I do not want to be watched by tradesmen and mad scientists who study me with an aim to compel me to "consume" something or to think and behave in a certain way. I do not want anybody to gather data about me, to profile me, and especially not to target me. I know what I need and what I want, and what I can afford, and I do not want to be imposed anything by anybody.

Regarding the targeting of the individuals, practiced by marketing and service companies, but also by many others, various proposals have been put forward with an aim to keep this intrusive practice inside certain limits. Firstly, all kinds of automated massive sending of messages to targeted consumers (based on addresses obtained by data gathering) should be forbidden. Secondly, the state administration should establish a registry of addresses and numbers of the people who do *not* want to be targeted by anybody and for whatever reason. Such a registry should be mandatory and all marketing and advertising subjects should be legally obliged to respect it (cf. Shenk 1997, p. 207). I support such proposals the aim of which is to provide citizens a protection from the aggressive targeted advertising and manipulation; but it does not seem that such proposals have much chance to be successfully implemented. Intense targeted advertising makes people confused and neurotic. However, this practice could hardly be stopped, because in the techno-economic world, everything that is technically feasible and that may favour business, has the absolute right to exist. People have been made *tool-serving consumers*, and they have been treated as such.

In the disputes about privacy and business interests, there is not much discourse about the *mental profile of the society* which is so obsessed by data gathering and by targeting of the people reduced to consumers. I hold that the situation in this regard is getting repulsive and insane. I do not care much about my privacy; but I am frustrated with the fact that I am compelled to live in a world in which people are constantly observed like rats in an experimental maze, and targeted by various advertisers and tradesmen like hares chased by a pack of wild dogs. *Not individual privacy but collective madness is the basic issue regarding the excessive data gathering, observation and targeting of the people*.

7. Risks and threats

Complex systems are normally not perfect; they contain some errors in design and production; elements of such systems sometimes fail, and those who work with these systems make mistakes. Errors, failures and mistakes related to a system of data gathering and surveillance can have tragic consequences for innocent people, and they can cause harm to a community. There are disturbing reports in this regard, although the holders of power have good reasons to cover up the existence of such problems as much as they can. Since I am not involved in criminal activities, I hope that the systems of data gathering and surveillance have

been designed well, produced well, and used well. Generally speaking, technological systems are getting better and more reliable, and they are also operated rather well, so that we have good reasons to hope that technical difficulties will not be happening often and that they will not have too bad consequences.

Regarding possible abuses of the of data gathering and surveillance, the situation is quite different. Data gathered for whatever purposes can be abused, and with the increase of intensity of data gathering and surveillance, increases also the plausibility that the results of these activities will be abused. Data can be abused by those who collect them legally, as well as by those who come in their possession in an illegal way. Data may be abused with an aim to gain some profit for their possessor, to harm somebody, and for subversive activities against a society. Many problems do not have a perfect solutions; but they can be solved in very bad ways. One such problem related to data gathering and surveillance regards the issue of who is to *supervise the supervisors*, and how. The other regards the question of who can *protect the data* gathered in various processes of data gathering and surveillance, and how. None of the two problems have a perfect solution, but they can both be solved very badly. Those who are in position to supervise other people, have a power over those whom they supervise. This power grows with the levels of hierarchy of the system. At each of the levels people can abuse in various ways the power that the system gives them. A perfect system of extensive data gathering and surveillance may lead to a perfectly totalitarian society. An imperfect such system may lead to a highly corrupted society in which everybody abuses others in accordance with his or her power.

Extensive data gathering and surveillance may not bring much good, and they always bring various risks. The assumption that more intense data gathering and surveillance bring more useful knowledge and better security, is dubious. First of all, the gathered data may not be processed and used in optimal ways. Secondly, these data can come into the hands of those who will use them for illegal or subversive purposes. In sum, if business forces and social institutions overstep a certain measure in data gathering and surveillance, this will create many difficulties to the citizens and it will gradually lead to a totalitarian society. It is difficult to say what exactly should be considered the right measure in the space of data gathering and surveillance; in any event, in this space of activities, more does not mean better.

The advance of science and technology have always served holders of power rather than common people. Various *scientific societies* which started to emerge in the seventeenth century, treated ordinary people in ways that were profitable for the elites, and deflected them from the political and religious ideas which could have called into question the existing authorities and structures of power. For example, the immutability of natural laws that physicists started to discover at that time, was used as the basis for the claims that the social narrative (of that time) and the existing structure of social power, were also immutable and that they could not be changed (cf. Noble 1997, pp. 203-204). During the twentieth century, as well as today, scientists have served existing powers even more directly than their predecessors were doing it. The development of information technology has been closely related to military and governmental purposes. These technologies are now used for many purposes, but they have also created vast possibilities of surveillance, manipulation and control of the people.

Figuratively speaking, information technology facilitates shaping and control of the people at the *software level*. On the other hand, biotechnology facilitate shaping and control of the living beings, including people, at the *hardware level*. This can have much more radical consequences than the software shaping has. "Genetic engineers, supported by the state, have laid the technological foundations for an Orwellian future", concludes Noble (p. 206). It remains to be seen to what extent will the present holders of social power use the means that science and technology has bestowed upon them, for the development of a truly totalitarian

(Orwellian) society. If there will still be anybody able to see anything. In any event, for a totalitarian society, one does not need the monsters of the past, such as Fascism, Nazism or Stalinism; a complete dominance of the ruthless capitalism is enough to transform a formally democratic and free society into a factually totalitarian society. Totalitarian should be considered every society in which a narrative and practice have a status of absolute truth, a criticism of which is condemned and punished, formally or informally the same. In the ruthless capitalism, corporate interests and profit are treated as absolute values; whatever promotes them is accepted and practiced, regardless of the harm it brings to the people and to the nature; whatever obstructs the pursuing of these supreme aims of capitalism, is overridden by it. Corporate business controls the space of public discourse and mould the mind of people by its disinfotainment industry. It gathers data about everything and targets people in intrusive ways with the aim to compel them to behave in the way it wants them to behave. All these elements together create a totalitarian social environment.

Finally, there have always been people who adored power and supported rigid ideologies as well as a totalitarian social environment. A totalitarian system is an ideal social environment for sadists: by serving the power in such a system, they gain the possibility to practice their sadism without any risk (cf. Fromm 1992). A society that practice intense data gathering, surveillance and targeting of the people, have good chances to become a truly totalitarian society, and then also a sadistic society. It used to be considered entertaining to watch people being torn apart by wild animals as well as being tortured and killed. We may not want to admit it, but such kinds of entertainment are still appealing to many among us. It has been noticed that many people enjoyed watching scenes of military attacks of a technologically far superior military power against a technologically inferior one. How many of these people who enjoyed watching such scenes, tried to imagine the horrors of those small people who were hit by these attacks? Not many, I am afraid. Technological advance may be changing the forms of our barbarism, but the essence seems to remain the same. A brief view on televisions screens that surround us indicates that contemporary audience is not less interested in the spectacles of violence and destruction than the audience in the Roman amphitheatres had been. Indeed, the monster of destructiveness is always close to us and it may be hidden in us. Hence, the increase of technological power and efficiency always caries a risk of creating such technological and social conditions which could lead to the submission of the entire humankind to the worst inclinations of the worst among its members.

8. Concluding remarks

Intrusive observation and aggressive targeting of the people, for business purposes and security reasons as well as for other purposes create a totalitarian living space. Totalitarian societies used to be imposed by states and religious institutions, and they were based on political ideologies and religious dogmas. The danger of such kind of totalitarianisms always exist, and it will exists as long as there are states and religions. In the present age, the capitalist narrative has imposed a new global techno-economic ideology which is very intrusive and aggressive towards people and nature. Relying on its technological power, the ruthless capitalism has been creating a new business civilization which nominally promotes freedom, but which could turn out even more totalitarian than the old ideologies, dogmas and regimes have been. The powerful trinity Technology, Business and Security has sized the world; this trinity can bring to people a lot of good, but also a lot of evil. This trinity tend to create a new kind of society, the Surveillance Society, in which extensive data gathering, intrusive observation and surveillance, and aggressive targeting of the people by specific messages, have an essential role and pervade the entire space of human activities and life.

This will be an unhappy society of confused and neurotic people, and it will be totalitarian almost by definition.

What can the common people do to prevent the creation of such a surveillance society towards which the present techno-economic paradigm, the business civilization and its disinfotainment have been heading? Not much, I am afraid. We can only hope that the movement towards the totalitarian society will not succeed, and that data gathering, observation and targeting will not manage to transform people and their living space into rats in a maze of a mad scientist. We can base this hope on three elements; the first of them is weak, the second is stronger and defiant, and the third is slightly cynical and its power is hard to estimate. Firstly, our hope relies on the common sense of the holders of power; we hope that they will not allow the totalitarian tendencies of the techno-economic society to go too far. This is the weak element because modesty and power rarely go long way together; the totalitarian tendencies of the present techno-economic system can also run out of control of the holders of power. A stronger reason for hope comes from the present techno-economic system itself. This system produces everything that can be sold, so that there is a hope that it will produce also some means which protect people of its totalitarian behaviour. This sounds like a vicious circle, and it may also seem ridiculous, but this should not discourage us. The idea of large anti-virus systems, firewalls, and similar miracles could have also sounded ridiculously a few decades ago, and yet it has become an essential element of our reality, and a huge business, of course. It may be insane to produce various technological systems and at the same time also the means that obstruct their activities, but that is what people have normally been doing. Finally, a cynic or an optimist, let us say, could argue that the techno-economic world is getting too complex to be kept under an efficient control. A thorough system of data gathering and surveillance will produce an incredibly large quantity of all sorts of data by which it will congest itself so that it will not work well. This may be a sane approach to the problem in a situation when nothing better can be done.

Despite our three reasons for hope that the things will not get too bad, the totalitarian tendencies of the present techno-economic world remain a real threat with which people will have to live and cope as they can. Data gathering, observation, surveillance and targeting of the people do not regard only the issue of privacy. The problem is much wider and more essential: *people are observed and targeted with an aim to be mastered*. This is a much more important fact than the loss of privacy. Information technology allows employers a thorough surveillance of the activities and movement of employees; it allows government administration to monitor citizens at every step; and it allows business forces to shape the living space as well as the mind and behaviour of the people in ways that serves their aims. Information technology has created the means by which a truly totalitarian society can be created for the first time in history. A new tyranny may not come, but it may also be approaching and rather close.

Information technology is an extremely efficient means which has brought to people wondrous powers in the space of communication, knowledge, and control. It has brought new opportunities and freedoms to billions of people. However, this same technology can be used by the holders of economic, political and spiritual power in ways that steadily increase their power over the common people, and lead towards a totalitarian and oppressive society, or to a new mental and physical slavery. The feeling that one has been constantly watched by invisible eyes, listened by invisible ears, and fingered by invisible fingers, is unpleasant. Being constantly targeted and manipulated makes this situation even worse. A society must practice data gathering to learn those basic facts which are necessary for its optimal functioning; it must practice observation and surveillance to be able to prevent irresponsible and criminal behaviour and subversive activities; it must also target people with various messages to achieve some positive aims. However, no data gathering, surveillance and

targeting can make people and world better without a constructive and benevolent behaviour of the people themselves. Hence, humankind must reshape its narratives, its socio-economic systems and its behaviour at all levels in the ways that protect human dignity and promote a global solidarity. Because without this, no advance of technology, data gathering and surveillance can make the life of people more safe and more pleasant.

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PREMA DRUŠTVU NADZIRANJA

SAŽETAK

Članak se bavi pitanjima prikupljanja podataka, nadziranja i intenzivne upotrebe ciljanih poruka u suvremenom životnom prostoru koji je oblikovan tehnologijom i kapitalističkim svjetonazorom. Oni koji posjeduju relevantna znanja o drugima, posjeduju moć nad njima, i oni mogu tu moć rabiti i zlorabiti na razne načine. Intenzivno prikupljanje podataka, promatranje i nadziranje olakšavaju manipuliranje ljudima i omogućavaju stvarnim nosiocima moći da oblikuju društvenu stvarnost na načine koji služe njihovim interesima, ali koji mogu lako voditi prema totalitarnom društvu. Totalitarne sustave su obično nametale države ili vjerske organizacije, i oni su se zasnivali na političkim ideologijama ili religijskim dogmama. Rabeći moć tehnologije, suvremeni kapitalizam stvara jednu novu poslovnu civilizaciju koja nominalno promiče otvorenost i slobodu, ali koja pokazuje jasne totalitarne tendencije. Članak iznosi niz kritičkih promišljanja vezanih uz ta pitanja.

***Ključne riječi**: prikupljanje podataka, potrošački profili, promatranje, privatnost, nadziranje, ciljanje, poslovna civilizacija, totalitarno društvo*

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A PROCESS-BASED APPROACH TO KNOWLEDGE MANAGEMENT

ABSTRACT

This paper analyses the relationship between business process modelling, knowledge management and information systems development projects. The paper's main objective is to present business rules as the encoded knowledge of corporate business practices. Further, it introduces a rule-based business activity meta-model as a repository in which business knowledge can be captured and traced from their origin in the business environment through to their implementation in information systems. The case study of the Croatian Ministry of Finance is presented, discussing the practical experience in integrating business process repository and organisational knowledge as the foundation for information system development.

Keywords: *knowledge management, business process modeling, business rules, public sector, Ministry of Finance, Corporate Modeler.*

1. Introduction

The initiatives that are currently being or have been widely implemented in organizations are information systems/workflow management systems (IS/WFMS) development and knowledge management (KM) projects (Chaffey and Wood, 2005; Harmon, 2003). They are based on developing a common IT infrastructure and common business processes, emphasizing how firms can enhance competitive advantage through the more effective utilization of their information and knowledge assets. In order to continuously analyse, change and improve their business processes, companies use business process modelling techniques and tools, conducting business process change projects and developing business process repositories. Business process modelling as an approach focuses on understanding the underlying business processes where business rules are one of the most important elements for the detailed and formalised description of all facts (knowledge) which are to be implemented during IS development (Kovacic, 2004).

Usually, public sector organizations face challenges that differ from the challenges for private firms. They have to meet multiple, often conflicting goals and they are subject to constraints of a financial, legal, contractual, personnel and institutional nature. Radical process-focused change in public sector organizations can only be achieved through deep changes in their bureaucratic practices. Renovation in the public sector mostly emphasizes quality and productivity improvements, the elimination of bureaucracy, process simplification and the

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reduction of processing times. In public administrative processes ontology-based organizational memory systems are especially important: many existing sources of knowledge, laws, comments on laws, specific regulations, old similar cases, available case-specific documents and information etc., are prevalent in different places and in different forms and representations, at several degrees of formality, and are related through many links (Papavassiliou et al., 2003). In order to make informed, transparent and accountable decisions consistent with the past that are compliant with the law and consistent with similar decisions in other places, all of this knowledge should be placed within a coherent framework.

This research presents an approach to analyze and capture business knowledge by using a business rule-transformation concept. The paper is structured as follows. We first briefly introduce the aspects of knowledge management (Section 2). In Section 3 the role of business process modeling, business rules and a business rule-transformation approach are presented. This is followed by the Section 4 which describes the IS development project at the Croatian Ministry of Finance. The findings obtained from the case study are analyzed and discussed. Finally, the Section 5 outlines the conclusions and discusses some directions for further research.

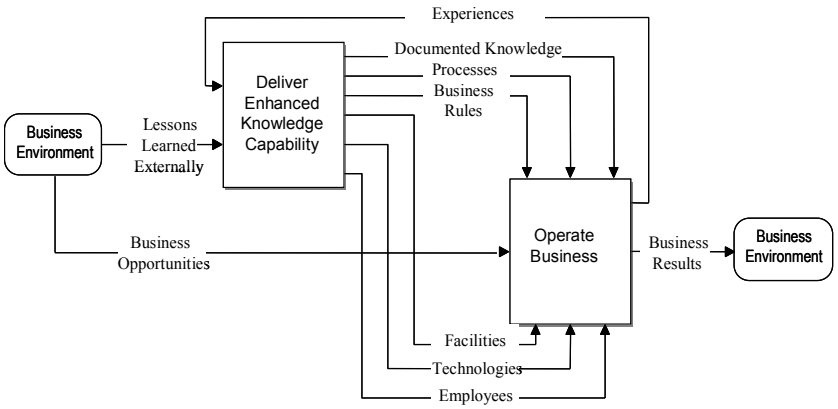
2. Knowledge management: a process-based approach

Knowledge can be defined as including all factors that have the potential to influence human thought and behavior and that sometimes allow the explanation, prediction and control of physical phenomena (Hall and Andriani, 2003). This is a very broad definition and includes factors such as skills, intuition, organizational culture, reputation, and codified theory. Knowledge could be classified into various types, but it has become an accepted convention to divide knowledge into two major types: tacit and explicit knowledge. Tacit knowledge originates and is applied in the minds of the owners of knowledge. It is the most powerful form of knowledge, grown from the employees' experience and business practice. This type of knowledge is difficult to present formally, as well as difficult to communicate and share. Explicit knowledge in organizations often becomes embedded in documents, repositories, organizational routines, processes, practices and norms. It could be articulated formally, could be shared, transmitted, processed and stored easily. Organizational knowledge is a mixture of explicit and tacit knowledge and the role of KM is to make it available as an organizational asset. Organisational knowledge as an important element of the entire business knowledge could be systemized, documented and retrieved in business process repository developed by business process modelling tools, within business process change projects. The management and processing of organizational knowledge are increasingly being viewed as critical to organizational success.

Business knowledge can be seen to have a life cycle of its own (Burlton, 2001). Knowledge can be created within or outside the organization, it must be stored somewhere, be found, acquired, put to use and learned. Knowledge must be made available in readily accessible forms such as documents, processes and business rules. These can be embedded in human resources, information technologies, or the design of facilities (Figure 1).

Figure 1.

The knowledge creation and exploitation process



(source: Burlton, 2001)

Knowledge management is the term adopted by the business community in the mid-1990s to describe a wide range of strategies, processes and disciplines that formalize and integrate an enterprise's approach to organizing and applying its knowledge assets (Waltz, 2003). KM enables the creation, communication, and application of knowledge of all kinds to achieve business goals (Tiwana, 2000). KM is a set of professional practices that improves an organization's human resource capabilities and enhances the organization's ability to share what employees know (Burlton, 2001). It is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance (O'Dell and Grayson, 1998). Finally, it is increasingly recognized as an integral part of an organization's strategy to improve business performance (Carillo *et al.*, 2003; Zack, 1999).

Davenport and Cronin (2000) have identified three approaches to KM: (1) KM is information management by another name since it is focused on the coding and classification of recorded data, information and knowledge; (2) KM is the management of know-how: processes and ontologies - the emphasys is on the discovery and extraction of knowledge from existing processes and resources and (3) KM optimizes the conditions for adaptive co-evolution, the key is the interplay of tacit and explicit knowledge. The key objectives and purpose of KM from the business process prospective are: (1) the externalization of knowledge of individuals or groups, and consequently the spreading, sharing and reusing of knowledge; and (2) providing access to the desired knowledge to support the productivity and competency of all employees performing business activities. Process-oriented knowledge management aims to provide employees with task-related knowledge of the organization's operative business processes. In this environment, knowledge can be offered to an employee in a much more targeted way. The process-oriented view offers several advantages for KM initiatives: a value chain orientation; context relevance; widely accepted management methods; improvement in the handing of knowledge; process benchmarking; and support for process-oriented KM (Kang et al., 2003).

3. Business process modeling as a foundation for Knowledge Management

Business process model builds up a company-wide knowledge base and is the starting point for the constant adaptation of organizational structures to the dynamic company environment; they provide a 'process' approach to knowledge management.

3.1 Business process modeling tools

Very complex and process-oriented nature of business has led organizations to use process modelling methods and tools as a means of managing the complexity of these systems, and to aid in achieving business goals. Business process modelling (BPM) has now been in the public domain for four decades, but it is only in the late 1990s that integrated business process modelling tools have been developed. Integrated process modelling tools must be capable of showing interconnections between the activities and conducting a decomposition of the processes. These tools must help users to conduct "what-if" analyses and to identify and map no-value steps, costs, and process performance (bottleneck analysis). They should be able to develop AS-IS and TO-BE models of business processes, which represent both existing and alternative processes. They can be used to predict characteristics that cannot be directly measured, and can also predict economic and performance data that would otherwise be too expensive or impossible to acquire. Each BPM software application is defined by a mix of several components. The most important components of BPM tools are: (1) process modelling and design; (2) process monitoring; (3) process operation (automation and integration); (4) technology platforms and interfaces. However, the common characteristic of BPM tools is the ability to develop, use and maintain the business process repository.

The role of BPM in Knowledge management is threefold: (1) business processes, if modelled and captured in business process repository, are a part of codified intellectual capital of the organisation; (2) knowledge processes in an organisation should be a part of business process repository; (3) business process repository could be used for knowledge creation, sharing and distribution (Kirikova and Makna, 2005; Persson and Stirna, 2002; Apshavalka and Grundspenkis, 2003; Woitsch and Karagiannis, 2002). Business process repository contains existing process knowledge documented in the form of business rules: policies and procedures, job descriptions, business forms and application code, relational data-base management system rules (tables, constraints, and triggers). Business process modelling (BPM) as an approach focuses on understanding the underlying business processes where business rules are one of the most important elements for the detailed and formalised description of all facts (knowledge) which are to be implemented during IS development (Ball, 1998, Giaglis et al., 2005).

3.2. Business rules in Knowledge management

Business rules are not a process. Burlton (2001) separates 'know from the flow'. Business rules represent the 'know' part of corporate business processes. They really mean establishing the encoded knowledge of corporate business practices as a resource in its own right (Ross, 2003). According to this definition, business rules can be seen as a subset of business knowledge. They should be described in a natural language first and the business process should be modeled only at the level of detail that is sufficient to achieve these objectives.

In order to present and discuss actual problems related to business-rules analysis and the refinement of business knowledge, some limits of the existing business process modeling methods and tools have to be exposed:

- Business-process modeling is performed using either inadequate descriptive notations from management accounting or through the poor use of graphical notations that were created for software development and do not take organizational issues into account (Valiris and Glykas, 1999).
- Native formats of process models, designed using different modeling languages, are unsuitable for distribution and review by final users (Kalpic and Bernus, 2002).
- There is no formal underpinning to ensure consistency across models. When graphical notations are used in business-process modeling and business redesign, there is no way of verifying the logical consistency of the resulting models. Semantic mistakes or the disregarding of relevant aspects may lead to some expensive misjudgments (Valiris and Glykas, 1999).
- On the other hand, some organizations formalize knowledge externalization and have a tendency to overanalyze an existing system and therefore get stuck in the business process analysis phase of the project (e.g., analysis paralysis) from which they are never able to move on (Chen, 1999).

Detailed information system modeling of the processes or workflow structures takes place at the operational level. Workflow systems are able to support business processes if the business process is clearly structured and defined (Kovacic, 2003; Kovacic, 2004). Workflows are refined and modeled at the level of particular interdependent business activities that are performed by actors (resources) in an organization in order to achieve common goals. At this level, the more exact and certain information about a workflow is the better the modeling results will be. The problem lies in the conflict of aims arising between the need for accurate information and the difficulties of obtaining it due to the often obsolete documents describing the flow structure, varying or even contradictory statements from the employees, and time constraints (Grover et al., 1995).

For many years there has been increased recognition in Information Systems (IS) modeling of the dynamic behavior of organizations (Green and Rosemann, 2000). Business process models are maps or images of the logical and temporal order of business activities performed on a process object. Business process modeling has been embraced as an appropriate way to describe business behavior. Every process is represented by its precise description, which contains both the behavior and structure of all objects that may be used during execution of the process. Business-process modeling as an approach focuses on understanding the underlying business processes where business rules are one of the most important elements for the detailed and formalized description of all facts or business knowledge, which are to be implemented during business process renovation and IS development.

The enterprise model, such as business process models, captures knowledge, which explains the motivation for the existence of rules (Bajec and Krisper, 2005). If enterprise models represent process knowledge then we must better understand the role of business rules, the process of knowledge transformation and the extent of knowledge externalization (codification of tacit knowledge) from tacit to explicit. In knowledge-intensive settings, business processes are typically complex and weakly structured and therefore incapable of being a direct basis for the development of knowledge infrastructures supportive of the business process (Strohmaier and Tochtermann, 2005). To resolve this problem of complexity, some authors propose a rule dictionary (Krallmann and Derszteler, 1996) or rule repository where business rules (Herbst, 1996; Herbst, 1997; Knolmayer et al., 2000) and business knowledge have to be represented (Haggerty, 2000). This repository where we capture, store and manage business rules is the core of a development environment providing appropriate tools for process, workflow, data and

organization modeling, process refinement, as well as import and export capabilities. A rule-repository system also provides the opportunity to put into play capabilities for analysis and simulation (Knolmayer et al., 2000). Our experience leads us to the conclusion that a rule-based methodology (as a part of process-based knowledge management) has advantages over established tool-supported Petri nets (i.e. INCOME) and EPC (i.e. ARIS) rule-refinement approaches (described in van der Aalst, 1999, and Scheer and Allweyer, 1999).

3.3 Business rules and the business-rule meta model

Business rules have grown in importance and popularity in the last few years. They have become recognized as distinct concepts that play a key role in developing applications which are flexible and amenable to change (Bajec and Krisper, 2005; Barnes and Kelly, 1997; Date, 2000; Youdeowei, 1997). While a lot of work has already been done in various fields of business-rule research, most notably in rule analysis, classification, articulation and formalization (Hay and Healy, 1997; Herbst, 1996; Herbst, 1997; Moriarty, 2000; Ross, 1997; Tanaka, 1992), a broader view is required, namely a behavioral or conceptual view of business rules. The fact is that business rules are constantly changing at the business level yet we are unable to keep up with the changes required for supporting IS. Thus, an ongoing business-rule management environment is required whereby each business-rule instance can be traced from its origin through to its implementation.

Business rules can be defined and classified in many different ways. The business rule is an atomic piece of business knowledge, specified declaratively, whose intention is to control, guide or enhance behavior. A rule may be established in order to ensure that one or more business goals are achieved, to enhance productivity in day-to-day work, to assist the business in making decisions, and/or to regulate or guide external activities (Ross, 1997). Business rules can be classified in many different ways. When examining business rules with regard to business processes, the following three relationships stand out:

- a business rule relating to the overall business process or a *Global rule*;
- a business rule relating to business process activity or an *Activity rule*; and
- a business rule relating to the IS/WF process definition or a *Structural rule*.

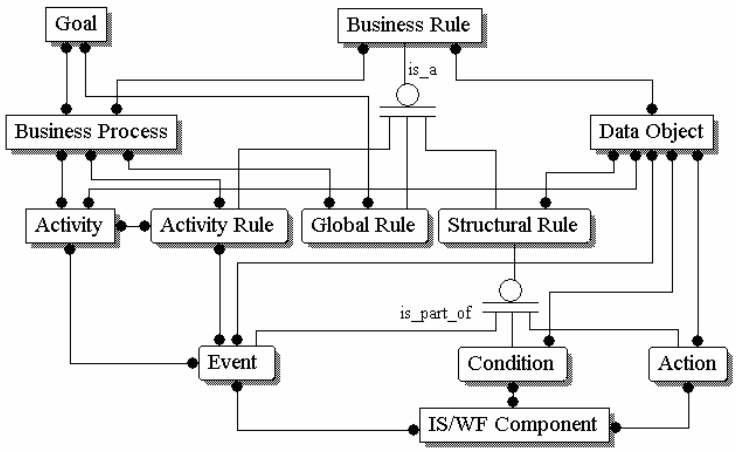
A business process is defined as a subset of business activities performed by the organization to achieve the goals for which it has been created. *Activities* correspond to different stages of process execution. In order to be initiated, some activities require particular artifacts or events as an input which may be taken directly from the environment or produced as outputs by other activities. Thus, an *Event* is a passive element of the process that reflects a signal in a business environment which triggers the execution of an activity. *Data object* is an instance containing a collection of data and methods for operating on that data.

In the *business activity meta-model* presented in Figure 2, business rules are divided into two categories: *behavioral and structural*. The categorization described here is only an example of a business-rule taxonomy that we have found useful in our research. Global rules that relate to an overall business process act as an interface between a particular business process and the goal that the process has to achieve. They define or restrict organizational behavior. Such rules should be broken down into detailed behavioral rules governing specific business process activities and further into rules that control the operations within these activities. When developing *IS/WF components* or applications in support of business processes, both business rules that apply to an overall process and the rules that apply to a specific process-activity rule have to be considered and broken down into detailed (structural) rules. A process-activity rule

or life-cycle rule is an assertion that governs or constrains changes to business objects or facts (English, 1998). Therefore, the detailed structured rules as specifications of requirements for the development of IS/WF applications are proposed.

Figure 2.

Business activity meta-model



The taxonomy of structural rules presented above is based on Martin's work (Martin and Odell, 1998) with additional classes coming from the GUIDE scheme (Hay and Healy, 1997). A list of different business rule taxonomies can be found in Gottesdiener (Gottesdiener, 2000). It was shown in the work of Herbst (Herbst, 1996) that a combination of *Events, Conditions* and *Actions* (known as an ECA extended to an ECAA structure) can be used to specify individual business rules. An IDEF1X notation convention is used to develop the meta-model. Relationships between entities have n:m cardinality. The global rule (in the centre) is an aggregation of behavioral and structural business-rule components. The first (left) part of the meta-model contains the entities and relationships related to business process and behavioral features (Entities: Goal, Business Process, Activity, Global Rule, Activity Rule, and Event), while the right part of the meta-model focuses on structural and IS/WF implementation characteristics (Entities: Data Object, IS/WF Component or module, Structural Rule, Event, Condition and Action). The business activity meta-model is proposed as an appropriate starting point for the business-rule refinement process at the activity level of the business process. The business rules that underline the business activities are first described in a natural language. In subsequent steps, these rules are refined in a structured way as a set of structured rules representing the business process at different abstraction levels. In the case of small and less complex models, a manual revision is more economical and less time-consuming. The business activity meta-model concentrates on the role business rules play with respect to IS/WF-related concepts. Its function is to describe those activities that must be undertaken to achieve an explicit goal and establish a clear link between the business and IS/WF modeling.

4. A case study of the Croatian Ministry of Finance

In order to assist candidate countries in their preparations for joining the European Union (EU), the European Community gives candidate countries financial aid through its pre-accession funds. Upon becoming an applicant country, Croatia received the possibility of participating in

the European Community's Aid Programmes. As a Central European country, Croatia was eligible to access three pre-accession funds - PHARE, ISPA and SAPARD. Financial aid provides funds for particular projects with a well-defined strategy and objectives at the national level, as well as defined key performance indicators which must be tracked and reported to the EU. A country receiving financial aid is expected to establish a tracking system for projects in order to monitor the realization and success of enforcement and efficiency of using funds. The main objective of the EU is to ensure that the funds are used towards the previously defined purpose, while also teaching future members to accept the concept of tracking results and benefits in the public sector and financing projects according to success criteria.

4.1 Case Background

Following the policy of decentralisation, the processes of project tendering, contracting as well as financial and administrative management are handled by the national implementing structures of the candidate country under supervision of the Commission and the EC Delegation. The Ministry of Finance, precisely the Department for Financing EU Assistance Programmes and Projects (i.e. the Central Financing and Contracting Unit) is responsible for financial and administrative management of EU pre-accession funds in Croatia. The Department for Financing EU Assistance Programmes and Projects is the central unit responsible for financing, procurement, payment, monitoring and execution revision of all Croatian decentralized projects financed from EU pre-accession funds.

The first step in the process of setting up the system of financial and administrative management was establishing the National Fund (NF) and the Central Financing and Contracting Unit (CFCU). The National Fund is the treasury for EU funds. The concept is the same as the state treasury, which the country organizes to manage the state budget. The main task of the National Fund is efficient financial management of EU funds assigned for approved projects. The selection and management of the appropriate contracting procedure within the project or programme cycle is also the legal responsibility of the beneficiary country. The Department for Financing EU Assistance Programmes and Projects mentioned above, acts as the Central Financing and Contracting Unit (CFCU). The main tasks and responsibilities of the CFCU are organization, selection and management of tender procedures, payment to selected contractors and monitoring the execution of the contract.

In order to achieve better and simpler financial management and control of funds, the EU requires the establishment of an information system (IS) to support the business activities of the National Fund and Central Financing and Contracting Unit. The main processes which the system has to support are: planning of fund expenses, tendering, monitoring project execution, financial management, accounting, revision and control. It is expected that the IS could give information on: the project to be financed, the best tenderer, when and how EU financial aid will participate, what is contracted, amount spent and the effectiveness and efficiency of spending. The IS must assure a very high level of quality and transparency, generating reports which confirm that the funds are used in the appropriate manner.

4.2 Discussion and analysis

Considering that the Ministry of Finance does not use an application by which the National Fund and Central Financing and Contracting Unit could govern efficiently and according to EU requests, it was necessary to implement a new application. In the public tender process for development of such an application, a contract was signed with the software company

InfoDom. InfoDom was able to offer an application supporting procurement processes according to Croatian public procurement law and containing almost all the elements defined by the EU in the request for IS support.

The customization and implementation of the application "CRO4EU" was divided into five phases. *Phase I* was the establishment of a project team which consisted of experts for application development, experts for business process management, experts for deployment and experts from the Ministry of Finance – the future end-users. In *Phase II,* business processes were modelled. The main differences between EU procurement procedures and the procurement procedures proposed by Croatian public procurement law were pointed out. According to Croatian public procurement law, public organizations and companies in Croatia are obliged to conduct procurement procedures. On the other hand, tenders conducted as part of projects financed under the EU pre-accession funds were not subject to Croatian public procurement law. Since all tender procedures are defined in detail by the EU and the Croatian Ministry of Finance lacked experience with these procedures, it was necessary to conduct a deep analysis of EU procedures and rules in order to identify and define business processes and customize the application according to the defined processes. Corporate Modeler (Casewise) was used for business process modelling. All processes, their owners, executors, preconditions and results were identified, analyzed and designed in detail. An integrated business process repository was developed and implemented. This repository integrates all known knowledge on financial management, tender processes, program control and project execution.

The repository, "rich" in knowledge, enables easier customization of the application and embedding of knowledge in *Phase III*. All processes which had clearly defined procedures or business rules were identified during Phase II and implemented in the phase of business application development and customization. Once customization was complete, *Phase IV* was started, including several activities: testing, implementation of the application and education of future users. The implementation and testing activity was finished successfully – the application was accepted by the users and just a few additional customizations were required. With completion of Phase V and the education of users, the project was closed and the application was implemented. In February 2006, the Croatian Ministry of Finance began to use the application.

Business knowledge built into the process repository in the form of business procedures and rules and transformed into program code, allows the application to "lead" end-users through the steps of the business process, depending on an entire range of business situations and pre-defined parameters. This could be explained by the case presented further. The EU defined sixteen different tender procedures depending on the value of procurement and procurement type (procurement method) – service, supplies, works or grant. When the user opens and registers a new tender, it is necessary to define the amount of procurement and the procurement method. In our case (Figure 3), the planned value is €250,000 and the procurement method is service, as the object of tender is Study of Administrative Capacity in the area of Maritime Safety. Based on the knowledge, procedures and values implemented in the business process repository, the application automatically determines the tender procedure. Comparing the list of available tender procedures (Table 1) and the tender procedure which was proposed and implemented by the software, it could be concluded that the selection made by the application was correct. This short example confirmed the successful implementation and use of knowledge in the IS.

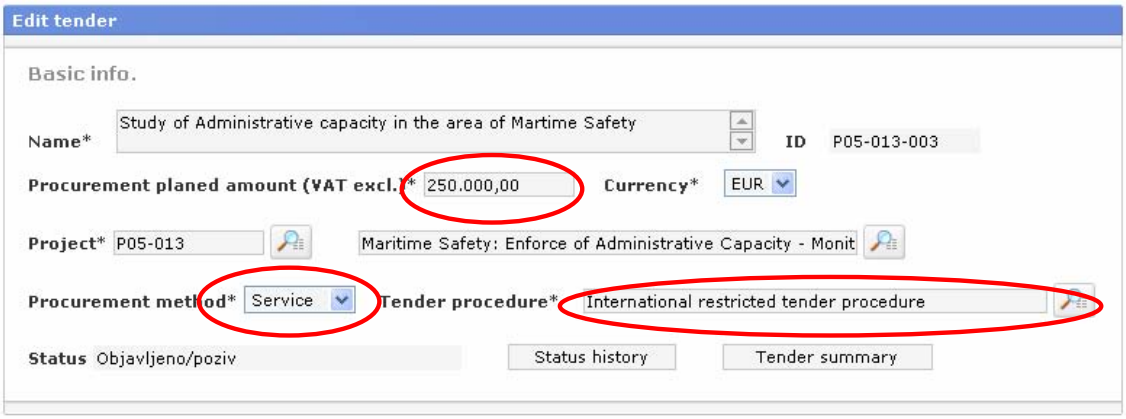
Table 1.

The list of available tender procedures

TYPE	VALUE/ PROCEDURE	VALUE/ PROCEDURE		VALUE/ PROCEDURE
SERVICES	**≥ €200,000** International restricted tender procedure	**< €200,000 but >€5,000** **1.** Framework contracts **2.** Competitive negotiated procedure		**≤ €5,000** Single tender
SUPPLIES	**≥ €150,000** International open tender procedure	**< €150,000 but ≥€30,000** Local open tender procedure	**< €30,000 but >€5,000** Competitive negotiated procedure	**≤ €5,000** Single tender
WORKS	**≥ €5,000,000** **1.** International open tender procedure **2.** International restricted tender procedure (exceptional cases)	**< €5,000,000 but ≥ €300,000** Local open tender procedure	**< €300,000 but >€5,000** Competitive negotiated procedure	**≤ €5,000** Single tender
GRANTS	*Procedure*	International Call for Proposals	Local Call for Proposals	Direct Award
	Programme amount	**≥ €2,000,000**	**< €2,000,000**	*Amount irrelevant to procedure*
	Project amount	**> €100,000**	**≤ €100,000**	*Amount irrelevant to procedure*

Figure 3.

An example of embedding knowledge into the application



Business process modelling enables the generation, documentation and reuse of a massive amount of knowledge concerning business policy, procedures and rules. In the "CRO4EU" application (described above), nearly twenty procedures are currently implemented. All procedures were designed and documented by the Casewise Corporate Modeler (http://www.casewise.com/) in the form of event-process diagrams. Owing to implemented knowledge, business processes are executed faster and more efficiently, allowing for easier

implementation of the IS for new users and significantly reducing the possibility of mistakes. All requests are fulfilled: monitoring the efficiency of programs and projects realizations, financial management, controlling all relevant transactions from project planning and registering through procurement processes, contracting and payment to account tracking. A very important feature of the Casewise Corporate Modeler is the possibility to create any type of BPMN and UML diagrams. Casewise BPMN and UML extensions are very significant and important because this set of templates bridges the gap between business processes and IT development by transforming business process diagrams into UML diagrams or BPMN diagrams, which then can be transformed in BPEL. In the case of developing the "CRO4EU" application, this possibility was not applied as the majority of the application already existed, and therefore it was not necessary to generate code from the beginning but instead only to customize the existing application.

5. Conclusion

Management of knowledge can improve business performance by extracting, sharing and reusing experience and know-how. In order to gain a sustainable competitive advantage, more and more companies are starting to organise their work around cross-functional business processes. When it comes to process support, information systems and workflow technology have been widely recognised as one of the leading process-oriented business technologies. Knowledge capturing and representation methods are crucial to manage knowledge inventory in an organization. An overview of the current state of the business process modelling tools reveals that further research is needed to transform goal-oriented business process models into models' representations the systems and software engineers are working with. It is vital that the knowledge captured in the goal-oriented business process models can be integrated with today's software development processes.

This paper has explored their combined influence on organizational efficiency and flexibility. The "CRO4EU" solution is analyzed to show the elements of a successful business process based knowledge management and its implications in the public sector. The research confirms that the analysis and modeling of business processes is indeed useful since it provides insights into the policies, practices, procedures, organization, process flows and consequently shifts people's minds from a functionally to a process-oriented organization. The proposed business process modeling approach is valuable for understanding business rules and the relationship between knowledge and the processes since the process model works as a knowledge mediator between a knowledge worker and their successor. The continued development of BPM and KM software tools should enable the transformation of the integral business processes model into the knowledge repository.

Despite the dangers of generalizing from a single case, this study can serve as useful theoretical and conceptual foundations for future research. The most critical issues of the business-rule refinement process at the activity level of the business process have been recognized, but there are still other factors to be identified and analysed. The analysis of expected changes and positive impacts will be an integral part of future research on KM as a part of business process change projects in other Croatian and Slovenian companies.

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MANAGEMENT ZNANJA TEMELJEN NA PROCESU

SAŽETAK

U ovom radu analizira se veza između modeliranja poslovnih procesa, upravljanja znanjem i razvoja informacijskih sustava. Cilj rada je opisati pristup prikazivanju znanja o poslovnoj praksi u obliku poslovnih pravila. Objašnjava se postupak pohranjivanja znanja u obliku meta-modela kao sastavnog dijela repozitorija poslovnih procesa koji omogućuje prikaz, pohranjivanje i praćenje znanja, od trenutka njegovog nastanka u poslovnom okruženju, do njegove primjene u razvoju informacijskih sustava. U radu je prikazana studija slučaja Ministarstva financija Republike Hrvatske i opisana je integracija organizacijskog znanja u repozitoriju poslovnih procesa koji je korišten kao osnova za razvoj informacijskog sustava.

Ključne riječi: *upravljanje znanjem, modeliranje poslovnih procesa, poslovna pravila, javni sektor, Ministarstvo financija, Corporate Modeler.*

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SELF-PERCEIVED COMMUNICATION COMPETENCE OF ECONOMICS STUDENTS IN BUSINESS ENGLISH

ABSTRACT

The purpose of this research is to investigate self- perceived communication competence (SPCC) of Economics students in Business English. We conducted a longitudinal study starting with the first year students and repeated with the same sample of students during their second and third year of study. The results of the study indicated that differences in SPCC between the years do exist. The SPCC gradually improved between the first, the second and the third year.

***Keywords**: communication competence, self-perception, Business English*

INTRODUCTION

For most people communication is simply talk. It is a natural event. The field of communication focuses on how people use messages to generate meanings within and across various contexts, cultures, channels, and media.

When we communicate we transmit (by speech, signals, writing, or behaviour) information (thoughts and emotions) so that it is satisfactorily received and understood. Human beings do not exchange data–we understand information. Communication researchers refer to the process as "sharing meaning" and prefer to define communication as "the management of messages for the purpose of creating meaning." (Neuliep, 2000: 86)

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Communication is strategic in as much as it is goal-driven. Craig (1999:272) writes, "it would be pointless not to assume that discourse is in some sense and to some degree intentionally directed toward goals". This perspective is shared by many prominent communication researchers (Berger, 1995; Canary and Cody, 2000; Kellermann, 1992; Roloff, Soule and Carey, 2001).

But the question is how do we know if communication is competent? Initially, Spitzberg (1988:68) defined communication competence as "the ability to interact well with others". He explains, "the term 'well' refers to accuracy, clarity, comprehensibility, coherence, expertise, effectiveness and appropriateness". A much more complete operationalization is provided by Phillips (2000) when he suggests that communication competence is best understood as "a situational ability to set realistic and appropriate goals and to maximize their achievement by using knowledge of self, other, context, and communication theory to generate adaptive communication performances." Communicative competence is measured by determining if, and to what degree, the goals of interaction are achieved. As stated earlier, the function of communication is to maximize the achievement of "shared meaning."

Canary and Cody (2000) provide six criteria for assessing competence which include, but are not limited to, perceived appropriateness and effectiveness.

The criteria include:

1. Adaptability (the ability to change behaviours and goals to meet the needs of interaction)

2. Conversational Involvement (behavioural and cognitive activity, cognitive involvement demonstrated through interaction behaviours, assessed according to responsiveness, perceptiveness, attentiveness)

3. Conversational Management (how communicators regulate their interactions, adaptation and control of social situations, who controls the interaction ebb and flow and how smoothly the interaction proceeds, how topics proceed and change)

4. Empathy (the ability to demonstrate understanding and share emotional reactions to the situation, need not lead to "helping" the other persons cognitive understanding; parallel emotions)

5. Effectiveness (achieving the objectives of the conversation, achieving personal goals, a fundamental criteria for determining competence)

6. Appropriateness (upholding the expectations for a given situation, fundamental criteria for determining competence).

According to Canary and Cody (2000) communication competence is the ability to send messages which promote attainment of goals while maintaining social acceptability. Competent communicators attempt to align themselves with each other's goals and methods to produce a smooth, productive, and often enjoyable dialogue. The aim of our research is to investigate the self- perceived communication competence of Economics students in Business English during the first, the second and the third year of their studies.

METHODS

A longitudinal study was carried out on a total of 107 subjects (58 females and 39 males), students majoring in tourism, marketing, informatics and finance at the Faculty of Economics and Tourism in Pula.

We started the research with a sample of 173 students, who were attending the first year of Faculty, but gradually, during the years, the number of students diminished and 107 students enrolled in the third year of studying. Participation was voluntary and took place during regular class time.

Instruments were completed with no personal identification (except sex and code) to insure anonymity and increase the probability of honest responses.

The measure was a self-report scale that was translated from English to Croatian and back-translated to insure accuracy.

Measures

The measure of communication competence employed was the Self-perceived communication competence scale (McCroskey, J.C. and McCroskey, L.L., 1988b). The SPCC consists of 12 items. Twelve speaking situations, ranging from talking to a friend to presenting information to a large group of people, were listed. The items reflect four communication contexts (public speaking, talking in large meetings, talking in small groups, and talking in dyads) and three types of receivers (strangers, acquaintances, and friends). In earlier studies, internal (alpha) reliability estimates of .92 (McCroskey, J.C. and McCroskey, L.L. 1988b) and .93 (McCroskey and Richmond, 1990) have been observed. Subjects were asked to rate their perceived communication competence in each situation on a scale to 100, with 0 being completely incompetent and 100 being competent. Scores above 85 indicate high SPCC; scores below 59 indicate low SPCC.

The reliability of the scale in this investigation is .86.

Data analysis

The results from the questionnaires were processed using SPSS for Windows (Statistical Package for Social Sciences). The difference between communication competences among the years was investigated by paired t-tests.

RESULTS AND DISCUSSION

Communicative competence is how well people interact with others (Spitzberg and Cupach, 1984; Hargie, Dickson, D., Boohan, M. and Huges, K., 1998; Rubin, 1991). There are appropriate behaviours that are more effective in certain situations. Competence has to do with knowing these behaviours, when to use them, and actually using them.

During the Business English lessons students learn to apply communication skills of listening, perception, language usage, nonverbal communication, and conflict resolution. Emphasis is placed on effective communication and methods for overcoming barriers to communication (especially during presentation, meetings and negotiations).

Table 1.

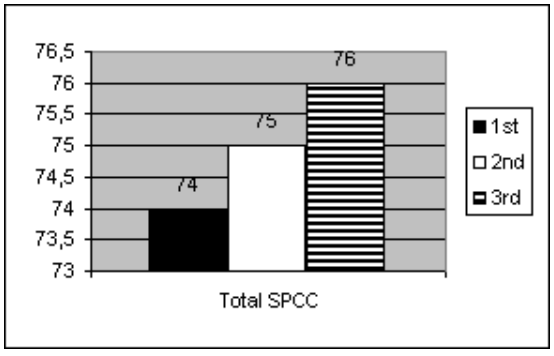
Mean scores by years

Measures	Range	1st	2nd	3rd
Public	0 - 100	49	55	67
Meeting	0 - 100	45	50	57
Group	0 - 100	54	60	69
Dyad	0 - 100	61	66	71
Stranger	0 - 100	72	71	73
Acquaintance	0 - 100	67	69	70
Friend	0 - 100	83	85	85
Total SPCC	0 - 100	74	75	76

An examination of the data reported in Table 1 indicates large differences in mean scores among the years studied.

Graph 1.

SPCC- total scores



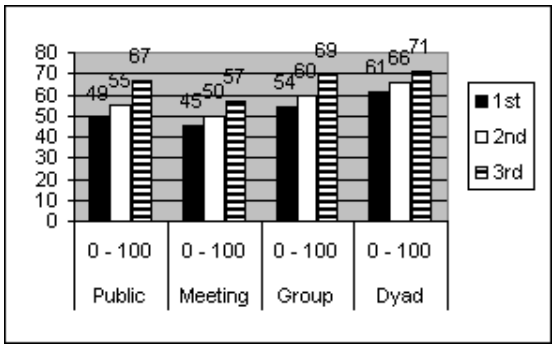
Norms for SPCC scores
> 85 High SPCC; < 59 Low SPCC

With regard to the total SPCC scores we may conclude that our students believe that their communicational competence is medium. In the third year the SPCC is higher than it was in the first and second. The third year students reported the higher communicational competence while the first year students reported the lowest. (Graph 1).

We wanted to investigate the difference in communication competence among the years and that's why we used paired t-tests. A paired samples t-test indicated that there is a statistically significant difference between the years.
Second year students SPCC was significantly higher than the first year students, t (106) = 5,815; p<. 001.
Third year students SPCC was significantly higher than the second year students, t (106) =10,225; p<. 001.
Third year students was significantly higher than the first year students, t (106) = 15,609; p<. 001.

Graph 2.

SPCC- four communicational contexts

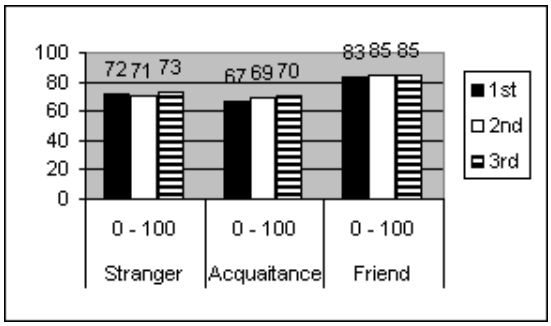


Norms for SPCC scores
> 85 High SPCC; < 59 Low SPCC

From the graph no. 2 we can see that nowadays, the third year students believe they are more competent to communicate in all four communicational contexts in comparison to two and three years ago.
For all students talking in large meetings drew the least self-perceived communication competence while talking in a dyad the most.
First year students reported low SPCC for public talking, talking in a meeting and group talking and medium SPCC in talking in a dyad. Only the first year students reported low SPCC for group talking. The primary goal of small group communication is to share meaning which leads to effective decision-making and problem-solving. Sorensen (1981) coined the term group hate to describe how many people hate working in groups. She showed a direct relationship between group hate and communication competence.
Most people are not trained in group work. When people lack the training and skills to function competently, people tend to avoid group membership. We can see that after learning to apply communicational skills our students, already in the second year, reported medium SPCC for group talking.
Second year students believe that they are not competent in talking in large meetings and public speaking but they believe that they may communicate in a group and talking in a dyad.
Third year students reported medium SPCC for all communicational situations except for talking in meetings where they reported low SPCC. A survey by Robert Half International found that executives spend approximately twenty- one weeks a year in meetings and six of those weeks worth of meetings were considered a total waste of time (Alexander, 1989). We suppose that our students may also agree with the results of the above mentioned survey.

Graph 3.

SPCC- three types of receivers



Norms for SPCC scores
> 85 High SPCC; < 59 Low SPCC

According to the results presented in the graph no. 3, nowadays our students believe that they are more competent to communicate than two and three years ago.
All students reported a generally medium SPCC for talking to strangers and acquaintance but high SPCC for talking to friends.
It is interesting that our students reported higher SPCC for talking to strangers than acquaintances. The previous research (McCroskey and Richmond, 1990; Barraciough, Christophel and McCroskey, 1998) reported different results. They reported low SPCC for talking to strangers. We assume that our students reported rather high SPCC for talking to strangers because of frequent contact with them. Lot of tourists, visitors and businessmen come to Istria (especially during summer) so they have opportunities to talk to them. The majority of students work during the summer as waitress, tourist guides, tourist animators and in that way they may practice their English.

CONCLUSIONS

An examination of the data reported in the graphs indicates large differences in mean scores among the years studied.
According to the norms from the SPCC scores our students believe that their communicational competence is medium. They reported the higher communicational competence for talking with friends and lower for talking in meetings. When one speaks a language that is not their first language, it is likely they will see her/himself as less competent as a communicator.
Their SPCC gradually improved, the lowest was in the first year and the highest in the third.

However, the study has some limitations. SPCC is a self-assessment of competence. The danger of self assessments is that the relationship between actual competence and self perceived competence is dubious. Some people have very accurate perceptions of themselves. Others do not. Just as some people believe they are better at communication than they actually are, some believe they are worse. People who suffer from high levels of communication anxiety tend to report that they are poor communicators. Some are; just as many actually are not. People's abilities to communicate effectively vary a great deal, and sometimes the same person is more competent to communicate in one situation than in another.

Many people are highly critical of their own public speaking performances. They may believe that the speech they just gave was poor, they stuttered, stammered, shook, and knocked their knees together. However, to an audience, all of their "mistakes" seemed rather natural and may have gone unnoticed by everyone except the speaker.

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SAMOPROCJENA KOMUNIKACIJSKE KOMPETENCIJE STUDENATA EKONOMIJE PRI UPOTREBI POSLOVNOG ENGLESKOG JEZIKA

SAŽETAK

U ovom istraživanju željeli smo istražiti kolika je samoprocjena komunikacijske kompetencije studenata ekonomije pri upotrebi poslovnog engleskog jezika. Proveli smo linearno istraživanje sa studentima prve godine ekonomije koje smo ponovili s istim uzorkom tijekom druge i treće godine. Rezultati istraživanja pokazali su da postoje razlike u samoprocjeni komunikacijske kompetencije. Samoprocjena komunikacijske kompetencije postepeno se povećala kroz godine.

Ključne riječi: *komunikacijska kompetencija, samoprocjena, poslovni engleski jezik*

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Original scientific paper
Izvorni znanstveni rad

THE EFFECT OF REAL EXCHANGE RATE CHANGES ON CROATIAN BILATERAL TRADE BALANCES

ABSTRACT

The impact of exchange rate fluctuations on merchandise volume has been a major issue for policymakers and economists. The purpose of this study is to examine whether bilateral real exchange rate changes in Croatia have any significant impact on trade balances between Croatia and her six main trading partners (Slovenia, Austria, Germany, Italy, United Kingdom and France), except Bosnia and Herzegovina due to the lack of data. The relationship between the exchange rate and trade balance need to give answer whether depreciation results in increase in export volume and decrease in import volume to overcome the increase in import prices. The present study also tests, using generalized impulse response function, for the J-curve as a J-shaped time path of the trade balance in responses to depreciation. That means that after such an exchange rate change, the trade balance initially falls and then slowly rises, perhaps to a higher level than initially. The results do not provide empirical support for the J-curve. Impulse response function shows that after a current depreciation, there will be a dip in the export-import ratio. The long-run export-import ratio appears to be higher than the point of this early dip in four out of six cases. However, in all cases, the export-import ratio does not achieve higher long-run equilibrium than the initial one, after the depreciation.

***Key words**: Trade balance, real exchange rate, J-curve, VEC model*

1. Introduction

This study addresses the question of whether bilateral exchange rate changes in Croatia have any significant and direct impact on trade balances between Croatia and her main trading partners. Exchange rate is one of the important prices in an open economy since it affects many business, investment and policy decisions. The relationship between the exchange rate and the current account is one of the main issues for macroeconomic policymakers because highly negative or highly positive current account is associated with inoptimal trade situations. In

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addition, movements in current account are reflected in national income. The policymakers can be interested in how the exchange rate can affect the current account.

Investigation of the relationship between the exchange rate and current account need to give answer whether a currency depreciation results in a sufficient increase in export volume and decrease in import volume (the volume effect) to overcome the increase in import prices (the import value effect). In that case the trade balance rises. In contrast, if the value effect is stronger than the volume effect, the trade balance diminishes. In other words we can talk about this relationship in terms of elasticities; if the price elasticities of import and export demand in absolute terms are sufficiently high (low) then the trade balance will rise (fall) in response to currency depreciation. However, price elasticities for import and export demand may be changing over time resulting in the J-curve. The J-curve is a J-shaped time path of the trade balance in response to depreciation because, after depreciation, the trade balance initially falls and then slowly rises to a higher level than initial[1].

The purpose of this paper is to examine the validity of the bilateral J-curve for Croatia as a small open country.[2] We employ a vector error-correction model to analyze the relationships between the following variables: the export-to-import ratio, the real exchange rate, domestic output, and foreign output (for each of the Croatian main trading partner country). We use monthly data since the part of the J-curve for which the value effect is stronger than the volume effect may be observable only at the monthly level and some of the dynamics may fit more appropriately with monthly data. The drawback of using monthly data is that it requires a proxy for domestic and foreign product. For the monthly data, we use the country industrial production indices as a proxy for domestic product.

The paper is organized as follows. In the next chapter, we review some of the literature on the J-curve phenomenon. The short-run effects of the J-curve are presented in the third section. The empirical model is discussed in the fourth section followed by data description used in the study. Chapter six presents the obtained results, while chapter seven concludes followed by the literature.

2. Literature review

Numerous empirical investigations of how exchange rate changes affect the trade balance (or the export-to-import ratio) in the long-run and the short-run have been done for industrialized economies, see for example; Rose and Yellen (1989) and Koray and McMillan (1999) for the US; Gupta-Kapoor and Ramakrishnan (1999) and Lal and Lowinger (2001) for Japan; Hacker and Hatemi-J (2003), for small North European economies; and Boyd, Caporale and Smith (2001), Bahmani-Oskooee and Alse (1994) and Bayoumi (1999) for various industrialized economies. There are also many studies on the J-curve dealing with East Asian economies, see for example, Hsing and Savvides (1996) on Korea and Taiwan; and Wilson and Tat (2001) on Singapore. Rose (1990) and Bahmani-Oskooee and Alse (1994) have also examined the J-curve phenomenon for various developing economies.

[1] This J-shaped time path arises because import and export demand elasticities may be initially low (after depreciation) and higher after some time. Low initial elasticities may arise from the fact that it takes some time for old export and import orders to be fulfilled and it may take some time to change input patterns in production.

[2] The smallness of Croatia makes her heavily reliant upon trade and particularly sensitive to variations in trade.

Various studies have been done to show the influence of exchange rate on trade balance and to provide valuable inputs to policy makers based on the devaluation adjustment process (effected through the nominal exchange rate) to county's trade balance, see for example, Himarios (1989); Rose and Yellen (1989) Bahmani-Oskooee (1991); Arize (1994); Buluswar et al. (1996); Rahman and Mustafa (1996), Rahman et al. (1997); Wei (1999); Baharumshah (2001); Bahmani-Oskooee (2001); Singh (2002). Some studies have presented a little evidence of existence of the J-curve. Rose and Yellen (1989) found no statistically reliable indications of a J-curve for the US bilateral trade with respect to the G-7 countries or for aggregate US trade. Rose (1990) likewise found no evidence for the J-curve among some developing countries using a similar methodology. Bahmani-Oskooee and Alse (1994) considered the relationship between the import-to-export ratio and the real effective exchange rate for nineteen developed countries and twenty two developing. In six cases they found evidence of cointegration; namely for Brazil, Costa Rica, Ireland, The Netherlands, Singapore and Turkey. The data from all of these countries indicated that depreciations resulted in trade balance increases in the long run (the opposite was true in the Irish case). Using an error-correction model these authors also determined that for Costa Rica, Ireland, the Netherlands and Turkey, depreciation results in the short-run trade balance deterioration. Hsing and Savvides (1996) tested whether the trade balances of Korea and Taiwan show the J-curve effect. They examined the trade balances of each of these countries with respect to Japan and with respect to the US. Their estimated results generally failed to show the existence of a J-curve effect when using an unrestricted distributed lag model. However, they found some evidence for the J-curve when using the polynomial distributed lag model, most notably in the case of Korea-US trade.

3. Short-run effects of the J-curve

The analysis of the J-curve effect in Croatia is based on the model, in which the volume of import and export depends on income and on real exchange rate, *i.e.*:

$$T_B = f(Y_F, Y_D, R_R) \qquad (1)$$
$$(+\ ,\ -\ ,\ +)$$

Y_F and Y_D are foreign and domestic incomes. R_R is the real exchange rate which is bilateral exchange rate between the Croatian kunas and currencies of the Croatia's leading trading partners, *i.e.*:

$$R_R = \frac{P_D}{P_F R_E} \ . \qquad (2)$$

In equation (2) P_F are the producer' prices of a specific country (the main Croatian trading partners), and R_E is the bilateral exchange rate defined as a number of domestic currency units per unit of a foreign currency. P_D are producers' prices in Croatia. The assumed signs of partial derivations are showed under the equation (1). It is also assumed that:

$$dT_B/dY_F>0 \quad \text{and} \quad dT_B/dY_D<0, \qquad (3)$$

i.e. that the increase in the world income will lead to an improvement of the trade balance and the increase in domestic income will lead to a deterioration of the trade balance. Additionally, it is assumed that:

$$dT_B/dR_R>0\ , \qquad (4)$$

since, under assumption of validity of critical values for coefficients of price elasticity, the devaluation will lead to an increase in export volume and decrease of import volume, due to cheaper domestic products intended for export and reduced import volume (as exported domestic goods will be less expensive in foreign currency and imported foreign goods will be more expensive in national currency). When trade balance is defined as an export-to-import ratio, then trade balance is in equilibrium when $T_B=1$, in surplus when $T_B>1$ and in deficit when $T_B<1$. The equation (1) can also be expressed in the form:

$$T_B = A\left(\frac{Y_F}{Y_D}\right)^a R_R{}^b \varepsilon\,, \tag{5}$$

where A, a and b are constants and ε is a stochastic error. Based on preceding assumptions, it follows that a>0 and b<0. When real depreciation (increase in real exchange rate) turns up the export quantity rises and the import quantity falls. This leads to improvement of the trade balance, *i.e.* to a volume effect. On the other hand, the real depreciation results in more expensive unit of import which has a negative effect on the trade balance. This effect is known as the J-curve effect. The traditional J-curve theory is based on the assumption that initially the import value effect is stronger than the volume effect, because the quantities of export and import slowly adjust to the real exchange rate changes. There are several reasons for such a slow reaction in export and import quantities. One of them is the time required for economic agents to accept the occurred changes. Another is the time required to take new actions after the newly established situation has been recognized. New orders and the establishment of business connections may take a while. Finally, there is also production lag delivery and substitution of materials and equipment of which relative prices are changed.

The traditional explanation of the J-curve has often been criticized, too. It should be pointed out that a higher speed of price adjustment with regard to quantities is not the only reason for the short-run deterioration of the trade balance, caused by the real depreciation. Such effect can also come up in a case of sticky prices, where export and import quantities adjust freely in time immediately after depreciation. Thus the J-curve effect does not necessarily imply a fast pass through. If import prices are sticky, the consumers will anticipate their increase as a consequence of devaluation and will revise their future purchase, which might possibly lead to dynamics similar to the J-curve effect. There are also other explanations for deterioration of trade balance in the short-run because of exchange rate depreciation; such as habits in consumption, overlapping phenomena (Mansoorian, 1998) or explanations based on the theory of hysteresis (Dixit, 1994).

4. The empirical model

The primary relation we are interested in within this study is that between the trade balance and the real bilateral exchange rate. We do not define trade balance as exports minus imports. Instead we analyse the ratio of exports to imports because of its property that it can be logged regardless of whether there is a trade surplus or not. The trade balance is, of course, affected by other factors besides the real exchange rate. The most important is national income or GDP because of demand effects: a rise in domestic national income causes a decrease in the trade balance due to higher imports, and a rise in foreign national income causes an increase in the trade balance due to higher exports. As a result of the importance of domestic and foreign outputs to trade, we include them both in our empirical model as variables of interest, along with the export-to-import ratio and the real exchange rate. The discussion of obtained empirical results is

based on using bilateral data on monthly basis. Therefore, we use the real effective exchange rate for the real exchange rate and indices of industrial production for domestic and foreign output. We are interested in linear interaction between the four variables logged to take advantage of elasticity interpretations, namely; the logged export to import ratio *ln(EX/IM),* the logged real effective exchange rate *ln(RER)*, logged domestic real output *ln(Y)* and logged foreign real output *ln(YF).* For the analysis of trade balance in a multivariate framework we defined a vector of variables:

$$Z_t = (tb, rer, y, yf)' . \tag{6}$$

and allow all four variables to be potentially endogenous.[3] The vector autoregressive (VAR) model is defined:

$$Z_t = A_1 Z_{t-1} + \ldots + A_k Z_{t-k} + \mu + u_t , \quad u_t \approx \mathrm{IN}(0, \Sigma) , \tag{7}$$

Model (7) can be transformed into a vector error-correction, VEC model, which is more suitable for the analysis of interactions between the variables, both in the short-run and in the long-run. The associated VEC model is:

$$\Delta Z_t = \sum_{i=1}^{k-1} \Gamma_i \Delta Z_{t-i} + \Pi Z_{t-1} + \mu + u_t , \tag{8}$$

where μ is a vector that captures the deterministic components and Γ_i are matrices of parameters[4] for the growth rates of the variables. Matrix Π contains information on the long-run relationships. In fact, $\Pi = \alpha\beta'$, where β is 4 by r matrix of the long-run coefficients (cointegration vectors) and α is 4 by r matrix of the respective loadings and represents the speed of adjustment towards the long-run equilibrium. r is a number of cointegrating vectors of the system, and k is a lag length of the VAR model.

An important issue in applying the model is the selection of the optimal lag order (k) because the entire analysis is sensitive to the lag length. k is determined to solve the trade-off between improving the fit of the model (which requires additional lags) and granting a sufficiently high number of degrees of freedom (which requires parsimonious parameterization).

After choosing the optimal lag length[5] each variable was tested for unit roots. In order to classify the series based upon trend and unit root properties we performed ADF tests (e.g. Dickey-Fuller, 1979). As a confirmation to the ADF results we additionally performed KPSS tests (e.g. Kwiatkowski *et al.,* 1992) which differ in the specification of the null hypothesis. ADF test has a nonstationarity as a null hypothesis *i.e.* the null hypothesis is that the variable under investigation has a unit root, while in the KPSS test it is assumed that the variable is stationary.

If all variables appear to have a unit root, testing for cointegration is feasible. We want to find out if there are some linear combinations between variables that are stationary, *i.e.* I(0). In that case the variables are said to cointegrate and the linear combinations between them are called cointegrating vectors. The implication of cointegration is that the variables are genuinely related and they establish the long-run steady state. In order to test for cointegration, we employed

[3] Small letters denote ln transformation, *i.e.* ***tb*** is ln of export to import ratio (trade balance), ***rer*** is ln of real effective exchange rate, ***y*** and ***yf*** are domestic and foreign income in the ln form.

[4] $\Gamma_i = -(I - A_1 - \ldots - A_i)$, i=1,…,k-1 and $\Pi = \alpha\beta' = -(I - A_1 - \ldots - A_k)$

[5] The lag length is chosen to be the same for all variables in the model.

Johansen's reduced-rank procedure, (Johansen, 1988, and Johansen and Juselius, 1990). For the Johansen's procedure, there are two test statistics for the number of cointegrating vectors: the trace (λ_{trace}) and the maximum value statistics, ($\lambda_{\max}$). In the trace test, the null hypothesis is that the number of cointegrating vectors is less than or equal to r, where r = 0 to 4. In each case the null hypothesis is tested against the general alternative. The maximum eigenvalue test is similar, except that alternative hypothesis is explicit. The null hypothesis r=0 is tested against the alternative that r=1, r=1 against r=2, etc.

After deciding if variables in the model cointegrate and obtaining the number of cointegrating relationships, we proceed to generate the impulse response functions (IRFS) based on the VEC model to trace out the possible J-curve effect. The impulse response functions are the dynamic responses of each endogenous variable to a one-period standard deviation shock to the system. From these functions we can observe if there is a J-curve effect and causal run from exchange rate to trade balance. If we identify the J-curve effect we can observe if it is the 'strong-form' (the ratio immediately drops after the shock and gradually rises thereafter) or the 'weak-form' form (the trade ratio drops soon, but not immediately, after the shock and gradually rises thereafter) and whether the trade balance ends up higher in the long-run after the shock.

IRFS are obtained from the moving average representation of the VEC (VAR) model[6]. By construction, the errors in any equation in a VEC (VAR) model are usually uncorrelated. However, there could be contemporaneous correlations across errors of different equations. It is customary to transform these correlation by ortogonalizing the innovations in the model according to a prespecified causal ordering. After the factorisation, the transformed innovations become uncorrelated with each other at all lags as well as contemporaneously. Usually, errors are orthogonalized through Choleski factorization. However, the Choleski factorization suffers from the problem of depending on the ordering of the variables. Usually, the most variance is attributed to whichever variable comes first. An attempt to avoid the difficulties of identifying orthogonal shocks is estimating the generalized impulse response functions (GIRFS) introduced by Pesaran and Shin, (1998). Unlike the traditional impulse response analysis, GIRFS do not require orthogonalization of shocks and are invariant to ordering of the variables in the model[7].

5. Data

For the study of bilateral trade flows with respect to Croatian main trading partners, we used monthly data. The empirical period is from January 1995 to January 2005. The beginning of the empirical period has been chosen due to the fact that effects of the stabilization program brought in Croatia by the end of 1993 started to show only by the mid of 1994. The data come from the IMF's *International Financial Statistics* (*IFS*).

As the most important Croatian trading partners we consider France, Germany, Italy, Slovenia, the United Kingdom and Austria[8]. The real effective exchange rate, variable *RER*, is in terms of domestic currency per foreign currency, *i.e.* a rise in the variable represents a real depreciation of the domestic currency against the specific country, indicating a gain in competitiveness. The real exchange rate for each bilateral trade analysis is computed by using the domestic nominal

[6] The choice of VEC or VAR depends on existence of cointegration among variables

[7] The idea in computing the GIRFS is in computing the shocks with each variable in turn being first in a Choleski ordering. However, if the shocks are highly correlated it is very difficult to interpret the GIRFS sensibly. Fortunately, it was not the case in our study.

[8] Bosnia and Herzegovina was not included in the analysis due to data unavailability.

exchange rates with a specific country (domestic currency per euro) multiplied by the specific country consumer price index and divided by the domestic consumer price index. For domestic real output and foreign real output, we used data that differ from GDP, which is not available on a monthly basis. Therefore, for our monthly data analysis we employed the industrial production indexes which showed to be the adequate approximation for the GDP variable. The data are seasonally adjusted using Tramo-Seats method.

6. Empirical results of real exchange rate change

First we examined the time series properties of the macro variables performing the unit root tests. The results of ADF tests are presented in Table 1. They show that all variables except trade balance for France and the United Kingdom are integrated of order one[9]. In spite of that, to make analysis similar for all countries, we proceed with the analysis with all variables treated as being I(1).

Prior to testing for cointegration, the optimal lag length of the VEC model had to be determined. Applying the strategy discussed in the previous section, we chose *k* by minimizing information criteria (AIC, BIC and HQ)[10] and at the same time we tried to reduce auto-correlation[11]. Performing a battery of diagnostic checks with various values of lag lengths, k=2, proved to be the optimum for France, Germany, Italy and Austria. For Slovenia and the United Kingdom we opted for lag, k=3.

Table 2 reports the results from the cointegration analysis. Focusing on the Johansen test results, one cointegration vector is detected for France, Germany, the United Kingdom and Austria. In the case of Slovenia, $\lambda_{\max}$ - statistic suggests one cointegrating vector while λ_{trace} indicates two. The graphs of cointegrating relationships and the roots of the companion matrix clearly signify one cointegrating relation. Thus, for Slovenia we conclude that there is one long-run relationship among variables. Exception is Italy for which the null hypothesis of no cointegration cannot be rejected.

The estimated cointegrating vectors for each country applying Johansen procedure and normalised for the trade balance is given in Table 3. For each country, the adjustment parameter $\hat{\alpha}_{1i}$ has an expected negative sign denoting the speed of adjustment towards the long-run equilibrium. Their significance indicates the significance of the error-correction term[12] in the short-run model[13].

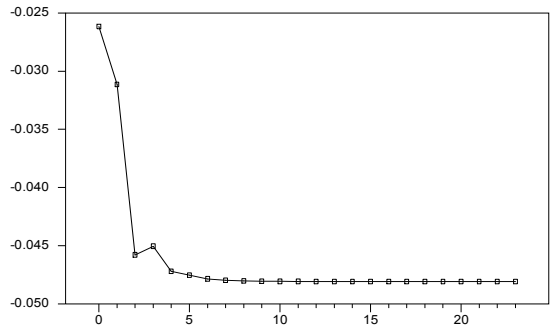
Using our findings of one cointegrating vector for the specified countries and no cointegration relationship for Italy, we proceed with the estimation of the generalized impulse response function (GIRFS) based on the VEC model (VAR model which incorporates the ECT variable) to trace out the possibility of the J-curve effect. For Italy, GIRFS were calculated using VAR model of the first differenced variables. Impulse response functions showing the effect of trade balance (*tb*) to a unit increase (a one standard deviation "shock") in the real effective exchange rate, *i.e.* the increase in real exchange rate for each country is presented in Figure 1.

[9] The results are confirmed by KPSS test and are obtained upon request.
[10] AIC, BIC and HQ are Akaike (1973), Schwarz (1978) and Hannan and Quinn (1979) criteria respectively.
[11] We tested for block significance of the variables.
[12] The error correction term, *ECT* variable, is a difference between actual trade balance and its long run value as predicted by the cointegration relationship.
[13] The estimates of the short-run relationships for each of the Croatian main trading partner country are given in Table 4 in Appendix.

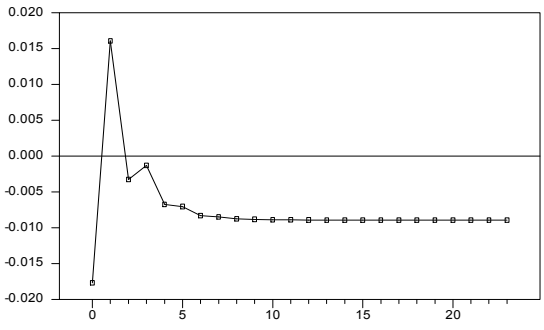
One standard deviation increase ("shock") in real bilateral exchange rate changes equals 0,97% depreciation of Croatian kunas in the case of France, for Germany it equals 0,92% and for Italy it corresponds to 1,5% depreciation of kunas. For Slovenia, the United Kingdom and Austria, one standard deviation depreciation in real exchange rate is equivalent to 0,83%, 1,65% and 0,78% depreciation of Croatian kunas, respectively.

Figure 1: Generalized impulse responses of a trade balance with regard to real bilateral exchange rate changes

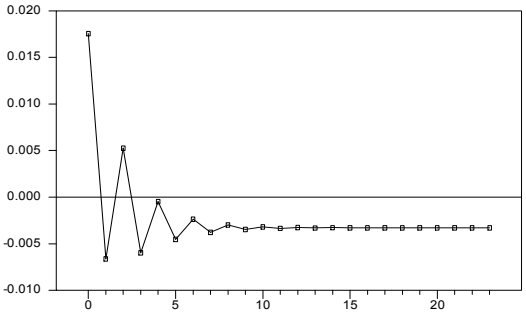
France



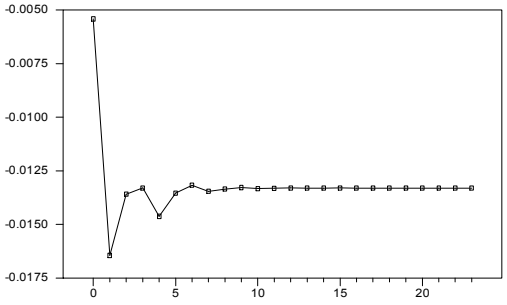
Germany



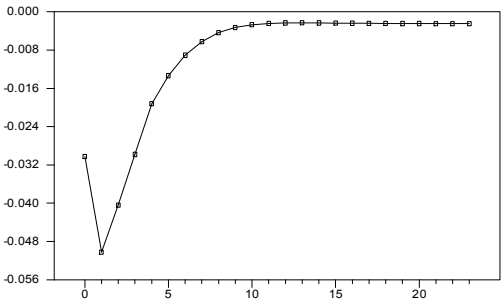
Italy



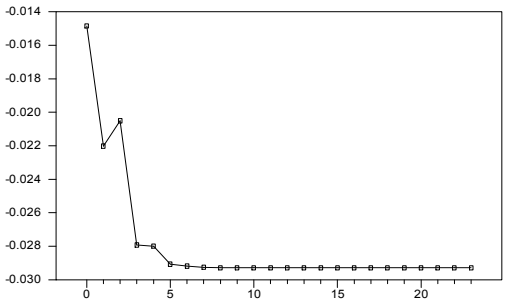
Slovenia



United Kingdom



Austria



As it can be seen in Figure 1, the contemporaneous response to a real depreciation is a decrease of export to import ratio for all countries except Italy. For France the contemporaneous

decrease equals 2,6% and it drops to its lowest value within the first six months. Constancy in the export to import ratio is then attained being 4,8% lower than its initial value.

In the case of Germany, after contemporaneous decrease of 1,8% and sudden increase after a month, trade balance collapses to its long-run value, which is 0,9% lower than its initial one, within the first six months.

For Slovenia, the contemporaneous drop of 0,5% is followed by a decrease in the trade balance within the first eight months. Eight to nine months after the shock, export to import ratio stabilizes obtaining its long-run value being 1,3% lower than its initial level.

Austria case is similar. Following the contemporaneous decrease of 1,5%, import to export ratio deteriorates within the first six months after which it stabilizes obtaining its long-run value which is 3% lover than its initial one.

For the United Kingdom, there is an initial drop in the trade balance of 3%, but its lowest value is attained after a month being 5% lower than its initial level. Export to import ratio starts to increase after the second month. Within nine to ten periods, it stabilizes around its long-run value which is almost the same as its initial one (0,3% lower than its initial value).

The case of Italy differs from others in the study. The contemporaneous response of export to import ratio to a one standard depreciation of real exchange rate is increase of 1,8%. After that, trade balance alternates within the first nine to ten months. Its constant, long-run value is achieved after that period being 0,3% lower than its initial value.

7. Conclusion

Analysing obtained results from our empirical study it appears that a J-curve phenomenon is not supportive for almost all of Croatian main trading partners (Slovenia, Austria, Germany, Italy and France) except for the United Kingdom. We have applied the methodology of generalized impulse response functions to investigate the phenomenon with respect to bilateral trade of these countries employing the monthly data. For each country, the impulse response function shows that the effect of export to import ratio to a unit increase in the real effective exchange rate is present within the first six to nine months. After that, the trade balance stabilizes obtaining its long-run value which is mostly lower than its initial value. In the case of Austria the long-run value (achieved after six months) is 3% lower than its initial value. For France, the long-run value (achieved after six months) is 4,8% lower, for Slovenia (achieved after eight to nine months) is 1.3% lower and for Germany the long-run value (achieved after six months) is 0,9% lower than its initial value. In the case of Italy and the United Kingdom, the effect of unit depreciation in real exchange rate on trade balance diminishes after nine to ten months attaining its long-run value that is almost the same as its initial one. The United Kingdom case appears supportive of the J-curve although a higher export-import ratio than initial is not achieved.

These results are very likely to be interesting for policymakers, because of the short-run effect on the export-import ratio after a depreciation (which makes export-import ratio below its initial level), and the long-run effects of depreciation on the export-import ratio (which makes export-import ratio higher than its initial level). The results do not provide empirical support for the J-curve. Impulse response functions show that after a current depreciation, there will be a dip in the export-import ratio. The long-run export-import ratio appears to be higher than the point of this early dip in four out of six cases. However, in all cases, the export-import ratio does not achieve higher long-run equilibrium than the initial one, after the depreciation.

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EFEKT PROMJENA STVARNOG TEČAJA NA HRVATSKU BILATERALNU TRGOVINSKU BILANCU

SAŽETAK

Utjecaj fluktuacije tečaja na volumen roba predstavlja važno pitanje za kreatore ekonomske politike. Cilj ovog rada je ispitati imaju li bilateralne promjene stvarnog tečaja u Hrvatskoj iole značajan utjecaj na trgovinsku bilancu između Hrvatske i njenih glavnih šest trgovinskih partnera (Slovenije, Austrije, Njemačke, Italije, Velike Britanije i Francuske), izuzev Bosne i Hercegovine radi nedostatka podataka. Odnos između tečaja i trgovinske bilance trebao bi pokazati rezultira li deprecijacija povećanjem izvoza i smanjenjem uvoza kako bi se izbjeglo povećanje uvoznih cijena. Ovaj rad također ispituje korištenje generalizirane funkcije impulsnog odziva, gdje je J-krivulja J-oblikovano vremensko kretanje trgovinske bilance kao odaziv na deprecijaciju. To znači da nakon takve promjene tečaja, trgovinska bilanca u početku pada da bi se polako podigla, moguće i na viši nivo od početnog. Rezultati ne daju empirijsku potvrdu J-krivulje. Funkcija impulsnog odziva pokazuje da će nakon tekuće deprecijacije doći do pada u odnosu izvoza i uvoza. Dugoročni odnos izvoza i uvoza čini se veći od tog početnog pada u četiri od šest slučajeva. Ipak, u svim slučajevima, nakon deprecijacije odnos izvoza i uvoza ne dostiže dugoročno viši nivo od onog početnog.

Ključne riječi: *Vanjskotrgovinaska bilanca, realni tečaj, J krivulja, VEC model*

APPENDIX

Table 1.

ADF unit root tests for bilateral data (significance 5%)[14]

H_0 I(1), H_1 I(0)	Conclusion	H_0 I(2), H_1 I(1)	Conclusion
	France		
Trade balance	Series stationary around a non-zero mean		
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	Germany		
Trade balance	Series contains a unit root with zero drift	Trade balance	Series has no unit root
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	Italy		
Trade balance	Series contains a unit root with zero drift	Trade balance	Series has no unit root
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	Slovenia		
Trade balance	Series contains a unit root with zero drift	Trade balance	Series has no unit root
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	United Kingdom		
Trade balance	Series has no unit root		
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	Austria		
Trade balance	Series contains a unit root with zero drift	Trade balance	Series has no unit root
Real Exchange rate	Series contains a unit root with zero drift	Real Exchange rate	Series has no unit root
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root
	Croatia		
Indust. Product. Index	Series contains a unit root with zero drift	Indust. Product. Index	Series has no unit root

[14] The appropriate number of lagged differences was determined by Schwarz (1978) BIC criterion.

Table 2.

Johansen's test for the number of cointegrating vectors

H_0: r =	p-r	λ	λ_{max}	λ_{trace}	λ_{max} - 10% critical value	λ_{trace} - 10% critical value
France (k= 2)						
0	4	0.2852	39.96*	51.67*	24,73	43,95
1	3	0.0625	7.67	11.71	18,60	26,79
2	2	0.0291	3.51	4.04	12,07	13,33
3	1	0.0044	0.53	0.53	2,69	2,69
Germany (k=2)						
0	4	0.2227	29.99*	44.18*	24,73	43,95
1	3	0.0803	9.96	14.19	18,60	26,79
2	2				12,07	13,33
Italy(k=2)						
0	4	0.1700	22.17	40.58	24,73	43,95
1	3	0.1108	13.98	18.41	18,60	26,79
2	2				12,07	13,33
Slovenia(k=3)						
0	4	0.1926	25.25*	54.37*	24,73	43,95
1	3	0.1328	16.81	29.12*	18,60	26,79
2	2				12,07	13,33
United Kingdom(k=3)						
0	4	0.1968	25.86*	45.43*	24,73	43,95
1	3	0.0904	11.19	19.57	18,60	26,79
2	2				12,07	13,33
Austria(k=2)						
0	4	0.2587	35.62*	50.24*	24,73	43,95
1	3	0.0833	10.35	14.62	18,60	26,79
2	2	0.0351	4.25	4.27	12,07	13,33
3	1	0.0002	0.02	0.02	2,69	2,69

Notes: Critical values for Johansen's test were taken from Osterwald-Lenum, (1992).

Table 3.

The estimated cointegrating vector(s) for each country applying Johansen's reduced-rank procedure

Country		*tb*	*rer*	*y*	*yf*
France	**β'**	-1.000	4.035	2.482*	1.450
LR-test	CHISQ(1)		3,27	7,27	0,43
	p-value		(0,07)	(0,01)	(0,51)
	α'	-0.622*	0.000	-0.008	-0.004
	t-value	(-6.488)	(0.113)	(-1.198)	(-1.800)
Germany	**β'**	-1.000	1.428	2.374*	-0.410
	CHISQ(1)		2,55	12,57	0,18
	p-value		(0,11)	(0,00)	(0,67)
	α'	-0.363*	-0.016	-0.062*	-0.005
	t-value	(-3.463)	(-1.941)	(-3.290)	(-0.479)
Italy		No cointegration relationship			
Slovenia	**β'**	-1.000	2,285	2,507	-4,168*
	CHISQ(1)		2,14	1,86	7,30
	p-value		(0,14)	(0,17)	(0,01)
	α'	-0,278*	-0,009	0,003	0,047*
	t-value	(-3,379)	(-1,439)	(0,179)	(3,128)
UK	**β'**	-1.000	-0.357	0.344	-8.482
	CHISQ(1)		0,10	0,16	0,16
	p-value		(0,75)	(0,69)	0,20
	α'	-0.245*	-0.012	0.005	0.005
	t-value	(-4.252)	(-1.707)	(0.584)	(1.563)
Austria	**β'**	-1.000	4.158*	-1.210	0.203
	CHISQ(1)		9,30	2,58	0,08
	p-value		(0,00)	(0,11)	(0,77)
	α'	-0.552*	-0.012*	0.007	0.003
	t-value	(-5.682)	(-2.170)	(0.454)	(0.245)

Notes:

a) *β represents the cointegrating vector and α represents the adjustment parameter vector.*

b) ** represents statistical significance at 5%. For vector β, the value of likelihood ratio statistic and the p-value are presented in the parentheses. For vector α, t-values are presented in the parentheses.*

c) *−1.000 implies that the cointegrating vector is normalised with respect to the variable.*

Table 4.

Estimates of the short-run relationship; $ECT_{t-1} = \alpha_1 \beta_1' Z_{t-1}$

Country: France						
Variable	**Constant**	Δtb_{t-1}	Δrer_{t-1}	ΔY_{t-1}	ΔYf_{t-1}	ECT_{t-1}
Coefficient	10,381*	-0,038	0,169	0,239	-6,646*	-0.622*
"t-value"	6,479	-0,433	0,057	0,198	-2,015	-6.488

Country: Germany						
Variable	**Constant**	Δtb_{t-1}	Δrer_{t-1}	ΔY_{t-1}	ΔYf_{t-1}	ECT_{t-1}
Coefficient	2,993*	-0.338*	3.015*	0.229	0.571	-0.363*
"t-value"	3,452	-3.722	2.623	0.505	0.612	(-3.463)

Country: Italy					
Variable	**Constant**	Δtb_{t-1}	Δrer_{t-1}	ΔY_{t-1}	ΔYf_{t-1}
Coefficient	0.001	-0.615*	-0.582	-1.409	-4.438
"t-value"	0.031	-8.288	-0.415	-1.451	0.03125

Country: Slovenia										
Variable	**Constant**	Δtb_{t-1}	Δtb_{t-2}	Δrer_{t-1}	Δrer_{t-2}	ΔY_{t-1}	ΔY_{t-2}	ΔYf_{t-1}	ΔYf_{t-2}	ECT_{t-1}
Coefficient	-2.094*	-0.154	-0.086	-1.050	0.698	0.522	0.552	-0.655	-0.218	-0,278*
"t-value"	-3.382	-1.497	-0.884	-0.909	0.609	1.059	1.161	-1.305	-0.456	-3,379

Country: United Kingdom										
Variable	**Constant**	Δtb_{t-1}	Δtb_{t-2}	Δrer_{t-1}	Δrer_{t-2}	ΔY_{t-1}	ΔY_{t-2}	ΔYf_{t-1}	ΔYf_{t-2}	ECT_{t-1}
Coefficient	0,898*	0.077	0,193*	-1.479*	0,697	0,148	-0,075	0,699	0,687	-0,245*
"t-value"	3,989	0.861	2,240	-2,007	0,941	0,259	-0,133	0,401	0,395	-4,252

Country: Austria						
Variable	**Constant**	Δtb_{t-1}	Δrer_{t-1}	ΔY_{t-1}	ΔYf_{t-1}	ECT_{t-1}
Coefficient	-3.084*	-0.103	0.606	-1.019	1.684*	-0.552*
"t-value"	-5.677	-1.155	0.363	-1.799	2.564	(-5.682)

*Note: t-values are presented in the parentheses. * denotes significance at 5% level.*

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MONUMENT ANNUITY AS ECONOMIC INSTRUMENT – FROM THEORY TO CROATIAN PRACTICE

ABSTRACT

An annuity is a payment for the use of a fixed resource, such as land, natural resources or in our case a cultural monument. The theory of annuities has been developed by numerous economic theorists, primarily examining land annuities, amongst them W. Petty, A. Smith, D. Ricardo, T. R. Malthus, K. Marx, P. A. Samuelson and others. Monument annuity, therefore, represents an irreplaceable economic instrument through which the economic value of the monument is asserted on the market. Through its functions the annuity enables the management of protected built heritage as well as the realization of the most important objective of protection, and that is not only the preservation of the monument value of built heritage but also the "wise use" of built heritage in economic development.

Key words:*: monument annuity, economic value of the heritage, cultural heritage*

1. A THEORETICAL APPROACH TO THE CONCEPT AND DEFINITION OF AN ANNUITY

An annuity is a payment for the use of a fixed resource, such as land, natural resources or in our case a cultural monument. The theory of annuities has been developed by numerous economic theorists, primarily examining land annuities, amongst them W. Petty, A. Smith, D. Ricardo, T. R. Malthus, K. Marx, P. A. Samuelson and others. W. Petty developed the annuity theory by examining increased value, according to which annuities appear in only two forms, that of land annuities and monetary annuities (interest). He considered land annuities the primary form for increased value, while monetary annuities came from the land annuities. According to him, annuities are the entire excess after the deduction of the cost of production that includes a fee for the producer. Petty is the first to establish the term differential annuities, where he fully recognizes the importance of land position in relation to the market and recognizes fertility as the second criteria of differential annuities.

In following this review of the most important theories and theoreticians on annuities, the subsequent definitions for the ideas or annuities and land annuities arise. An annuity is income that in kind or money is acquired by a certain individual (person of independent income), without their work or entrepreneurial action, on the basis of ownership over real estate. Land annuities are a form of economic payment for the use of land ownership, and the collection of annuities is an economic form of realization of land ownership. Starting with annuities as income in kind or money, acquired by certain individuals (persons of independent income), without their work or entrepreneurial actions, on the basis of ownership

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of real estate, the following text gives the determination of monument annuities, and the basis for the characteristics of a monument as a fixed factor in the market. Payment for the use of a monument is viewed as a monument annuity, first by viewing the basic characteristics that a cultural monument has as a fixed factor in a market, and then through an examination of the characteristics of this type of annuity, as well as methods for its determination. Therefore, as with land annuities which represent an economic form of payment for use to the land owner, monument annuities represent an economic form of payment for the use of cultural monuments, or in other words their monument characteristics.

Monument annuities, in similarity to land annuities, can appear in three forms[1], and they are:

- absolute annuity;
- differential annuity I and
- differential annuity II.

The absolute monument annuity is the annuity brought by every monument on the basis of ownership, and represents the value of the space and structure that, due to its monumental characteristics, has a special value. This, as a rule, is the result of the use of the monument with the lowest monumental values, in others words payment for their consumption. **Differential monument annuity I** is displayed through various monumental values, and therefore various economic values (fertility), and various distances from markets. In other words, it is rare to find two identical monuments, and when they do exist, it is very rare that they are in the same position in relation to the market. **Differential monument annuity II** is displayed as the income realized after additional investment is made into a monument to make it more fit for consumption. These investments do not have to be made on the monument, but can be in the contents of the infrastructure, which in the end act as an improvement to the conditions for consuming the monument (increased fertility). This can be the result of past or present investments.

A monument annuity is similar to a land annuity. A monument that has a greater quality of monument characteristics, or in other words a greater monument value, and which is closer to the market, or which has lower maintenance costs than one which is further from the markets, will realize an increased profit in the form of differential monument annuities. In all three forms of the phenomena of monument annuity it can be claimed that there is the appearance of a fourth form, monopoly annuity. However, it must first be taken into consideration that every monument is unique in a certain way and due to this uniqueness, which is represented through its monumental value, the monument achieves a monopolistic position in the market. Therefore, there is no situation where there is more than one monument, which leads to a monopolistic position and with this a monopolistic annuity. In this way, the monopolistic position of the monument is represented in all forms of monument annuities, coming to expression especially when the monument is of exceptional quality. This then represents a special form on monopolistic surplus profit, in other words these exceptional conditions allow for the production of special types of goods and services.
The further analysis of monument annuities, especially those that are collected from architectural heritage, deals with differential monument annuities, while absolute monument annuity is only important in a theoretical sense.

2. CHARACTERISTICS OF MONUMENT ANNUITY

[1] *Marx, K.: Kapital, Kultura, Zagreb, 1948, treći svezak*

It is necessary to establish the characteristics of monument annuities to differentiate them from annuities gained from structures or land. For this reason the following text will point out the basic characteristics of monument annuities. The basic characteristic of monument annuities is that they result exclusively from the use of a monument or its monumental properties, which are realized in the market due to the consumption of goods and services. The characteristics of a monument annuity cannot be viewed without a prior review of the basic characteristics of a cultural monument as a fixed factor in a market.
If one were to analyze the importance of a cultural monument they would observe five basic characteristics that establish it as a fixed factor in market relations, and they are:

- Restriction in the number of monuments,
- Uniqueness (there are no two alike) that makes the owner a monopolist,
- Proof of identity,
- The need to preserve the monument restricts opportunities to use it, and
- The effect of time on preservation.

The first characteristic is the restriction on the number of cultural monuments, within the area of individual countries or even the entire world. The restriction in the number cannot always be taken literally, since it is indisputable that there are discoveries of items and objects with monumental qualities still being made, while time mercilessly destroys individual monuments. For this characteristic it is important to stress that it is not possible to produce a cultural monument, nor otherwise intentionally create it. Only with the passage of time, and based on expert valuation, will an object be recognized as a monument and this serves only as a pre-condition for the inclusion of such an object in the national holdings of cultural heritage, or of the world. The second characteristic is the uniqueness of every individual monument. In other words, there are no two monuments that are the same. Even if two were found, for example two castles or villas, they would be found at different locations. Therefore, the owner or holder of the monument is a monopolist and can have corresponding benefits due to this fact. Artistic, historical or other characteristics of the monument, which are also called monumental qualities, contribute to the uniqueness of the monuments. An important characteristic of uniqueness is the authenticity of the monument due to which replicas of the original do not have the same monumental value, or even the same economic value.

The third characteristic of the monument is its bearing witness to human creativity in a specific time period. Monuments are proof of the cultural identity of a man or community to which the monument belongs or belonged. The fourth characteristic of a monument is the fact that its preservation restricts opportunities for its use. The need to extend the «life» of a monument, to preserve it for future generations, restricts the use of it. These restrictions, which are becoming increasingly common in appearance, can now be considered a generally accepted principle in developed societies. They restrict the consumption of a monument, preventing the devastation that could be caused by its uncontrolled consumption.
The fifth characteristic is the merciless effect of time on the preservation of a monument. In other words, no matter how much a good is preserved from deterioration, no matter how much care and attention is given, no matter how much is invested in its preservation, there is always a natural end to every good, and even a monument. There are no eternal materials, and the same is true of monuments, and therefore every one of them has a restricted time of existence. Luckily for mankind, many constructors were aware of this mercilessness and in a desire to make their creations «eternal» used materials that successfully resist the effects of

time (the Egyptian pyramids, the Roman and Greek temples, etc.). In contrast to this, the common architectural heritage in many regions has completely disappeared since the materials used could not survive for long durations.

One characteristic that arises from the direct use of a monument is that it is expressed as a price for service in which the «consumer» realizes direct benefit for visiting the monument. This form of direct use, and with it the collection of this form of monument annuity is, as a rule, very transparent in practice and this eases its recognition and determination. Take for example a museum institution or castle, where admission is charged for access. In buying the admission ticket the visitor pays a monument annuity, as a price for the right to visit and review the museum collection or monument. However, not all forms of direct use, and with that, other forms of monument annuities, are that transparent. For example, a building that is a monument and located in the commercial center of a city, whose space is used for commercial activities, can at the same time have both monument annuities and positional annuities, and it is very complicated to separate them. With indirect use, monument annuities are hidden in the market price of products or services and it is commonly very difficult to express them as an exact amount realized on that basis. Most commonly it is only possible through comparisons between the same products or services to determine the participation of the indirect effect of a monument on price. This type of comparison is not always possible, which complicates the process of determining monument annuities for this form of use. An example would be the production of replicas of a monument, which by themselves, as products, would have minimal value if they didn't simultaneously represent a copy of the original monument. The characteristics of monument annuity are partially affected by the method of their creation, in other words whether they arise as the result of direct or indirect use. In both forms of use, it must be emphasized that the monument annuity arises as a result of use of a monument in which a benefit is realized.

3. ESTABLISHING THE MONUMENT ANNUITY

From the previous text it is obvious that a cultural monument achieves an annuity and this annuity is the result of direct or indirect consumption. The realization of monument annuities in certain conditions is established with the recognition of these values by the market. Very frequently, a monument annuity is not easily recognized as a unique amount in the price for a service offered by the monument, such as the entrance ticket for visits to a museum or a castle. More frequently the monument annuity is hidden in the differences of prices between similar services that are offered in the monument or some other location. One illustrative example is the price of services in a hotel located within the monument structure with the prices of the services in a hotel of the same category located within a modern structure.
What are the reasons for establishing monument annuities? The following are only the most basic reasons for establishing monument annuities:

- as instruments to ensure resources for the maintenance and preservation of a monument, and
- as a regulator for the rational use of a monument as a scarce resource.

The establishing of a monument annuity, both its amount and method of collection in individual cases, especially when the owner is allowed to do the collection, represents one method of insuring the necessary resources for the maintenance and with this the preservation of the monument. Very frequently the maintenance costs of a monument, or preservation, are greater than those of similar goods that do not have monumental characteristics. In other

words, the preservation of monumental characteristics frequently demands special and, as a rule, more expensive activities for the maintenance and preservation of such goods. The establishment of monument annuities is especially useful for the goal of balancing supply and demand for a certain monument. The absence of payment of annuities for very attractive monuments, such as the Pyramids of Egypt, the Great Wall of China, and many others, would create crowds of visitors who through their great number could threaten even the further existence or preservation of the monuments. Therefore the establishment of the annuity, through the payment of entrance fees, as the simplest form of collection, in other words the level of the entrance fees, regulates the relationship between the demand and objective capabilities related to the amount of visitors that can visit a cultural monument without threatening its integrity and monumental characteristics. Even though only two important reasons were given for the establishment of monument annuities, this is frequently not the case in practice. Why? The non-establishment of monument annuities can be attributed frequently to the following reasons: First, the owners of a cultural monument, as a rule, do not find it necessary to increase their income, and when they decide to do this they cannot recognize the methods to achieve or increase their income. The second reason, which as a rule leads to excessive use of the cultural monument, is that the owner considers it too expensive to create a system for payment, or the collection of annuities, and therefore rejects payments and leaves allows the use of the resources without compensation. Both of these reasons lead to the non-establishment of annuities, and its collection in practice, become serious reasons for the need to establish monument annuities in cases of monument use, as a hypothesis for its collection.

4. COLLECTION OF MONUMENT ANNUITIES – CROATIAN EXPERIENCES

During the analysis of the collection of monument annuities it is important to observe who collects that monument annuity in practice and how. These two basic questions are extremely important if one wishes to affect changes in the collection of monument annuities, both in the economic processes, and through the introduction of systems for collecting monument annuities.
The collection of monument annuities can be:

- non-regulated – which means the process of collection occurs exclusively through economic actions in the market. Individuals with positions that allow them to determine the level of annuity and the method of its collection, have almost complete freedom in decision making;
- partially regulated – which means the process of collection occurs within partially set frameworks, and a portion is surrendered to the effects of market factors;
- regulated – which means the process of collecting monument annuities is ordered, both in regards to the level and the method of collection.

In cases of monument annuity collection, it is also important to differentiate whether it is the result of direct consumption or indirect consumption of the monument. The following text will analyze some methods of collection for both types of consumption.

The consumption of many other products and services, in addition to the monument and its presentation, can lead to the collection of monument annuities.
An analysis follows of an example where the method of monument annuity collection is the offering of a service in which the consumer participates in direct consumption of the monument. The organized viewing of a monument is one such type of this service. This service, in addition to the optical experience, contains a summary of the basic information

concerning the monument that is then presented to the visitor. Practice has shown that visitors readily use organized viewing of a monument or settlement or even the organized viewing of several monuments. With this they convert their visit to a monument into a cultural-educational act. They also receive a confirmation of the authenticity of the monument, in other words they confirm that they have visited a special place and gained a special experience, which in turn makes their trip special. Cities that are a common tourist destination develop various sightseeing programs, and the most common places visited by these programs are in fact monuments. In addition to services that are connected with the direct consumption of a monument, there are also products. This type of product most commonly takes the role of a souvenir that cannot be found elsewhere, more specifically it can only be obtained during a visit to the monument. It is in this way that many museums create replicas of items that are found in their holdings, that visitors can purchase at the museum shop during their visit. In addition to replicas of authentic monuments, occasionally there is the appearance of actual portions of a monument that are sold as souvenirs. After the fall of the Berlin Wall, there was the offering of products that contained actual portions of mortar or brick from the Berlin Wall as souvenirs. The special quality of this souvenir cannot be doubted, and it is of no surprise that buyers were found. This type of product can be found during the restoration of a monument, when replaced segments are sold as souvenirs, and this sale contributes to the collection of resources for further renewal of the monument. The examples presented indicate the possibility of creating very attractive and special souvenirs whose authenticity compensates for the lack of any useful value and which make them special products that assist in the collection of monument annuities. In other words, such a piece of stone or other material would be almost worthless if it were not an authentic piece of a monument.

4.1. COLLECTION OF ANNUITIES THROUGH INDIRECT MONUMENT CONSUMPTION

The examples given have shown only a few forms of indirect monument consumption, many forms and examples of such consumption have not attracted the necessary attention. However, it is indisputable that this form of monument consumption appears as a result of organized activities that have their economic reasons and effects. From a market-based standpoint, indirect consumption, in similarity to direct consumption, obtains a monument annuity as a price for consumption. In this case, the annuity is most often collected by the entrepreneur, or by an individual who is not the owner of the monument and even has no type of association with the monument. In this way, for example, a professional photographer will sell a picture of monument for the creation of postcards at a price higher than for other visited structures, despite the fact that the production price and time required to create each picture is the same. The photographer will therefore collect a monument annuity, even though they have no obligation towards the monument or its owner. A similar example is when a wine producer uses outlines or drawings of cathedrals, castles or monument sites on the bottle labels. They pay for the design work of the individual who created the label in which they also pay a portion for the monument annuity for the indirect consumption of the monument. If that same designer were to use another artist's creation (picture, symbol, etc.) for the creation of the same label, instead of a drawing of the monument, regulations would require not only a payment to the author, but commonly also their permission.

Croatian regulations concerning the protection of cultural goods have had provisions where this form of monument annuity is collected in the benefit of the monument, or cultural heritage, for a longer period. The implementation of Article 51 of the Law led to the collection, in 1988 alone, of $121,668 US (or 994,903 HRK according to the exchange rate

valid for July 20, 2001) from the region of the former municipality of Dubrovnik for the renewal and protection needs. The Law on the Protection and Preservation of Cultural Goods[2] appreciated the beneficial experience gained from the quoted provisions of the Dubrovnik Law, and a special section of the Law proscribes the method of collecting budget income on the basis of the use of a cultural good, more specifically in Article 112 and 113. These quoted provisions regulate the method of monument annuity collection from the indirect consumption of a monument, more specifically in two ways: when the monument, or a recognizable portion, is used for commercial purposes in photographs, badges, stickers and souvenirs; and the other described cases when the monument or its portion is used for promotional activities. At the end of 2003, the Law on Changes and Additions to the Law on the Protection and Preservation of Cultural Goods («Narodne novine», No. 103/03) was brought, which introduced another form of collection of monument annuities for the indirect consumption of a monument, and it is regulated by Article 114a. According to Article 114a, all economic subjects that perform one of the mentioned activities are legally obligated to pay into the National Budget the amount of 0,05% of their realized annual income from the previous year for monument annuities. The majority of activities that are required to pay this form of monument annuities are related to tourism, banking, telecommunication and the transport of passengers. The connections between tourism and heritage are quite transparent and show the reasons why there is the obligation to pay monument annuities for the indirect consumption of a monument. However it is necessary to explain the reasons why this obligation is regulated for the activities of banking, telecommunication and transport of passengers. All three activities have their special role in tourism, which is just one of the reasons. The activity of telecommunications is present, with its infrastructure, in almost all monuments and monuments sites. The transport of passengers, whether it is intra-city or inter-city, also has a direct benefit from monuments. Passengers may use public transportation to visit monuments, amongst other things.

4.2. RESULTS FROM THE COLLECTION OF MONUMENT ANNUITIES FOR 2004-2005.

During 2004, the Ministry of Culture requested all city and municipal administrations to deliver a Decision concerning the level of monument annuities, as well as an estimate of the resources that the administrations were planning to collect in 2004, based upon the bringing of that Decision. An example of the estimates of the City of Korcula, which on July 19, 2004, brought a Decision on the level of monument annuities for the urban site of the City of Korcula.

[2] *"Narodne novine", No. 69/99.*

Table 1.

Monument annuities collection

CITY/MUNICIPALITY					
		CITY OF KORCULA			
MONUMENT SITE					
		URBAN CENTER OF THE CITY OF KORCULA			
Reg.no.		Date Decision brought			19.07.2004
Prevent.		Date Decision implemented			29.07.2004
No.	Zone and/or Activity	Level of Annuity	Number of payers	Surface m2	Expected Annuity
1	2	3	4	5	6
		3,00 Kn	10		54.192,00
		4,00 Kn	112		513.600,00
		5,00 Kn			
		6,00 Kn	5		128.160,00
		7,00 Kn	1		840,00
		8,00 Kn	2		56.064,00
		9,00 Kn			
		10,00 Kn			
	TOTAL		**130**	**0,00**	**752.856,00**

Source: Ministry of Culture

On the basis of the Decisions brought and the submitted estimates, a summary was created that encompasses 26 cities and municipalities that, up to September 23, 2004, had brought adequate Decisions and informed the Ministry of Culture of the same.

Table 2.

Monument Annuities Collection in Croatia

Monument annuity – estimate September 23, 2004			
CITY/MUNICIPALITY	DECISION	m2	*ESTIMATE*
ZAGREB	01.01.2004.	2.715.307,21	175.173.090,72
CITY OF KORČULA	29.07.2004	0,00	752.856,00
ROVINJ	01.09.2005	35.989,21	1.295.611,56
BUJE	01.07.2004	5.791,21	119.647,00
KARLOVAC	01.07.2004	60.047,00	1.441.692,00
ĐURĐEVAC	15.04.2004	396,00	23.760,00
ČAKOVEC	01.01.2004	22.953,48	1.893.695,76
NAŠICE	01.01.2004	26.852,00	966.672,00
OSIJEK	01.08.2004	343.000,00	1.100.000,00
POŽEGA	15.02.2004	10.912,41	392.846,76
RIJEKA	08.03.2004	311.412,18	12.232.619,07
NOVI VINODOLSKI	09.03.2004	930,68	48.395,36
RAB	10.07.2004	10.710,00	160.650,00
CITY OF MALI LOŠINJ	05.06.2004	30.278,00	681.139,00
CITY OF VELI LOŠINJ	05.06.2004	682,00	15.550,00
OPATIJA	01.01.2004	0,00	15.260,40
HRVATSKA KOSTAJNICA	01.06.2004	2.260,54	47.471,34
SISAK	01.04.2004	149.221,25	5.171.725,71
OMIŠ	12.08.2004	4.036,44	145.311,84
TROGIR	15.04.2004	16.200,00	658.000,00
ŠIBENIK	17.08.2004	19.200,00	1.651.332,00
VODICE	01.01.2004	4.139,00	244.620,00
PAG	01.01.2004.	2.884,15	102.982,40
BAKAR	01.10.2004.	5.135,39	184.874,04
SUPETAR	01.10.2004.	0,00	250.000,00
DUBROVNIK	01.01-2004.	17.680,51	2.102.122,80
TOTAL		**3.796.018,66**	**206.871.925,76**

Source: Ministry of Culture

A majority of the resources, according to this estimate, were to be collected in the region of the City of Zagreb, but that did not occur. The reason for this was most probably the local elections, since the city and municipal administrations then extended implementation. This point can be confirmed in the statements made by some municipal leaders during the election campaigns. They publicly opposed the implementation of already brought Decisions concerning the level of monument annuities or refused to bring such Decisions for monument sites in the area of their city or municipality. During 2004, a total of 67,9 million Kuna was collected as monument annuities, of which 48,6 million, or 71,5%, was from the indirect consumption of a monument. From direct consumption, according to square meter, only 19,3 million was collected, instead of the estimated 206,8 million, or an actual portion of 28,5% of the total collected resources.

Table 3.

Monument annuities collected during 2004 and 2005.

MONUMENT ANNUITY	2004.		2005.	
	HRK (000.000)	EURO (000.000)	HRK (000.000)	EURO (000.000)
TOTAL	67,9	9,2	111,5	15,1
0,05% of total income (Article 114a of Law)	48,6	6,6	62,1	8,4
By square meter (Article 114 of Law)	**19,3**	**2,6**	**49,4**	**6,7**

Source: Ministy of Culture

A comparison of the indicators of the collected monument annuities from 2004 and 2005, shows that in 2005 64% more annuities were collected than in the previous year. Noticeable growth was observed in annuities from direct consumption, where 156% more was collected than in 2004. This growth is explained by the increase in the number of cities and municipalities that not only brought Decisions concerning the level of monument annuities, but also that implemented them in practice. This is confirmed by the indicators related to the amount of monument annuities collected, according to which the City of Rijeka, even though containing a monument site much smaller than that of the City of Zagreb, collected more than Zagreb in 2005. In addition, the amounts collected in five cities were also much higher than in 2004. Since not all cities and municipalities have properly followed this legal obligation, even in 2005, the following years can expect increased growth in this type of annuity based upon the estimates from 2004. The top five cities with the highest collected resources from monument annuities based on municipal Decisions, by square meter, are:

Table 4.

Monument Annuities in Major Cities

CITY	2004.		CITY	2005.	
	HRK (000.000)	EURO (000)		HRK (000.000)	EURO (000)
Zagreb	8,0	1,081	Rijeka	9,2	1,243
Rijeka	5,3	716	Zagreb	8,1	1,095
Sisak	1,9	257	Dubrovnik	3,2	445
Split	1,3	176	Varaždin	3,2	440
Karlovac	**1,0**	**135**	**Split**	**3,1**	**419**

Source: Ministry of Culture

Monument annuities from indirect consumption (according to Article 114a of the Law) collected in 2005 were 27% higher than in 2004, which is primarily a result of a very successful tourism season where numerous business people, those responsible for paying this form of annuity, realized a growth in total income. Since the indicators are related to the location of the headquarters of the economic subjects, it is obvious that the largest amounts were collected in the largest Croatian cities, and that the City of Zagreb led in both 2004 and 2005. For this form of monument annuity, the collection is legally entrusted to the Taxation authority that prevents payment evasion. The first five cities with the highest collected resources from monument annuities, according to a rate of 0.05% of total income, are:

Table 5.

Highest Collected Monument Annuities

CITY	2004.		CITY	2005.	
	HRK (000.000)	EURO (000)		HRK (000.000)	EURO (000)
Zagreb	17,5	2,364	Zagreb	30,5	4,122
Rijeka	2,3	311	Rijeka	3,5	472
Split	1,6	216	Split	2,6	351
Dubrovnik	0,8	108	Dubrovnik	1,2	162
Osijek	**0,6**	**81**	**Zadar**	**1,1**	**149**

Source: Ministry of Culture

The Law regulates the division of the collected monument annuities, where 60% goes to the benefit of the city or municipality of the area where it is collected and 40% to the benefit of the National Budget (distributed by the Ministry of Culture).

Table 6.

Division of monument annuities in 2004 and 2005.

MONUMENT ANNUITIES	2004.		2005.	
	HRK (000.000)	EURO (000.000)	HRK (000.000)	EURO (000.000)
TOTAL	67,9	9,2	111,5	15,1
Cities and municipalities	40,7	5,5	66,9	9,1
National budget	**27,2**	**3,7**	**44,6**	**6,0**

Source: Ministry of Culture

The institution of monument annuities is gradually entering into Croatian practice and is showing expected results. In areas where this form of collecting resources began immediately after the Law was brought into effect there has been a systematic restoration of protected heritage, and the public in these places has given this process a positive grade. Numerous cities and municipalities are at the beginning of introducing monument annuities, while some small local units of self-government are stubbornly, out of political reasons, not implementing the regulations of the Law, bringing damage to the protected cultural heritage that exists within their authority.

4.3. THE PURPOSE OF MONUMENT ANNUITIES

The fact of whether a monument annuity resulted from direct or indirect monument consumption will be ignored during the examination of the purpose of the collected annuities. If one wished to review the purpose of the collected monument annuities it is first necessary to confirm who collected it. In other words, the annuity collector could be:

- the owner of the monument,
- the user of the monument,
- the country,
- the local authorities of the region where the monument is located,

- an entrepreneur who performs an activity related to the monument, or
- even a citizen in some cases.

The importance of the annuity collector in relation to its purpose is seen through the relationship between the annuity collector and the monument itself. It is therefore necessary to show the variety of relationships towards the monument by different annuity collectors. One can start with the monument owner, who naturally wishes to preserve their possession and therefore, as a rule, invests in it. It follows that when an owner collects an annuity it most frequently is added to the resources that are invested in the maintenance and preservation of the monument. Another possible annuity collector is the user of the monument, who is not the owner of the monument. They are therefore most commonly interested only in the possible use of the monument, and consider the maintenance and preservation of the monument the obligation of the owner. The user of a monument is prepared to invest in the monument only when they can significantly improve their own benefits. If they do achieve a position where they can collect the annuities, it is improbable that the collected annuities would be converted into investments into the monument.

The country or nation is another possible annuity collector, which can use regulations to proscribe that the collected annuities, or a portion of them, become income for the national budget. In this case the nation is obliged to invest into the protection and preservation of cultural heritage for the common good. However this obligation is general in nature and as a rule exists without consideration of the amount of annuities collected. It should be therefore held that if a nation obtains the position of annuity collector, all of these resources should be used exclusively as additional resources for the protection and preservation of cultural heritage. The local authorities can also be an annuity collector, through the collection of local taxes and utility charges. In this role the local authorities act similarly to the national ones by using the annuities as income for their budget, but in this case they have a significantly reduced obligation towards investment in the protection and preservation of monuments than for the national level case. Local authorities most frequently consider investment in monuments as an obligation of the owner or the general community, in other words the country. Another possible annuity collector is an entrepreneur who is connected to the monument through a type of activity, whereby they acquire a portion of their income through the use, or consumption, of the monument. An entrepreneur is an individual who is focused on acquiring income, and therefore, as is the case for monument users, is not prepared to pay for investments in the monument unless they can result in profits or some other benefits. Therefore the entrepreneur is also not prepared to invest the collected annuities for the benefit of the monument. Instead the priority is on the use of the annuities for the development of the entrepreneur's own businesses.

Finally, citizens can also be possible annuity collectors. If they achieve this position, they are not interested in monument preservation investment since they are not the owners. In other words, the citizen considers that the fulfillment of their obligation towards monuments comes through the payment of taxes to the national and local authorities, and therefore considers the collected annuities to be a result of their own personal skills and therefore their own income.

After reviewing the relationship between the monument and the possible annuity collectors it can be concluded that the collected annuities can only have a few purposes, and they are for:

- investment in the preservation of the monument that enabled the annuity,
- investment in the preservation of architectural heritage,
- investment in the preservation of cultural heritage,
- covering other forms of consumption by the annuity collector.

The purpose of the collected annuities very frequently uncovers the level of economic consideration that should be given to the monument, and also heritage, as an economic factor.

THE ROLE OF MONUMENT ANNUITIES

The monument annuity, therefore, represents an economic form of collecting assets for the consumption of the monument, namely, its monument properties and as such represents the:

- Pecuniary equivalent for direct and/or indirect monument consumption;
- Regulator of monument consumption;
- Factor which stimulates the owner to manage the monument with a view to its preservation.

The monument annuity is a payment for using the monument as a fixed resource and its collection prevents the free-of-charge use of the monument in economic processes. Therefore, its payment, either for the direct or indirect consumption of the monument, acknowledges the participation of the monument in economic processes, namely, on the product and service market. As a rule, the annuity collected from the direct consumption of the monument is quite evident as it is collected during the direct contact of the consumer with the monument either in the form of a ticket for visiting the monument or as a component part of some of the services or products available to the visitors of the monument. As opposed to direct collection for the consumption of the monument, in the case of indirect consumption, the collection of monument annuity is often disguised in the market price of various products or services so that its acknowledgement most frequently requires both an analysis of the price structure as well as an analysis of the connectedness of the specific service or product with the protected built heritage. In order for the consumption of the monument, either direct or indirect, to be effectuated, at least minimum investments have to be made in its preservation and maintenance and the benefits that can be attained through the consumption of the monument recognized. The minimum level of monument consumption therefore implies the existence of a minimum level of preservation and consumption including the provision of necessary facilities for the rendering of appropriate services. The monument cannot become a source of extensive services without adequate prior investments that will make that possible. Otherwise the monument could remain untapped from the economic point of view, namely, used only by the owner for his own needs or else the consumption of the monument, if not followed by adequate investments in its preservation and maintenance, could cause its accelerated deterioration.

The consumption of the monument, both direct and indirect generates benefits to the consumer which can be distinguished as the value of its very use for the consumer himself and as an authentic (implicit) value manifested through the very existence of the monument which in the future could open up the possibility of its consumption on the part of every individual in society. For assessing the benefits individuals have from monument consumption, economists have developed methods whose application can facilitate the determination of the economic value of the monument, namely, evaluate the effects of the preservation policy that is presently being implemented. Although it has already been noted that the owner is obliged to invest in the preservation of the protected building regardless of whether he has an economic interest to do so or not, it is important to accept the fact that the very existence of the economic value of the monument will significantly motivate the owner to invest in the preservation of the monument. The economic assessment of the monument is carried out by the application of adequate methods wherein the economic value of the monument represents the difference between the overall proceeds generated or could be generated by the monument in a given period and the overall costs of managing and maintaining the monument in the same period. Monument annuity is an important component

of the overall proceeds generated by the monument given that it is the price for the effected direct and indirect consumption of the monument. In this way monument annuity has a direct impact on the economic value of the monument, since, as already mentioned, in the process of preserving the monument, the safeguarding of monument properties is an imperative, implying that monument preservation and maintenance costs are unavoidable while proceeds from monument consumption as a rule are dependent on monument management. The collection of monument annuity regulates the supply and demand relationship in respect to direct or indirect monument consumption. This function of monument annuity is important for the direct consumption of the monument where, for example, the excessive number of visitors to the monument or some other form of excessive consumption can devastate the monument itself or its monument properties. Excessive use not only threatens the preservation of monument properties, namely, monument value but also threatens the economic value of the monument that could be achieved in the future. The function of monument annuity as a regulator of the direct consumption of the monument is particularly important in tourism. The example of the monument ensemble of Venice best illustrates the effects of an excessive number of tourists who continuously visit this internationally famous tourist destination. It should be mentioned here that every monument, namely, monument ensemble has its own direct consumption capacity and the monument annuity is the only economic regulator of that consumption.

Monument annuity as an important factor of the economic value of the monument stimulates the owner to be a good manager. A good monument manager invests in the preservation of monument properties owing to which the building has been protected and safeguards and enhances the economic value of the monument. For achieving both of the set goals of good management, the proceeds generated by the monument are important and give particular meaning to monument annuity. Proceeds from monument consumption that are higher than preservation and maintenance costs make the preservation of the monument sustainable in the long term. This is confirmed by numerous examples in practice in which monument preservation projects have been transformed into business projects with revenues which many times over exceed the means invested in the preservation of the monument.

The monument annuity motivates the owner to preserve the usefulness of the monument either for him or for other users of the monument. In that way, while pursuing his own interests the owner contributes to the preservation of the monument as social value.

5. CONCLUDING REMARKS

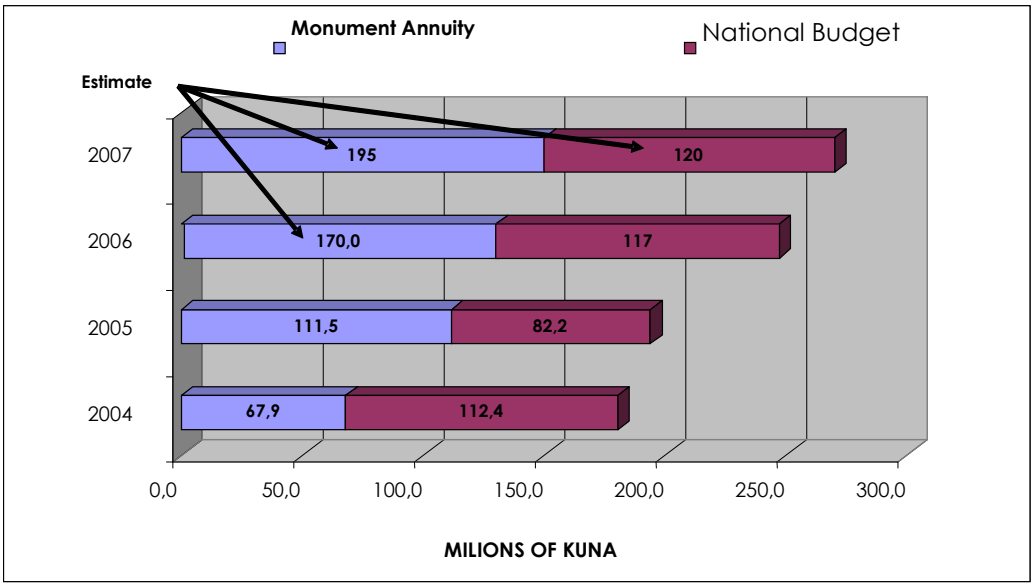
The annuity as income, generated without work on the basis of the ownership of the protected building, belongs to the owner of the monument. However, the building he happens to own has been proclaimed a monument without the will and influence of the owner, taking into consideration the expertly established monument properties of the building. The protection of the building, likewise without the owner having a say in the matter, obliges the owner to preserve the monument properties and, in the process, sets certain limits to his right of using the building. Accordingly, a building that has been proclaimed a monument also attains a dimension of social value which others too will begin to use. This use forms the direct and indirect consumption of the monument, which we described in detail above, as well as the reasons which necessitate payment for the consumption by the user in the form of an annuity. However, in practice the owner can collect only the annuity resulting from the direct use of the building - monument, while it would be completely impossible for him to collect from the indirect use of the building monument. Likewise it would be difficult for the owner of a building that is located within a monument ensemble to collect the annuity either from direct or indirect consumption effected within the monument ensemble. Therefore the

need for the state to intervene through its conservation service, which protected the building as a monument in the first place, by establishing a system for collecting monument annuity on behalf of the owner, offers itself as one of the possible solutions. The establishment of a monument annuity collection system sets the economic framework for forming a monument market. Built heritage monuments are component parts of the fixed fund of the state's national assets and are as such of special interest to society, not only due to their monument values but also owing to their social and economic values. The establishment of a monument annuity collection system, particularly when the collected annuity is returned for settling the costs of preserving protected built heritage, at the same time encompasses all the users of the monuments and enabling participation in the preservation of the monuments proportionate to their use. Such a system enables the owner of the monument, as well as society at large, to become aware of the economic value of each individual monument or monument ensemble and thereby secure their preservation for future generations. In this way not only will the monument substance be preserved but the protected built heritage placed in the function of the economic development of the region it is located in.

Croatian experiences are based on legally obligated expenditures collected from monument annuities for the preservation of cultural heritage that significantly increases resources for this purpose. In addition to the resources that the individual owners of each individual monument invest in the preservation of the protected cultural heritage, the following Figure shows the investment from the National Budget and that from the collected monument annuities realized during 2004 and 2005, as well as projections for 2006 and 2007.

Figure 1.

Investment in the protection of cultural heritage from the resources of monument annuities and the National Budget from 2004 – 2007.



Source: Ministy of Culture

Monument annuity, therefore, represents an irreplaceable economic instrument through which the economic value of the monument is asserted on the market. Through its functions the annuity enables the management of protected built heritage as well as the realization of the most important objective of protection, and that is not only the preservation of the

monument value of built heritage but also the "wise use" of built heritage in economic development.

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SPOMENIČKA RENTA KAO EKONOMSKI INSTRUMENT - OD TEORIJE DO HRVATSKE PRAKSE

SAŽETAK

Spomenička renta je naknada koja se plaća na korištenje fiksnih resursa poput zemlje, prirodnih resursa ili u slučaju kulturnih spomenika. Teorija renti u fokusu je istražianja brojnih ekonomista, osobito onih koji su se u svojim istraživanjima bavili istraživanjem zemljišnih renti poput W. Petty, A. Smith, D.Ricardo,T.R.Malthus, K.Marx, P.A.Samuelson i drugi. Spomenička renta predstavlja nezamjenjivi ekonomski instrument pomoću kojeg se ekonomska vrijednost spomenika utvrđuje na tržištu. Kroz svoju funkciju spomenička renta omogućava upravljanje zaštićenom spomeničkom baštinom kao I ostvarenje osnovnih ciljeva koje se zaštitom spomenika želi ostvariti. Time se ne ostvaruje samo zaštita naslijeđene spomeničke baštine već i racionalno korištenje spomeničkih vrijednosti u gospodarskom razvoju.

***Ključne riječi**: spomenička renta, ekonomska vrijednost baštine, kulturna baština*

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PRAVNI I EKONOMSKI ASPEKTI REGULACIJE POSLOVNIH BANAKA U PROCESU EKONOMSKE I MONETARNE INTEGRACIJE REPUBLIKE HRVATSKE

LEGAL AND ECONOMIC ASPECTS OF BUSINESS BANKS REGULATION IN THE PROCESS OF ECONOMIC AND MONETARY INTEGRATION OF THE REPUBLIC OF CROATIA

ABSTRACT

The system of regulation of business banks is determined by the aims and the role of monetary and credit policies in economy and the level of independence of monetary institutions. In order for the problems in the banking system to represent the least possible burden for the state budget in the sense of bank recovery costs, the banking sector has for decades been subject to a strict legal and economic regulation that contributes to the efficiency of the banking system by supporting the interests of capital owners and the society as a whole. In the Republic of Croatia, as well as in other states, the development of the monetary system is directly connected to the development of entrepreneurial freedom, new financial services and forms, and the development of non-banking financial intermediaries. The development also brings some risks that affect the economy. With their purpose and effect, the principles, methods and procedures of regulation, surveillance and control of the banks are directed towards both the national needs and the requirements the Republic of Croatia has to meet as a candidate state for the European Union.

The purpose of this paper is to show the existing system of surveillance and control of business banks on the part of the central monetary authority in the Republic of Croatia; generally analyze the system of surveillance in the European monetary union, with an institutional presentation of the functions and competences of the European central bank in that system; critically analyze the appropriateness and effectiveness of the existing Croatian system in the case of a renouncement of the monetary independence of the Republic of Croatia, and the joining of the unitary currency area and the European monetary union.[1]

Key words: *legal regulation, economic regulation, control, monetary independence*

1. Uvod

Gospodarski rast ovisi o stabilnom financijskom sustavu, unutar kojeg ključno mjesto zauzima monetarni sustav koji se po definiciji dijeli na središnju banku i sustav poslovnih banaka.[2]

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[1] Joining the European monetary union is not a choice but an obligation, after joining the economic and political union.

[2] Vidi: Božina, L.; Novčana ekonomija; Pula; Fakultet ekonomije i turizma "Dr. Mijo Mirković" Pula; 2003.; Perišin, I./Šokman, A./Lovrinović, I.; Monetarna politika; Pula; Fakultet ekonomije i turizma "Dr. Mijo Mirković" Pula; 2001.

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Sustav poslovnih banaka i njegovu ulogu u cjelokupnom financijskom sustavu možemo predočiti obrnutom piramidom koja pojašnjava povezanost evolucije novca i novčanih oblika tijekom procesa razvoja banaka i novca općenito. Na bankarskom se sustavu temelji složena i raznolika struktura financijskih oblika i instrumenata, institucija, varijabli i odnosa u nacionalnom financijskom i gospodarskom sustavu. Kako banke već prema načelima svog postojanja i djelovanja pridonose dobrobiti pojedinca – vlasnika, ali i općem društvenom dobru, politička je vlast u državi uvijek snažno zainteresirana za održanje učinkovitosti poslovanja banaka i stabilnosti javnog povjerenja u bankarski sustav. Kako bi nepravilnosti u poslovanju, te općenito problemi u bankarskom sustavu, predstavljali najmanje opterećenje za državni proračun u smislu troškova sanacije banaka, bankarski je sektor već desetljećima podvrgnut strogoj zakonskoj regulativi te nadzoru i kontroli nadležnih državnih institucija.[3] O učinkovitost te kontrole ovisi učinkovitost bankarskog sustava u pogledu vlasnika kapitala banke, ali i društva u cjelini.

U Republici Hrvatskoj postoji stalna težnja središnje monetarne vlasti da razvojem monetarnog sustava doprinosi razvoju poduzetničkih sloboda, novih financijskih usluga i oblika te razvoju nebankarskih financijskih posrednika. Promišlja se i o popratnim rizicima njihovog utjecaja na gospodarstvo, o pronalasku načela, metoda i postupaka regulacije i nadzora banaka koji će smislom i učinkovitošću odgovarati ne samo nacionalnim potrebama već i zahtjevima koje pred Republiku Hrvatsku postavlja njen status države kandidata za prijam u Europsku uniju.

Smisao i svrha ovoga rada jest prikazati postojeći sustav nadzora i kontrole poslovnih banaka od strane središnje monetarne vlasti u Republici Hrvatskoj (od strane Hrvatske narodne banke), okvirno razložiti sustav nadzora Europske monetarne unije, uz institucionalni prikaz funkcija i nadležnosti Europske središnje banke u tom sustavu, te kritički analizirati prikladnost i učinkovitost postojećeg hrvatskog monetarnog sustava u slučaju odricanja od monetarne suverenosti Republike Hrvatske, priključenja jedinstvenom valutnom području i Europskoj monetarnoj uniji.

2. Sustav nadzora i kontrole poslovnih banaka u Republici Hrvatskoj

Potpuna sloboda poslovanja banaka pod uvjetima i zahtjevima tržišta, nije moguća s obzirom na njihovu ulogu u gospodarstvu i njen utjecaj na gospodarsku stabilnost. Uloga središnje banke u tom pogledu, slična je u svim državnim porecima, a to je osiguranje takvog sustava nadzora i kontrole te podzakonskih propisa kojima će osigurati stabilnost i sigurnost poslovanja banaka.[4] Razborito reguliranje nadzora i kontrole bankarskog sustava ima dobar učinak na odluke o pribavljanju financijskih sredstava i alokaciju kreditnog potencijala.[5] Izuzmemo li prikaz evolucijskog tijeka nadzora banaka i pri tom empirijski utvrđene, poželjne ciljeve takvog postupka, kao teorijski općeprihvaćene ciljeve nadzora i kontrole banaka možemo izdvojiti:

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[3] Bankovna regulativa je u stvari uplitanje države u poslovanje banaka. Bankarsko poslovanje je izloženo brojnim rizicima koje tržište svojim mehanizmima nije u stanju samo ukloniti. Cilj regulative je smanjiti rizik depozitara i potaknuti konkurenciju u financijskom posredovanju. Bankarska regulativa (propisi npr. Zakon o bankama) čine pravno okruženje, kod kojeg je uloga nadzora osigurati skladnost poslovanja banaka s pravnom regulativom. Ekonomska regulativa nema za cilj normiranje poslovanja banaka već omogućavanje provođenja monetarne politike preko npr. obveznih rezerva i rezerva likvidnosti, propisa o deviznoj kontroli.

[4] Djelotvornost provođenja nadzora i kontrole ovisi o znanju i iskustvu osoblja. Nužna su interdisciplinarna znanja glede financijske i kreditne analize; bankovnih tehnika i operacija; pravne regulative i revizijsko-računovodstvenih tehnika. Naravno u pozadini toga su makroekonomska znanja.

[5] Kreditni potencijal računski utvrđujemo tako da od pasive oduzmemo rezerve koje poslovne banke moraju držati kod središnje banke.

• **osiguranje solventnosti banke**

Posljedica nesmetanog djelovanja zakona ponude i potražnje, temeljnih načela liberalnog tržišnog gospodarstva na poslovanje određenog broja sudionika na tržištu, jest insolventnost.[6] Njom nastaje niz poteškoća za vjerovnike, vlasnike i djelatnike banaka, uz povećanje mogućnost pojave tzv. "domino efekta", odnosno izloženosti ostalih banaka u sustavu insolventnosti. Samo zakonsko reguliranje poslovanja banke ne može u potpunosti otkloniti ovu mogućnost, ali prikladan sustav nadzora i kontrole povećava stupanj sigurnosti poslovanja sustava te povjerenje javnosti u njegovu stabilnost.

• **osiguranje likvidnosti**

Nadzorom i kontrolom poslovanja valja razvijati likvidnost banaka. Potrebno je istaknuti kako je pojam likvidnosti bitno različit od pojma solventnosti i označava sposobnost poslovne banke da ispuni svoje tekuće dospjele obveze. Kada bi pitanje likvidnosti bilo prepušteno procjeni samih banaka pojave nelikvidnosti bile bi učestalije, a klijenti banke bi čak i privremenu nelikvidnost poslovnog subjekta smatrali znakom insolventnosti što bi moglo ozbiljno narušiti stabilnost sustava.

• **izgradnja ekonomski djelotvornog i konkurentnog financijskog sustava i sustava nadzora**

Zakonski okvir poslovanja banaka trebao bi poticati konkurentnost i razvoj novih usluga po cijenama koje su alokativno učinkovite. U tržišnim prilikama, banke mogu zadržati postojeće i pridobiti nove klijente samo ako primjereno raspolažu svojim gospodarskim potencijalom.

Potrebno je istaknuti da pojmovi "kontrola" i "revizija" označuju ispitivanje pravilnosti i vjerodostojnosti pojava i procesa te su sastavnice pojma "nadzor" kao šireg i nadređenog pojma. U radu pojam nadzora i kontrole koristi kako bi se istakla razlika između nadzora poslovanja banaka, praćenjem izvješća koje poslovna banka dostavlja središnjoj banci, te kontrole poslovanja analizom izvornih podataka u samoj banci.

Nadzor i kontrola poslovanja poslovnih banaka jest sustav koji primjenjuje pojedina država radi održanja stabilnosti u bankarskom sustavu i osiguranja zaštite depozitara, a temelje se na zakonskom okviru i razboritosti utvrđenih regulatornih mjera te politike nadzornih tijela.

U proteklom desetljeću Republika Hrvatska i njena središnja monetarna vlast, Hrvatska narodna banka, učinile su značajne napretke u izgradnji suvremenog vlastitog modela nadzorno-kontrolne funkcije i u njegovom jačanju. Svakako da kontinuitet u primjeni načela nadzora i kontrole poslovanja nije bilo jednostavno ostvariti, primarno radi negativnog naslijeđa iz prijašnjeg državnog i političkog uređenja ovog dijela financijskog sustava. Osnovni cilj nadzora i kontrole jest spriječiti nastanak poteškoća u poslovanju banaka. Međutim, koliko god provedba ove funkcije bila učinkovita, ona nikako ne može zamijeniti potrebu za tržišnom disciplinom ili javnošću poslovanja, što banke u praksi često nisu shvaćale. Iz ovlasti provođenja nadzora i kontrole ne proizlazi odgovornost za probleme koji nastaju kao posljedica loših poslovnih odluka jer niti jedna nadzorno-kontrolna institucija, niti u zemljama gdje su poslovne banke podvrgnute nadzoru desetljećima, ne može jamčiti kako se neka banka neće suočiti s poteškoćama. Nadzor i kontrola stabilnosti, sigurnosti i zakonitosti poslovanja banaka provodi se radi zaštite širih društvenih interesa i interesa vlasnika banke. U okviru banke, s primarnim zadatkom zaštite interesa vlasnika, za ova pitanja ovlaštene su i

[6] Insolventnost približno definiramo kao stanje kada je tržišna vrijednost aktive poslovnog subjekta, ispod ukupne vrijednosti njihove pasive. Ukratko, poslovni subjekt nije u stanju trajno ispunjavati sve svoje obveze.

odgovorne osobe koje obavljaju unutarnju kontrolu i unutarnju reviziju te nadzorni odbor banke. Potvrda objektivnosti financijskih izvješća banke dana je putem mišljenja neovisnog vanjskog (eksternog) revizora.

Temeljem pozitivnih propisa u Republici Hrvatskoj nadzor i kontrolu provođenja poslovne politike, poštivanja procedura i postupaka upravljanja rizicima obavljaju:

a) Uprava banke – unutarnja kontrola

Uprava samostalno vodi poslove i zastupa banku, odgovorna je za poštivanje svih postojećih propisa i za uspostavu valjane procedure interne kontrole banke[7]. Služba unutarnje kontrole izravno je podređena upravi banke i odgovorna za nadzor pravilnosti provedenih postupaka i poslovanje banke.

b) Nadzorni odbor – unutarnja revizija

Nadzorni odbor nadzire rad uprave banke u vođenju poslova i obveza dioničkog društva, a o obavljenom nadzoru podnosi pisano izvješće skupštini društva, odnosno zastupnicima vlasnika dioničkog društva. U najvećem broju slučajeva sam nadzorni odbor ne može kvalitetno u cjelovitoj mjeri udovoljiti ovim svoji obvezama, pa je radi toga nadzorni odbor sukladno Zakonu o bankama obvezan imenovati unutarnjeg revizora koji prati i provjerava zakonitost poslovanja, primjenu računovodstvenih standarda, vrši procjenu klasifikacije kredita, sustava upravljanja rizicima, a sve radi sprečavanja propusta uprave u provođenju poslovne politike koji bi mogli umanjiti djelotvornost ili dovesti u pitanje poslovanje banke[8].

c) Eksterna revizija

Zakonom o reviziji eksterna revizija definirana je kao postupak ispitivanja i ocjene financijskih izvješća te podataka i metoda koji se primjenjuju pri sastavljanju financijskih izvješća na temelju kojih se daje stručno mišljenje o realnosti i objektivnosti stanja imovine, kapitala, obveza i rezultata poslovanja[9]. Uloga revizije u nadzorno-kontrolnom sustavu jest odrediti problematična sredstva, identificirati stvarne i potencijalne gubitke, identificirati i klasificirati koncentraciju kredita, pokazati primjenjuju li se, i u kojoj mjeri, općeprihvaćeni računovodstveni standardi, jesu li procedure unutarnjih kontrola i unutarnje revizije učinkovite. Kako bi se podržalo povjerenje javnosti, godišnje izvješće banke zajedno sa mišljenjem neovisnog revizora, mora biti dostupno. O svim činjenicama koje ugrožavaju stabilnost poslovanja, a time i sam opstanak banke, ili su dokaz o povredi zakona i neprimjerenog vođenja poslova, revizor je obvezan izvijestiti Hrvatsku narodnu banku.

d) Nadzor i kontrola Hrvatske narodne banke

Regulacijom i nadzorom bankarskog sustava država može intervenirati ne samo u bankovne djelatnosti već i šire tržišne procese. Hrvatska narodna banka organizacijom i provođenjem *off-site* nadzora i *on-site* kontrole može, u određenoj mjeri, pridonijeti većoj stabilnosti i sigurnosti bankarskog sustava. Nadzor i kontrola koju provodi Hrvatska narodna banka temelji se na Zakonu o bankama i propisima donesenim na osnovu tog Zakona[10]. Za ostale oblike poslovanja zadužene su druge državne nadzorne službe (Porezna uprava − dio; Kriminalistička policija − kriminalna kaznena djela; Devizni inspektorat − devizno-carinski propisi, itd.). Međutim, cjelovit nadzor podrazumijeva suradnju i razmjenu informacija između više institucija koje kao dio svog djelokruga poslovanja posluju s bankama, slijedom čega su i

[7] Čl. 23., st. 1. Zakona o bankama, u vezi s čl. 27. istog Zakona; Zakon o bankama , Narodne Novine br.84/02.
[8] Čl. 107. Zakona o bankama, u vezi s čl. 109. i 110. istog Zakona; Zakon o bankama , Narodne Novine br.84/02.
[9] Čl. 2. Zakona o reviziji; Zakon o reviziji, Narodne novine br. 146/05.
[10] Čl. 115. Zakona o bankama; Zakon o bankama , Narodne Novine br.84/02.

pojedine institucije ovlaštene provoditi nadzor nad poslovanjem banaka (primjerice, Porezna uprava i Devizni inspektorat Ministarstva financija Republike Hrvatske)[11].

3. Metode i postupci kontrole poslovnih banaka od strane Hrvatske narodne banke

Nadzorno-kontrolna funkcija koju provodi Hrvatska narodna banka kao središnja novčana vlast u Republici, odvija se prema sustavu usvojenim uz stručno-tehničku pomoć Međunarodnog monetarnog fonda. Metodološki se ova funkcija provodi putem:

a) postupka off-site nadzora
Nadzor se provodi analizom pojedinačnih ili, prema raznim kriterijima, agregiranih podataka i pokazatelja iz izvješća koje su poslovne banke obvezne u zakonom propisanim rokovima dostavljati Hrvatskoj narodnoj banci, te praćenjem omjera i trendova matematički izračunatih na temelju prikupljenih podataka o poslovanju pojedine banke.

b) postupak on-site kontrole
Postupak kontrole kojim se izravno u banci analizira izvorna dokumentacija, knjigovodstvena i druga evidencija poslovanja, te izvršava provjera zakonitosti, objektivnosti i vjerodostojnosti iskazanih podataka o poslovanju banke.
Hrvatska narodna banka provedbom nadzora i kontrole, odnosno praćenjem i provjeravanjem poštuju li banke zakonske norme i prudencijalne zahtjeve koji smanjuju mogućnost pojave neuspješnosti, nezakonitosti i nestabilnosti u njihovom poslovanju, obavlja svoj dio zadatka u izgradnji stabilnog bankarskog sustava. U praksi pojedinih država poznati su slučajevi primjene samo jedne metode, ali i komplementarne primjene obiju metoda. U nekim državama (Savezna Republika Njemačka ili Republika Austrija, primjerice) nadzorne vlasti opredijelile su se samo za metodu off-site nadzora praćenja poslovanja banaka oslanjajući se pri tom, u on-site dijelu, na stručnost neovisnih revizorskih tvrtki. S obzirom na razinu razvijenosti revizijske profesije u našoj zemlji opredjeljenje je, od samog početka, da nadzor i kontrolu treba obavljati primjenom obiju metoda. Ove dvije funkcije metodološki su razgraničene i danas organizacijski smještene u zasebne direkcije u okviru Sektora za nadzor i kontrolu Hrvatske narodne banke.
Vrste izvješća, rokove dostave i obujam podataka i pokazatelja (*input baze podataka*), način obrade i izračuna pojedinačnih i prosječnih pokazatelja, trendova (*output baze podataka*), i što sve čini podlogu za analizu financijskog izvješća, propisom utvrđuje Savjet Hrvatske narodne banke. Kontinuirano praćenje poslovanja i financijskog stanja u bankarskom sustavu metodom off-site nadzora provodi se provjerom računske i logične ispravnosti primljenih podataka, analizom propisanih pokazatelja i njihovih trendova; te ukazivanjem on-site kontroli u što ranijoj fazi na pojedinu banku ili njeno područje poslovanja gdje su uočeni negativni trendovi, nepravilnosti ili nezakonitosti, pa je stoga potrebno provesti kontrolu u samoj banci i otkloniti poremećaj u poslovanju korektivnim mjerama. Što se učestalosti ovakvog nadzora tiče, prema iskustvima stabilnih sustava, provođenje on-site kontrole cjelokupnog poslovanja banke potrebno je jedanput godišnje barem za banke koje imaju određeno značenje u sustavu. Cjelokupni postupak on-site kontrole sastoji se od:

- pripreme za kontrolu;
- obavljanja postupaka i procedura kontrole sukladno metodologiji;
- poduzimanja mjera za poboljšanje utvrđenog stanja i
- pokretanja postupka za primjenu sankcija.

[11] Sukladno čl. 115., st. 5. Zakona o bankama; Zakon o bankama , Narodne Novine br.84/02.

Bankarske krize ipak ostaju česta pojava, unatoč učinkovitosti nadzorno-kontrolne funkcije koju provode nadležne institucije. Hrvatska narodna banka poduzima brojne mjere i aktivnosti, kako na području unapređenja regulacije tako i na području unapređenja sustava nadzora i kontrole, a sve radi poboljšanja stabilnosti poslovanja banaka.
Međutim, u tržišnoj ekonomiji temeljenoj na konkurenciji mora postojati i mogućnost "prirodne selekcije" koja jamči opstanak poslovno ″najsnažnijih″ banaka. Netočno je stoga shvaćanje kako svaki pojedinačni neuspjeh banke, izravno ukazuje na neučinkovitost nadzora i kontrole cjelokupnog bankarskog sustava.

4. Europska središnja banka i monetarna integracija

Postanak i djelovanje Europske monetarne unije u međunarodnom financijskom okružju, od 1. siječnja 1999. godine, predstavlja jedinstveni pothvat u povijesti regionalnih ekonomskih integracija, utoliko što prethodno nije zabilježen sličan primjer monetarnog ujedinjavanja dobrovoljnim odricanjem od značajnog dijela nacionalne suverenosti država temeljem međunarodnog ugovora. Kako Europska unija predstavlja političko-pravnu tvorevinu *sui generis* čija institucionalna politička struktura predstavlja u mnogo čemu međunarodnopravne presedane, tako i monetarna unija Europskih zajednica pokazuje niz osobitosti koje se ogledaju u ulozi i funkciji Europske središnje banke kao ključne institucije unutar monetarne unije koja je od početaka svog djelovanja izložena argumentiranoj kritici dijela stručne javnosti.
U europskom poslijeratnom razdoblju formirala su se dva osnovna modela središnjeg bankarstva, u literaturi poznati kao anglo-francuski i njemački model[12]. Analizom strukture i ciljeva djelovanja Europske središnje banke očito je kako je tijekom Maastrichtskih pregovora prevagnuo njemački model središnjeg bankarstva. Ovaj model strukturiranja središnje banke ističe važnost klasičnih ciljeva monetarne politike, prije svega *stabilnosti cijena* kao osnovnog cilja koji nije podređen ostalim ciljevima čije se ostvarivanje uvjetuje punim ostvarenjem primarnog cilja monetarne politike.[13] Anti-inflatorno djelovanje središnje novčane vlasti Europske unije kao izričit cilj zabilježen je u Statutu Europske središnje banke (čl. 105. TEU) dok se ostali općeprihvaćeni ciljevi ekonomske politike, poput ostvarivanja pune zaposlenosti, uopće ne spominju u Statutu Središnje banke. Kritike upućene na teret smjernica monetarne politike ove europske središnje novčane vlasti većinom argumentiraju stav kako izuzetna politička neovisnost ove središnje banke (sukladno čl. 107. TEU), iako jamči posvećenost ostvarenju njenih zadaća, svakako čini upitnim njenu odgovornost u političkom i pravnom smislu. Prema istraživanju koje su 1999. godine proveli Bini-Smaghi i Gros, na primjerima triju središnjih banaka – američke Federal Reserve System (FED), Europske središnje banke i njemačke Bundesbank, upravo je središnja banka Europske monetarne unije određena kao najneovisnija, uz čvrstu nadređenu pozicioniranost unutar strukture Europskog sustava središnjih banaka (European System of Central Banks). Snažna pozicija ove središnje banke teorijski je zanimljiva i stoga što ona kao međunarodnopravni subjekt nije nositelj prenesenog dijela nacionalne monetarne suverenosti država članica monetarne unije, već bi to pravno gledano bio Europski sustav središnjih banaka odnosno Europske zajednice s kojima su

[12] Ova dva modela središnjeg bankarstva razlikuju se bitno u pitanju vođenja i upravljanja središnjom bankom i po pitanju političke neovisnosti središnje novčane vlasti. Anglo-francuski model podrazumijeva veći stupanj podložnosti domaćim političkim smjernicama izvršne vlasti, dok njemački model karakterizira izrazita politička neovisnost središnje banke i posvećenost ″klasičnim″ ciljevima monetarne politike koji se ostvaruju neovisno o političkim smjernicama izvršne vlasti.
[13] Izravno se zamjećuje sličnost Hrvatske narodne banke i njenog cilja stabilnosti cijena s modelom strukturiranja Europske središnje banke i njenim ciljevima monetarne politike izraženim u njenom Statutu koji je sastavni dio Ugovora o Europskoj uniji iz 1992. godine (Treaty on European Union) i Protokola na taj Ugovor; izvor www.europa.com.

članice sklopile ugovore o pristupanju monetarnoj uniji, dok ju Europska središnja banka samo operativno izvršava u svom djelovanju.
Daljnje kritike terete sam Statut Europske središnje banke koji se smatra krutim u smislu da se njegova revizija i izmjena mogu ishoditi samo revizijom temeljnog Ugovora o Europskoj uniji i to jednoglasnom odlukom svih članica. Navedena činjenica onemogućava fleksibilno i promptno reagiranje središnje banke na zahtjeve koju pred nju postavlja eventualna novonastala ekonomska situacija unutar jedinstvenog valutnog područja.
Tijekom svog djelovanja u cilju ostvarenja stabilnosti cijena i drugih ciljeva ekonomske politike Europska središnja banka se može susresti sa teškoćama i griješiti u procjenama te poduzetim koracima. U Europskoj uniji moraju postojati učinkoviti i brzi mehanizmi nadzora djelovanja središnje banke i sankcioniranja nepravilnosti i mogućih nezakonitosti u njenom djelovanju. Međutim, upravo u odgovornosti Europske središnje banke nalazi se dvojbena problematika čiju je suštinu potrebno sažeto izložiti.
Obzirom na prethodno navedenu činjenicu kako Europska središnja banka uživa veću političku neovisnost nego bilo koja suvremena, nacionalna središnja banka, potrebno je upozoriti kako se ona ipak razlikuje od nacionalnih središnjih banaka već prema tome što njen legitimitet ne proizlazi iz demokratske volje naroda koja je na nju prenesena putem predstavnika zakonodavne vlasti, primjerice parlamenta, kojem bi u konačnici i odgovarala u svome djelovanju. Guverner središnje banke podnosi redovita izvješća Europskom parlamentu koji ipak ne može primijeniti sankcije prema središnjoj banci te je stoga očito kako ova institucija Europskih zajednica nema praktičke i stvarne ovlasti nad središnjom bankom. Takva izuzetna hijerarhijska neovisnost Europske središnje banke suprotna je i sa stajalištima poznatim u teoriji gdje veći stupanj političke neovisnosti podrazumijeva i odgovarajući stupanj odgovornosti. Zajedničko provođenje suvereniteta koje su na Europsku središnju banku prenijele nacionalne središnje banke ne može se izjednačiti s odnosom koji nacionalne središnje banke imaju prema demokraciji izraženoj u njihovoj neovisnosti. Srž problematike nalazi se na apstraktnijoj razini, u tome što na europskoj razini ne postoji zajednička hijerarhija vrijednosti koja bi Europsku središnju banku podvrgnula suverenitetu naroda.

5. Nadzor banaka i financijska stabilnost Europske unije

Strategija uspostavljanja ekonomske i monetarne unije definirana Maastrichtskim ugovorom, uspješno je i relativno bez poteškoća ujedinila države članice euro-zone u ekonomsku tvorevinu zadovoljavajućeg ekonomskog učinka. "Euro–zonu" obilježava više osobitosti od kojih se određene ogledaju i u specifičnost strukturiranja sustava nadzora poslovnih banaka na području Unije, te metoda održavanja financijske stabilnosti.
Odricanjem od monetarne suverenosti države članice monetarne integracije inicijativu, utvrđivanje i provođenje monetarne politike prepuštaju supranacionalnoj instituciji središnje novčane vlasti unutar Europske unije. Nacionalne središnje banke napuštaju najznačajniji dio svojih tradicionalnih funkcija i djelatnosti, ali iako više nisu nositelji monetarne politike, funkcija koja ostaje u ovlasti nacionalne središnje banke unutar monetarne unije jest postupak nadzora poslovanja banaka na njenom području (*supervision*). Opća načela regulacije banaka i njihova nadzora utvrđena su II. Bankovnom smjernicom iz 1989. godine kao sljedeća:

1. Odgovarajuće nacionalne institucije nadležne su i odgovorne za nadzor poslovnih banaka sa sjedištem na području predmetne države – **načelo kontrole države sjedišta**. Praktički, u slučaju primjerice Deutsche Bank i nadzora njenog poslovanja odgovorne su njemačke nadležne institucije, ukoliko se njeno sjedište nalazi na njemačkom državnom području.[14]

[14] Primjer preuzet iz De Grauwe, P.; Economics of Monetary Union; Oxford University press, Oxford 2003.,

Ali, njemačke su vlasti ujedno nadležne za nadzor ove banke u drugim državama Europske unije.

2. Države članice odgovorne su za održavanje financijske stabilnosti unutar nacionalnog gospodarstva sukladno **načelu odgovornosti države domaćina**. U smislu prethodnog primjera, to praktički znači kako će njemačka središnja novčana vlast, odnosno odgovarajuće institucije, biti odgovorne za održavanje stabilnosti i povjerenja javnosti u domaći financijski, točnije bankarski sustav. Nadležne njemačke institucije odgovorne su za zakonitost poslovanja domaćih, ali i stranih banaka koje čine sastavni dio njemačkog financijskog sustava.
3. Članice Europske monetarne unije dužne su priznati pravnu i poslovnu sposobnost financijskih institucija sa sjedištem u drugim državama članicama. Financijske institucije moraju ishoditi od nadležnih institucija potrebnu radnu dokumentaciju kako bi nesmetano mogle poslovati unutar monetarne unije putem svojih podružnica i/ili predstavništava sukladno **načelu uzajamnosti (reciprociteta)**.

Izložena načela omogućuju strukturiranje takvog sustava nadzora poslovnih banaka koji je primjeren uvjetima veće segmentacije nacionalnih bankarskih sustava država članica monetarne unije. Redovitu dostupnost, transparentnost i pravovremenost podataka i informacija o poslovanju banaka, nadležnim kontrolnim institucijama jamči veću učinkovitost u provedbi nadzora, pa slijedom toga i veću financijsku stabilnost. Transparentnost i pravovremenost pristupa informaciji pozitivno je korelirana sa činjenicom što je u većini članica monetarne unije veći dio bankarskog sektora sastavljen od domaćih banaka čije se sjedište nalazi unutar državnog područja članice koja putem središnje banke provodi nadzor poslovne banke. Više od 90% svih bankarskih kredita odobrenih od strane poslovnih banaka unutar euro-zone u 2002. godini bili su odobreni rezidentima, čime se potvrđuje orijentiranost banaka domaćem poslovnom okruženju. Kao razlog veće segmentiranosti bankarskog sektora unutar članica nalazi se u još uvijek relativno kratkom vremenskom trajanju ekonomske i monetarne integracije Europskih zajednica. Najveća prepreka integraciji financijskih tržišta članica − u vidu postojanja zasebnih nacionalnih valuta, uspješno je otklonjena te je stoga euro svakako pridonio homogenizaciji bankarskih sektora, dok se druga poteškoća – nepostojanje harmoniziranih pravnih propisa na području prava financijskih transakcija (posebice bankarsko pravo koje u mnogim državama članicama monetarne unije ili državama kandidatima i tranzicijskim državama nije još sustavno razvijeno) također je ključna problematika čije ubrzano rješavanje svakako pridonosi homogenizaciji financijskih tržišta unutar monetarne unije

Sukladno financijskim predviđanjima, financijski sektor Europske monetarne unije i dalje će se ubrzano integrirati te se procjenjuje kako će više od polovice bankarskog sektora u većini članica euro-zone predstavljati inozemne banke sa sjedištem u nekoj od država članica izvan čijeg državnog područja djeluju. Primjerice, ukoliko bi talijanska središnja novčana institucija – Banca d'Italia provodila nadzor nad podružnicom inozemne poslovne banke našla bi se pred poteškoćom kako na učinkovit način prikupiti podatke i izvješća o pokazateljima poslovanja predmetne banke kako bi se pravovremeno mogla reagirati ili upozoriti na eventualne poteškoće unutar bankarskog sustava. Moglo bi se pretpostaviti kako bi potrebne informacije talijanskoj središnjoj banci dostavljale slične financijske institucije nadležne za provedbu nadzora poslovnih banaka u državi članici u kojoj se nalazi sjedište predmetne banke. Izloženo rješenje moguće dvojbe čini se logičnim, no u praksi postavlja se eventualno pitanje koliko će navedene institucije biti transparentne i voljne prilikom objavljivanja traženih podataka drugim središnjim bankama te koliko će njihova analiza biti objektivna i neovisna, i prije svega pravovremena. Praksa dokazuje kako su često nadležne institucije nerazborito

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prikazivale podatke kojima su raspolagale, selektivno ih objavljivale, ili nerijetko ih uskraćivale kako negativna ocjena stabilnosti sustava i boniteta pojedinih banaka ne bi izazvala moguće nepovjerenje javnosti.
Problem nadzora poslovnih banaka koje posluju na području jedne države članice, koji unutar ove *sui generis* ekonomske i monetarne integracije, ostaje u ovlasti nacionalnih središnjih banaka, postaje očit u slučaju bankovne krize. Primjer tipične krize bankarskog sustava izazvane likvidacijom banke s lošom kreditnom pozicijom i boniteta koja umanjuje povjerenje javnosti u solventnost ostalih banaka unutar sustava, ukazuje kako je osnovna zadaća nacionalne središnje banke očuvanje solventnih poslovnih banaka od mogućeg nepovoljnog utjecaja privremene nelikvidnosti u gospodarstvu (razlikovanje kratkoročno nelikvidnih ali solventnih poslovnih banaka od onih insolventnih), što je zapravo i najveći izazov u preventivnom djelovanju središnje banke. Ukoliko nacionalne središnje banke država članica monetarne unije ne raspolažu potrebnim i objektivnim financijskim podacima, središnja banka mogla bi pružiti mogućnost "posljednjeg utočišta" kreditiranjem inozemne poslovne banke koja je zapravo insolventna. Naravno, središnja banka neće izravno snositi troškove o obzirom da je osigurana propisanim rezervama koje je inozemna banka obvezna držati kod nje, ili pak drugim financijskim instrumentima, no ipak nije primjereno da u nekim slučajevima tradicionalna funkcija "institucije posljednjeg utočišta" postane nepromišljena ili dvojbena.

6. Zaključak

Postojeći sustav nadzora banaka u Europskoj uniji tek kratkoročno udovoljava zahtjevima učinkovitosti i pravovremenosti. Nepostojanje centralizirane regulacije i nadzora banaka na području Unije predstavlja stalnu prepreku potpunoj integraciji bankarskog sektora država članica i njegovoj stabilnosti kao i šire stabilnosti financijskog sustava euro-zone. Skroman napredak, s obzirom na važnost ove zadaće, predstavljaju načela II. bankovne direktive. Ipak, nove dvojbenosti i poteškoće javljaju se usporedo s intenziviranjem integracijskih procesa unutar ovog sektora financijskih tržišta. Prije svega, to se odnosi na izgledne poteškoće pri udruživanju banaka (*bank mergers*), posebice prilikom preuzimanja pojedinih poslovnih banaka od strane većih i snažnijih inozemnih banaka. Može se zaključiti da veliki broj nacionalnih središnjih banaka, o čijem odobrenju ovisi pravovaljanost ovih udruživanja, neće podržati integriranje financijskih tržišta pomoću navedenih postupaka s obzirom da bi se time njihove nadzorne ovlasti i mogućnost kontrole nad stabilnošću domaćeg financijskog sustava značajno umanjila.[15]
Potrebno je ukratko izložiti način prilagodbe hrvatskog sustava nadzora i kontrole zahtjevima standarda Europske monetarne unije. Nedvojbeno je da se takvo izlaganje temelji na pretpostavci da Republika Hrvatska uopće pristane na odricanje od svoje monetarne suverenosti kada formalnopravno postane članicom Unije. U takvim uvjetima Hrvatska narodna banka neće izgubiti svoju nadzorno-kontrolnu funkciju nad bankarskim sektorom, već će i dalje biti nadležna institucija koja će pravovremeno izvršavati ovu zadaću te dostavljati prikupljene podatke i izvješća ostalim državama članicama prema potrebi. Potrebno je pri tome u potpunosti ujednačiti pokazatelje, metode i standarde izvješćivanja, no kako HNB već postiže rezultate na tom dijelu usklađivanja, izgledno je da će takve prilagodbe biti uspješne. Ono što može predstavljati poteškoće jest potreba spajanja razdvojenih postupaka off-site nadzora i on-site kontrole u jedan jednostavniji jedinstveni postupak. Izazov u tome predstavlja još uvijek nedovoljna objektivnost Hrvatske narodne banke u procjeni boniteta i stabilnosti poslovne banke. Većina članica monetarne unije ozbiljno shvaća problematiku nadzora bankarskog sektora, te neprofesionalnost i nerealnost u procjeni najstrože sankcionira.

[15] U skladu sa načelom kontrole države sjedišta.

Problem pronalazimo i u samoj strukturi našeg bankarskog sektora. Činjenica je da naš bankovni sustav nije koncentriran u mjeri nekih tranzicijskih zemalja (primjerice Mađarske), ali njegovu slabost svakako predstavlja većinsko strano vlasništvo banaka. Imajući na umu načela II. bankovne direktive znači da će osim monetarne suverenosti, temeljem načela kontrole države sjedišta, hrvatska središnja banka izgubiti i većinu svojih nadzornih ovlasti upravo na način koji ostale članice pokušavaju izbjeći; pribrojimo li tome i moguću zainteresiranost financijskih investitora za daljnja pripajanja na hrvatskom bankovnom tržištu, mogli bismo se naći bez ikakve značajne kontrole i nadzora nad većinom operativnog bankarskog sektora na državnom teritoriju. U nadležnosti Hrvatske narodne banke, u današnjim uvjetima, ostao bi određen broj manjih banaka nevelikog financijskog potencijala. Zaključak je da bi stabilnost bankarskog, ali i cjelokupnog financijskog sustava uvelike ovisila o dobronamjernosti nadležnih nadzornih institucija u drugim državama, što Republiku Hrvatsku stavlja u nezavidan položaj.

Izuzmemo li ovaj problem, prilagodba hrvatskog sustava nadzora banaka standardima Europske monetarne unije ne izgleda pretjerano problematičnom. Neizvjesnost unosi jedino potreba za izmjenama nadzornog sustava unutar same Unije. Iz svega što je bilo izloženo, zaključujemo da će u budućnosti nadležna tijela Europske unije sigurno pokušati naći nove načine funkcioniranja Europske središnje banke u pogledu provedbe funkcije nadzora. Kako proces integracije bankarskih sektora bude jačao, te homogenizacijom bankarskih sustava, iskazat će se potreba i za jednim centraliziranim, supranacionalnim tijelom (institucijom) koje će biti jedinstveni nositelj funkcije nadzora. Ostaje za razmotriti hoće li ta institucija djelovati uz suradnju nacionalnih središnjih banaka prilikom provedbe funkcije nadzora i hoće li ona djelovati u sklopu Europske središnje banke ili kao izdvojena institucija. Potrebno će biti istovremeno jasnije pravno definirati odgovornost Europske središnje banke, te ustanoviti svojevrsne "kočnice" njenog djelovanja i ovlasti.

Euro-zona jest jedinstvena pojava u okvirima svjetske ekonomije, koja složenost svoje strukture temelji na jedinstvu ne samo monetarnih, već i političkih i socijalnih instituta i specifičnosti. Jasno je da se susreće s pojedinim poteškoćama i pravnom "nedorečenošću" u pojedinim područjima svog djelovanja, no time se ne umanjuje valjanost zadaća koje pokušava ostvariti. Pitanje obujma ovlasti Republike Hrvatske koje će ona zadržati ukoliko ostvari članstvo u europskoj zajednici, ovisit će ne samo o pregovaračkim rezultatima na području ekonomske politike, već ponajprije o rezultatima i stručnosti koju hrvatska središnja banka pokazuje u svojoj nadzorno-kontrolnoj funkciji čime će jedino moći izboriti ozbiljnu poziciju unutar europskih monetarnih prilika i time dopustiti postavljanje uvjeta i zahtjeva unutar monetarne unije. No postizanje takve razine samosvijesti u monetarnom djelovanju, i inače, trebalo bi biti ciljem svake suvremene središnje banke.

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PRAVNI I EKONOMSKI ASPEKTI REGULACIJE POSLOVNIH BANAKA U PROCESU EKONOMSKE I MONETARNE INTEGRACIJE REPUBLIKE HRVATSKE

SAŽETAK

Sustav regulacije poslovnih banaka određen je ciljevima i ulogom monetarne i kreditne politike u gospodarstvu te razinom suverenosti monetarnih institucija. Kako bi problemi u bankarskom sustavu predstavljali najmanje moguće opterećenje za državni proračun, u smislu troškova sanacije banaka, bankarski je sektor već desetljećima podvrgnut strogoj pravnoj i ekonomskoj regulaciji što doprinosi učinkovitosti bankarskog sustava, podržavajući interese vlasnika kapitala i društva u cjelini. U Republici Hrvatskoj, kao i u drugim državama, razvoj monetarnog sustava izravno je vezan uz razvoj poduzetničkih sloboda, novih financijskih usluga i oblika te razvoj nebankarskih financijskih posrednika. Razvoj donosi i rizike, njihove implikacije na gospodarstvo. Načela, metode i postupci regulacije, nadzora i kontrole banaka, svrhom i učinkovitošću okrenuti su ujedno nacionalnim potrebama i zahtjevima koje pred Republiku Hrvatsku postavlja status države kandidata za prijam u Europsku uniju.

Smisao i svrha ovoga rada jest prikazati postojeći sustav nadzora i kontrole poslovnih banaka od strane središnje monetarne vlasti u Republici Hrvatskoj, okvirno razložiti sustav nadzora unutar Europske monetarne unije, uz institucionalni prikaz funkcija i nadležnosti Europske središnje banke u tom sustavu te kritički analizirati prikladnost i učinkovitost postojećeg hrvatskog sustava u slučaju odricanja od monetarne suverenosti Republike Hrvatske, priključenja jedinstvenom valutnom području i Europskoj monetarnoj uniji.[16]

Ključne riječi: *pravna regulacija, ekonomska regulacija, kontrola, monetarna suverenost*

[16] Priključenje europskoj monetarnoj uniji nije izbor već obveza, nakon uključivanja u ekonomsko- političku uniju.

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Preliminary paper

ZNAČAJKE PODUZEĆA PRIMORSKO GORANSKE ŽUPANIJE U KONTEKSTU KONCEPTA PODUZEĆA KOJE UČI

THE CHARACTERISTICS OF COMPANIES IN THE PRIMORSKO GORANSKA COUNTY IN THE LEARNING COMPANY CONTEXT

ABSTRACT

The aim of this paper is to evaluate the characteristics of the learning company concept in general and on the sample of companies in the Primorsko Goranska County with the purpose of providing the background for the transformation of traditional companies towards the learning company. In order to verify the hypothesis the following methods were used: methods of analysis and synthesis, descriptive method, comparative method, mosaic method, method of verification and disproof and statistical methods. On the basis of research results it can be concluded that the need for permanent learning requires the environment that supports learning, and that is the learning company concept. The results of the research lead to the conclusion that further efforts are required in order to investigate, popularize and effectively implement this concept.

***Keywords**: learning, learning company, companies in the Primorsko goranska County*

1. Uvod

Pojava gospodarstva znanja nastalog pod utjecajem dubokih društvenih i gospodarskih promjena podrazumijeva radikalne promjene u koncepciji poslovanja. Za razliku od klasične ekonomije, utemeljene na kapitalnim ulaganjima i radnoj snazi, nova se ekonomija zasniva na stvaranju i eksploataciji znanja transformiranog u inovacije i nove tehnologije. Znanje se pojavljuje kao glavna ekonomska kategorija, bilo kao tržišna roba ili opredmećeno u inovacijama, proizvodima i uslugama. U skladu s tim, za ostvarivanje razvojnih ciljeva i držanje koraka sa svjetskim tehničko-tehnološkim trendovima potreban je sve veći broj visokoobrazovanih stručnjaka i znanja.

U kontekstu stalnih promjena i potrebe njihovim upravljanjem ne postoje više stabilne konkurentske prednosti. Jedini način njihova održanja predstavlja svakodnevno učenje o kupcima, tržištu, tehnologijama i interesima svih zainteresiranih strana. Temeljni uvjet održanja konkurentske pozicije postaje učenje, ali i sposobnost učenja bržeg od konkurencije. To znači postati poduzećem koje uči.

U hrvatskim se poduzećima nedovoljna pozornost posvećuje promjenama u kontekstu stvaranja nove ekonomije temeljene na učenju i upravljanju znanjem. Posljedice toga odražavaju se na gubitak konkurentskih prednosti. Izlaz za hrvatska poduzeća, suočena s egzistencijalnim problemima zbog gubitka tržišta, nalazi se u intenziviranju inovacijske aktivnosti i iskorištavanju ljudskih potencijala, što pretpostavlja transformaciju postojećeg sustava u sustav proizvodnje znanja. Gospodarski subjekti trebaju razvijati okružje poticajno za učenje i razvijanje vještina. Takvo okružje može osigurati koncept poduzeća koje uči.

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Činjenica da je koncept poduzeća koje uči nedovoljno teorijski poznat i proučavan pa stoga i u praksi nedovoljno primijenjen na metodičan način, razlogom je da se problematika koncepta poduzeća koje uči, kao preduvjeta za uspješno provođenje procesa učenja, konzistentno istraži i predlože primjerena rješenja koja mogu slijediti i hrvatska poduzeća kako bi smanjila razvojni jaz i izgradila trajne konkurentske prednosti.

U radu se teorijski dokazuje sljedeća temeljna hipoteza: *Suvremeni poslovni procesi sve se više temelje na informacijama i znanju što poduzećima postavlja zahtjev za kontinuiranim učenjem. Potreba permanentnog učenja zahtijeva formiranje okružja koje potiče učenje, a to je koncept poduzeća koje uči.* U cilju dokazivanja temeljne hipoteze postavljaju se sljedeće podhipoteze:

H1: *Koncept učeće organizacije je univerzalan i može se primijeniti na poduzeća bez obzira na njihovu djelatnost, odnosno primjenjiv je na svaku organizaciju.*

H2: *Postoji pozitivna korelacijska veza između ulaganja u edukaciju zaposlenih i koncepta poduzeća koje uči,*

H3: *Uvođenje koncepta poduzeća koje uči neovisno je o veličini prihoda poduzeća već zahtijeva promjenu organizacijske strukture i kulture, sustava vođenja i motivacije, odnosno kolektivnu promjenu mišljenja.*

2. Pojam učeće organizacije

Ideja o učećoj organizaciji sazrijevala je godinama i nastala kao rezultanta rada brojnih stručnjaka, ali i praktičara koji su ideje ispitivali u praktičnom okružju. Pojedini autori razvijali su svoju viziju učeće organizacije. Kenneth Leithwood *et al.* (1995) definiraju učeću organizaciju kao skupinu ljudi koja slijedi zajedničku svrhu, ali istovremeno i individualne svrhe, s kolektivnom predanošću da redovito vrednuju vrijednost ove svrhe, modificirajući je tako da ima smisla i kontinuirano razvijajući efikasnije i efektivnije načine ostvarivanja te svrhe. Cummings i Worley (1993,25) definiraju učeću organizaciju kao organizaciju koja ima izraženu sposobnost učenja, prilagođavanja i mijenjanja. To je organizacija u kojoj se procesi učenja analiziraju, razvijaju, prate i usklađuju s inovativnim i razvojnim ciljevima organizacije. Garvin (1993) učeću organizaciju definira kao organizaciju vještu u stvaranju, stjecanju i transferiranju znanja i mijenjaju svoga ponašanja kao odraza novih znanja i spoznaja. Senge (1990,20) je vidi kao organizaciju u kojoj učenje podrazumijeva stalno testiranje i transformaciju iskustva u znanje dostupno svima u organizaciji, a koje je značajno za temeljnu svrhu organizacije.

Na osnovi različitog poimanja filozofije učeće organizacije može se zaključiti da je učeća organizacija takva organizacija koja teži stvaranju vlastite budućnosti, a proces učenja shvaća kao kontinuiranu i kreativnu aktivnost kojom će ostvariti taj cilj. Takva organizacija omogućuje da ljudi na svim razinama: individualnoj, timskoj i kolektivnoj permanentno unaprjeđuju svoje sposobnosti kako bi stvarali rezultate do kojih im je stalo. Učeća se organizacija stoga razvija i prilagođava novim uvjetima, odnosno transformira se kako bi odgovorila potrebama i aspiracijama ljudi, kako u organizaciji tako i izvan nje.

Iako među autorima nema konsenzusa oko definicije koncepta učeće organizacije, moguće je identificirati njegove elemente: individualno, timsko i organizacijsko učenja. Individualno učenje predstavlja temelj učeće organizacije jer organizacije uče posredstvom učenja svojih članova. Stoga svaka organizacija koja želi postati učećom treba poticati i podupirati učenje svih svojih članova. Tradicionalni programi obrazovanja i treninzi imaju važnu ulogu u razvijanju individualnoga učenja. Međutim, neformalno učenje, posebno učenje integrirano u radne zadatke jednako je važno, ako ne i važnije jer pruža veću slobodu u učenju.

Budući da se sve više radnih zadataka povjerava timovima, timsko učenje je postalo važan čimbenik organizacijskoga razvoja. Timovi su skupine ljudi, ali također i samostalni entiteti. Ključni čimbenik za učeću organizaciju postaje transfer iskustva učenja i znanja između članova timova, kao i između drugih timova. Može se zaključiti kako u obavljanju zadataka u timu nije važan samo timski rad već i timsko učenje. Razvijati idealno okružje za učinkovito učenje u skupinama jednako je važno kao i osigurati uvjete za individualno učenje.

Kako bi se omogućio slobodan i lateralan tijek komuniciranja i time pojačalo učenje na svim razinama u organizaciji potrebno je implementirati komunikacijske sustave. Time individualno i timsko učenje postaje utkano u «tkivo» organizacije. Informacijski i komunikacijski sustavi u organizaciji trebaju onemogućiti gubljenje rezultata individualnoga i timskoga učenja. Ključno je stoga razvijati institucionalnu memoriju u obliku sustava za pohranjivanje i pribavljanje materijala kojima se može pristupiti u svakom trenutku i u formatu koji omogućuje najlakše razumijevanje. Stoga je proces upravljanja znanjem potrebno razvijati paralelno s procesima organizacijskoga učenja.

U literaturi još nije došlo do usuglašavanja mišljenja jesu li učeća organizacija i organizacijsko učenje različiti ili istovjetni fenomeni (npr. Goh, 2003, Terziovski et al. 2000). Jensen i Rasmussen (2004) razlikuju mikro i makro razinu. Na mikro razini, odnosno razini pojedinca učenje se smatra stjecanjem vještina i znanja. Na makro razini, odnosno razini organizacije, učenje se smatra agregiranjem vještina i znanja svih pojedinaca. Stoga se učeća organizacija smatra entitetom koji usmjerava promjene na makro razini, dok se organizacijsko učenje odnosi na osobe koje stječu i nadograđuju znanja u procesu interakcije s drugim ljudima. Pa ipak, kretanja na mikro i makro razini su složena te iskazuju nelinearnost i kaotičnost.

Ideja učeće organizacije predstavlja perspektivu konvergencije triju ideja (Salaman, 2001). U prvom redu, ona uključuje vrijednosti organizacijske fleksibilnosti i adaptabilnosti kojom se nastoje prevladati disfunkcionalnosti birokracije. Zatim propagira ulogu poduzeća kao moralnoga entiteta na tržištu. Naposljetku, koncept učeće organizacije potiče liberalne vrijednosti učenja, individualnoga rasta i razvoja. Međutim, potrebno je naglasiti kako se ovaj koncept ne zadržava samo na poticanju ovih značajka, već se zalaže za njihovo inherentno međudjelovanje.

3. Značajke koncepta poduzeća koje uči

Koncept kojim se naglašava učenje kao izvor konkurentskih prednosti svi autori ne nazivaju jednako, ali se može uočiti značajno preklapanje u sadržaju onog što su pokušali izraziti. Tako Pedler, Burgoyne i Boydell (1996) koriste pojam «poduzeća koje uči» za kojeg smatraju da je manje mehanički i odnosi se na bilo koju grupu ljudi u poduzeću koja djeluje zajedno s ostalima u procesu traženja i istraživanja načina kako ljudi mogu najbolje raditi i živjeti zajedno. Prema njihovom mišljenju poduzeće koje uči je organizacija koja pomaže i omogućuje učenje svim svojim članovima i stalno se transformira, odnosno svjesno mijenja sebe i svoj sadržaj. Nonaka i Takeuchi (1995) koriste pojam «poduzeće koje stvara znanje» za poduzeće koje neprestano stvara nova znanja, širi ih po cijeloj organizaciji i brzo ih ugrađuje u nove tehnologije i proizvode kako bi ono poslovalo uspješno.

Poduzeće je prije svega organizacija pa se pojmovi učeća organizacija i poduzeće koje uči mogu smatrati sinonimima. Budući da je pojam organizacija širi od pojma poduzeće, ovim nazivom sugerira se univerzalnost primjene ove filozofije na sve oblike organizacija. Ipak, potrebno je posebno izučavati značajke poduzeća kao učeće organizacije zbog specifičnosti njegova ustroja i djelovanja. Poduzeće koje uči stoga je takva organizacija koja ima implementirane sustave, mehanizme i procese pomoću kojih na osnovi učenja povećava sposobnost ostvarivanja održivih konkurentskih prednosti. Takvo poduzeće adaptivno je na promjene u okolini, neprestano povećava svoje sposobnosti za promjenom i prilagodbom,

razvija individualno i kolektivno učenje te koristi rezultate učenja kako bi ostvarilo svoje ciljeve stvaranja vrijednosti.

Koncepti kojima se intenzivira znanje i učenje poduzeća mogu se podijeliti na četiri skupine (McGill, Slocum, 1996, 9): poduzeća orijentirana znanju, poduzeća orijentirana razumijevanju, poduzeća orijentirana mišljenju i poduzeća orijentirana učenju.

Tablica 1.

Usporedba tipova poduzeća temeljenih na znanju i učenju

	Poduzeće orijentirano znanju	***Poduzeće orijentirano razumijevanju***	***Poduzeće orijentirano mišljenju***	***Poduzeće orijentirano učenju***
Filozofija	usmjerena je na pronalaženje «jedine prave metode» koja povećava efikasnost procesa i omogućuje njihovu predvidljivost	vrijednosti usidrene u kulturi poduzeća određuju strategiju poslovanja, vlada vjerovanje u prevladavajuće mitove	aktivnosti poduzeća prate slijed problema, nepravilnosti se nastoje brzo odstraniti	svako iskustvo je prilika za poboljšanje
Praksa rukovođenja	kontrola pomoću pravila i odrednica, vođenje striktno prema «pravilima u knjizi»	oslanja se na tumačenja informacija, komunikaciju i jačanje kulture poduzeća	identificiranje problema, prikupljanje podataka i postavljanje koncepta rješenja	zahtijeva učenje, ohrabruje eksperimentiranje, podržava konstruktivne dijaloge
Suradnici	slijepo slijede naloge i ne pitaju zašto	specifične vrijednosti poduzeća su smjernice za poželjno ponašanja	produbljuju i implementiraju programirana rješenja	prikupljaju informacije, podržavaju različitost mišljenja i umrežavanje
Klijenti	oslanjaju se na to da poduzeće «zna najbolje»	vjeruju da vrijednosni sustavi poduzeća jamče pozitivna iskustva	tretiraju se kao problem koji treba što prije riješiti	aktivno sudjeluju u otvorenim i kontinuiranim dijalozima kao dio procesa podučavanja i učenja
Promjene	usmjerene na modifikaciju «jedine prave metode»	promjene se promatraju u okviru promjene vladajućih mitova	promjene u programima rješavanja problema, svaka nova metoda je «jedina prava»	razvijanje novih procesa da bi se konkurentska osnovica što bolje definirala i stvorile se dugoročne konkurentske prednosti

Izvor: cf: Pinchot, G., Pihchot, E.: The end of Bureaucracy and the Rise of the Intelligent Organization, Berrett-Koehler Publishers, San Francisco, 1993., str. 47.

Iz navedenoga je razvidno da se razvoj poduzeća od onih koje nastoje optimizirati upravljanje znanjem i onih koje se temelje na razumijevanju i/ili mišljenju treba kretati prema razvoju poduzeća temeljenog na učenju koje uključuje značajke prethodno navedenih koncepata, ali ih dalje razvija i daje primat procesu učenja koje se identificira kao temelj održivih konkurentskih prednosti.

Moguće je navesti i «silabus» poduzeća koje uči (cf: Peters, 1996, 4-10). To je poduzeće koje:

1. ***Uči o poslu*** koji se obavlja i traži načine kako ga unaprijediti. Ovaj segment učenja posebno se odnosi na individualno učenje, a Senge (1990) ga naziva «osobno majstorstvo». U ovom kontekstu može se konstatirati da učenje o poslu podrazumijeva dvostruko razumijevanje: razumijevanje tehničkih aspekata posla i razumijevanje dinamičke interakcije ljudi u kolektivu.
2. ***Uči kako postići organizacijsko usklađenje*** u smislu stvaranja zajedničkih vrijednosti, odnosno mentalnih modela, čime se može postići usklađenost organizacijske kulture i strategije. Collins i Porras (1994) ovaj cilj nazivaju ideološkom indoktrinacijom. Na taj se način nastoji postići da zaposlenici posao mogu obavljati na pravi način bez potrebe za izravnim nadzorom. Ovaj proces povezan je s procesom nastajanja izvirujuće strategije. Razvijanje izvirujuće strategije predstavlja izravnu manifestaciju organizacijskoga usklađivanja. Poželjno je da izvirujuća strategija nastane kao poticani, ali spontani dinamični odgovor na promijenjenu dinamiku u okruženju. Njenu spontanost može se postići pod pretpostavkom da su zaposlenici upoznati u poslovanje organizacije, razumiju prioritete i ciljeve te znaju granice ponašanja. Također je važno da su organizacijske vrijednosti poznate i artikulirane.
3. ***Uči o svojoj budućnosti*** korištenjem tehnika scenarij planiranja i anticipativnim razvojem kompetencija. Učenje o budućnosti uključuje dva aspekta: razumijevanje spektra mogućnosti koje iskazuju značajnu vjerojatnost ostvarenja i pripremanje za učinkovito djelovanje ukoliko se te mogućnosti ostvare. Kako bi se uspješno ostvarilo učenje o budućnosti može se okupiti grupu zaposlenika različitih profila, ali visoke razine znanja koji će se baviti ispitivanjem vjerojatnosti ispunjavanja određenih mogućnosti kao i njihovih prednosti i nedostataka. Na osnovi prikupljenih informacija ovaj tim ili menadžment poduzeća može razvijati moguće scenarije djelovanja prema identificiranim mogućnostima. U okviru plana djelovanja važno je ključne zaposlenike potaknuti na prikupljanje znanja o izglednim ishodima događaja kako bi se postigao visoki stupanj učinkovitosti ako se događaji zaista ostvare.
4. ***Uči o izravnom operativnom okružju*** i cjelokupnom opskrbnom lancu, odnosno o lancu stvaranja vrijednosti primjenom discipline sustavskoga mišljenja. Walton iz Walm-Marta je rekao: «*Ako ne uslužujete kupce, trebali biste uslуživati nekoga tko uslužuje kupce*». Ovom rečenicom može se identificirati važnost shvaćanja procesa stvaranja vrijednosti, kako u logističkom i operativnom smislu tako i u smislu tržišne valorizacije stvorene vrijednosti. Zaposlenike je potrebno poticati da pri sagledavanju svoga posla u lancu stvaranja vrijednosti primjenjuju sustavni pristup, odnosno uče o organizaciji poduzeća, načinu i metodama komuniciranja s kupcima i dobavljačima te funkcioniranju stimulacijske politike u tom segmentu. Važno je vidjeti «*veliku sliku*» kako bi se pravodobno izmjenjivali izgrađeni mehanizmi, odnosno izbjeglo pojavljivanje grešaka koji su zapravo posljedica loše konfiguracije.
5. ***Uči o načinima mijenjanja postojećih paradigma***, razmatra sadašnje i buduće mogućnosti i na taj način upravlja vlastitom budućnošću. Kako bi se ostvario ovaj cilj, u određenim vremenskim razdobljima ovisno o dinamičnosti grane u kojoj organizacija djeluje treba oformiti tim perspektivnih zaposlenika i razmotriti temeljna pitanja: «*što je naš posao?*», «*zašto određujemo cijene na određeni način?*», «*zašto primjenjujemo takvu organizacijsku strukturu?*» itd. Za svaki odgovor koji se razlikuje od dominantne stvarnosti potrebno je razraditi argumentirane alternative.
6. ***Uči kako razvijati organizacijsku memoriju***, odnosno sustave za stjecanje, skladištenje i pristupanje informacijama i znanju. Organizacije bez takvih sustava ne mogu razvijati sposobnost učenja. Mnoga poduzeća u tom smislu pišu izvješća

naslovljena kao «*Naučene lekcije*». U takvim izvješćima opisuju se situacije i način rješavanja problema u smislu studija slučaja koji mogu biti od koristi drugim zaposlenicima. U svakom slučaju, potrebno je održavati pisani trag o svim procesima, interakcijama i izuzecima.

S obzirom da je nemoguće da jedna, a posebice svaka osoba provodi učenje u svim navedenim područjima, može se zaključiti da je poduzeće koje uči koncept koji uključuje brojne dimenzije koje razvija kao organizacijske vrijednosti i konstantno nastoji održati stanje dinamičke ravnoteže.

Izgradnja poduzeća koje uči uključuje istovremeni rad na nekoliko područja. Prije svega potrebno je raditi na razvoju ljudskih potencijala na način da se planiraju dovoljna financijska sredstva za potporu učenju, učenje na radnom mjestu postavlja se kao jedan od prioriteta u obavljanju radnih zadataka, a znanje zaposlenika na svim se razinama razvija i osuvremenjuje treninzima, mentorstvom i programima razvoja talenata. Prilike za učenje trebaju biti ukomponirane u programe i radne operacije, eksperimentiranje treba postati zadatak svih zaposlenika, a nova znanja stečena eksperimentiranjem treba testirati.

Zaposlenici najveći dio ciljeva izvršavaju u okviru timskoga rada. U formiranim projektnim timovima sudjeluju članovi različitih odjela i hijerarhijskih razina, zaposlenici koji posjeduju rijetka i vrijedna znanja rotiraju unutar organizacije i sudjeluju u raznim timovima te se tako osigurava transfer znanja zaposlenika koji napuštaju tvrtku na njihove nasljednike.

Kako bi se ostvarili ciljevi izgradnje koncepta poduzeća koje uči, ali i jačala motivacija ljudskih potencijala, na poseban način oblikuje se i proces upravljanja kompenzacijama. Rad pojedinaca se procjenjuje i nagrađuje sukladno njihovom doprinosu razvoju inovacija i korisnih prijedloga, sustav nagrađivanja posebno vrednuje rezultate eksperimentiranja i učenja, a zaposlenici koji najviše pridonose kolektivnom učenju i dijele svoja znanja s kolegama imaju veće mogućnosti napredovanja. Identificirani zaposlenici koji posjeduju vrijedna i rijetka znanja posebno se stimuliraju, a sustav nagrađivanja ima dugoročnu orijentaciju.

Izgradnju koncepta poduzeća koje uči i rad zaposlenika potiče specifična učeća kultura. Klimu karakterizira pozitivno, proaktivno i odgovorno mišljenje, uzajamno povjerenje, otvorenost i suradnja. Potiče se komunikacija različitih razina menadžmenta kako bi se maksimiziralo učenje na svim razinama. Eliminira se strah kako bi pojedinci preuzimali rizik te se potiče učenje putem uspjeha, ali i neuspjeha. O pogreškama se otvoreno raspravlja, a kratkoročna rješenja problema se izbjegavaju. Samopouzdanje zaposlenika proizlaze ne samo iz činjenice «*znam*» nego i iz činjenice «*učim*». Stoga se permanentno osiguravaju programi treninga i edukacije. Na probleme se gleda kao na priliku za učenje ili promjenu, a proces učenja iniciraju postojeći ili očekivani problemi.

Kako bi proces razvoja koncepta poduzeća koje uči bio učinkovit, potreban je i specifičan stil vodstva. U poduzeću koje uči menadžment potiče zaposlenike u kreiranju zajedničke vizije, o dugoročnim odlukama raspravlja se i na nižim menadžerskim razinama, kao i među svim zaposlenicima, a u proces odlučivanja uključuju se i zaposlenici na koje se odluke odnose. Menadžeri u poduzeću koje uči predstavljaju kombinaciju trenera, mentora i vođe. Top menadžment anticipira trendove i reagira na pitanja od dugoročnog interesa utvrđujući potrebna znanja. Menadžment i zaposlenici svjesni su da je učenje jedini izvor održivih konkurentskih prednosti i potencijal za generiranje prihoda tvrtke. Potiče se kontinuirano ugrađivanje znanja u nove proizvode, usluge i procese, a menadžeri postavljaju ciljeve vezane za proces učenja u okviru poslovnih planova. Upravljanje organizacijskim znanjem jedno je od prioriteta provedbe strategije poduzeća. Menadžeri su sposobni identificirati zaposlenike koji posjeduju vrijedna i rijetka znanja te stimuliraju pristup učenju, intenzivnu razmjenu znanja i informacija i unutarnje poduzetništvo. Menadžeri također

opunomoćuju zaposlenike u radu i odlučivanju temeljeno na njihovom znanju i učenju. Svi članovi poduzeća koje uči otvoreno komuniciraju i pravodobno su informirani kako bi se spriječilo širenje neprovjerenih glasina. Stalno se evaluiraju tržište, konkurenti, želje kupaca, unaprjeđuju se performanse i sposobnosti. Snažno se ulaže u istraživanje i razvoj na osnovi čega se velikom brzinom uvode novi procesi, proizvodi i usluge.

Prilikom implementacije strategije za uvođenje koncepta poduzeća koje uči posebno je potrebno raditi na izgradnji učeće infrastrukture. Učeća infrastruktura podrazumijeva rad na stalnom unaprjeđenju organizacijskoga dizajna tako da se proces učenja više ne prepušta slučaju, već postaje sustavna djelatnost kojom se potiču procesi eksperimentiranja i testiranja naučenoga te se sustavno provodi difuzija novih saznanja i vještina. U poduzeću koje uči izgrađuju se informacijski sustavi koji povezuje sve članove poduzeća i kojima zaposlenici imaju pristup vanjskim informacijama. Razvijaju se sustavi i strukture kojima se prikupljeno znanje kodira, dokumentira, skladišti i stavlja na raspolaganje onima kojima je u poduzeću potrebno. Informacijski sustav je integriran, baziran na *real-time* principu i kontinuirano nadopunjavan i integriran te se vrednuje kao institucionalna memorija. Kompjuterski informacijski sustavi pomažu individualno i organizacijsko učenje, a znanje potrebno za donošenje odluka u okviru informacijskog sustava je dostupno i lako mu je pristupiti. Imenovan je menadžer znanja (*Chief information officer*) čiji su glavni zadaci razumijevanje, procesuiranje, modificiranje i razmjenjivanje znanja. Poduzeće razvija i koristi *business intelligence* radi prikupljanja podataka za unaprjeđenje proizvoda i usluga, a informacijski sustav omogućuje propagiranje znanja o najboljoj praksi.

Strategija izgradnje poduzeća koje uči može se označiti kao *puzzle* igra. Pravilnim slaganjem i oblikovanjem pojedinih sastavnica može se stvoriti potpuna slika kako bi poduzeće koje uči optimalno funkcioniralo, odnosno ostvarivalo ciljeve.

4. Rezultati istraživanja značajka poduzeća Primorsko goranske županije u kontekstu koncepta poduzeća koje uči

U cilju dijagnosticiranja stanja u poduzećima Primorsko-goranske županije i dokazivanja postavljenih hipoteza provedeno je istraživanje na poduzećima primjenom metode anketiranja i intervjua. Analiza se temeljila na prikupljenim primarnim podacima o poduzećima sa sjedištem u Primorsko-goranskoj županiji i njihovim performansama na osnovi obrazloženih značajka koncepta poduzeća koje uči. Kao metoda za prikupljanje podataka korišten je vlastiti anketni upitnik u kombinaciji sa strukturiranim intervjuom. Osnovni skup definiran je prema kriteriju aktivnih poduzeća s više od 50 zaposlenih. U prvoj skupini pitanja koristio se standardni oblik zatvorenih pitanja, otvorena pitanja, dihotomna pitanja i Lickertova skala stavova. Od 130 aktivnih poduzeća dobiveni su podaci od 41 poduzeća što predstavlja povrat od 31,5%.

Od 41 analiziranog poduzeća devet ih je bilo proizvodnih (22%), 26 uslužnih (63%), a 6 proizvodno-uslužnih (15%). Prema tržištu na kojem djeluju ispitana poduzeća rezultat je bio sljedeći: na domaćem tržištu djeluje 17 poduzeća ili 41%, na inozemnom dva poduzeća ili 5%, a i na domaćem i na inozemnom 22 poduzeća ili 54%. U ispitanom uzorku su dominirala poduzeća u privatnom domaćem vlasništvu − 20 poduzeća ili 49%. Sljedeću dominantnu skupinu činila su pouzeća u državnom vlasništvu − 10 poduzeća ili 24%.

Osnovna svrha poslovanja ispitanih poduzeća izražena je u njihovoj misiji. Od ispitanih poduzeća njih 36,5% je kao osnovnu svrhu svoga poslovanja navelo ostvarivanje cilja zadovoljstva kupaca. 29% menadžera ispitanih poduzeća poznaje važnost i ostalih zainteresiranih strana za poslovanje poduzeća pa navodi misiju kao kombinaciju ostvarivanja profita, zadovoljstva kupaca i vlasnika. Većina ispitanih poduzeća spoznaje da je osnovni izvor ostvarivanja profita, a time i zadovoljstva zaposlenih, menadžera i vlasnika upravo

zadovoljan kupac, što ukazuje na perspektivu unaprjeđenja poslovanja prema trendovima tržišta i zahtjevima kupaca. Zabrinjavajuća je činjenica da poduzeća u osnovnoj misiji ne vrednuju ostvarivanje cilja maksimizacije zadovoljstva zaposlenika. Izvor prihoda i profita jesu kupci, ali čimbenici koji stvaraju vrijednost su zaposlenici koje treba stimulirati i težiti njihovom većem zadovoljstvu u radu.

Velika većina menadžera (90%) nije znala samostalno identificirati organizacijsku strukturu koja je projektirana u poduzeću, što je porazan podatak. Nerazumijevanje ove problematike nameće pitanje o mogućnostima ostvarivanja zacrtane strategije. Ipak, intervju je ukazao da menadžeri spoznaju vrijednost fleksibilne organizacije. Organizacijske strukture se kombiniraju na način da se u postojeću, najčešće funkcionalnu organizacijsku strukturu, implementiraju projektne strukture, odnosno profitni centri. Unatoč postojanju definiranih služba, organizacija se u ispitanim poduzećima ne shvaća kruto, već se mijenja prema potrebama.

Za razvoj poduzeća u smjeru koncepta poduzeća koje uči potrebno je jačati i procjenjivati procese kontinuiranoga učenja, kako kroz programe edukacije tako i kroz učenje kroz rad, interakciju između zaposlenika, ali i ostalih interesnih skupina. Zbog povijesnih okolnosti razvoja gospodarstva poduzeća Primorsko-goranske županije posebno trebaju ulagati u programe edukacije zaposlenika kako bi se prevladao razvojni jaz. Jačanjem ulaganja u programe edukacije te istodobnim izgrađivanjem sastavnica koncepta poduzeća koje uči u smislu učeće kulture, vođenja koje potiče participaciju i opunomoćenje zaposlenika te informacijskog i komunikacijskog sustava može se ostvariti multiplikativni učinak u smislu jačanja baze znanja kroz individualno učenje, ali i organizacijskog učenje kroz razmjenu eksplicitnoga i implicitnoga znanja i njegovu kodifikaciju u organizacijskoj memoriji poduzeća. Sastavnice koncepta poduzeća koje uči kao što su: koncept razvoja ljudskih potencijala, ulaganje u individualno, timsko i organizacijsko učenje, stjecanje, stvaranje, skladištenje, pristupanje znanju i njegovo korištenje u radu, jačanje timskog rada, nagrađivanje učenje i razmjene znanja, organizacijska kultura temeljena na procesima učenja i razmjene znanja, transformacija funkcije vođenja, proces opunomoćenja, kao i integrirani informacijski sustav koji se vrednuje kao institucionalna memorija i facilitator procesa učenja analizirane su zasebno na osnovi anketnog ispitivanja menadžera poduzeća.

Ispitana poduzeća u 49% slučajeva nemaju posebnu službu niti odjel za razvoj, provedbu i evaluaciju razvoja kadrova. Za primjenu koncepta poduzeća koje uči važno je pratiti ulaganja poduzeća u edukaciju zaposlenika. Budući da zanemarivi broj poduzeća precizno prati ulaganja u edukaciju, dobiveni rezultati predstavljaju procijenjeno prosječno ulaganje po zaposleniku u posljednjih nekoliko godina. Prosječno godišnje izdvajanje za edukaciju po zaposleniku navedeno je u Tablici 2. Treba napomenuti da nisu uključeni podaci za čak 12 poduzeća koja ili ulažu zanemarive iznose ili te iznose menadžeri nikako nisu mogli procijeniti što ukazuje na nedostatak sustavnoga pristupa ulaganju u ljudske potencijale, kao i praćenju rezultata takvoga ulaganja.

Tablica 2.

Ulaganje u edukaciju ispitanih poduzeća

Vrsta poduzeća	**Prosječno godišnje izdvajanje za edukaciju po zaposleniku u kn**
proizvodna	1000
uslužna	700
proizvodno-uslužna	750
prosjek:	**830 kn**

Porazan je podatak da su ulaganja u edukaciju zaposlenika u proizvodnim poduzećima samo 30% veća nego u uslužnim. Zbog potrebe većeg ulaganja u edukaciju u proizvodnim poduzećima razumljiva je dominacija uslužnih djelatnosti u Županiji, posebice trgovine. Prosječno procijenjeno ulaganje u edukaciju po zaposleniku od 830 kn godišnje vrlo je mali iznos i neće osigurati usavršavanje i jačanje kompetencija pojedinaca u poduzeću, a time ni poduzeća kao cjeline. Utvrđeni podatak o broju procijenjenih programa edukacije koje zaposlenici pohađaju godišnje od prosječno 3,06 programa u skladu je s podatkom o prosječnom procijenjenom iznosu ulaganja u edukaciju po zaposleniku i nedovoljan je za držanje koraka s razvojem znanja i vještina.

S tim u vezi potrebno je navesti ocjenu menadžera proizvodnih poduzeća o ulaganju vlastitoga poduzeća u edukaciju zaposlenika. Većina menadžera, njih čak 67%, smatra da je ulaganje u edukaciju zaposlenika u njihovom poduzeću sukladno potrebama, dok je tek 11% ispitanih ta ulaganja ocijenilo nedovoljnim. Čak 50% menadžera uslužnih poduzeća ulaganje u edukaciju zaposlenika ocijenilo je nedovoljnim. Zanimljivo je da je visok postotak (42%) onih koji ta ulaganja smatraju sukladnima potrebama. Kod proizvodno-uslužnih poduzeća rezultat je još porazniji: čak njih 83% ulaganje u edukaciju smatra sukladnim potrebama, dok ih 16,7% smatra nedovoljnim. Ovakav rezultat povezan je s činjenicom da u ispitanim poduzećima dominira srednja tehnologijska razina, prosječno se prati nova tehnologija i prosječno se reagira na tehnološke promjene. Činjenica da je veliki postotak menadžera zadovoljan ulaganjem u edukaciju zaposlenika, ne mora *a priori* biti negativan. Može se objasniti činjenicom da se ispitana poduzeća bave djelatnostima koja nisu intenzivna znanjem. Klasične djelatnosti niske tehnologijske razine ne mogu rezultirati novostvorenom vrijednošću koja će biti značajno profitno valorizirana.

Budući da su ispitane značajke poduzeća usko povezane s problematikom uvođenja koncepta poduzeća koje uči, istražena je subjektivna procjena ispitanih menadžera o uvođenju ovoga koncepta u njihovim poduzećima. Ispitivanjem je utvrđeno da menadžeri triju poduzeća smatraju da je koncept poduzeća koje uči u većoj mjeri već implementiran u njihovom poduzeću. Menadžeri 13 poduzeća ili 32% smatraju kako se koncept poduzeća koje uči, kao način razvoja konkurentskih prednosti počinje uvoditi u poduzeću, ali nije dovoljno razvijen te se poduzima njegovo daljnje istraživanja radi efikasnog uvođenja. Menadžeri 8 poduzeća ili 20% smatraju se upoznatim s tim konceptom i planiraju ga uvesti u razdoblju od jedne do pet godina. Može se smatrati da su ovi menadžeri upoznati sa zahtjevima ovoga koncepta i realno sagledavaju vrijeme potrebno za njegovu implementaciju. Menadžeri čak 17 poduzeća ili 41% izjavili su kako nisu upoznati s tim konceptom. Budući da je povrat anketa bio 31,5%, može se zaključiti kako je ovaj koncept općenito vrlo slabo poznat u navedenoj županiji i da predstoji rad na popularizaciji i učinkovitom uvođenju ovoga koncepta.

U poduzećima uzorka pomoću Lickertove skale stavova ispitane su sastavnice koncepta poduzeća koje uči kao što su: koncept razvoja ljudskih potencijala, ulaganje u individualno, timsko i organizacijsko učenje, stjecanje, stvaranje, skladištenje, pristupanje znanju i njegovo korištenje u radu, jačanje timskog rada, nagrađivanje učenja i razmjene znanja, organizacijska kultura temeljena na procesima učenja i razmjene znanja, transformacija funkcije vođenja, proces opunomoćenja, kao i integrirani informacijski sustav koji se vrednuje kao institucionalna memorija i facilitator procesa učenja.

Prema dobivenim podacima poduzeća u godišnjem proračunu planiraju nedovoljna financijska sredstva za potporu učenju (prosječna ocjena 2,90). Ovaj rezultat ukazuje na nekonzistentnost u izjavama menadžera s obzirom na procjenu čak 53% ispitanih menadžera kako je ulaganje u edukaciju u njihovom poduzeću po zaposlenom sukladno potrebama. Ipak menadžeri su svjesni potrebe unaprjeđivanja radnih performansa na što ukazuje prosječna ocjena od 3,21 kojom menadžeri ocjenjuju učenje na radnom mjestu u svom poduzeću kao jedan od prioriteta u obavljanju radnih zadataka. Iako menadžeri od zaposlenih zahtijevaju

unaprjeđenje radnih performansa, nedovoljno razvijaju i osuvremenjuju njihovo znanje mentorstvom i programima razvoja talenata (prosječna ocjena 2,85). Na zahtjev za unaprjeđenjem radnih performansa zaposlenih ukazuje i viša, ali ipak prosječna ocjena (3,14) za tezu da su prilike za učenje ukomponirane u programe i radne operacije. Ovi rezultati ukazuju na činjenicu da su zaposleni često prepušteni sami sebi i vlastitom snalaženju kako bi poboljšali radne performanse jer se njihovo znanje premalo unaprjeđuje mentorstvima i treninzima u poduzećima Primorsko-goranske županije.

Timsko identificiranje i rješavanje problema i korištenje tehnika poput *brainstorminga* u ispitanim poduzećima Primorsko-goranske županije prosječno je zastupljeno (ocjena 3,14). Budući da su timski rad i kreativne tehnike glavni izvor korisnih prijedloga, unaprjeđenja i poboljšanja radnih performansa, može se zaključiti kako ovo područje ispitana poduzeća moraju značajno unaprijediti. Ipak situacija je nešto bolja kada je riječ u formiranim projektnim timovima za koje vrijedi ocjena od 3,46 vezano za sudjelovanje članova različitih odjela u formiranim timovima. Prosječno je i sudjelovanje članova različitih hijerarhijskih razina (ocjena 3,36). Međutim, poduzeća nedovoljno koriste rijetka i vrijedna znanja zaposlenih unutar poduzeća kad je riječ o njihovom rotiranju unutar organizacije i sudjelovanju u različitim timovima (prosječna ocjena 3,00). Razlog se može naći u činjenici da poduzeća sustavno ne identificiraju i ne prate pojedince sa specifičnim znanjima, niti ulažu u njihov daljnji razvoj pa ih se stoga ni ne potiče na rotiranje u organizaciji i rotiranje u projektnim timovima[1]. Najviše zabrinjava podatak da je osiguravanje transfera znanja zaposlenih koji napuštaju tvrtku na njihove nasljednike tek prosječno zastupljeno (ocjena 3,02) što ukazuje na činjenicu da poduzeća gube stečena znanja, posebno ako znanja pojedinaca koji napuštaju poduzeće nisu formalizirana i postala eksplicitna. Na taj način, umjesto da se povećava ili barem održava razina znanja, neosiguravanjem njegovog transfera u poduzeću ono se smanjuje i treba ga ponovno stjecati, što zahtijeva dodatna ulaganja novca i vremena.

Rezultati istraživanja pokazuju da se rad pojedinaca ispodprosječno procjenjuje i nagrađuje sukladno iskazanoj kreativnosti i njihovom doprinosu razvoju inovacija, patenata i korisnih prijedloga (prosječna ocjena 2,56). Isto tako sustav nagrađivanja ispodprosječno vrednuje rezultate eksperimentiranja i učenja (prosječna ocjena 2,43). Budući da se rad pojedinaca ispodprosječno procjenjuje i nagrađuje sukladno njihovom doprinosu u učenju i razvoju korisnih prijedloga, moglo se očekivati da takvi zaposlenici imaju veće mogućnosti napredovanja u karijeri. Međutim, dobivena je prosječna ocjena od 2,85. Ovaj naizgled paradoksalan podatak može se objasniti činjenicom da se radi o malim i srednjim poduzećima s malim mogućnostima napredovanja na hijerarhijskoj ljestvici, a tu mogućnost zaposleni mogu dobiti gotovo jedino odlaskom ljudi koji su do tada radili na tim pozicijama.

Poduzeća također prosječno stimuliraju (ocjena 3,14) zaposlene koji posjeduju vrijedna i rijetka znanja čime se nastavlja trend podataka vezan za sudjelovanje pojedinaca koji posjeduju rijetka i vrijedna znanja u raznim timovima i njihovo rotiranje unutar organizacije. Ovaj podatak također ukazuje na činjenicu da poduzećima nisu potrebna specifična znanja njihovih zaposlenika, već se poslovanje odvija prema unaprijed određenim procedurama. Tome u prilog ide i činjenica o ispodprosječnom korištenju kreativnih tehnika, prezentacijskih i grafičkih metoda (ocjena 2,53) što upućuje na nedovoljno razvijenu kreativnost u poduzećima. To se reflektira na rezultatima vezanim uz stvaranje nove vrijednosti koji su nedovoljno obogaćeni novim znanjima i spoznajama.

S obzirom da poduzeća tek prosječno ocjenjuju utjecaj kvalitete motivacije na poslovanje poduzeća (ocjena 3,39), ne čudi da sustav nagrađivanja tek prosječno ima dugoročnu orijentaciju (prosječna ocjena 3,02). Stoga zaposleni nisu stimulirani na

[1]Zaključak izveden na osnovi strukturiranog intervjua s menadžerima.

poboljšanje svojih radnih performansa. Može se konstatirati da zadovoljstvo zaposlenih nije na visokoj razini. S jedne strane od njih se zahtijeva poboljšanje performansa, a s druge strane ne motivira ih se stimulacijama niti u dovoljnoj mjeri upućuje na programe obuke i razvoja kako bi povećali svoju bazu znanja i primijenili je u radu.

Ispitana poduzeća usmjeravaju razvoj organizacijske kulture prema pozitivnom, proaktivnom i odgovornom mišljenju, uzajamnom povjerenju, otvorenosti i suradnji na što ukazuje dobivena prosječna ocjena 3,39. Međutim, klima je tek prosječno stimulativna za procese učenje. Komunikacija različitih razina menadžmenta kako bi se maksimiziralo učenje na svim razinama pokazuje ocjenu 3,36. Klima tek prosječno potiče važnost učenja (ocjena 3,31), a tek se prosječno eliminira strah kako bi pojedinci preuzimali rizik (ocjena 3,09). Neuspjeh se u poduzeću ne smatra dobrom prilikom za učenje (ocjena 3,02), a prosječno se potiče otvorena rasprava o greškama (3,19). Proces učenja prosječno iniciraju postojeći ili očekivani problemi (ocjena 3,34) što znači da poduzeća uče zbog potrebe nametnute okruženjem, a ne radi stjecanja pionirskog statusa u djelatnosti kojom se bave. Ipak, optimistički djeluje činjenica da se kratkoročna rješenja problema izbjegavaju (ocjena 3,14), iako tek prosječno.

U ispitanim poduzećima top menadžment zaposlene ne potiče dovoljno na kreiranje zajedničke vizije (prosječna ocjena 3,21). Još nepovoljniji su podaci vezani za raspravljanje o dugoročnim odlukama na nižim menadžerskim razinama, kao i među zaposlenima, na što ukazuje ispod prosječna ocjena od 2,85. U proces odlučivanja tek se prosječno uključuju zaposleni na koje se odluke odnose (ocjena 3,07). Može se zaključiti kako je stupanj identifikacije zaposlenih s vizijom i misijom poduzeća nizak. Stoga se ne može pretpostaviti da zaposleni ciljeve poduzeća doživljavaju kao svoje i ulažu maksimalne napore u njihovo ispunjenje. Menadžeri sebe tek prosječno percipiraju kao kombinaciju trenera, mentora i vođe (ocjena 3,31). Ipak, menadžeri smatraju da nešto bolje anticipiraju trendove i reagiraju na pitanja od dugoročnog interesa utvrđujući potrebna znanja (3,48). Nešto boljom ocjenom menadžeri su ocijenili tezu kako su svjesni da je učenje jedini izvor održivih konkurentskih prednosti i potencijal za generiranje prihoda poduzeća (3,53). Menadžeri kao vođe smatraju da iznadprosječno potiču kontinuirano ugrađivanje znanja u nove proizvode, usluge i procese (3,63). Međutim, to ne dokazuju u praksi jer ciljeve vezane za proces učenja u okviru poslovnih planova postavljaju tek prosječno (3,21). Osim toga, zabrinjavajuće je da upravljanje organizacijskim znanjem nije jedan od prioriteta provedbe strategije poduzeća (2,85). Ovaj podatak u skladu je s činjenicom da se nedovoljno osigurava transfer znanja zaposlenih na njihove nasljednike, kao i da pojedinci koji posjeduju rijetka i vrijedna znanja nedovoljno sudjeluju u radu različitih timova i nedovoljno rotiraju unutar organizacije. Menadžeri, ipak, smatraju kako su sposobni identificirati zaposlene koji posjeduju vrijedna i rijetka znanja (ocjena 3,68). No, ostaje činjenica da ta znanja ne koriste na pravi način i ne stimuliraju takve zaposlene. Podatak kako vođe tek prosječno (3,19) potiču individualno i timsko učenje, kao i pristup učenju, razmjeni znanja, informacija i unutarnje poduzetništvo (3,17) ipak ukazuje na stanje stvari i važnost koju menadžeri pridaju znanju i njegovoj ulozi u procesu stvaranja vrijednosti. Osim toga, menadžeri ne smatraju da su zaposleni dovoljno sposobni i obučeni odlučivati te ih tek prosječno opunomoćuju u radu i odlučivanju temeljeno na njihovom znanju i učenju (3,24). Ovakvo stanje čini upitnim mogućnost razvijanja izvirujuće strategije demokratskog stila vođenja i opunomoćenja zaposlenih.

Ispitani menadžeri nisu upoznati s potrebom široke dostupnosti informacija svima u poduzeću kako bi sustav bio transparentan. Menadžeri dakle ne primjenjuju tzv. način vođenja *otvorene knjige*. Smatraju zadovoljavajućim postupak nadopunjavanja informacijskoga sustava i njegove integriranosti (3,51). Međutim, informacijski sustav tek se prosječno vrednuje kao institucionalna memorija (3,21). Unatoč činjenici da se prema prosječnoj ocjeni od 3,04 čini da kompjuterski sustavi pomažu individualno i organizacijsko

učenje, intervjuom je utvrđeno da se to najviše odnosi na povremeno i većinom samostalno i samoinicijativno traženje podataka na internetu. Zabrinjava relativno niska ocjena (3,19) koja ukazuje na prosječnu dostupnost znanja u okviru informacijskoga sustava potrebnog za donošenje odluka. Na nesustavno prikupljanje podataka i nedovoljno korištenje mogućnosti informacijskog sustava ukazuje i činjenica o nedovoljnom korištenju mogućnosti *business intelligencea* radi prikupljanja podataka za unaprjeđenje proizvoda i usluga (ocjena 2,65).

Radi ispitivanja značajki koncepta poduzeća koje uči i dijagnosticiranja stanja poduzeća na području Primorsko-goranske županije potrebno je istražiti korelacije između pojedinih ispitivanih varijabla. U poduzećima iz uzorka ispitane su sastavnice koncepta poduzeća koje uči navedene u prethodnom dijelu. Provedena je faktorska analiza kojom je utvrđeno visoko opterećenje manifestnih varijabli na prvom faktoru, odnosno visoka korelacija s prvim faktorom. Ovom analizom dokazano je da su sve ispitane varijable istovremeno i sastavnice koncepta poduzeća koje uči. Nekoliko varijabli koje su bile visoko korelirane s dva ili više faktora isključeno je iz daljnje analize. Sumiranjem dobivenih varijabla dobiven je faktor poduzeća koje uči.

Pri utvrđivanju korelacije odabranih varijabla korištena je *Spearmanova korelacija* budući da su varijable sastavnica poduzeća koje uči statistički značajno odstupale od normalne raspodjele pa se nisu mogli koristiti parametrijski statistički postupci. Tablica 3. prikazuje rezultate ispitivane korelacije između varijabli prihoda, korištenja *benchmarkinga*, broja zaposlenika, ulaganja u edukaciju po zaposleniku, djelatnosti poduzeća i koncepta poduzeća koje uči.

Tablica 3.

Analiza međuovisnosti odabranih varijabli

Variable	Spearman Rank Order Correlations (Podaci nakon faktorske-svi) MD pairwise deleted Marked correlations are significant at p <,05000 Faktor UCORG	Prihod	Bench	Br zap.	Edu/zap.	Djelat.
Faktor UCORG	1,000000	0,009916	0,231687	-0,009588	0,597109	-0,248287
Prihod	0,009916	1,000000	0,044933	0,328473	0,044784	0,116890
Bench	0,231687	0,044933	1,000000	-0,059769	0,229206	0,066953
Br. zap.	-0,009588	0,328473	-0,059769	1,000000	0,023617	0,128072
Edu/zap.	0,597109	0,044784	0,229206	0,023617	1,000000	-0,320041
Djelat.	-0,248287	0,116890	0,066953	0,128072	-0,320041	1,000000

Analiza međuovisnosti ukazuje na pozitivnu korelaciju varijabli ulaganja u edukaciju zaposlenika i poduzeća koje uči. Takav je rezultat očekivan i dokazuje postavljenu hipotezu o potrebi ulaganja u edukaciju zaposlenika kako bi se implementirao koncept poduzeća koje uči. Analizom nije dokazana statistički značajna korelacija između varijabli *benchmarkinga*, prihoda i djelatnosti poduzeća s obzirom na varijablu poduzeća koje uči. Budući da je istraživanjem utvrđena ispodprosječna ocjena o propagiranju znanja o *best practiceu* kao rezultatu provedbe *benchmarkinga* (2,36 prema Lickertovoj skali stavova), što je temeljni način optimalnog korištenja informacija dobivenih *benchmarkingom*, rezultat o nepostojanju statistički značajne korelacije s varijablom poduzeća koje uči može se smatrati očekivanim. Tezu o međuovisnosti varijabli *benchmarkinga* i koncepta poduzeća koje uči potrebno je stoga ispitati kod poduzeća koja sustavno primjenjuju *benchmarking* i koriste informacijski sustav radi širenja identificirane najbolje prakse u poduzeću.

Rezultat o nepostojanju statistički značajne korelacije između prihoda i koncepta poduzeća koje uči je očekivan, budući da koncept poduzeća koje uči zahtijeva prvenstveno unutarnju transformaciju poduzeća, promjenu organizacijske strukture i kulture, vođenja i sustava upravljanja kompenzacijama kao i kolektivnu promjenu mišljenja, a tek potom ulaganje u informacijski sustav i edukaciju zaposlenika. Rezultat o nepostojanju statistički značajne korelacije između varijabli poduzeća koje uči i djelatnosti poduzeća također je u potpunosti očekivan i dokazuje postavljenu hipotezu kako je koncept poduzeća koje uči univerzalan te se može primijeniti na poduzeća bez obzira na njihovu djelatnost, odnosno primjenjiv je na svaku organizaciju.

Analizom je utvrđena statistički značajna povezanost između varijabli broja zaposlenika i volumena prihoda poduzeća. Ova činjenica ukazuje kako u procesu stvaranja vrijednosti ispitanih poduzeća nisu presudni potencijali zaposlenika, njihova znanja i kompetencije već samo njihov broj, odnosno njihova radna snaga.

Analizom je utvrđena međuovisnost varijabli ulaganja u edukaciju zaposlenika i djelatnosti poduzeća. Podatak iz Tablice 3. o negativnoj korelaciji ovih varijabli proizlazi iz metodologije obrade. Naime, proizvodna poduzeća bila su označena nulom, proizvodno-uslužna jedinicom, a uslužna dvojkom. Rezultati analize korelacije varijabli ukazuju na tezu da je oznaka poduzeća niža što je veće ulaganje u edukaciju zaposlenika. Ova je teza u skladu s već navedenom činjenicom da su proizvodna poduzeća, tj. poduzeća s oznakom nula najviše ulagala u edukaciju zaposlenika (prosječno godišnje 1000 kn, prema 700 kn koliko su prosječno ulagala uslužna poduzeća).

5. Zaključak

Izvor konkurentskih prednosti u uvjetima intenzivnog tehničko-tehnološkog razvoja postaje znanje, upravljanje znanjem i učenje, posebice učenje brže od konkurencije. Ovaj zahtjev može osigurati učinkovito primijenjen koncept poduzeća koje uči. Istraživanjem poduzeća sa sjedištem u Primorsko-goranskoj županiji utvrđen je nedostatak sustavnoga pristupa ulaganju u ljudske potencijale, kao i praćenje rezultata takvoga ulaganja. Klasične djelatnosti kojima se bave ispitana poduzeća niske tehnologijske razine, uz slabo ulaganje u edukaciju zaposlenika, ne mogu rezultirati novostvorenom vrijednošću koja će biti značajno profitno valorizirana. Ne može se očekivati da će ispitana poduzeća stoga biti predvodnici razvoja i prosperiteta ove županije.

- Analiza međuovisnosti ukazala je na pozitivnu korelaciju varijabli ulaganja u edukaciju zaposlenika i poduzeća koje uči. Nije utvrđena statistički značajna korelacija između prihoda i koncepta poduzeća koje uči budući da taj koncept zahtijeva prvenstveno unutarnju transformaciju poduzeća, promjenu organizacijske strukture i kulture, vođenja i sustava upravljanja kompenzacijama, odnosno kolektivnu promjenu mišljenja. Rezultat o nepostojanju statistički značajne korelacije između varijabli poduzeća koje uči i djelatnosti poduzeća dokazuje postavljenu hipotezu o univerzalnosti ovoga koncepta. Na osnovu rezultata istraživanja provedenog na uzorku poduzeća Primorsko-goranske županije može se zaključiti kako je potreban daljnji rad na istraživanju, popularizaciji i učinkovitom uvođenju ovoga koncepta.

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ZNAČAJKE PODUZEĆA PRIMORSKO GORANSKE ŽUPANIJE U KONTEKSTU KONCEPTA PODUZEĆA KOJE UČI

Sažetak

Cilj ovoga rada je istražiti i ocijeniti značajke koncepta poduzeća koje uči općenito i na uzorku poduzeća Primorsko-goranske županije sa svrhom stvaranja osnovice za definiranje aktivnosti za transformaciju klasičnih poduzeća prema poduzeću koje uči. U svrhu dokazivanja hipoteze primijenjene su sljedeće metode: metoda analize i sinteze, deskriptivna metoda, komparativna metoda, metoda mozaika, metoda dokazivanja i opovrgavanja te statističke metode. Na osnovi rezultata istraživanja može se zaključiti da potreba permanentnog učenja zahtijeva formiranje okružja koje potiče učenje, a to je koncept poduzeća koje uči. Rezultati istraživanja provedenog na uzorku poduzeća Primorsko goranske županije ukazuju kako je potreban daljnji rad na istraživanju, popularizaciji i učinkovitom uvođenju ovoga koncepta.

***Ključne riječi**: učenje, poduzeće koje uči, poduzeća Primorsko goranske županije*

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Ticijan Peruško**

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Pregledni rad
Review

KRATKI OSVRT NA MODELE ZA PREDVIĐANJE STEČAJA

SHORT RETROSPECTION ON BANKRUPTCY PREDICTION MODELS

ABSTRACT

Actuality of bankruptcy prediction leads many authors to research in this area. Scientific approach to bankruptcy prediction, which includes statistical and mathematical analysis methods, resulted in developing many bankruptcy prediction models. This text is presenting most commonly used statistical and mathematical methods in bankruptcy prediction, bankruptcy prediction models which were found to be often employed in theory and practice as well as their limitation and suggestions for future research. Models are mostly developed by using data of the companies which were doing business in high developed economies so the authors suggest that the future work should be done in performing the research among the companies in transitional countries.

Keywords: *Financial stability, bankruptcy, bankruptcy prediction models, statistical and mathematical methods*

1. UVOD

Tržišni način privređivanja karakterizira postojanje niza poslovnih rizika s kojima su suočeni poduzetnici pri obavljanju gospodarske djelatnosti. Rizik od gubitka tržišta prodaje i nabave, valutni rizik, rizik promjene kamatnih stopa, rizik gubitka djelatnika i mnoštvo drugih poslovnih rizika sastavni su dio života poslovnih subjekata pri čemu se mnogi od njih nisu u stanju nositi s njima te su prinuđeni napustiti tržišnu utakmicu. Prestanak poslovanja jednog poslovnog subjekta često za sobom povlači niz multiplikativnih učinaka, budući da je imao razvijenu mrežu poslovnih odnosa s mnoštvom drugih poslovnih subjekata koji su zainteresirani za njegovo poslovanje (stakeholdersi). Stoga je u interesu svakog poslovnog subjekta procjenjivati vjerojatnost stečaja poslovnih partnera u cilju odgovarajućeg upravljanja poslovnim rizicima. U tom smislu na raspolaganju im stoji niz različitih alata među kojima značajno mjesto zauzimaju financijski pokazatelji.

Predviđanju stečaja u početku se pristupalo razmatranjem pojedinačnih financijskih pokazatelja i njihovom usporedbom s određenim referentnim vrijednostima temeljem čega su izvođeni određeni zaključci. Implementacijom statističkih i matematičkih metoda u svrhu predviđanja stečaja otišlo se korak dalje te su razvijeni modeli za predviđanje stečaja kod kojih su središnje mjesto također zauzimali financijski pokazatelji, a bitan napredak učinjen je u smislu određivanja važnosti pojedinog pokazatelja te preciznosti korištenog modela. Navedeni modeli izvedeni su na temelju podataka iz financijskih izvještaja stvarnih poslovnih subjekata te se razlikuju ovisno o njihovim obilježjima. Odgovarajuću pozornost treba, dakle, pridati obilježjima modela, ali i zemljama u kojima je razvijen, s obzirom da među zemljama postoje razlike u društveno-ekonomskim i institucionalnim uvjetima poslovanja.

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Cilj rada je istaknuti znanstveni pristup predviđanju stečaja, kao pravnog mehanizma kojim se iz tržišta isključuju nedovoljno učinkoviti poslovni subjekti, te sustavno prikazati razvoj modela za predviđanje stečaja. U tom smislu će se u drugom poglavlju opisati posebnosti znanstvenog pristupa stečaju, nakon čega će se naglasiti kvantitativne metode korištene za razvoj modela za predviđanje stečaja. Pregled najznačajnijih modela dan je u četvrtom poglavlju, dok će se na kraju pozornost usmjeriti na neka otvorena pitanja u predviđanju stečaja.

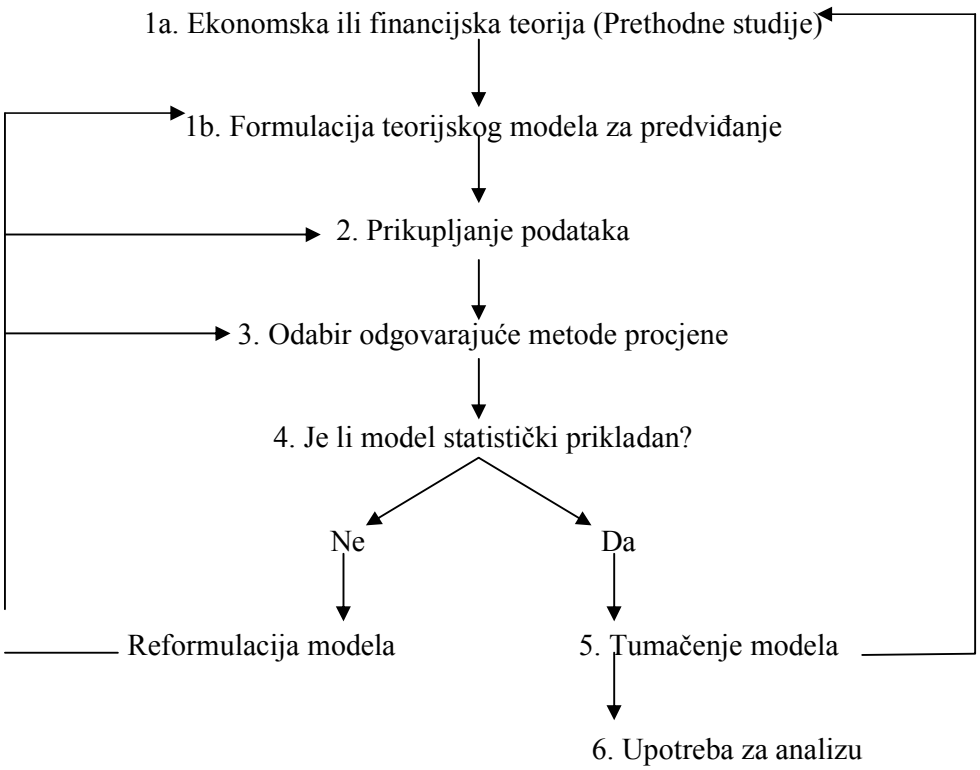
2. ZNANSTVENI PRISTUP PREDVIĐANJU STEČAJA

Nesposobnost opstanka na tržištu sastavni je dio tržišne ekonomije u kojoj opstaju samo dovoljno učinkoviti poslovni subjekti. Predviđanje stečaja staro je koliko i tržišni način privređivanja, ali se tek afirmacijom ekonomije kao društvene znanosti, te razvojem statističkih i matematičkih metoda navedenoj problematici pristupilo sustavno i znanstveno utemeljeno. U tom smislu razvijena je široka lepeza različitih modela za predviđanje stečaja te se često postavlja pitanje kojeg od njih odabrati u danom slučaju. Da bi odgovorili na to pitanje nužno je izložiti znanstveni pristup predviđanju stečaja i u okviru njega usredotočiti se na odgovarajuće statističke i matematičke metode.

Slikom 1. prikazan je koncept znanstvenog pristupa problematici predviđanja stečaja (Brooks, 2002).

Slika 1.

Znanstveni pristup predviđanju stečaja



Izvor: Preuzeto od Brooks, 2002.

Znanstveno utemeljen pristup predviđanju stečaja započinje formulacijom teorijskog modela na osnovi dostignutih teorijskih spoznaja iz ekonomske i financijske teorije (koraci 1a. i 1b.). Nastoje se zapravo utvrditi varijable i njihov utjecaj na vjerojatnost nastanka uvjeta za stečaj. Vjerojatno je da model neće u potpunosti obuhvatiti sve relevantne varijable, ali je bitno da predstavlja dovoljno dobru aproksimaciju istih kako bi bio u stanju predvidjeti stečaj.

Idući korak sastoji se u prikupljanju podataka relevantnih za razvoj modela, koji se najčešće sastoje od informacija o otvaranju stečaja, računovodstvenih podataka, obilježja poslovnih subjekata i ostalih podataka koji se u pojedinom slučaju smatraju neophodnim. Izvori podataka uključuju razne baze podataka, a u određenim slučajevima do njih je moguće doći i izravno od poslovnih subjekata.

U trećem koraku potrebno je odabrati metodu procjene prikladnu za model predložen u prvom koraku. Odabir odgovarajuće metode ponajviše ovisi o formulaciji teorijskog modela, tj. teorijskog okvira za predviđanje stečaja. Ovdje se radi o odabiru odgovarajuće statističke, odnosno matematičke metode te se postavljaju pitanja da li se radi o linearnom ili nelinearnom odnosu između varijabli u modelu, da li će se koristiti statički ili dinamički, jednovarijantni ili multivarijantni model i sl.

Četvrti korak obuhvaća statističku procjenu, odnosno vrednovanje modela u smislu njegove prikladnosti u okviru čega se izračunavaju odgovarajući parametri. Ukoliko model nije statistički prikladan za predviđanje bankrota, pristupa se reformulaciji modela (korak 1a. i 1b.), prikupljanju dodatnih podataka (korak 2.) ili se odabire neka druga, prikladnija metoda procjene (korak 3.).

Ukoliko je pak, model prikladan, potrebno ga je protumačiti s teorijskog aspekta (korak 5.) pri čemu se razmatraju vrijednosti i predznaci pojedinih varijabli uključenih u model, odnosno uspoređuju se s teorijskim postavkama postavljenim u koraku 1. Neusklađenost razvijenog empirijskog modela s teorijskim postavkama zahtijeva nadogradnju teorijskog okvira, a ukoliko «teorijski model za predviđanje stečaja nikako ne uspijeva biti potvrđen empirijskim modelom i podacima, postoje jake indicije da teorijski koncept mora biti proširen ili čak izmijenjen» (Westgaard, 2005, 5).

Ocjena sukladnosti empirijskog modela s teorijskim postavkama čini posljednju provjeru modela prije same upotrebe za potrebe analize (korak 6.). Ukoliko model prođe posljednji test, spreman je za praktičnu upotrebu gdje će proći kroz niz provjera koje će poslužiti kao osnova za njegovo daljnje usavršavanje. Svoju primjenu isti može pronaći u bankarstvu prilikom procjene kreditnog rizika, pri uspostavi i održavanju poslovnih odnosa između novih i postojećih poslovnih partnera, pri procjeni ulaganja u vrijednosne papire, u reviziji i mnogim drugim područjima, tu je vidljiva široka mogućnost njegova primjene što ga čini posebno aktualnim.

3. KVANTITATIVNE METODE U RAZVOJU MODELA ZA PREDVIĐANJE STEČAJA

Osnova modela za predviđanje stečaja nalazi se u implementaciji odgovarajućih kvantitativnih metoda. One obuhvaćaju niz statističkih i matematičkih metoda kojima se nastoje pronaći prikladne varijable signifikantne za predviđanje stečaja i izvesti njihova kombinacija u cilju što preciznijeg predviđanja nesposobnosti poslovnog subjekta da nastavi poslovati u vremenski neograničenom roku.

Financijski pokazatelji kao instrument ocjene kreditne sposobnosti poslovnih subjekata počinju se koristiti početkom 20. stoljeća. Istraživanja provođena 30-tih godina 20. stoljeća potvrdila su da se vrijednost financijskih pokazatelja financijski zdravih poslovnih subjekata i

onih koji se približavaju stečaju bitno razlikuje. Začeci korištenja kvantitativnih metoda za predviđanje stečaja sežu u šezdesete godine. Tada je u istraživanjima istaknuto mjesto zauzela diskriminantna analiza. Sedamdesetih godina, uz korištenje diskriminantne analize, istraživači počinju implementirati modele linearne vjerojatnosti[1] i logit/probit analizu u svrhu predviđanja stečaja. Razvoj informatičke tehnologije u osamdesetim godinama omogućuje korištenje složenijih i sofisticiranijih kvantitativnih metoda te se počinju implementirati tehnike matematičkog programiranja i simulacijske tehnike, a kao prva među njima istaknula se tehnika stabla odlučivanja, odnosno rekurzivnog odjeljivanja[2]. Slijede ih naprednije ekonometrijske metode u okviru kojih se ističu višenominalni logit modeli[3] te dinamički modeli vremenskih serija. U posljednjih petnaestak godina predviđanju stečaja pristupa se implementacijom različitih naprednih metoda među kojima su najznačajnije: neuronske mreže, analiza preživljavanja, genetski algoritmi, višedimenzionalno skaliranje, ekspertni sustavi, teorija kaosa, teorija katastrofe i dr.

U nastavku će se ukratko opisati osnove onih kvantitativnih metoda kojima je u teorijskim razmatranjima i praktičnoj upotrebi posvećena veća pozornost.

2.1. Diskriminantna analiza

Implementacija diskriminantne analize u predviđanju stečaja rezultira izvođenjem modela koji diskriminira, odnosno klasificira poslovne subjekte na one kod kojih je vjerojatan i one kod kojih nije vjerojatan stečaj. Klasifikacija poslovnih subjekata provodi se usporedbom vrijednosti modela pojedinog poslovnog subjekta s kritičnim vrijednostima. Ukoliko je vrijednost diskriminantne funkcije pojedinog poslovnog subjekta veća od kritične vrijednosti, moguće je zaključiti da financijsko zdravlje poslovnog subjekta nije dovedeno u pitanje i obrnuto.

Model se izvodi analizom varijabli signifikantnih za predviđanje stečaja (uglavnom financijska, a ponekad i ostala obilježja poslovnog subjekta) iz uzorka poslovnih subjekata kojima je financijska stabilnost ozbiljno narušena i onih čije financijsko zdravlje nije dovedeno u pitanje. Ovom tehnikom nastoji se maksimizirati varijanca podataka između dviju grupa poslovnih subjekata, pri čemu se u isto vrijeme minimizira varijanca podataka unutar svake grupe.

Izgled modela prikazan je jednadžbom (1).

$$Z_i = \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n \qquad (1)$$

gdje je:

Z_i – vrijednost diskriminantne funkcije,
$X_1 \ldots X_n$ – vrijednost nezavisne varijable signifikantne za predviđanje stečaja (određeno obilježje poslovnog subjekta), dok n predstavlja broj varijabli i
$\beta_1 \ldots \beta_n$ – ponderi nezavisnih varijabli.

[1] Linear probability models
[2] Recursive partitioning
[3] Multinominal logit models

2.2. Modeli linearne vjerojatnosti

Modeli linearne vjerojatnosti jednostavni su statistički modeli kojima se linearnom kombinacijom nezavisnih varijabli procjenjuje vjerojatnost otvaranja stečajnog postupka.

Model linearne vjerojatnosti prikazan je jednadžbom (2).

$$P_i = \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \varepsilon_i \quad (2)$$

gdje je:

P_i – vjerojatnost pokretanja stečajnog postupka,
$X_1 ... X_n$ – vrijednost nezavisne varijable signifikantne za predviđanje stečaja (određeno obilježje poslovnog subjekta), dok *n* predstavlja broj varijabli,
$\beta_1 ... \beta_n$ – ponderi nezavisnih varijabli i
ε_i – standardna pogreška.

Jednostavnost ove metode čini je zanimljivom za upotrebu u predviđanju stečaja. Ipak, njezin bitan nedostatak nalazi se u činjenici što se temelji na pretpostavci linearnog odnosa između zavisne i nezavisnih varijabli kao i u činjenici što zavisna varijabla (vjerojatnost pokretanja stečajnog postupka) može poprimiti negativne vrijednosti ili vrijednosti iznad 1.

2 .3. Logit i probit analiza

Logit i probit analiza javila se kao odgovor na nedostatke modela linearne vjerojatnosti. Logit i probit modeli za predviđanje stečaja rezultiraju izračunom vjerojatnosti pokretanja stečaja u intervalu od 0 do 1. Isto tako odnos između zavisne varijable i nezavisnih varijabli je nelinearan što je mnogo bliže stvarnosti i čini ove modele posebno aktualnim u predviđanju stečaja.

Jednadžba (3) prikazuje logit model (Zavgren, Friedman, 1988, 36), dok jednadžbe (4) i (5) prikazuju probit model (Westgaard, 2005, 7).

$$P_i = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n)}} \quad (3)$$

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \varepsilon_i \quad (4)$$

$$P_i = F(Z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}y^2} dy \quad (5)$$

gdje je:

P_i – vjerojatnost pokretanja stečajnog postupka,
F(Z) – kumulativna normalna funkcija,
$X_1 ... X_n$ – vrijednost nezavisne varijable signifikantne za predviđanje stečaja (određeno obilježje poslovnog subjekta), dok *n* predstavlja broj varijabli,
$\beta_0 ... \beta_n$ – ponderi nezavisnih varijabli i
ε_i – standardna pogreška.

Oba modela daju vrlo slične rezultate. Jedina razlika među njima vezana je za korištenje distribucije koja se odnosi na slučajnu varijablu. Pri izračunu logit modela distribucija slučajne varijable prikazuje se logističkom funkcijom, dok se kod probit modela pretpostavlja normalna distribucija.

2.4. Višenominalni logit modeli

Novost kod višenominalnih logit modela je cjelovitije ocjenjivanje financijskog zdravlja poslovnih subjekata. Naime, prijašnji modeli ocjenjivali su financijsko zdravlje poslovnih subjekata kao dobro ili loše, odnosno razdvajali su poslovne subjekte na financijski zdrave i one kod kojih je vjerojatno pokretanje stečajnog postupka. Za razliku od prijašnjih modela, ovi modeli procjenjuju vjerojatnost nastupa određene razine financijskog zdravlja poslovnih subjekata. Njima je, primjerice, moguće procijeniti vjerojatnost nastupa nekog od sljedećih stanja:

Stanje 5: financijska stabilnost,
Stanje 4: ograničena sposobnost, odnosno nesposobnost isplate dividendi,
Stanje 3: ograničena sposobnost, odnosno nesposobnost isplate kredita, zajmova i dospjelih dužničkih vrijednosnih papira,
Stanje 2: ograničena sposobnost, odnosno nesposobnost isplate obveza prema dobavljačima i ostalim vjerovnicima i
Stanje 1: pokretanje stečaja.

Višenominalni logit model prikazan je jednadžbom (6) (Westgaard, 2005, 9).

$$P_i(Y=j) = \frac{e^{\beta_{0,j}+\beta_{1,j}X_1+\ldots+\beta_{n,j}X_n}}{\sum_{j=0}^{J} e^{-(\beta_{0,j}+\beta_{1,j}X_1+\ldots+\beta_{n,j}X_n)}} + \varepsilon_i \qquad (6)$$

gdje je:

j – stanje,
P_i (Y=j) – vjerojatnost da će poslovni subjekt *i* dospjeti u stanje *j*,
$X_1 \ldots X_n$ – vrijednost nezavisne varijable signifikantne za predviđanje stečaja (određeno obilježje poslovnog subjekta), a *n* predstavlja broj varijabli,
$\beta_{0,j} \ldots \beta_{n,j}$ – ponderi nezavisnih varijabli za svako stanje *j* i
ε_i – standardna pogreška.

2.5. Stablo odlučivanja (rekurzivno odjeljivanje)

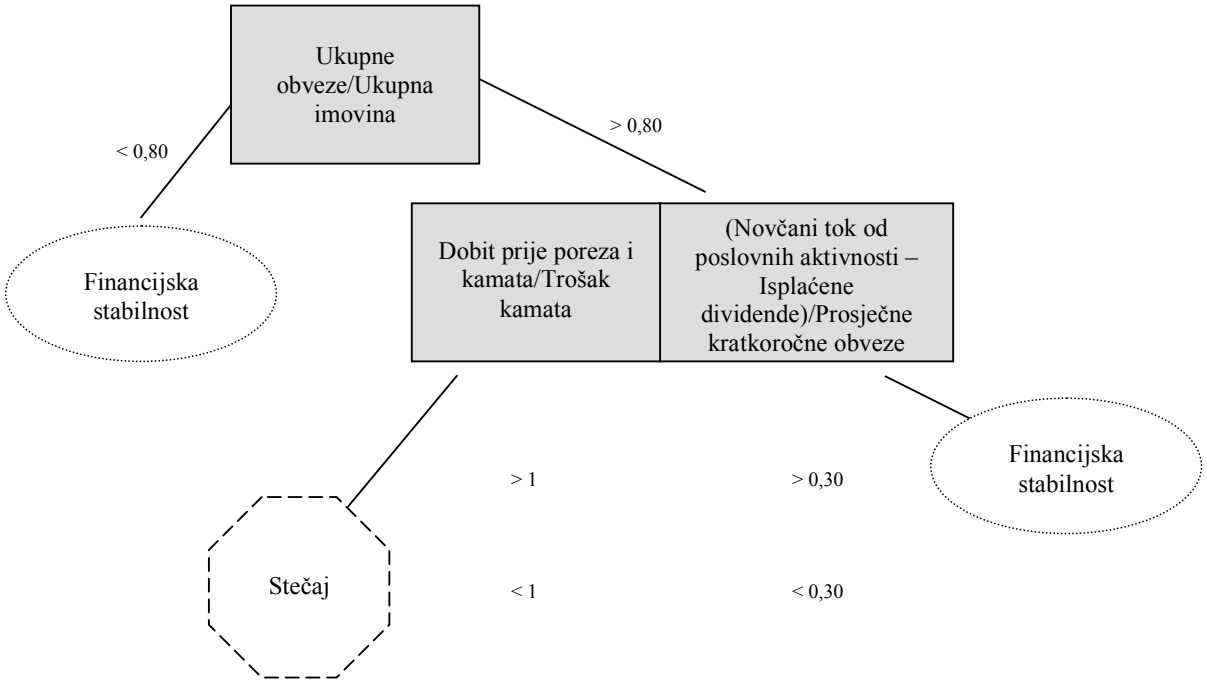
Stablo odlučivanja neparametarska je tehnika klasifikacije poslovnih subjekata na financijski zdrave i one koji ispunjavaju uvjete za pokretanje stečajnog postupka. Izrada stabla odlučivanja uključuje odabir uzorka poslovnih subjekata, njihovih financijskih i ostalih

signifikantnih obilježja, utvrđivanje pripadnosti poslovnih subjekata grupi financijski zdravih ili onih koji zadovoljavaju uvjete za pokretanje stečaja te procjenu troškova pogrešne klasifikacije. Uobičajeno je da se prilikom izrade stabla odlučivanja u svrhu predviđanja stečaja koriste financijski pokazatelji s odgovarajućim graničnim vrijednostima. Odabir pokazatelja i izračun njihovih graničnih vrijednosti određen je minimiziranjem pogreške klasificiranja poslovnih subjekata između različitih grupa.

Stablo odlučivanja prikazano Slikom 2. dijeli poslovne subjekte prema visini pokazatelja zaduženosti. Oni, kojima je pokazatelj zaduženosti manji od 0,80, smatraju se financijski stabilnim, dok se kod drugih pristupa daljnjoj analizi na temelju pokazatelja pokrića troškova kamata i novčanog pokrića kratkoročnih obveza. Ukoliko je pokazatelj pokrića troškova kamata veći od 1, a pokazatelj novčanog pokrića kratkoročnih obveza veći od 0,30 poslovni subjekt smatra se financijski stabilnim. U suprotnom slučaju on ispunjava uvjete za pokretanje stečajnog postupka.

Upotreba ove metode predviđanja stečaja vrlo je praktična zbog svoje fleksibilnosti, ali rezultira određenim problemima u smislu višestruke pojave istog pokazatelja, ali s različitim kritičnim vrijednostima kao i situacijama u kojima nisu zadovoljena oba uvjeta (primjerice kada je pokazatelj pokrića troškova kamata veći od 1, ali je novčano pokriće kratkoročnih obveza manje od 0,30).

Slika 2: Primjer stabla odlučivanja[4]



Izvor: Izradio autor

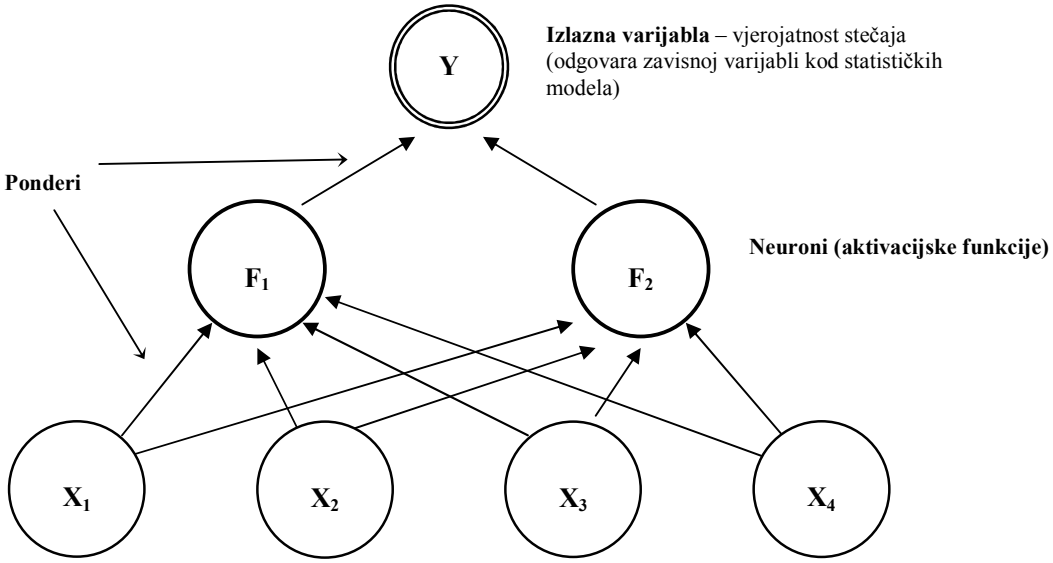
[4] Uz navedene pokazatelje mogu se javiti i neka druga obilježja poslovnih subjekata. Kritična vrijednost pojedinog pokazatelja na slici više je indikativnog karaktera i daje primjer stabla odlučivanja.

2.6. Neuronske mreže

Neuronske mreže, kao oblik nelinearne optimizacije, koje koriste različite pondere i funkcije s ciljem pretvaranja ulaznih podataka u korisne informacije, svoju primjenu pronalaze i u predviđanju stečaja. Funkcioniranje ove tehnike najbolje prikazuje Slika 3.

Slika 3.

Primjer neuronske mreže



Izvor: Prilagođeno prema Westgaard, 2005., str. 11.

Neuronske mreže sastavljene su od niza čvorišta raspoređenih po razinama.[5] Na najnižoj razini svako čvorište predstavlja jednu ulaznu varijablu koja može obuhvaćati financijsko ili neko drugo obilježje poslovnog subjekta. Između najniže, srednje i najviše razine postoje određene veze. Slično kao i kod statističkih modela, jakost veza između ulaznih i izlaznih varijabli, odnosno između različitih razina utvrđena je putem pondera. Srednja razina sastavljena je od neurona koji predstavljaju aktivacijske funkcije u okviru kojih se ulazne varijable transformiraju korištenjem zadane funkcije. Treća, najviša razina predstavlja izlaznu varijablu koju čini ponderirani zbroj neurona i koja zapravo prikazuje vjerojatnost nastupa uvjeta za pokretanje stečajnog postupka. Može se uočiti da statistički modeli o kojima je bilo ranije riječi predstavljaju zapravo posebne oblike neuronskih mreža.

4. PREGLED NAJZNAČAJNIJIH MODELA

Rastući broj statističkih i matematičkih metoda i atraktivnost problematike predviđanja stečaja naveo je veliki broj znanstvenika da istražuju navedeno područje što je rezultiralo

[5] Broj razina može biti različit. U primjeru je dana neuronska mreža s tri razine.

razvojem niza modela. Među njima su se, kao najviše citirani i/ili u praksi najviše korišteni, istaknuli modeli, nastali kao rezultat istraživanja, sljedećih autora:

- Williama H. Beawera,
- Edwarda I. Altmana,
- Edwarda B. Deakina,
- Jamesa A. Ohlsona,
- Roberta O. Edmistera,
- Christine V. Zavgren i
- Petera Kraliceka.

U nastavku će biti govora o istraživanjima navedenih autora pridržavajući se kronologije objave rezultata istraživanja u relevantnoj literaturi.

4.1. William H. Beawer

Korisnost financijskih pokazatelja William H. Beaver testirao je na primjeru predviđanja financijskog neuspjeha poslovnog subjekta gdje je pod neuspjehom podrazumijevao "nesposobnost poslovnog subjekta da podmiri dospjele financijske obveze" (Beawer, 1966, 71). Beawer je proveo empirijsko istraživanje na uzorku od 158 proizvodnih korporacija čijim se dionicama javno trgovalo. Uzorak je podijeljen na dvije jednake grupe. Prva grupa sastojala se od 79 korporacija koje su ušle u stečaj u razdoblju od 1954. do 1964. godine, dok je druga grupa obuhvaćala isti broj financijski zdravih korporacija. Za obje kategorije prikupljeni su financijski izvještaji, i to za razdoblje od pet godina prije pokretanja stečajnog postupka za prvu grupu, te za isto petogodišnje razdoblje za drugu grupu. Navedene korporacije poslovale su u 38 različitih djelatnosti, njihova aktiva varirala je od 600 tisuća do 45 milijuna dolara, dok je prosjek iznosio 6 milijuna dolara.

Za potrebe analize Beawer je izabrao 30 pokazatelja grupiranih u šest skupina. Odabir pokazatelja izvršen je na temelju sljedećih kriterija: 1. učestalo spominjanje pokazatelja u literaturi; 2. dobri rezultati pokazatelja pri predviđanju stečaja u prijašnjim istraživanjima ili 3. pripadnost skupini pokazatelja na temelju novčanog toka. Odabrani pokazatelji ispunjavali su jedan od navedenih kriterija. Na svakom pokazatelju proveden je klasifikacijski test raščlambe te je iz svake od šest skupina pokazatelja izabran onaj koji je imao najmanju pogrešku klasifikacije poslovnih subjekata na financijski zdrave i one u poteškoćama tijekom petogodišnjeg razdoblja promatranja. Tablica 1. prikazuje izabrane pokazatelje i pripadajuće pogreške klasifikacije svakog od njih. Pokazatelji su navedeni redom počevši od najpreciznijih prema manje preciznima.

Tablica 1.

Pogrešno klasificiranje poslovnih subjekata za šest najtočnijih pokazatelja u %

Rang	Pokazatelj	Godine prije stečaja				
		1	2	3	4	5
1	Novčani tok / Ukupne obveze	13	21	23	24	22
2	Neto dobit / Ukupna imovina	13	20	23	29	28
3	Ukupne obveze / Ukupna imovina	19	25	34	27	28
4	Kratkotrajna imovina / Kratkoročne obveze	20	32	36	38	45
5	Radni kapital / Ukupna imovina	24	34	33	45	41
6	(Kratkotrajna imovina – zalihe – kratkoročne obveze) / (Operativni troškovi – amortizacija – umanjenja imovine)	23	38	43	38	37

Izvor: Prilagođeno prema Beawer, 1966., str. 85.

4.2. Edward I. Altman

Zasigurno najznačajniji doprinos razvoju modela za predviđanje stečaja dao je Edward I. Altman. Godine 1968. objavio je rezultate prvog multivarijantnog istraživanja odnosa između financijskih pokazatelja i vjerojatnosti stečaja. Za razliku od Beawerovog jednovarijantnog modela, koji je istaknuo važnost pojedinih pokazatelja za predviđanje stečaja, Altman je smatrao da "upotreba samo jednog pokazatelja za predviđanje stečaja može dovesti do krive interpretacije, ukoliko je isti "uštiman" ili izjednačen se nekim drugim pokazateljima koji pokazuju drugačije vjerojatnost stečaja" (Tearney, Vitezić, 1996, 171).

Empirijsko istraživanje provedeno je na uzorku od 66 proizvodnih poslovnih subjekata čijim se vrijednosnim papirima javno trgovalo. Uzorak je bio podijeljen na dvije jednake grupe. Prva grupa obuhvaćala je proizvodne poslovne subjekte koji su pokrenuli stečajni postupak u razdoblju od 1946. do 1965. godine. Veličina aktive ove grupe poslovnih subjekata varirala je od 700 tisuća do 25,9 milijuna dolara s prosjekom od 6,4 milijuna. Druga grupa obuhvaćala je financijski stabilne poslovne subjekte iz iste djelatnosti i približno iste veličine aktive. Prikupljeni financijski izvještaji za poslovne subjekte iz obiju grupa odnosili su se na isto izvještajno razdoblje. Na temelju prikupljenih financijskih informacija izračunata su 22 financijska pokazatelja te su provedbom metode statističke analize pod nazivom multivarijantna diskriminantna analiza utvrđeni ponderi za svakog od njih. S obzirom da važnost među pokazateljima varira, izdvojeno je pet pokazatelja koji najbolje diskriminiraju financijski zdrave od poslovnih subjekata suočenih s pokretanjem stečajnog postupka. Razvijen model za predviđanje stečaja, poznat pod nazivom Z-score prikazan je jednadžbom (7).

$$Z = 0.012X_1 + 0{,}014X_2 + 0{,}033X_3 + 0{,}006X_4 + 0{,}999X_5 \qquad (7)$$

gdje je:

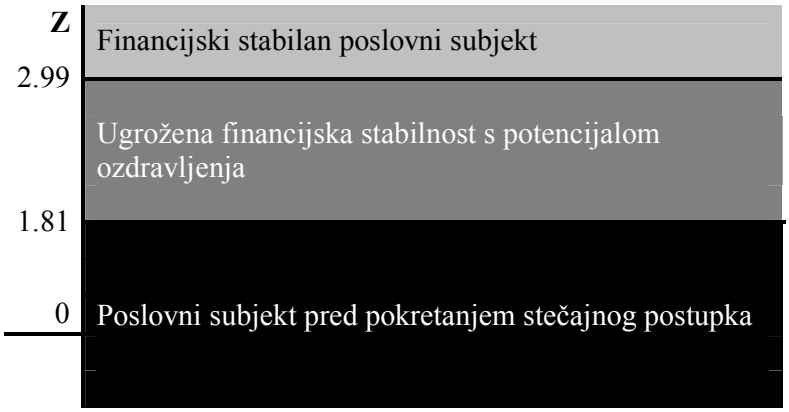
Z – vrijednost diskriminantne funkcije,
X_1 – radni kapital / ukupna imovina,
X_2 – zadržana dobit / ukupna imovina,
X_3 – dobit prije kamata i poreza / ukupna imovina,

X_4 – tržišna vrijednost glavnice / ukupne obveze (knjigovodstvena vrijednost) i
X_5 – prihodi od prodaje / ukupna imovina.

Daljnjom statističkom analizom izvedenog modela Altman je utvrdio kritične vrijednosti diskriminantne funkcije koje su prikazane Slikom 4.

Slika 4.

Kritične vrijednosti Z-score s pripadajućom ocjenom financijske stabilnosti



Izvor: Preuzeto od Zenzerović, 2005., str. 43.

Prema modelu, vrijednost Z-score poslovnog subjekta niža od 1,81 ukazuje na veliku opasnost od pokretanja stečajnog postupka, dok vrijednost iznad 2,99 znači da se radi o financijski stabilnom poslovnom subjektu. Vrijednosti unutar intervala od 1,81 do 2,99 predstavljaju tzv. "sivu zonu".

Nakon izvođenja diskriminantne funkcije, Altman je pristupio testiranju njezine točnosti na uzorku poslovnih subjekata i utvrdio je da preciznost opada kako se produžuje vremenski horizont predviđanja. Preciznost funkcije, odnosno modela prikazana je Tablicom 2.

Tablica 2.

Točnost predviđanja stečaja Z-score

Godine prije pokretanja stečajnog postupka	Postotak točnosti razvrstavanja
1	95
2	72
3	48
4	29
5	36

Izvor: Preuzeto od Altman, 1968., str. 604.

Budući da je navedeni model za predviđanje stečaja izveden korištenjem podataka proizvodnih poslovnih subjekata čije su vrijednosnice izlistane na burzi, Altman je u kasnijim istraživanjima izvršio dvije korekcije. Prva se odnosila na prilagodbu modela za predviđanje stečaja onim poslovnim subjektima čije vrijednosnice nisu izlistane na burzi, odnosno koji su u vlasništvu manjeg broja osoba. Sukladno tome, u brojniku varijable X_4 došlo je do zamjene

tržišne vrijednosti glavnice njezinom knjigovodstvenom vrijednošću, a prilagođeni su i ponderi pa novi model izgleda ovako:

$$Z' = 0{,}717X_1 + 0{,}847X_2 + 3{,}107X_3 + 0{,}420X_4 + 0{,}998X_5 \quad (8)$$

Prilikom tumačenja korigiranog modela potrebno je obratiti pozornost na kritične vrijednosti koji više ne iznose 2,99, odnosno 1,81, već 2,90 i 1,23.

Druga izmjena rezultat je nastojanja da se model prilagodi predviđanju stečaja neproizvodnih poslovnih subjekata. Iz modela je tako isključena varijabla X_5 jer se ona bitno razlikuje između različitih djelatnosti. Izmjenom modela došlo je do izmjene kritičnih vrijednosti koje sada iznose 2,60 i 1,10. Novi je model prikazan jednadžbom (9).

$$Z'' = 6{,}56X_1 + 3{,}26X_2 + 6{,}72X_3 + 1{,}05X_4 \quad (9)$$

4.3. Edward. B. Deakin

Edward B. Deakin u svojoj studiji, rezultate koje je objavio 1972., kombinira istraživanja Beawera i Altmana. Istraživanjem je obuhvatio uzorak od 64 poslovna subjekta koji su bili podijeljeni na dvije grupe. Prvu grupu činili su poslovni subjekti kod kojih je pokrenut stečajni postupak u razdoblju od 1964. do 1970. godine, dok su drugu grupu činili financijski zdravi poslovni subjekti. Kao i u ranijim istraživanjima, postojala je podudarnost između dviju grupa u pogledu veličine aktive, razdoblja na koje su se odnosili financijski izvještaji te djelatnosti poslovnih subjekata. Za potrebe provedbe istraživanja odabrano je 14 pokazatelja koje je koristio Beawer.

Prva analiza obuhvatila je upotrebu metodologije koju je koristio i Beawer, odnosno provođenje klasifikacijskog testa raščlambe. Nalazi su ukazali na tendenciju potvrđivanja zapažanja do kojih je došao isti autor.

Druga metoda obuhvaćala je provođenje multivarijantne diskriminantne analize nad istih 14 pokazatelja. Provođenjem ove metode statističke analize, Deakin je došao do spoznaje da eliminiranje varijabli s niskim ponderom u funkciji bitno utječe na povećanje pogrešnog klasificiranja poslovnih subjekata. Isto tako utvrdio je da se relativan značaj pokazatelja tijekom vremena mijenja iz čega je moguće zaključiti da sve varijable značajno utječu na diskriminacijsku sposobnost funkcije (Deakin, 1972, 173). Tablicom 3. prikazani su financijski pokazatelji uključeni u model s pripadajućim ponderima.

Tablica 3.

Financijski pokazatelji s pripadajućim ponderima po godinama prije pokretanja stečajnog postupka

Pokazatelji	Godina prije pokretanja stečajnog postupka				
	5	4	3	2	1
Novčani tok / Ukupne obveze	-0,250	0,094	0,104	-0,046	0,005
Neto dobit / Ukupna imovina	0,122	0,219	-0,585	0,378	0,083
Ukupne obveze / Ukupna imovina	0,220	-0,133	0,287	-0,225	-0,184
Kratkotrajna imovina / Ukupna imovina	0,406	-0,017	0,436	-0,410	-0,101
(Novac + utržive vrijednosnice) / Ukupna imovina	0,230	-0,062	-0,479	0,394	0,212
Radni kapital / Ukupna imovina	0,487	-0,054	0,106	0,102	-0,176
Novac / Ukupna imovina	0,621	-0,701	-0,205	-0,626	-0,900
Kratkotrajna imovina / Kratkoročne obveze	0,003	-0,001	-0,069	0,020	0,052
(Novac + utržive vrijednosnice) / Kratkoročne obveze	0,068	0,017	0,034	-0,065	-0,068
Novac / Kratkoročne obveze	-0,077	0,165	0,151	0,111	0,096
Kratkotrajna imovina / Prihodi od prodaje	-0,018	0,283	0,057	-0,060	-0,020
(Novac + utržive vrijednosnice) / Prihodi od prodaje	0,123	0,138	0,176	-0,014	-0,074
Radni kapital / Prihodi od prodaje	-0,009	0,243	-0,159	0,132	0,069
Novac / Prihodi od prodaje	-0,084	0,492	-0,055	-0,203	0,209

Izvor: Preuzeto od Deakin, 1972., str. 175.

4.4. James A.Ohlson

James A. Ohlson objavio je 1980. godine rezultate istraživanja koje je proveo na 2163 proizvodna poslovna subjekta u razdoblju od 1970. do 1976. godine. Uzorak je, slično kao i u prijašnjim istraživanjima, bio podijeljen na dva dijela, ali je za razliku od njih prvi dio obuhvaćao 105 poslovnih subjekata nad kojima je pokrenut stečajni postupak, dok je drugi sadržavao podatke 2058 financijski zdrava poslovna subjekta. Istraživanjem su prikupljeni financijski izvještaji poslovnih subjekata za razdoblje od tri godine prije pokretanja stečajnog postupka te su na temelju njih izračunati sljedeći pokazatelji:

1. veličina mjerena logaritmom odnosa ukupne imovine i indeksa bruto nacionalnog proizvoda;
2. pokazatelj zaduženosti kao odnos ukupnih obveza i ukupne imovine;
3. udio radnog kapitala u ukupnoj imovini;
4. odnos kratkoročnih obveza i kratkotrajne imovine;
5. dummy varijabla[6] 1 – 1, ukoliko su ukupne obveze veće od ukupne imovine i 0 ako je obrnut slučaj;
6. udio neto dobiti u ukupnoj imovini;
7. odnos novčanog toka od poslovnih aktivnosti i ukupnih obveza,
8. dummy varijabla 2 – 1, ukoliko je neto dobit negativna kroz posljednje dvije godine i 0 u ostalim slučajevima te
9. $\frac{NI_t - NI_{t-1}}{|NI_t| + |NI_{t-1}|}$ gdje je NI_t neto dobit u posljednjem razdoblju promatranja (Ohlson, 1980, 118).

Nakon izračuna pokazatelja provedena je logit statistička analiza koja je rezultirala izvedbom triju modela za predviđanje stečaja. Model 1 predviđa stečaj unutar prve godine, Model 2 unutar druge godine, pod uvjetom da nije pokrenut stečaj u prvoj godini, dok je Model 3 izveden za predviđanje stečaja unutar razdoblja od dvije godine. Tablicom 4. prikazana su tri modela za predviđanje stečaja s pripadajućim ponderima.

Tablica 4.

Ohlsonovi modeli za predviđanje stečaja

Model	Redni broj pokazatelja									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Konstan -ta**
Model 1										
Ponderi	-0,407	6,03	-1,43	0,0757	-2,37	-1,83	0,285	-1,72	-0,521	-1,32
Model 2										
Ponderi	-0,519	4,76	-1,71	-0,297	-2,74	-2,18	-0,78	-1,98	0,4218	1,84
Model 3										
Ponderi	-0,478	5,29	-0,99	0,062	-4,62	-2,25	-0,521	-1,91	0,212	1,13

Izvor: Prilagođeno prema Ohlson, 1980., str. 121.

Preciznost navedenih modela može se ocijeniti zadovoljavajućom. Naime, Model 1 točno predviđa stečaj u 96,12 % slučajeva, Model 2 u 95,55 %, dok preciznost Modela 3 iznosi 92,84 %.

Glavnim odrednicama predviđanja stečaja Ohlson smatra: veličinu, financijsku strukturu mjerenu pokazateljem zaduženosti, pokazatelje uspješnosti poslovanja koji uključuju odnos neto dobiti i ukupne imovine i/ili odnos novčanog toka od poslovnih aktivnosti i ukupnih

[6] Dummy varijable koriste se u slučajevima kada se u funkcijama žele istaknuti prisutnost ili odsutnost određenih obilježja. U situacijama kada je prisutno određeno obilježje dummy varijable poprimaju vrijednost 1, dok u suprotnom iznose 0.

obveza te naposljetku pokazatelje likvidnosti (udio radnog kapitala u ukupnoj imovini ili isti pokazatelj kombiniran s odnosom kratkoročnih obveza i kratkotrajne imovine).

4.5. Robert O. Edmister

Istraživanje problematike predviđanja stečaja uglavnom se odnosilo na srednje i velike poslovne subjekte. Razlog tome nalazio se u činjenici što su financijske informacije bile dostupnije za navedene subjekte, dok se do financijskih izvještaja malih poslovnih subjekata teže dolazilo. Robert. O. Edmister među prvima je pristupio istraživanju predviđanja stečaja malih poslovnih subjekata[7]. Istraživanje je obuhvatilo 19 u literaturi najčešće spominjanih financijskih pokazatelja prikladnih za predviđanje stečaja te su oni izračunati za 562 mala poslovna subjekta. Pod stečajem se podrazumijevala nesposobnost poslovnih subjekata da podmiruju dospjele rate kredita, te se nije zahtijevalo da nad njima bude formalno pokrenut stečajni postupak. Promatrani financijski izvještaji odnosili su se na razdoblje od 1958. do 1965. godine, a korištena je dobro poznata multivarijantna diskriminantna analiza. U odnosu na ranije studije, Edmister u istraživanje uvodi sljedeće novosti: korištenje trogodišnjeg prosjeka pokazatelja, korištenje trogodišnjeg trenda kretanja pokazatelja te odnos pokazatelja poslovnog subjekta s prosječnim pokazateljem djelatnosti. Obilježje su Edmisterovog modela dummy varijable koje ovise o vrijednosti izračunatih pokazatelja. Model za predviđanje stečaja prikazan je jednadžbom (10).

$$z = 0{,}951 - 0{,}423X_1 - 0{,}293X_2 - 0{,}482X_3 + 0{,}277X_4 - 0{,}452X_5 - 0{,}352X_6 - 0{,}924X_7 \quad (10)$$

gdje je:

z – vrijednost diskriminantne funkcije,

X_1 – 1 ukoliko je čisti novčani tok / kratkoročne obveze manji od 0,05, a 0 u ostalim slučajevima,

X_2 – 1 ukoliko je glavnica / prihodi od prodaje manji od 0,07, a 0 u ostalim slučajevima,

X_3 – 1, ukoliko je (radni kapital / prihodi od prodaje) / (radni kapital $_{\text{ukupne djelatnosti}}$ / prihodi od prodaje $_{\text{ukupne djelatnosti}}$) manji od – 0,02, a 0 u ostalim slučajevima,

X_4 – 1, ukoliko je (kratkoročne obveze / glavnica) / (kratkoročne obveze $_{\text{ukupne djelatnosti}}$ / glavnica $_{\text{ukupne djelatnosti}}$) manji od 0,48, a 0 u ostalim slučajevima,

X_5 – 1, ukoliko (zalihe / prihodi od prodaje) / (zalihe $_{\text{ukupne djelatnosti}}$ / prihodi od prodaje $_{\text{ukupne djelatnosti}}$) ima rastući trend[8] i manji je od 0,04, a 0 u ostalim slučajevima,

X_6 – 1, ukoliko pokazatelj ubrzane likvidnosti / pokazatelj ubrzane likvidnosti $_{\text{ukupne djelatnosti}}$ ima padajući trend i manji je od 0,34, a 0 u ostalim slučajevima i

X_7 – 1, ukoliko pokazatelj ubrzane likvidnosti / pokazatelj ubrzane likvidnosti $_{\text{ukupne djelatnosti}}$ ima rastući trend, a 0 u ostalim slučajevima (Edmister, 1972, 1489).

Preciznost predviđanja Edmisterovog modela prikazana je Tablicom 5.

[7] Pod malim poslovnim subjektima Edmister je podrazumijevao one koji su kod Agencije za mala poduzeća (Small Business Administration) podigli kredit ili kojima je ista izdala garanciju.
[8] Trend se promatra za trogodišnje razdoblje.

Tablica 5.

Točnost predviđanja stečaja Edmisterovog z-pokazatelja

Edmisterov z-pokazatelj	Postotak točnosti razvrstavanja	
	Pokrenut stečaj	Financijski zdravi poslovni subjekti
- 0,469	80	100
0,470 – 0,519	85	95
0,520 – 0,529	90	95
0,530 -	100	86

Izvor: Preuzeto od Edmister, 1972., str. 1489.

4.6.Christine V. Zavgren

Kao temelj za provedbu istraživanja problematike predviđanja stečaja, Christine V. Zavgren odabrala je varijable čiju je signifikantnost, provedbom faktorske analize, utvrdio George E. Pinches. Radi se o pokazateljima koji prikazuju sve značajnije financijske aspekte poslovanja i koji su relativno stabilni kako u dugom, tako i u kratkom roku. Navedeni pokazatelji prikazani su u nastavku:

1. Obrtaj zaliha (OZ) = Prosječne zalihe / Prihodi od prodaje
2. Obrtaj potraživanja (OP) = Prosječna potraživanja / Prosječne zalihe
3. Novčana pozicija (NP) = (Novac + utržive vrijednosnice) / Ukupna imovina
4. Trenutna likvidnost (TL) = (Novac + utržive vrijednosnice) / Kratkoročne obveze
5. Povrat na ulaganja (ROI) = Dobit iz redovnih aktivnosti / Dugoročni izvori sredstava
6. Financijska poluga (FP) = Dugoročne obveze / Dugoročni izvori sredstava
7. Obrtaj kapitala (OK) = Prihodi od prodaje / (Fiksna imovina + radni kapital)

Za potrebe analize primijenjena je logit analiza. Uzorak se sastojao od 45 proizvodna poslovna subjekta nad kojima je pokrenut stečajni postupak i isto tolikog broja financijski zdravih subjekata odgovarajuće veličine i djelatnosti. Promatrano je razdoblje od 1972. do 1978. godine. Nalazi istraživanja predočeni su Tablicom 6.

Tablica 6.

Rezultati logit analize za pet godina

Godina prije pokretanja stečajnog postupka	Pokazatelji							
	Konstan-ta	OZ	OP	NP	TL	ROI	FP	OK
1	-0,23883	0,00108	0,01583	0,10780	-0,0307	-0,0049	0,04350	-0,0011
2	-2,61060	0,04185	0,02215	0,11231	-0,0269	-0,0144	0,04464	0,00063
3	-1,51150	0,06257	0,00829	0,14248	-0,0155	0,00519	0,01822	0
4	-5,94570	0,09157	0,01667	0,05917	-0,0041	0,0195	0,04100	0,00363
5	-6,87660	0,08835	0,00692	0,15786	-0,0002	-0,023	0,04311	0,00798

Izvor: Preuzeto od Zavgren, Friedman, 1988., str.38.

4.7.Peter Kralicek

Peter Kralicek među poznatijim je neameričkim istraživačima koji je provodeći multivarijantnu diskriminantnu analizu izveo model za predviđanje stečaja. Koristeći se podacima iz financijskih izvještaja njemačkih, švicarskih i austrijskih poslovnih subjekata, Kralicek je izveo sljedeći model:

$$DF = 1{,}5X_1 + 0{,}08X_2 + 10X_3 + 5X_4 + 0{,}3X_5 + 0{,}1X_6 \quad (12)$$

gdje je:

DF – Vrijednost diskriminantne funkcije,
X_1 – Čisti novčani tok / Ukupne obveze,
X_2 – Ukupna imovina / Ukupne obveze,
X_3 – Dobit prije kamata i poreza / Ukupna imovina,
X_4 – Dobit prije kamata i poreza / Ukupni prihodi,
X_5 – Zalihe / Ukupni prihodi i
X_6 – Poslovni prihodi / Ukupna imovina.

Kralicekov DF pokazatelj može poprimiti pozitivne i negativne vrijednosti, pri čemu negativne vrijednosti ukazuju na insolventnost, a pozitivne na solventnost poslovnog subjekta. Kritične vrijednosti DF pokazatelja prikazane su Tablicom 7.

Tablica 7.

Kritične vrijednosti DF pokazatelja s pripadajućom ocjenom financijske stabilnosti

Vrijednost DF pokazatelja	Financijska stabilnost
> 3.0	IZVRSNA
> 2.2	VRLO DOBRA
> 1.5	DOBRA
> 1.0	OSREDNJA
> 0.3	LOŠA
≤ 0.3	POČETAK INSOLVENTNOSTI
≤ 0.0	UMJERENA INSOLVENTNOST
≤ -1.0	IZRAZITA INSOLVENTNOST

Izvor: Prilagođeno prema Koban, 1978.

5. NEKA OTVORENA PITANJA PRI PREDVIĐANJU STEČAJA

Financijski pokazatelji najčešće su korišteni, iako ne i jedini, instrumenti za predviđanje stečaja. Njihova upotreba u statističkim i matematičkim metodama analize rezultirala je razvojem niza modela za predviđanje stečaja o kojima je ranije bilo riječi. Teorijski i praktični doprinos modela je neupitan, iako postoje određena ograničenja u njihovoj primjeni. Uz ograničenja koja proizlaze iz nedostataka određene statističke i/ili matematičke metode analize i pretpostavki kojih se potrebno pridržavati prilikom njihove provedbe, potrebno je naglasiti da su se u izvođenju svih modela koristili podaci iz uzorka poslovnih subjekata. Nadalje, modeli su izvedeni na temelju podataka iz 60-tih i 70-tih godina prošlog stoljeća. Otada su se tržišni i ostali uvjeti poslovanja bitno izmijenili, a pojavio se i čitav niz "novih" industrija te je vjerojatno da bi za primjenu modela u današnjim uvjetima bila potrebna njihova odgovarajuća korekcija. Isto tako glavnina modela izvedena je koristeći podatke poslovnih subjekata koji posluju u Sjedinjenim Američkim Državama ili u nekim drugim razvijenim tržišnim gospodarstvima gdje su društveno-ekonomski, institucionalni i ostali uvjeti poslovanja ipak značajno drugačiji nego što je to slučaj u tranzicijskim gospodarstvima, poput hrvatskog. Stoga se, kao otvoreno područje za buduća istraživanja, nameće potreba izvođenja modela za predviđanje stečaja poslovnih subjekata koji obavljaju djelatnost u tranzicijskim gospodarstvima, odnosno gospodarstvima niže razvojne razine.

Uz relevantne financijske pokazatelje, sve veću važnost zauzimaju kvalitativni pokazatelji, varijable povezane s korporativnim upravljanjem i stanje u okruženju. Njihovom kombinacijom, kao kvalitativnom nadopunom tradicionalnih modela, moguće je očekivati daljnja poboljšanja na području predviđanja stečaja. Imajući na umu činjenicu da su poslovni subjekti, s aspekta varijabli koje utječu na njihovo poslovanje, izuzetno kompleksni pa je kod njih posebno naglašeno obilježje stohastičnosti, nerealno je očekivati izvođenje optimalnog modela za predviđanje stečaja. Ipak, dovoljno dobra aproksimacija stvarnosti i odabir signifikantnih varijabli može rezultirati relativno pouzdanim modelom koji svoju široku primjenu može pronaći i u praktičnoj upotrebi na što ukazuju ranije prezentirani modeli.

6. ZAKLJUČAK

Dinamični tržišni uvjeti dovode do eliminacije nedovoljno djelotvornih i učinkovitih poslovnih subjekata. Stoga je u teorijskim raspravama, ali i praksi već niz godina naglasak stavljen na anticipiranje vrijednosti varijabli kojima je moguće predvidjeti stečaj. Znanstveni pristup predviđanju stečaja doveo je do razvoja niza modela izvedenih korištenjem statističkih i matematičkih metoda počevši od diskriminantne analize, pa sve do kompleksnih matematičkih i simulacijskih tehnika koje podrazumijevaju upotrebu računala. Prikazani modeli za predviđanje stečaja sastoje se uglavnom od kombinacije financijskih pokazatelja kojima se izračun temelji na podacima iz financijskih izvještaja i kao takvi obuhvaćaju kvantitativne aspekte poslovanja. Iako su financijski izvještaji vrijednosni odraz realne stvarnosti poslovnog subjekta, njima nije moguće u potpunosti obuhvatiti kompleksnost poslovanja pa se stoga kao nadopuna modelima za predviđanje stečaja sugerira korištenje kvalitativnih varijabli koje u prvom redu obuhvaćaju atribute korporativnog upravljanja i stanje u okruženju u kojem poslovni subjekt djeluje. Ovo posebice dolazi do izražaja u tranzicijskim gospodarstvima gdje kvaliteta financijskog izvještavanja nije dosegnula zadovoljavajuću razinu i gdje je institucionalni okvir poslovanja podložan kontinuiranim promjenama zbog čega su poslovni subjekti suočeni s dodatnom razinom neizvjesnosti. Unatoč tome, ipak se ističe potreba razvoja modela prikladnog za predviđanje stečaja u tranzicijskim gospodarstvima čemu se do sada nije sustavno i znanstveno utemeljeno pristupilo, a prethodno prikazane metode analize i izvedeni modeli daju zadovoljavajuću osnovu za daljnja istraživanja.

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KRATKI OSVRT NA MODELE ZA PREDVIĐANJE STEČAJA

SAŽETAK

Uvijek aktualna problematika stečaja navela je niz autora na istraživanje u navedenom području. Znanstveni pristup problematici stečaja, u okviru kojeg je primjenjivan niz statističkih i matematičkih metoda analize, rezultirao je izvedbom različitih modela. Radom su prikazane najčešće korištene statističke i matematičke metode, nakon čega je dan pregled modela za predviđanje stečaja koji su u teoriji i praktičnoj primjeni zauzeli najistaknutije mjesto. Također, ukazano je na ograničenja modela za predviđanje stečaja i utvrđene su smjernice za buduća istraživanja. Modeli su uglavnom izvedeni korištenjem financijskih informacija poslovnih subjekata koji obavljaju djelatnost u razvijenim tržišnim gospodarstvima, te se kao otvoreno područje za buduća istraživanja nameće razvoj modela za predviđanje stečaja poslovnih subjekata u tranzicijskim gospodarstvima.

Ključne riječi: *Financijska stabilnost, stečaj, model za predviđanje stečaja, statističke i matematičke metode*