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Arengud ja ümberstruktureerimine

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C.

TÖÖSTUS 4.0

Sissejuhatavaid mõtteid hetkeolukorrast

Saksa valituse ja tööstuse esindajate ühine tulevikuprogramm-platvorm – *Tööstus 4.0* (saksa keeles – Industrie 4.0), tähendab kõikehõlmavat ja järjepidevat toote või teenuse loomise, logistika ja kasutamise digitaalset võrgustumist. Tihti räägitakse sellest kui neljandat tööstusrevolutsiooni vallandavast momendist.[1] Konventsionaalse automatiseerimise puhul analoogses maailmas on masinad programmeeritud niimoodi, et nad teatud kindlatele signaalidele reageerides võtavad üle üksikuid funktsioone. Platvormi *Tööstus 4.0* stsenaariumid hõlmavad terveid süsteeme. Need süsteemid toimivad suures ulatuses iseseisvalt nii impulssidele reageerimisel, järgnevate protsessifaaside plaanimisel ja vastavate automatiseerimisprogrammide genereerimisel kui ka esilekutsutud protsesside kontrollimisel. Inimeste ja masinate liidesekohad on selles suhtes põhimõtteliselt muutunud. Reaalne ja digitaalne, teise sõnaga virtuaalne maailm sulanduvad üha enam kokku. Seejuures tekib mitmetasandiline ja omavahel põimunud andmemassiiv, mis hinnanguliselt kahekordistub iga kahe aasta möödudes ja mille mahtu mõõdetakse triljonite ühikutega (Big Data).[2]

Uusi teadmisi hangitakse tänapäeval rohkem kui ei kunagi varem intensiivse uurimistöö tulemusena. Uurimistulemuste baasil arendatakse digitaalsete tehnoloogiate abil täiesti uuelaadseid tooteid. Uurimis- ja arendustöö on platvormi *Tööstus 4.0* alustaladeks. See mõiste ei hõlma aga mitte ainult – kuigi nimetuse järgi võiks seda arvata – uusi ja pidevalt edasiarendatavaid materiaalseid tooteid nagu kõrgtehnoloogilised tootmisvahendid ja tarbekaubad, mille puhul üha suureneva osa väärtusloomest moodustavad pooljuhid ja tarkavara, vaid *Tööstus 4.0* hõlmab ka mittemateriaalsete toodete tekkimise. Tegu on siinkohal teenustega, mis tulenevad võrgustunud tootmisportsesside andmetest ja mille põhjal rakenduvad tehnilised uuendused.

Pärast USA subprime-kinnisvaralaenude kriisist rulluma hakanud finantskriisi, mis saavutas oma kõrgpunkti 2008. aastal ja mis viis pankade ja praegugi veel kestva riigivõlgade ja eurokriisini, pole maailma majanduskasv veel täielikult toibunud. Aga tänu platvormi *Tööstus 4.0* abil hoo sisse saanud tehnilisele pöördele on paljudes tööstusriikides märgata tagasihoidlikku, ent – nagu näib – fundamentaalset majandustegevuse elavnemist.

Suurim osa saadaolevatest toorainetest läheb tööstuse tarbeks. Koos erasektoriga kasutatakse tööstuses ka kõige rohkem primaarset ja elektrienergiat. Pidades silmas seda, et looduslikud ressursid nagu õli, maagaas ja mitmed metallid on järjekindlalt vähenemas, siis võivad digitaalselt juhitavad väärtusloomeahelad ja seeläbi saavutatav tööstuslike tootmisprotsesside efektiivsem juhtimine luua olulise baasi jätkusuutlikuks majanduskasvuks.

Logistika, toote või teenuse loomise ja kasutamise võrgustumine areneb üha edasi ja hõlmab peagi kõiki rahvamajanduse tasandeid. Ka eramajapidamisi puudutab see tulevikus üha kasvavamal määral. Niisugusteks väljakutsuvateks muudatusteks ei pea

[1] Tehniliste revolutsioonide järjekorras 1. aurumasin, 2. elektrifitseerimine ja konveier 3. arvuti.
[2] 10^{18} = eksabaiti; edaspidi tullakse veel selle juurde tagasi.

valmis olema mitte ainult riikide valitsused ja nende majandussüsteemid, ka kogu ühiskonna identiteet hakkab edaspidi muutuma. See ilmneb juba praegu noorte põlvkondade harjumuste, huvide ja maailmavaate selgesti tuntavas teisenemises.

Tööstus 4.0 vallandab töömaailma fundamentaalse ümberkujundamise. Üha enam tööjõudu asendatakse intelligentsete algoritmide ja robotidega. Sellest pole puudutatud mitte ainult väljaõppeta töötajad vaid ka inimesed, kellel on nn teadmistepõhine haridus ja väljaõpe nagu oskustöölised, pangaametnikud, advokaadid, isegi ka arstide kutsetöös toimuvad põhjapanevad muudatused. Teisest küljest vajatakse aga üha enam vastava haridusega tarkvara- ja kommunikatsioonitehnoloogia personali, seda ka süsteemitehnika (*Systems Engineering*) alal. Tekivad uute ülesannetega uued elukutsed nagu näiteks andmeteadlased (*Data Scientists*), kes struktureerimata andmemassist filtreerivad välja püstitatud eesmärkide saavutamise jaoks vajalikku informatsiooni.

Töötegemine on tulevikus tunduvalt vähem konkreetse aja ja kohaga seotud kui see on praegu. Paindlik tööülesannete täitmine nagu näiteks töötamine kodus või interneti kaudu (*crowdworking*) levivad järjest enam.

Töötajatel tuleb omaks võtta teistsugune mõtlemine ja õppida end sisse lülitama moodsatesse tootmisprotsessidesse. Näiteks võib olla vajalik, et töötaja lülitub ühtsesse võrku intelligentsete robotitega (APAS – automatiseeritud tootmisassistendid), mis on salvestanud olulised tööülesande andmed ja mis toetavad inimtööjõudu pidevalt tähtsa informatsiooni edastamisega (*Cyber Physical System*).

Kuna üldine tendents on selline, et uusi tooteid arendatakse ja testitakse arvutis ja nende tootmiseks vajalikke protsesse simuleeritakse kõigepealt virtuaalselt, siis otsitakse eelkõige niisuguseid töötajaid, kes rakendatavaid arvutiprogramme valdavad. Nad peavad olema võimelised mõistma komplekssseid andmemassiive ja neid eesmärgipäraselt töötlema. Peale selle on nõutav iseseisev ja ettehaarav mõtlemis- ja sisseelamisvõime, täpsus, loomingulisus, vastutustunne, samuti võime ja valmidus koostöö tegemiseks. Kellel kirjeldatud omadusi ei ole ja pole ka eeldusi nende omandamiseks, siis tulevikus läheb niisugustel inimestel töö leidmine üha raskemaks või tuleb neil leppida vähemtasustatava tööga. Kasvava digitaliseerumisega vajatakse üha vähem lihtsat käelist tegevust nõudvat või rutiinset tööd. Niisugused tööd jäävad masinate teha. 18.sajandil kasutusele võetud aurumasin ja mehaanilised kangasteljed kutsusid esile esimese tööstusrevolutsiooni, mille kaasnähte nagu suurenev tööpuudus, palgadumping ja tööliste ülestõusud tuleb igati vältida. Siinkohal on hädavajalik riigi profülaktiline abi piisavate võimaluste loomisel kõrgekvaliteedilise välja- ja ümberõppe ning täienduskoolituse saamiseks. Tuleb ära hoida olukorra tekkimine, kus *summa summarum* rohkem töökohti kaob kui neid juurde tekib.

Digitaalne võrgustumine on riigipiiride ülene, seetõttu peavad riigid oma rahvamajandust fundamentaalseteks muutusteks ette valmistama. Kuna innovatsioon nii tootmismenetluste kui ka toodete valdkonnas hakkab tulevikus tootlikkuse tõstmises ja seega ka riikide rahvusvahelises konkurentsivõimes üha otsustavamat rolli mängima, tuleb tugevdada valmidust ja võimekust innovatsioonideks, ühtlasi ka nende kiiret ellurakendamist. Mis oleks sellest kasu, kui mõne riigi ettevõtted on edukad innovaatiliste menetluste või toodete väljatöötamisel, ent teiste riikide rahvusvahelist konkurentsi pakkuvad ettevõtted uusi ja süsteemselt hästi kombineeritavaid ideid kiiremini

realiseerivad? Seepärast on iga üksiku riigi ettevõtete jaoks tähtis välja võidelda edumaa uute teadmiste saamisel, luua nii innovaatiliselt kui ka tehnoloogiliselt laiapõhjaline baas ja olla sel viisil konkurentidest alati ees. Selle eesmärgi saavutamiseks tuleb kasuks koostöö IT-valdkonna tunnustatud spetsialistidega, kes on oma erialal juba midagi saavutanud. Kõne alla tuleks ka nn start-up-firmad (idufirmad), kelle sageli erakordset ideede rikkust saab kasutada oma juba olemasolevate teadmiste ja kogemustega kombineerides. Ka suurettevõtetele annab see võimaluse mitmekülgseks arenguks. Seepärast võiks igakülgne üksteise aitamine olla kõigile osapooltele kasulik.

Seoses kasvava andmeedastusega võrgustatud masinate ja digitaliseeritud tarnekettide vahel interneti teel suureneb andmevarguste ja küberrünnakute oht viiruste ja troojalaste abil. Pahavara programmid nagu Stuxnet, Duqu ja Flame on sihikule võtnud digitaalsed kontrollsüsteemid ja võivad põhjustada seda, et nakatunud arvuteid võib kasutada spionaažiks ja neist on võimalik üles leida salajasi konstruktsioonipatente ja uusi tootedetaile või neid koguni võõrjuhtimisele allutada. Efektiivseid krüpteerimistehnoloogiaid vajatakse tänapäeval rohkem kui ei kunagi varem. Andmevoogude turvamist ja pidevat kontrolli tuleb pidada platvormi *Tööstus 4.0* rakenduste esmajärgulise tähtsusega ülesanneteks. See on väga oluline näiteks siis, kui masinad ja seadmed riigipiiri üleselt interneti teel kaughoolduseks või andmete analüüsiks üksteisega ühendatakse. Eriliseks väljakutseks kujuneb andmete kindlustamine juhul, kui kommunikatsioon toimub üleilmsete platvormide nagu suurte USA kontsernide pilveteenuse pakkujate kaudu.

Selleks et uurimis- ja arendustöö piiride üleselt koopereerudes vabalt areneda saaks, tuleb väljatöötatud tulemuste kaitseks püstitada üldkehtivad patendi- ja autoriõiguse reeglid. Seejuures tuleb luua aus tasakaal eelkõige nimetatud õiguse omaniku ja tarbija huvide vahel. Vajalik on ka selgeks teha vastutuse küsimus juhtudel, kui näiteks süsteemid autonoomselt kommunitseeruvad ja vastavate algoritmide alusel tootmisinformatsiooni välja nõuavad ja nii selle omandamine õiguslikult siduvaks muutub. Kogu õiguslik regulatsioon peab olema praktikaga tihedalt seotud ja haarama kõiki majandusharusid.[3] Spionaaži, sabotaaži ja muude kriminaalsete mõjutuste vastu võitlemisel ja silmas pidades absoluutset vajalikkust nii siseriiklikule kui ka rahvusvahelisele küberkuritegevusele täie karmusega vastu astuda, tuleb tagada ka tarbijakaitse.

Kõik ettevõtted alates nn üleilmsetest tegijatest (*Global Players*) kuni väikeettevõteteni peavad vastama platvormi *Tööstus 4.0* väljakutsetele. Muidu tekib oht, et neil kaob kontakt võrgustunud väärtusloomeahelatega ja seega kaotavad nad ka juurdepääsu

[3] vastavalt eesmärgile tihedas koostöös tööstusega, nagu näiteks digitaalühenduse Bitkom „Allianz für Cybersicherheit“ (Küberturvalisuse Liit).
Spionaaži, sabotaaži ja muude kriminaalsete mõjutuste vastu võitlemisel ja silmas pidades absoluutset vajalikkust nii siseriiklikule kui ka rahvusvahelisele küberkuritegevusele täie karmusega vastu astuda, tuleb tagada ka tarbijakaitse.
Vastusena platvormi *Tööstus 4.0* loomisele rajasid USA-s kontsernid Cisco, IBM ja General Electric oma platvormi ***I**ndustrial **I**nternet **C**onsortium* (IIC). Nüüdseks on sellega ühinenud rohkem140 firmat, sealhulgas on ka Saksa ettevõtted nagu Bosch, Siemens ja SAP. Platvormi liikmed teevad koostööd praktilisi katseid tehes. Liikmete väidete põhjal pole tegemist standardite konkureerimisega, vaid uurimisprojektide mitmekesisusega.

efektiivsust tõstvatele ning kulusid vähendavatele informatsiooni ja kaupade voogudele. Seni praktiseeritavat niššipoliitikat tulevikus enam ei eksisteeri. Teisest küljest on edaspidi kõikide väikeste ja keskmiste ettevõtete kaasahaaramine vältimatu, et tagada tervenisti võrgustunud protsessid ja lõppeesmärgina ka platvormi *Tööstus 4.0* edu. Niisugused firmad seisavad siiski spetsiifilise probleemi ees – nad ei suuda finantseerida töötajate staapi, kes tegeleks üksnes digitaliseerumisest tulenevate ülesannetega. Neil tuleb pöörduda kompetentsikeskuste poole või omakorda otsida sellealast koostööd. Kui selline tee valitakse, siis on tähtis saavutada, et säiliks äriline iseseisvus. Igal juhul tuleb aga tagada, et veel keegi kolmas ei pääseks ettevõtte spetsiifilistele andmetele kontrollimatult ligi.

Tehnilise progressi edasiviiv jõud mõjutab praktiliselt kõiki majandusalasid.[4] Isegi põllumajandusel tuleb alluda nendele väljakutsetele. Aastaks 2050 elab maakeral eeldatavasti üheksa miljardit inimest. Kõikide inimeste piisavaks ja tervislikuks toitmiseks tuleb leida teid ja vahendeid, et jätkusuutlikult parandada saagikust ja saagi kvaliteeti ning vähendada kadusid saagikoristusel. Ainult eesrindlik põllumajandus suudab innovaatiliste tehnoloogiate abil tagada toiduainetega varustamist vajalikus koguses ja tervist mitteohustava kvaliteediga.

Kui arvestada üksikute kaupade kvaliteedi paranemist, siis on aastate jooksul – hoolimata hindade numbrilisest kasvust – hinnad suhteliselt alanenud. See kehtib üldjoontes nii masina- ja seadmeehituse, auto- ja elektroonikatööstuse ning muude tööstusharude toodete kohta, aga ka teenuste kohta nagu kommunikatsioon, liiklus, meelelahutus, vahendamine, nõustamine, hooldamine.

Tööstus 4.0 tähendab seda, et tööstusmaad on astunud uude ajajärku, mida iseloomustab tootlikkust tõstvate toodete ja teenuste innovatsiooni lakkamatu tulv. Selle kogumajanduslik mõju erineb tunduvalt tasase arengu varasematest järelnähtustest, mis väljendus hinnaindeksites ja sisemajanduse koguprodukti mõõdukates kasvunäitajates. Peaaegu kõik majanduse valdkonnad on sellest mõjutatud. See kehtib ka majandussektori, eriti pangandussektori kohta. Niisiis tuleb muuhulgas hakata järele mõtlema, kas ja kuidas rahapoliitika eesmärki kohandada uue trendiga.

Euroopa Keskpank (EKP) loodi 1998. aastal. Panga eesmärgiks on hinnataseme stabiilsuse tagamine. Põhikirjas pole seda taset täpsemalt defineeritud. Kuna hinnad väljendatakse numbriliselt ja koondatakse üldmajanduslikult vaatepunktist lähtudes indeksitesse, siis konkretiseeris EKP nõukogu operatiivset sihtarvu harmoniseeritud tarbijahinnaindeksi kaudu. Nõukogu liikmetele oli seejuures selge, et majanduses pole midagi absoluutset ja et statistiliste andmete ja nende abil arvutatud tulemuste abil ei saa teha täpseid järeldusi tegelikkuse kohta. Seepärast ei nimetanud nad sihtarvuks mitte kindlat indeksi väärtust, vaid leppisid kokku vahemikus, mille suuruseks on *„null kuni kaks protsenti“*. Seega loeti iga kallinemist alates kahest protsendist kuni nullini kooskõlas olevaks verbaalselt defineeritud eesmärgiga.

[4] Näiteks tervishoiu alal tehakse praktilisi katseid patsientide telemeditsiinilise jälgimisega, mille puhul automaatselt edastatakse arstile mobiilside kaudu patsientide verenäitajad, kehatemperatuur, pulsi sagedus jms. Võrgupõhise analüüsiplatvormi abil saab arstipraksises ajaliselt paralleelselt kontrollida, kas patsient on õige ravimikoguse sisse võtnud.

Masuaastal 2003 muutis EKP nõukogu selle eesmärgi vahemikku, milleks sai *„vähem kui kaks protsenti, aga kahe protsendi piirimail“*. Niisiis tõmmati eesmärgiks võetud vahemikku koomale ja tõsteti nulljoont silmas pidades.

Kuigi nii tolleaegsed kui ka praegused hinnaarengud väliselt sarnanevad, olid ja on nende peamised põhjused täiesti erinevad. 2003. aastal olid majanduses määravaks konjunktuursed, niisiis rohkem lühiajaliselt mõjuvad tegurid. Lühiajaliste häiretega tuleb põhimõtteliselt võidelda just antud eesmärgiks loodud vastumeetmetega.

Õigupoolest on ebaaus niisuguses olukorras hakata saavutamata jäänud eesmärgipüstitust korrigeerima vastavalt tegelikule majanduspoliitilisele arengule. See võrduks samaga, kui mittesaavutatud keskkonnaalaseid sihte püütaks tagantjärele varjata standardite kohandamisega. Asjakohane poliitika oleks tolleaegsete raamtingimuste puhul nõudnud eesmärgile viivaid meetmeid, mitte aga eesmärgi korrigeerimist. Üldiselt pole aga rahapoliitika ülesandeks konjunktuuripoliitikat ajada, vaid maksupoliitikat arvestades hoolitseda rahaväärtuse stabiliseerimise eest.

Tööstus 4.0 on muutnud makroökonoomika toimimise raamtingimusi. Ka rahapoliitikal tuleb sellele vastavalt häälestuda. Tõstatub küsimus, kas 2003. aastal ettevõetud rahapoliitilise eesmärgi muudatus on asjakohane veel tänapäevalgi. *Tööstus 4.0* kujundab olulisel määral nii praegusi kui ka tulevasi hinnaarenguid. See tähendab seda, et jätkuv majanduse digitaliseerimine ja sellest tulenevad edusammud tootlikkuses kompenseerivad tulevikus senisest enam hindade kallinemist mõjutavaid tegureid. Järelikult tuleb väga ebamääraselt formuleeritud hinnataseme ülempiiri *„vähem kui kaks protsenti, aga kahe protsendi piirimail“* ka edaspidi kirjeldatud arengutendentsidele kohandada.

August 2015

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Eesti

INDUSTRIE 4.0

Gedanken zur gegenwärtigen Situation

Mit der neu etablierten Plattform *Industrie 4.0* ist eine umfassende und fortschreitende digitale Vernetzung von Leistungerstellung und Logistik sowie Leistungverwertung gemeint. Oft wird vom auslösenden Moment zur vierten industriellen Revolution[1] gesprochen. Bei konventionellen Automatisierungen in der analogen Welt sind Maschinen darauf programmiert, dass sie auf bestimmte Signale nur einzelne Funktionen übernehmen. Industrie-4.0-Szenarien umfassen dagegen ganze Systeme. Diese Systeme sind weitgehend verselbstständigt in den Reaktionen auf Impulse, im Planen weiterer Ablaufphasen und Generieren entsprechender Automatisierungsprogramme sowie Überwachen der induzierten Prozesse. Die Schnittstellen zwischen Menschen und Maschinen haben sich insoweit grundlegend verändert. Reales und digitales, das heißt virtuelles Geschehen verschmelzen zusehends. Dabei entsteht ein vielschichtig zusammenhängendes Datenvolumen. Dieses verdoppelt sich nach Schätzungen alle zwei Jahre und führt zu Datenvolumina in Größenordnungen von Trillionen[2] (Big Data).

Wissen wird heute mehr denn je durch intensive Forschung erweitert. Aus den Forschungsergebnissen werden unter Einsatz digitaler Techniken (IT-Technik) neuartige Güter entwickelt. Forschung und Entwicklung sind die Grundlagen für Industrie 4.0. Dieser Begriff bezieht sich aber nicht nur – wie der Ausdruck vermuten lassen könnte – auf neuartige und fortlaufend weiterentwickelte materielle Güter, wie hochgradige Produktionsgüter und Konsumwaren, bei denen ein wachsender Anteil der Wertschöpfung auf Halbleiter und Software entfällt; Industrie 4.0 umfasst auch die Entstehung immaterieller Güter. Dabei handelt es sich um Dienstleistungen, die sich aus den Daten der vernetzten Produktionsprozesse herleiten und die technischen Neuerungen zum Einsatz bringen.

Seit dem Subprime-Desaster (US-Immobilienkrise), das über den Höhepunkt der Finanzkrise 2008 zur Banken- und gegenwärtig noch andauernden Staatsschulden- und Eurokrise geführt hat, hat sich das Wirtschaftswachstum weltweit noch nicht wieder erholt. Mit Industrie 4.0 und dem induzierten technischen Wandel als treibende Kraft kündigt sich aber in zahlreichen Industriestaaten ein zwar verhaltener, aber – wie es scheint – grundlegender Wiederanstieg der Wirtschaftsaktivitäten an.

Der größte Teil der verfügbaren Rohstoffe wird im industriellen Bereich eingesetzt. Zusammen mit dem privaten Sektor wird hier auch die meiste Primär- und elektrische Energie in Anspruch genommen. In Anbetracht dessen, dass natürliche Ressourcen, wie Erdöl, Erdgas und zahlreiche Metalle, zunehmend knapper werden, können durch digital gesteuerte Wertschöpfungsketten und die damit zu erreichenden effektiveren Steuerungen der industriellen Fertigungsprozesse wichtige Voraussetzungen für nachhaltiges Wirtschaftswachstum geschaffen werden.

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[1] Nach den technischen Revolutionen 1. Dampfmaschine, 2. Elektrifizierung und Fließband sowie 3. Computer.

[2] 10^{18} = Exabytes; zukünftig auch darüber.

Die Vernetzung von Logistik, Leistungerstellung und Leistungverwertung wird weiter fortschreiten und sich über alle Ebenen der Volkswirtschaft erstrecken. Auch die privaten Haushaltungen werden zukünftig stärker davon erfasst werden. Auf diese herausfordernden Veränderungen müssen sich nicht nur Regierungen und Wirtschaft einstellen; auch die Identität der Gesellschaft wird sich weiter verändern. Das zeigt sich bereits heute im divergenten Wandel der Gewohnheiten, Interessen und Weltanschauungen nachfolgender Generationen.

Industrie 4.0 bewirkt eine grundlegende Neugestaltung der Arbeitswelt. Immer mehr Arbeitskräfte werden durch intelligente Algorithmen und Roboter ersetzt. Davon betroffen sind nicht nur ungelernte Mitarbeiter, sondern auch Menschen mit sogenannter wissensbasierter Berufsausbildung, wie Facharbeiter, Bankangestellte, Anwälte, ja auch Ärzte erfahren gravierende Veränderungen in ihrem Berufsleben. Andererseits wird zunehmend fachkundiges Personal für Software- und Kommunikationstechnologie sowie für Systems Engineering benötigt. Neue Berufe mit neuen Aufgaben entstehen, wie beispielsweise 'Data Scientists', die aus der oft unstrukturierten Datenflut nützliche Informationen für anstehende Fragestellungen oder Zielvorgaben herausfiltern.

Die Arbeit wird zukünftig weniger raum- und zeitgebunden sein als das bereits heute der Fall ist. Flexible Einsätze, wie das Arbeiten vom heimischen Arbeitsplatz aus oder der Arbeitseinsatz via Internet (Crowdworking), werden weiter zunehmen.

Die Mitarbeiter müssen umdenken und lernen, sich in moderne Produktionsprozesse einzubringen. Das ist beispielsweise dann der Fall, wenn sie mit Robotern (’**A**utomatischen **P**roduktions**as**sisten’, Apas) intelligent vernetzt werden, die relevante Auftragsdaten gespeichert haben und die menschliche Arbeitskraft fortlaufend durch Übermittlung wichtiger Informationen unterstützen (Cyber Physical System).

Weil mit steigender Tendenz Produkte am Computer entwickelt, getestet und die Produktionsprozesse zuvor virtuell simuliert werden, sind Leistungen von Mitarbeitern gefragt, welche die dazu zum Einsatz kommenden Programme beherrschen. Sie müssen befähigt sein, komplexe Daten zu erfassen und zielorientiert aufzubereiten. Darüber hinaus sind selbstständiges und vorausschauendes Denk- und Einfühlungsvermögen, Präzision, Kreativität, Verantwortungsbewusstsein und auch die Fähigkeit sowie Bereitschaft zur Zusammenarbeit wichtige Voraussetzungen. Wer diese Eigenschaften nicht besitzt oder von seiner Veranlagung her nicht erwerben kann, wird es zukünftig immer schwerer haben, eine Beschäftigung zu finden. Oder er wird sich mit minderbezahlten Tätigkeiten begnügen müssen. Mit zunehmender Digitalisierung kommen einfache manuelle Tätigkeiten und Routinearbeiten immer weniger zum Einsatz und werden von Maschinen übernommen. Die Begleiterscheinungen der ersten industriellen Revolution im 18. Jahrhundert durch Einführung der Dampfmaschine und des mechanischen Webstuhls, wie steigende Erwerblosigkeit, Lohndumping und Arbeiteraufstände, gilt es zu vermeiden. Hier ist der Staat aufgerufen, prophylaktisch für ausreichende und qualitativ hochwertige Aus-, Weiter- und Fortbildungsmöglichkeiten zu sorgen. Es muss verhindert werden, dass summa summarum mehr Arbeitplätze wegfallen als neue entstehen.

Durch die sich über die Staatsgrenzen hinaus ausweitenden digitalen Vernetzungen stehen die nationalen Volkswirtschaften vor fundamentalen Veränderungen. Weil

Verfahrens- und Produktinnovationen zukünftig mehr denn je für Produktivitätssteigerungen und damit für die internationale Wettbewerbsfähigkeit der Länder ausschlaggebend sein werden, müssen Bereitschaft und Fähigkeit zu Innovationen sowie deren zügige Umsetzung gestärkt werden. Was nützt es, wenn die Unternehmungen eines Landes zwar in der Erarbeitung neuer Verfahren und Produkte erfolgreich sind, die internationale Konkurrenz aber kompatible Ideen schneller realisiert? Deshalb ist es für die Unternehmungen eines einzelnen Landes wichtig, Wissensvorsprünge zu erkämpfen, innovativ sowie technologisch breit aufgestellt und der Konkurrenz immer voraus zu sein. Diesem Vorhaben können Kooperationen mit Partnern aus der IT–Branche dienen, die über ausreichende Referenzen verfügen. Auch sogenannte Start-ups können dafür infrage kommen, wenn deren oft außerordentlicher Ideenreichtum gegen Einbringung eigener Erkenntnisse und Erfahrungen nutzbar gemacht werden kann. Selbst Großunternehmungen bietet diese Möglichkeit die Chance, sich diversifikativ zu entwickeln. Insoweit kann der allseitige Schulterschluss für die Beteiligten von Nutzen sein.

Mit steigenden Datenübertragungen zwischen vernetzten Maschinen und digitalisierten Lieferketten über das Internet steigt die Gefahr von Datendiebstahl und Cyberangriffen durch Viren und Trojaner. Schädigende Programme, wie Stuxnet, Duqu und Flame, zielen auf digitale Kontrollsysteme und können dazu führen, dass infizierte Computer nach geheimen Konstruktionspatenten und neuen Produktdetails ausspioniert oder gar fremdgesteuert werden. Effiziente Verschlüsselungstechnologien sind mehr denn je gefragt. Absicherung und ständige Überwachung der Datenströme sind vordringliche Aufgaben bei Industrie-4.0-Anwendungen. Das ist wichtig, wenn beispielsweise Maschinen über die Landesgrenzen hinaus zur Fernwartung und Datenanalyse durch das Internet miteinander verbunden sind. Eine besondere Herausforderung stellt die Sicherung von Daten dar, wenn die Kommunikation über weltweite Plattformen, wie Clouddienste großer US-Konzerne, abläuft.

Damit sich Forschung und Entwicklung auch in der grenzüberschreitenden Zusammenarbeit frei entfalten können, müssen zum Schutz der erarbeiteten Ergebnisse patent- und urheberrechtliche Bestimmungen allgemeinverbindlich aufgestellt werden. Dabei muss ein fairer Ausgleich zwischen den Interessen vor allem der Rechteinhaber und der Verbraucher geschaffen werden. Auch Haftungsfragen müssen geklärt werden, wenn beispielsweise Systeme autonom kommunizieren und auf Grund entsprechender Algorithmen Produktionsfaktoren anfordern und den Erwerb – rechtsverbindlich – bewirken können. Alle Regelungen müssen praxisnah und branchenübergreifend[3] entschieden werden. Bei der Bekämpfung von Spionage, Sabotage und sonstigen kriminellen Einflussnahmen und bei der absoluten Notwendigkeit, gegen Cyberkriminalität sowohl national als auch international mit aller Härte vorzugehen, muss der Verbraucherschutz gewahrt werden.

Als Antwort auf Industrie 4.0 ist in den USA die Plattform ’**I**ndustrial **I**nternet **C**onsortium’ (IIC) von Konzernen wie Cisco, IBM und General Electric gegründet worden. Inzwischen zählt der US-Pakt über 140 Mitglieder, darunter mit Bosch,

[3] Zweckmäßigerweise in enger Zusammenarbeit mit der Industrie, zum Beispiel mit der 'Allianz für Cybersicherheit' des Digitalverbandes Bitkom.

Siemens und SAP auch deutsche Firmen. Die Mitgliederfirmen kooperieren durch Feldversuche. Dabei geht es nach deren Aussagen nicht um einen Wettbewerb der Standards, sondern um die Vielfalt der Forschungsvorhaben.

Alle Unternehmungen, von sogenannten Global Players bis hin zu Kleinunternehmungen, müssen sich den Herausforderungen von Industrie 4.0 stellen. Sie laufen sonst Gefahr, den Anschluss an digital vernetzte Wertschöpfungsketten zu verfehlen und dadurch vom Effizienz steigernden sowie kostensenkenden Informations- und Güterfluss ausgeschlossen zu werden. Die bisher praktizierte Nischenpolitik wird es zukünftig nicht mehr geben. Andererseits ist die Einbindung auch kleinerer und mittlerer Unternehmungen in ihrer ganzen Breite unverzichtbar für durchgängig vernetzte Prozesse und damit letztendlich für den Erfolg von Industrie 4.0. Diese Firmen haben allerdings oft das besondere Problem, dass sie es sich nicht leisten können, einen Mitarbeiterstab zu finanzieren, der sich ausschließlich mit den Notwendigkeiten der Digitalisierung beschäftigt. Dann müssen sie sich an Kompetenzzentren wenden und gegebenenfalls Kooperationen eingehen. Kommt es dazu, ist es wichtig, dass sie ihre geschäftliche Unabhängigkeit aufrechterhalten. Auf alle Fälle muss gewährleistet sein, dass unternehmungsspezifische Daten nicht unkontrolliert durch Dritte abgerufen werden können.

Der technische Fortschritt als treibende Kraft wirkt so gut wie in allen Wirtschaftsbereichen.[4] Selbst die Landwirtschaft hat sich diesen Herausforderungen zu stellen. Im Jahr 2050 werden voraussichtlich mehr als neun Milliarden Menschen auf der Erde leben. Damit alle ausreichend und gesund ernährt werden können, müssen Mittel und Wege gefunden werden, um Ernteerträge und Produktqualitäten nachhaltig zu verbessern und Verluste nach der Ernte zu verringern. Nur eine fortschrittliche Landwirtschaft kann durch innovative Technologien die Versorgung mit Nahrungsmittel in ausreichender Menge und die Gesundheit nicht gefährdender Qualität gewährleisten.

Berücksichtigt man die Qualitätsverbesserungen der einzelnen Güter, dann sind im Verlauf der Jahre trotz numerischer Preissteigerungen die Preise – relativ – gesunken. Das gilt im Großen und Ganzen sowohl für Erzeugnisse des Maschinen-, Fahrzeug- und Anlagenbaus, der Elektrotechnikindustrie und anderer Industriebereiche als auch für Dienstleistungen, wie Kommunikation, Verkehr, Unterhaltung, Vermittlung, Beratung, Betreuung.

Industrie 4.0 ist Ausdruck dafür, dass die Industrieländer in ein neues Zeitalter eingetreten sind, das durch eine ständige Flut produktivitätssteigernder Produkt- und Dienstleistungsinnovationen gekennzeichnet ist. Ihre gesamtwirtschaftlichen Auswirkungen unterscheiden sich deutlich von früheren Folgeerscheinungen durch flache Entwicklungen der zu Indizes zusammengefassten Preise und moderate Wachstumsraten des Bruttoinlandproduktes. Fast alle Wirtschaftsbereiche sind davon

[4] Im Gesundheitswesen beispielsweise werden in Feldversuchen Patienten telemedizinisch überwacht, indem unter anderem ihre Blutwerte, Körpertemperaturen, Pulsschläge automatisch über Mobilfunk an den Arzt gemeldet werden. Durch eine webbasierte Auswertungsplattform in der Arztpraxis kann dann zeitnah überprüft werden, ob der Patient die richtige Menge Medizin eingenommen hat.

betroffen. Das gilt auch für den Finanzsektor, speziell für den Bankensektor. Insofern ist unter anderem zu überlegen, ob und wie das Ziel der Geldpolitik zukünftig dem neuen Trend angepasst werden muss.

Die **E**uropäische **Z**entral**b**ank (EZB) ist 1998 gegründet worden. Ihr Ziel ist die Gewährleistung der Preisniveaustabilität. In der Charta ist diese Marke nicht näher bestimmt. Weil Preise numerisch ausgedrückt und in gesamtwirtschaftlicher Sicht zu Indizes zusammengefasst werden, hat der EZB-Rat die operative Zielgröße durch den harmonisierten Verbraucherpreisindex konkretisiert. Die Ratsmitglieder waren sich dabei darüber im Klaren, dass es in der Wirtschaft nichts gibt, was absolut ist, und dass mit statistisch erhobenen Daten und den daraus errechneten Ergebnissen keine exakten Aussagen über die Wirklichkeit gemacht werden können. Deshalb nannten sie nicht einen bestimmten Indexwert als Zielgröße, sondern einigten sich auf einen Bereich *'zwischen null und zwei Prozent'*. Damit war jede Teuerungsrate von zwei Prozent und darunter bis null Prozent mit dem verbal definierten Ziel vereinbar.

Im Rezessionsjahr 2003 veränderte der Rat die Bandbreite und das Niveau dieses Zieles auf *'unter, aber nahe zwei Prozent'*. Der Zielbereich ist also eingeengt und im Hinblick auf die Nulllinie angehoben worden.

Obwohl die Preisentwicklungen seinerzeit wie heute vom äußeren Erscheinungsbild her Ähnlichkeiten aufweisen, waren und sind die vorherrschenden Ursachen völlig andere. 2003 bestimmten vor allem konjunkturelle, also mehr kurzfristig wirkende Faktoren das wirtschaftliche Geschehen. Kurzfristige Störungen müssen grundsätzlich durch gegensteuernde, zielgerichtete Ad-hoc-Maßnahmen bekämpft werden. Es ist im Grunde unredlich, in einer solchen Situation die Zielsetzung den wirtschaftspolitisch verfehlten Entwicklungen anzupassen. Das wäre gerade so, als wenn man nicht erreichte Umweltziele durch nachträgliche Anpassung der Standards zu kaschieren versuchte. Eine sachgerechte Politik hätte unter den damaligen Rahmenbedingungen zielführende Maßnahmen erfordert und nicht Zielkorrekturen. Im Übrigen ist es nicht Aufgabe der Geldpolitik, Konjunkturpolitik zu betreiben. Ihre Aufgabe ist es, konform mit der Fiskalpolitik für eine Stabilisierung des Geldwertes zu sorgen.

Durch Industrie 4.0 haben sich die Rahmenbedingungen für den makroökonomischen Geschehensablauf geändert. Darauf hat sich die Geldpolitik einzustellen. Die Frage ist, ob die 2003 vorgenommene Änderung des geldpolitischen Zieles zumindest heute sachgerecht ist. Die gegenwärtigen und zukünftigen Preisentwicklungen werden wesentlich durch Industrie 4.0 geprägt. Das bedeutet, dass die fortschreitende Digitalisierung der Wirtschaft und die dadurch bewirkten Produktivitätsfortschritte in Zukunft preistreibende Einflüsse stärker als bisher kompensieren werden. Folglich muss die – sehr vage formulierte – Obergrenze des Zielspektrums von *'unter, aber nahe zwei Prozent'* weiterhin diesen Entwicklungstendenzen angepasst werden.

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INDUSTRY 4.0

Introductory thoughts on the current situation

The joint future programme-platform of the German Government and representatives of the industrial sector – Industry 4.0 (in German – Industrie 4.0) consists in comprehensive and systematic digital networking of the creation, logistics and use of products or services. It is often regarded as an impetus which will start the fourth industrial revolution.[1] For conventional automation in analogous world, machines are programmed to take over single functions by responding to certain signals. The scenarios of the Industry 4.0 platform comprise entire systems. These systems largely function independently both in responding to impulses, planning the following process stages and generation of the respective automation programmes and monitoring of the processes generated. The man-machine interaction points have changed in principle in that respect. The actual and digital, i.e. virtual world are increasingly merged. This creates a multi-level and intertwined data set which according to the estimates doubles in volume every two years and contains trillions of units (Big Data).[2]

New knowledge is acquired nowadays more than ever as a result of intense research. Quite innovative products are developed through digital technologies on the basis of research results. Research and development activities are the pillars supporting Industry 4.0. However, this concept does not include just new tangible products that are constantly developed further, such as high technology production equipment and consumer goods, the created value of which increasingly consists of semiconductors and software – although we could assume that judging by the name – but Industry 4.0 covers also the creation of intangible products. These are services which arise from the data of networked production processes and on the basis of which technical innovations are implemented.

After the financial crisis which started to roll from the U.S. subprime mortgage crisis which reached its maximum level in 2008 and led to the crisis of banks and the still continuing crisis of national debts and the euro, the global economic growth has not fully recovered yet. But due to the technological revolution set in motion by the Industry 4.0 platform, a modest but – as it seems – fundamental recovery of economic activities can be observed in many industrial countries.Most raw materials available are used by the industrial sector. Together with the private sector, the industry uses also most of the primary and electrical energy. Considering that natural resources, such as oil, natural gas and several metals are continuously decreasing, the digitally controlled value creation chains and the resulting more efficient control of industrial production processes may create a significant basis for sustainable economic growth.

Logistics, networking of the creation and use of products or services is developing further and will soon comprise all levels of national economy. It will increasingly concern also households in the future. Not only national governments and their

[1] The sequence of technological revolutions was 1. steam engine, 2. electrification and conveyor, 3. computer.

[2] 10^{18} = exabytes; see the additional information below.

economic systems have to be ready for such challenging changes but the whole identity of the society will start changing in the future. This is evident already now in the clearly perceptible changes in the habits, interests and world outlook of young generations.

Industry 4.0 will launch a fundamental transformation of the employment world. Increasingly more labour is replaced by intelligent algorithms and robots. This concerns not only unqualified labour but also people with knowledge-based education and training, such as skilled workers, bank clerks, lawyers, even the work of physicians will undergo fundamental changes. On the other hand, increasingly more staff qualified in software and communication technology will be needed, also in the area of systems engineering. Professions with new duties will appear, such as data scientists who filter the information required for the established objectives from unstructured data sets.

In the future, employment will be considerably less than now related to specific hours and places. Flexible performance of duties, such as working from home or through the web (crowdworking) are increasingly common.

Employees have to adopt a different way of thinking and learn to integrate themselves in modern production processes. For instance, an employee may need to become a part of a network of intelligent robots (APAS – automated production assistants) which has recorded important information on the work duty and constantly supports human labour by communicating important information (cyber- physical system).

As the general trend is to develop and test new products in a computer and to simulate at first virtually the processes required for their production, the employees sought should above all be able to use the respective computer software. They have to be able to understand complicated data sets and effectively process them. The other required characteristics are independent and pro-active thinking and adaptability, accuracy, creativeness, sense of responsibility, also the ability and readiness for cooperation. For those who do not have the characteristics described or have no ability to acquire them, it will be more difficult to find jobs in the future or they will have to cope with less paid jobs. With increasing digitalisation, jobs with simple manual activities or routine work are less needed. Machines will take care of such jobs. Steam engine and mechanical looms taken into use in the 18th century led to the first industrial revolution, the implications of which, such as increasing unemployment, salary dumping and uprisings of workers should be certainly prevented. It is absolutely necessary to provide preventive support from the state to create sufficient opportunities for the acquisition of high-quality training and retraining and further training. A situation where *summa summarum* more jobs will disappear than are created should be prevented.

Digital networking is a supranational phenomenon, therefore countries have to prepare their national economy for fundamental changes. As innovation both in the area of production processes and products will have an increasingly critical role in raising the productivity and also international competitiveness of countries, the capacity for innovation and also for their fast implementation should be strengthened. What would be the use if the enterprises of a country were successful in the development of innovative processes or products but enterprises of other countries in international competition were implementing faster new ideas that can be easily integrated in systems? Therefore it is important for the enterprises of each country to fight for a head

start in the acquisition of new knowledge, to create a comprehensive innovative and technological basis and that way to stay always ahead of the competition. In order to achieve that it will be useful to have cooperation with recognised experts in the IT field who have already achieved something in their speciality. Also start-up businesses should be used as their often extraordinary wealth of ideas can be used by combining them with existing knowledge and experience. This will provide an opportunity for comprehensive development also to large companies. Therefore mutual assistance in many respects could be beneficial to all parties.

As the data communication between networked machines and digitalised supply chains is increasing on the internet, there will be a high risk of data theft and cyber attacks through viruses and Trojans. Such malware as Stuxnet, Duqu and Flame have targeted digital control systems and may make the infected computers suitable for espionage, and it may be possible to find secret patented structures and new product components in the computers or even subject them to external control. Effective encryption technologies are needed more than ever today. Security and constant monitoring of data flows should be regarded as tasks of primary importance for the applications of the Industry 4.0 platform. This is very important, for instance, when machinery and equipment are connected over state borders for remote maintenance or data analysis through the internet. Ensuring the security of data will be a special challenge when communicating through global platforms, such as the providers of cloud services of large U.S. corporations.

For unobstructed conduction of research and development activities through cross-border cooperation it will be necessary to establish generally accepted patent and copyright rules for the protection of the results developed. Here a fair balance should be found above all between the interests of the owner of the above-mentioned rights and the consumer. Also the issue of responsibility should be clarified for cases when, for instance, systems have autonomous communication and request production information on the basis of the respective algorithms and when its acquisition thus becomes legally binding. The whole legal regulation has to be closely related to practice and cover all economic sectors.[3]

Also consumer protection should be ensured in fighting against espionage, sabotage and other criminal acts and bearing in mind the absolute necessity to counter both domestic and international cyber crime with full severity.

As a response to the creation of the Industry 4.0 platform, the U.S. corporations Cisco, IBM and General Electric created their own platform **I**ndustrial **I**nternet **C**onsortium (IIC). By now, more than 140 companies have joined it, including German enterprises, such as Bosch, Siemens and SAP. The platform members have cooperation by performing practical tests. According to the members this is not a competition between standards but diversity of research projects.

All enterprises starting from global players to small businesses have to respond to the challenges of the Industry 4.0 platform. Otherwise they will risk losing touch with

[3] According to its purpose, in close cooperation with industry, such as the digital alliance Bitkom of the Allianz für Cybersicherheit (Alliance for Cyber Security).

networked value creation chains and therefore losing also an access to flows of information and goods which raise efficiency and reduce costs. The current niche policies will no longer exist in the future. On the other hand, involvement of all small and medium-sized businesses will be inevitable in the future to ensure fully networked processes and eventually also the success of the Industry 4.0 platform. Such enterprises face a specific problem, however – they are not able to finance the headquarters of the staff who would only work with duties arising from digitalisation. They have to use the assistance of centres of excellence or search for cooperation in that field. If such a path is chosen, it is important to achieve independence of the business. At any rate, access of third persons to specific information of the company should be prevented.

The impetus of technological development has an impact on virtually all economic sectors.[4] Even agriculture has to subject to these challenges. By 2050, the population of the world is expected to be nine billion. Ways and means will have to be found for adequate and healthy feeding of all people, in order to increase crop yields and crop quality in a sustainable manner and to reduce losses in harvesting. Only advanced agriculture can ensure the supply with food through innovative technologies in the required quantity and without setting human health at risk.

Considering the improvement of the quality of a few products, the prices have decreased in relative terms – despite the increase in prices in figures. This generally applies to the production of machinery and equipment, and products of the automotive and electronics industry and other industrial sectors, and also services, such as communication, traffic, entertainment, intermediation, consultation, maintenance.

Industry 4.0 means that industrial countries have entered a new era which is characterised by an endless flood of innovation to raise the productivity of products and services. The impact of this on economy as a whole is considerably different from the earlier implications of steady development, which were expressed in price indices and moderate GDP growth indicators. Almost all areas of the economy are influenced by this. This also applies to the business sector, particularly the banking sector. Thus, among other things, we have to start thinking how to adjust the objective of monetary policy to the new trend.

The European Central Bank (ECP) was established in 1998. The objective of the bank is to ensure the stability of the price level. It has not been defined more specifically in the statute. As prices are expressed in figures and combined into indices from the aspects of general economy, the Governing Council of the ECP specified the operative target figure through the harmonised consumer price index. It was certainly clear to the Governing Council members that there is nothing absolute in the economy and that statistics and any results calculated on their basis cannot serve as a basis for exact conclusions on the actual situation. Therefore they did not set a definite index value as

[4] For instance, clinical studies in health care are performed with telemedical monitoring of patients in which the blood parameters, body temperature, heart rate, etc. of patients are automatically sent to the doctor through mobile communication service. A network-based analysis platform makes it possible for the doctor's office to check in real time whether the patient has taken the right dose of medication.

the target but agreed on a range of “zero to two per cent“. Thus a price increase from two percent to zero was deemed to comply with the verbally defined objective.

During the year of economic recession 2003 the Governing Council of ECP changed the range of this objective to become “below two per cent but close to it“. Thus the targeted range was contracted and raised higher from the zero level.

Although the price developments at that time were similar to those of today at first glance, their main reasons were and are quite different. In 2003 the economic situation was determined by economic cycles, i.e. more short-effects of factors. Short-term deviations should be in principle countered with the specific countermeasures created for that purpose.

It is actually unfair to adjust the unachieved objectives in such a situation according to the actual development in economic policy. This would be the same as hiding unachieved environmental objectives by the adjustment of standards afterwards. It would have been politically appropriate to take measures to achieve the objective, not to adjust the objective in the framework conditions of that time. But it is generally not the task of monetary policy to pursue countercyclical policy but to take care of the stabilisation of the value of money, considering taxation policy.

Industry 4.0 has altered the framework conditions of functioning of macroeconomics. Also monetary policy has to be adjusted accordingly. The issue is whether the change in the target of monetary policy made in 2003 applies also today. Industry 4.0 considerably modifies both the current and future developments in prices. This means that the continuing digitalisation of the economy and the resulting progress in productivity will increasingly compensate the factors influencing price increases in the future. Consequently, the very vaguely formulated maximum price level “below two per cent but close to it” should be adjusted also in the future to the development trends described.

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MONETARY POLICY AT THE ZERO LOWER BOUND

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Abstract

Both interest rates and inflation rates in the Euro area have reached levels dangerously close to zero. By the strategy of quantitative easing the ECB has been providing ample liquidity – yet without lasting success. Several asymmetries in policy transmission and monetary policy making have been acknowledged when interest rates hit the zero bound. This paper starts with a short review of these asymmetries. Afterwards it turns to the issues of credibility and commitment. It is argued that the inflation forecasts of the ECB are central for the communication strategy. In the current situation they should signal the willingness to stick to low interest rates. Yet the ECB is shown to be rather more optimistic than other forecasters when the prevailing threats of deflation are concerned.

Keywords: Monetary Policy, Deflation, Term Structure, Expectations, Liquidity Trap

JEL classification: E31, E52, E58, E61

Introduction

Since the beginning of the financial crisis, the ECB has been lowering interest rates - first in order to ease the outright effects of the crisis, later to cope with continuing disinflation in the countries of the currency union and finally to beat the risk of deflation itself. The deposit facility touched the zero bound in July 2012 and even has been negative since June 2014. Monetary policy in Europe is currently being conducted at the zero bound. Inflation in the Euro area – the principle goal of the ECB - has been on a downward trend since the beginning of 2011. Forecasters – the ECB itself among them – continue to emphasize that lately headline inflation has been very low while core inflation has started to pick up again. While there is no debating the fact that the sharp drop in oil prices in 2014 has aggravated the disinflationary process, doubts remain as to the question if the risk of deflation itself has been banned.

For many years the academic discussion about monetary policy at the zero lower bound mainly focused on the situation in Japan (e.g. Ito/Mishkin 2004). At the beginning of the millennium it was first the US who faced sharp decreases in inflation rates. Monetary policy in Europe concentrated on fighting inflation, banning the thought of deflation more or less from the policy strategy - and from all official statements. The Bundesbank even went so far as to setting only an upper limit to inflation, while the ECB considers inflation rates below (but close to) two percent as price stability. Nevertheless, it seems that for many years monetary policy making gave different weights to the risks of inflation as opposed to deflation. Obviously these asymmetries have had a counterpart in the research on monetary policy transmission. It was mainly the Keynesian liquidity trap that

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addressed the nonlinearity in transmission when interest rates hit the zero bound. And for quite some time there seemed to be a fairly strong belief that the concept had lost its practical relevance (Krugman 1998). So the question arises as to other nonlinearities in the transmission of monetary policy at the zero bound: Do they or should they lead to asymmetries in monetary policy in times of inflation as opposed to deflation? (e.g. Bernanke et al. 2004, Jannsen et al. 2015, Coenen et al. 2003)

This paper focuses on the current situation of the ECB and addresses the question of potential asymmetries when fighting disinflation instead of inflation. Because of the prevailing situation in Europe the operational level of monetary policy is considered more prominent than the question of policy targets. The paper starts with a short review of the credit channel and the asset price channel of policy transmission. Common wisdom holds that the underlying mechanisms of these channels do not qualify as intermediate targets in normal times. It has been suggested that a deflationary situation might change this assessment (Eggertson 2003). Subsequently, the main focus in this paper is on the interest rate channel. The ECB can be said to be following the Keynesian proposal to use the fiscal channel in a liquidity trap, putting downward pressure on long term interest rates. But monetary policy is also transmitted via interest rate expectations. It is argued that the role of expectations in the interest rate channel played a strong role in the conduct of monetary policy in the 80s and 90s, when monetary policy makers focused strongly on rules and commitment. In the current situation the role of communication appears to have been weakened: The ECB has not fully adapted its communication strategy to the threats of deflation – it is behaving asymmetrically. To stress the argument, one of the main tools of monetary policy communication is analyzed: the publication and discussion of inflation forecasts. Finally possible reasons for this asymmetric behaviour are discussed.

Monetary policy transmission under deflation

While the interest rate channel still can be seen as the central part of monetary policy transmission, the growing complexity of financial and credit markets has given rise to other mechanisms that link monetary policy to the real economy. The main instrument of monetary policy is the overnight rate in the money market. Effects of changes in the overnight rate on longer term interest rates and other financial variables depend on the commercial banking sector and other segments of the financial markets. Since short run money market rates have very limited influence on the real economy, central banks have to rely completely on mechanisms in these sectors. Apart from the interest rate channel, monetary policy is assumed to be transmitted via asset prices, the exchange rate being the most prominent component. The balance sheet and bank lending channel are both summarized in the credit channel of monetary policy transmission.

The asset price channel of monetary transmission is the one that is least considered to be of any practical use to policy makers. The communication ties between financial markets and the central bank are much too close to use asset prices as intermediate targets of monetary policy (Mishkin 2004). What is more, in the current situation of zero interest rates the perfect substitutability between money and assets makes any links between asset prices and the real economy even less reliable than they would be in normal times (Bernanke et al. 2004). So it has to be assumed that apart from being useless in the official strategy of a central bank, the normal transmission via asset prices is limited in the current situation of the ECB.

A notable exception to this general assessment might be the exchange rate channel. Its relevance in the transmission mechanism is undebated even in times of deflation or disinflation. Its effectivity has been established for small economies like Switzerland (Svensson 2001, 2003). For larger economies the beggar-thy-neighbour effects of currency depreciations put a decisive limit to their role in monetary policy. Nevertheless, the increasing worries about the outlook for Europe, and the implications this might have for the world economy, have brought this mechanism back into focus even for the ECB. It seems that in the current situation the depreciation of the Euro might be tolerated for a limited time. It might be crucial in this context, that the ECB itself has classified this depreciation as an accidental and unexpected by-effect of other measures (ECB 2015)

Credit channel

The credit channel of policy transmission comprises both the balance sheet and the bank lending channel. They emphasize that monetary policy transmission is boosted by the effects of interest rates on assets and liabilities of private companies and commercial banks, respectively. The effects of both channels are more relevant the higher the leverage ratios of banks and companies: A strong reliance on external financing increases the risk of a liquidity crunch. The drop in asset prices makes further extension of credits impossible for banks – or access to credits impossible for companies. Therefore the overall effect of this channel is assumed to be stronger the more relevant SMEs are in an economy (Bernanke/Gertler 1995; Kashyap/Stein 1994; Angeloni et al. 2003)

While the traditional channels of policy transmission emphasize the role of credit demand for monetary growth, the credit channel focuses on supply side restrictions: Potential credit demand by private companies is not being satisfied for reasons of securitization either on the part of companies or of the banking sector. Empirical studies on the magnitude of this effect focus on the existence of credit crunches that are particularly relevant when interest rates are high. So the credit channel obviously is about nonlinearities in policy transmission. But it emphasizes effects that can be expected in times of high and rising interest rates. How about a situation in which interest rates reach the zero lower bound?

The asset price effect of decreasing interest rates improves the balance sheets of commercial banks as well as private companies. Hence, as long as interest rates are decreasing, the bank lending channel is strengthening the effects of monetary policy in the same way as it is when interest rates are rising. In a situation where interest rates touch the zero bound this effect will come to an end. Research by other authors suggests that the credit channel is more relevant when asset prices are still falling than at later stages of a crisis (Jannsen et al 2015).

Obviously, in a situation where credit supply is generally limited by balance sheet effects this will affect the monetary expansion – even though the limitation might not be caused by monetary policy. Possible reasons could be related to the requirements of banking supervision, which may reduce credit availability in times of economic recession. But this is not a matter of monetary policy: Potential conflict of interest between banking supervision and monetary policy goals has led to a rather strict

separation of the two in Europe. Therefore the hands of the ECB are somewhat tied in this matter - at least as far as a potential binding impact of balance sheets is concerned.

Nevertheless, since the beginning of the crisis the ECB has been taking some effort to improve credit availability on a more general level, the most prominent being the large increase in the availability of central bank money to the banking sector. The result of this strategy of "quantitative easing" has been an over-liquidity in the money market. This and the extensive use of the deposit facility by the banking sector have given rise to worries about the resulting inflationary threats.

The second effort is the bank lending survey that is being conducted on a regular basis by the ECB and that is giving evidence on potential shortfalls in credit supply as they are gauged by the banking sector. Having been established when the ECB first started to exist, and when monetary policy was still expected to be fighting inflation instead of deflation, it is still in place and is giving no indication that a credit crunch might be at work at the time being (ECB 2014, 2015).

After this short discussion of possible credit crunch effects we are left with the notion that the current threat of deflation looks more like a demand side than a supply side phenomenon in the credit markets. What is more, the credit channel does not seem to offer special risks in a situation of zero interest rates.

Interest rate channel at the zero bound

The interest rate channel states that monetary policy is transmitted first by reactions in the term structure of interest rates and subsequently by savings and investment decisions of both firms and private households. According to the classical hypothesis, long term interest rates equal average expected short term rates, possibly augmented by risk-premia on the longer maturities. Concerning the transmission of interest rate changes to the real sector, the relation between nominal and real rates is central. According to the Fisher hypothesis the difference between the two are (expected) inflation rates.

The oldest analysis of the interest rate channel in a deflationary situation is the Keynesian liquidity trap. In this situation money and bonds become perfect substitutes. Hence an additional supply of liquidity does not feed into lower interest on all maturities, as banks and private households prefer to hold cash. This situation is most likely to occur at zero – or very low – interest rates. This is why some authors call the current situation of interest rates hitting the zero bound a liquidity trap (Krugman 1998).

The threat of this situation is that monetary policy becomes completely ineffective when both interest rates reach the zero bound and inflation rates become zero or even negative. Both are currently true in the Euro zone. As it is well known, the Keynesian remedy in this situation is to use fiscal policy measures with accommodating monetary policy instead of monetary policy alone. Some authors refer to this as the fiscal channel of monetary policy transmission. The main effect of this Keynesian policy tool is a direct influence on longer maturities, so that the Central Bank can influence the whole term structure. It has also been stressed, that this mechanism can only be effective if the Central Bank is credible in signaling its willingness to stick to very low interest rates until the threat of deflation has been banned (Auerbach/Obstfeld 2004, Bernanke et al. 2004, Eggertson/Woodford 2003).

Obviously, the massive purchases of bonds by the ECB can be considered as a strategy that follows this Keynesian recommendation. The effect on longer term interest rates has been confirmed by many commentators – even though the ECB has hinted at its willingness to neutralize the liquidity effects when the time comes, which means that in this situation of deflationary threats the ECB still hints at its willingness to fight inflation. It is supported in that risk assessment by the BIS, for instance (Hannoun 2012).

What else can be done to affect the whole term structure and not only short term interest rates? As has been mentioned above, the main link between the two are expectations concerning the future path of interest rates. The fact that expected interest rates play a powerful part in monetary policy transmission has been acknowledged since the seminal papers by Kydland/ Prescott (1977) and Barro/ Gordon (1983). Both papers were written considering the threats of increasing instead of decreasing inflation rates. Both argue that if monetary policy does not only focus on inflation but also on economic growth, the temptation to lower interest rates beyond what has been expected by the public might endanger price stability. And worse, the fact that the public knows about these temptations will bias interest rate expectations downwards and hence give rise to a potentially vicious circle.

The resulting importance of credibility has influenced monetary policy making ever since. The discussion of rules versus discretion led central banks to disclose great parts of their decision making processes. This can be accomplished by sticking to a limited and well explained set of indicators, as the Bundesbank and later the ECB did. The Bundesbank's concept of targeting M3 as an intermediate goal was probably closest to a rule based strategy. The two pillar strategy of the ECB somewhat loosened this concept. An alternative strategy is being followed by the Fed and the Bank of England by publishing their minutes (and the communication skills of the former Fed Chairman Alan Greenspan). The two different approaches are also related to differing policy goals: While the Bundesbank and the ECB focus solely on inflation, both the Fed and the Bank of England have committed to targeting economic growth as well as inflation rates.

Credibility at the zero bound

Because of the assumed inflationary bias of monetary policy the notion of credibility has always centered on the question of how to fight inflation (instead of deflation) without affecting real growth too strongly. Maintaining low inflation rates in this scenario equals a prisoner's dilemma situation between the central bank and the public, where both parties do best if they stick to a low inflation scenario at all times. In this situation the question of threats becomes relevant. In the European context a strong component of threats on the part of the central bank has always been to be very "conservative" about the intentions of monetary policy (Rogoff 1985). On the operational level of monetary policy, "conservativeness" can be proved by the assessment of inflationary risks by the central bank as opposed to other forecasters. And more: By the manifested willingness to react strongly to perceived upward risks in the inflation outlook - no matter how that might affect economic growth.

What becomes of these credibility issues in a deflationary situation? In this situation the challenge for the Central Bank is to credibly inflate the economy (Eggertson 2003). In

order to do so it must make sure, that interest rates are low over the whole term structure. Some authors have stressed, that when approaching the zero bound, the decrease in interest rates has to be very aggressive. The reason is much the same as in a situation with an inflationary bias: Anticipation of the zero bound amplifies the magnitude of adverse shocks (Adam/ Billi 2004). The mechanisms by which credibility may be established in times of disinflation have been discussed in the literature: Most commentators favor the concept of forward guidance that is currently being followed by the ECB (Filardo/Hofmann 2014, Woodford 2012).

This concept can be seen as an adaption of the old rules' concept: By tying one's hands, it is argued, the public will be more willing to believe that interest rates will stay low until the risk of deflation is banned. In order to establish this guidance, calendar based as opposed to state contingent strategies are discussed. Uncertainties – and public knowledge about these uncertainties – make state contingent concepts more attractive. The indicators that seem appropriate in this context are the ones that can be deducted from the policy strategy – and are used in normal times as well.

So the relevance of the rules principle seems to apply when fighting inflation as well as when fighting deflation.

The second part of the credibility issue concerns the more informal communication – the "threats". In the communication of their monetary policy stance it is common practice for Central Banks to mirror their assessment of the economic and especially the inflation outlook to that of other forecasters. For the United States the relevance of the Central Bank forecast for expectations formation has been proven (Romer/Romer 2000). In order to prove their conservativeness the Bundesbank and later the ECB have always made a point of being rather pessimistic about its inflation outlook – so as to signal their willingness to combat any threats to price stability. Most of the time inflation forecasts would lie on the top of the prevailing range. If this communication channel is taken seriously in the current situation, the ECB should be more pessimistic than the average forecaster about the risks of deflation. So the ECB outlook should be lower than the average forecast. Just as in times of too high inflation rates this could signal the willingness to stick to the appropriate path of monetary policy longer than it would be expected in "normal" times. This would comply with a policy stance that has been suggested in the literature: to be rather dauntless in loosening policy conditions.

If the ECB is making use of this communication channel can easily be checked by comparing forecasts since the risk of a disinflationary process has been visible. In order to do so we have to compare the ECB inflation outlook with that of others. Here we consider the European Commission, the OECD and the Institut für Weltwirtschaft in Kiel – who have a strong focus on monetary policy and are known for a rather conservative view as far as monetary policy making is concerned. The time period begins at the beginning of 2011, the year in which inflation rates began to fall. Forecasts for the current and for the respective next year are considered in turn.

The ECB publishes standard deviations of their forecast along with the forecast itself. So it is possible to construct approximate confidence bands using the standard normal distribution. In the pictures below 90% bands of the ECB forecast are given together with the forecasts of each of the other institutions in turn. The current year forecasts are:

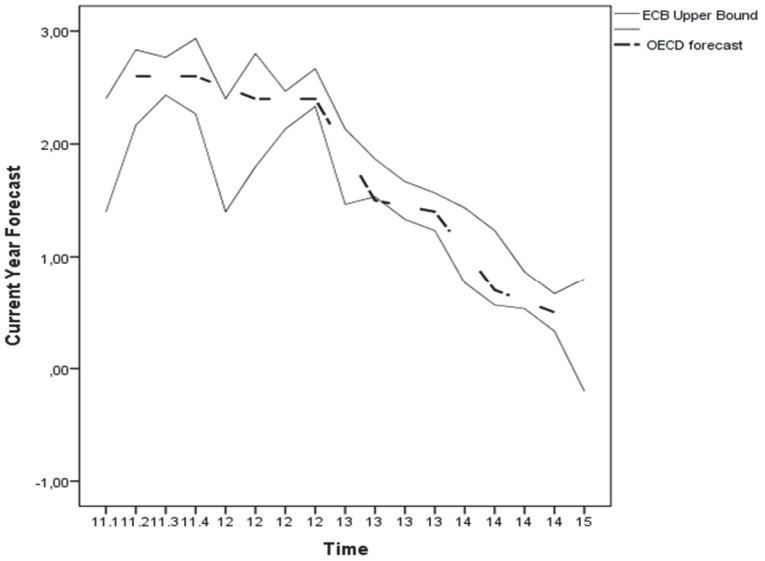

Figure 1: Current year inflation forecasts of ECB and OECD, own calculations

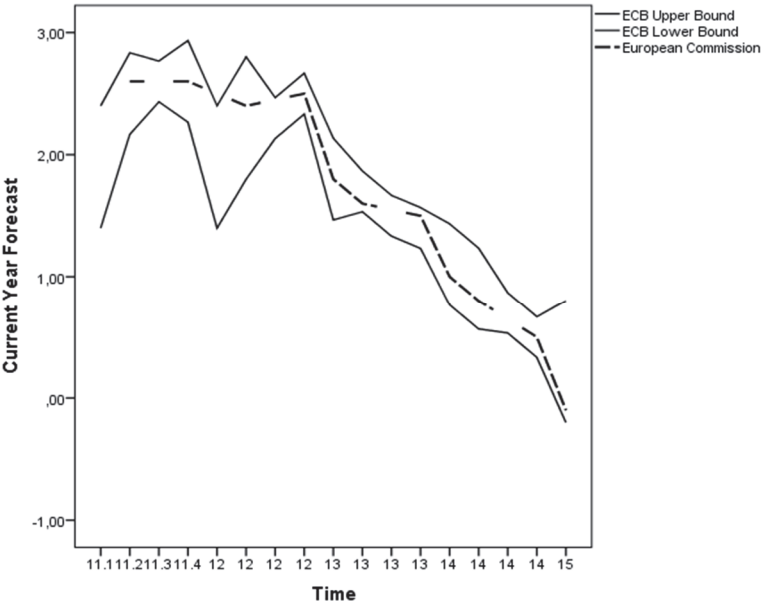

Figure 2: Current year inflation forecasts of ECB and European Commission, own calculations

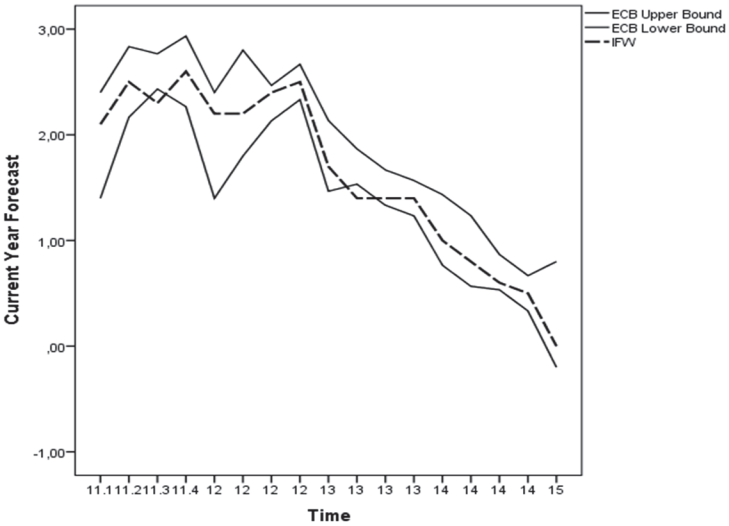

Figure 3: Current year inflation forecasts of ECB and IFW, own calculations

While the forecasts of each of the other institutions lies mostly within the 90% interval of the ECB forecast it becomes visible that the external forecasts lie closer to the lower than to the upper bound. This effect is stronger as inflation rates decrease.

For the next year the outlooks look as follows:

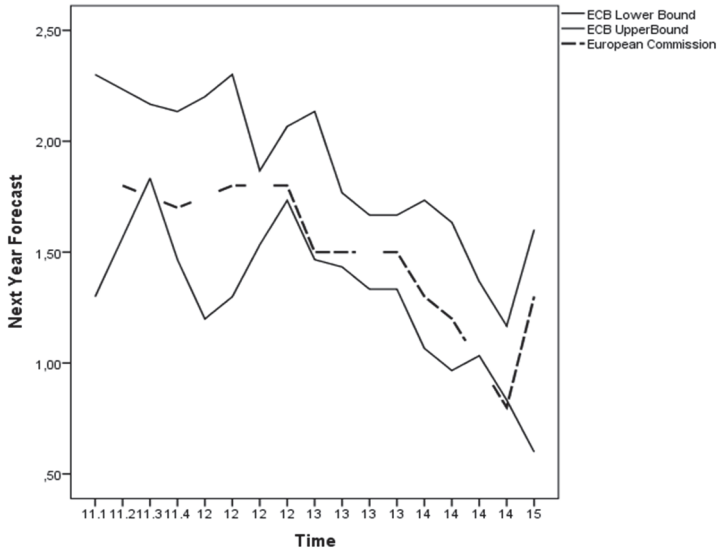

Figure 4: Next year inflation forecasts of ECB and European Commission, own calculations

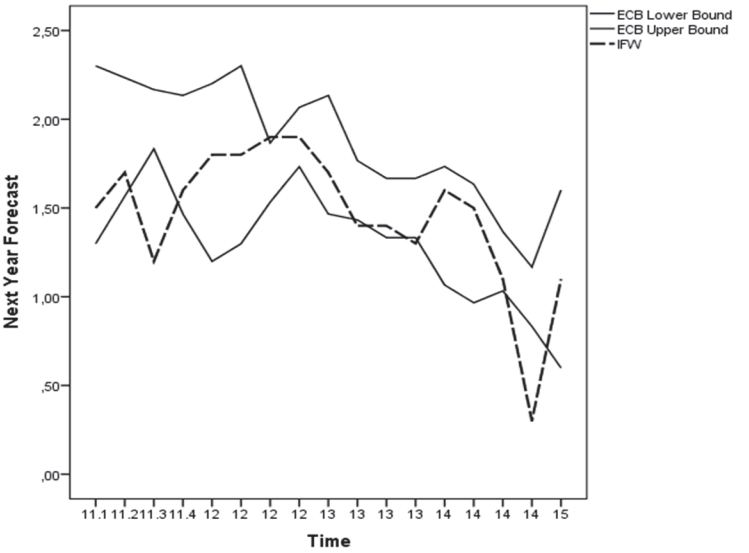

Figure 5: Next year inflation forecasts of ECB and IFW, own calculations

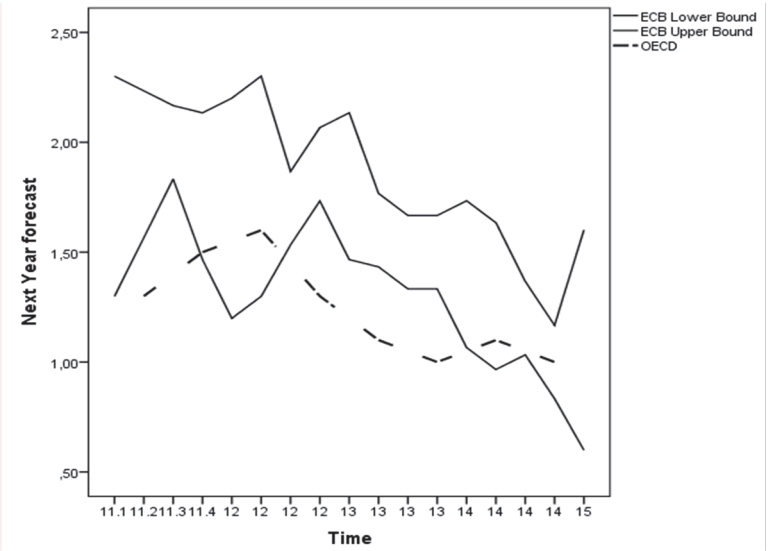

Figure 6: Next year inflation forecasts of ECB and OECD, own calculations

In these cases the effect is even stronger: in two of the three cases the ECB forecasts are significantly higher than those of the external forecasters. Having in mind, that the time lag between interest rate changes and their effect on the inflation rate is assumed to be

more than a year, the outlook for the next year is the one that is important for the future stance of monetary policy. The current year forecast can be considered to lie beyond any Central Bank influence.

The results are confirmed by T-Tests on the difference of the average forecasts. The table below gives the significance levels of the tests.

Current year forecasts:

ECB-European Commission	0,4
ECB-OECD	0,4
ECB-IFW	0,2

Next year forecasts:

ECB-European Commission	0,055
ECB-OECD	0,003
ECB-IFW	0,075

While on average there is no significant deviation of ECB forecasts from other forecasters, all following year deviations are significant at the 10% level, that from the OECD forecast even at the 5% level.

It can be concluded that currently the ECB is not making use of their inflation forecasts as a tool for forward guidance. More to the contrary, the forecasts signal that the ECB is rather more optimistic than other forecasters. The stronger the disinflation pressures become, the higher the relative position of the ECB forecast gets. It has already been mentioned that the analysis of other transmission channels has led to the conclusion that monetary policy should fight disinflation rather more aggressively than inflation. As far as the issue of credibility is concerned the ECB is doing just the opposite.

So the question arises why this is happening. One obvious reason could be the transmission process form real interest rates to private savings and investments. Clearly raising inflation expectations lowers the expected real interest rate when nominal rates are given. So there might be a tradeoff between lowering expectations concerning the future path of nominal rates on the one hand and raising expected real rates on the other. But there are several arguments why the ECB should target long term nominal rates instead of real rates. Firstly, the effect of the Central Bank inflation forecast on interest rate expectations has at least been proven for the US (Romer/Romer 2000). Secondly, the tradeoff faced by the Central Bank is just the same when inflation rates are high: By raising inflation expectations in a situation of high inflation the ECB lowers the real interest rate and stimulates the economy. In the past the greater weight was obviously given to steering expectations of future interest rates.

As far as other channels of policy transmission are concerned: Interest rate expectations play no prominent part in the credit channel. Yet they do in the exchange rate channel,

which might play a role in the current situation, as has been mentioned before. But the impact of this transmission channel would also profit rather than loose if interest rate expectations were lowered by the ECB.

To sum up: There seem to be no obvious reasons for the current forecasting strategy of the ECB. It has to be questioned why the ECB is not making use of this tool to give forward guidance to the markets. The case becomes stronger as other instruments become less powerful when inflation rates continue to be very low.

Conclusion

Many studies have come to the conclusion that the framework of monetary policy is, or should be asymmetric in times of inflation and deflation. Apart from the liquidity trap this applies to the quantitative range of optimal inflation targets and to the aggressiveness with which interest rates should be lowered when disinflation occurs. Also the optimal roles of different channels in the transmission mechanism differ in times of inflation and deflation.

This paper has investigated the role of Central Bank credibility when interest rates are bounded at zero. The main conclusion is that channels of monetary communication that have been used actively in the past seem to be of no relevance to the ECB in the current situation: While the liquidity management of the ECB focuses on fighting deflation, communication still sticks to the rules of inflationary situations. So the ECB is actually behaving asymmetrically. This becomes very obvious when comparing ECB inflation outlooks with those of others forecasters. It is argued, that less optimistic inflation outlooks might be an effective way of keeping interest expectations low.

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RESOURCE REVENUE MODEL FOR A DEVELOPED COUNTRY: CASE OF ESTONIA

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Abstract

The main objective of this paper is to find appropriate parameters for a resource revenue fund model in the industrial part of the World, with Estonia as an example. Based on literature review and case studies of resource revenue funds, four parameters are suggested: the period of resource revenue flow, the magnitude of the revenue flow relative to GDP, relative development level of the country and institutional development level. Additionally, four resource revenue fund models are characterized: fiscal, mixed, Permanent Income Fund and Sovereign Development Fund.

Analysis shows that for a country where the main natural resource is oil shale (as is the case in Estonia), the most suitable resource revenue fund model would be a blend of fiscal modelling and Sovereign Development Fund.

Keywords: natural resource revenue, natural resource funds, oil shale, mining regulation

JEL classification numbers: Q320

Introduction

Despite technological progress, mankind still needs and extracts annually a large variety of natural resources in large scale. Exploitation of exhaustible natural resources depends on the revenue to the society and effectiveness in using that revenue stream. There are several models for public resource revenue collection, revenue fund management and revenue distribution. While most research focus regarding resource revenue has been on developing nations with hydrocarbons revenues, there are substantial mineral resources also in industrial countries, and effectiveness of revenue allocation deserves equal attention there.

Elaboration of Estonian case shows that suitability of a particular resource fund model depends on several characteristics. A suitable and effective resource fund model can positively transform the economy in addition to being just an additional revenue stream. The purpose of this paper is to identify the most suitable parameters of a resource fund model in an industrial setting.

A methodology is developed and applied to case studies in order to draw motivated conclusions. The paper aims to address the following questions: What is the theoretical argumentation of resource funds? What are the main models of resource revenue allocation? What is the empirical experience of resource revenue funds in industrial

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countries? What is the most suitable resource fund model for Estonia given its main resource and development level?

1. Literature overview

The majority of literature on resource revenue deals with hydrocarbons revenue in developing countries. This is objectively understandable as hydrocarbons represent the largest wealth pool and are of major global economic significance. Much of the discussion has been on "resource curse" where major revenue streams lead to a currency appreciation, crowding out of other sectors of the economy, fiscal dependence, conflicts, corruption and political power monopolisation. (Sachs, Warner, 2001). Examples include Cameroon, Iraq, Libya, Venezuela, Mexico (Rey, 2011).

To overcome this resource curse already in 1953 British authorities established Kuwait Investment Authority that is the first of what is today called Sovereign Wealth Fund (SWF). In 2015 total of 68 national or state SWFs manage assets with a market value of 7.2 trillion USD. (Sovereign Wealth Institute) 56% of SWFs receive their revenue from oil and gas, some 10% from metal ores or minerals and many are non-commodity funds like Singapore Temasek or China Investment Corporation. The main logic for oil and gas revenue funds was the immense relative scale of revenue stream that was achievable from particular deposit fairly quickly (Davies, et al 2001). It was the Dutch experience with Groningen gas field that coined the term Dutch disease for currency appreciation and relative expensiveness of other exported products.

Tsani (2012) provides an extensive overview of the pro and con debate on resource funds (RF). Arguments for RFs are: (Tsani , 2012; Baena et al., 2012):

1. Insulate price volatility and exchange rate pressures;
2. improve fiscal discipline as tools of self-constraint upon fiscal actors;
3. serve revenue saving and intergenerational fairness goals;
4. funds can insulate natural resource revenues against rent-seeking, politicized use and corruption, enforcing the conditions of proper management of resource endowments;
5. capital allocation to non-resource sector;
6. Environment restoration can be viewed as capital investment.

The theoretical framework for resource funds is the Permanent Income Hypothesis (PIH) postulated by Milton Friedman in 1957 on an unrelated subject. Applied to resource revenues PIH would mean that states should view windfall revenue as a source of funds that can be levelled for a longer period to attain permanent income. By definition, expenses made out of a PIH oil revenue fund would be stable and would avoid boom and bust cycle (Segura, 2006). To achieve permanent income stream and not to inflate national economy further than private revenue streams from hydrocarbon development would, RF should diversify its assets globally and by asset classes according to Modern Portfolio Theory. Classical example of PIH application would be Government Pension Fund of Norway with current assets valuation of 719 billion USD.

Several analysts have argued that the permanent income rule is optimal only under special circumstances that do not apply to most developing countries (Collier and Venables, 2008; Van der Ploeg and Venables, 2009) or for revenues streams other than hydrocarbons. Most developing countries, however, are characterized by restricted

access to world capital markets, capital scarcity, and potentially high rates of return on domestic investment, especially if the government is able to efficiently supply public infrastructure and to improve the investment climate to raise returns on private investment. Under these circumstances, a more optimal strategy would be to devote a larger portion of resource revenues to high-return public domestic investments, leading to higher growth and, ultimately, a higher economic impact than under the permanent income strategy (Segal, 2012).

Much of the research has focused on developing nations with its apparent institutional problems, which have been present before discovery or exploitation of significant mineral resources. Revenue funds in Kuwait, Iran, Oman, Venezuela, Papua New Guinea, and Nauru are claimed to be institutional failures (Stevens, 2003). The main reason for this failure has been government mismanagement of fund resources. Baena et al (2012) concludes that following practices are essential for getting the management of a fund right: accountability, transparency in decision-making and information access, corporate governance, and clear and sustainable regulations. Also Leong, Mohaddes (2011) argue that "there are levels of institutional quality above which resource abundance becomes growth enhancing".

Thus, literature suggests intensity and period of revenue stream, economic development level and institutional quality are important factors influencing resource revenue utilization.

2. Resource fund models

Overview of resource fund models introduces some empirical examples around the world and their motivations showing how different models have been set up. Levels and means of taxation of natural resources vary across the world (see Otto et al, 2006). In case of oil, mostly ad valorem royalties are being used and effective rate of taxation (defined by World Bank and IMF as direct taxes related to production in relation to profit) is on average 60-70% (IMF 2012). In case of more labour intensive and less profitable iron ore the average effective rate of taxation is around 40-60% and for copper ore 45% (Otto et al, 2006). The main befit to society is employment, especially in remote rural areas where employment opportunities are otherwise scarce. This argumentation is key for low taxation of mining in Sweden and Finland with 0,02% of the ore value.

Wide varieties of resource revenue models are being used. Apparently, different models have developed in particular economic and political context. Most resource revenue models fall under one of these four categories: fiscal, savings fund, mixed model or the latest trend: sovereign development fund.

1) Fiscal model

All resource revenues flow into general government budget in United Kingdom, Denmark, Ireland, Australia, USA at federal level and Canadian provinces except for Alberta. Fiscal model serves its purpose for reallocating resource revenues to the population, but there is no saving nor insulation from price volatility.

Baena et al (2012) describe "Investments in the public sector and in infrastructure are usually lavish at period of high commodity prices, encouraging rent-seeking and policy

inefficiency. As windfall revenues diminish, governments turn to foreign markets for further sources of revenues, acquiring as a result an unsustainable level of debt".

2) Mixed model

Under mixed model most of the resource revenue is retained by the government budget and often part of the funds is allocated to the region of resource extraction. Peru is an example of mixed model where both mining royalties and even more significantly 50% of the corporate income tax of the mining companies is redistributed at regional level (see figure 1). In 2007 Peruvian government received total of 2 billion USD from corporate income tax from mining sector. Since 1999 10% of concession fees and privatisation revenues are diverted to Fiscal Stability Fund that has accumulated 7 billion USD by 2012.

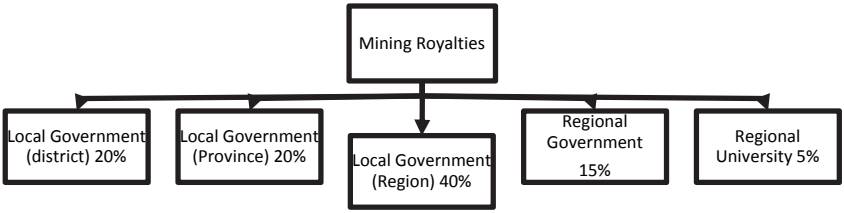

Figure 1. Mining revenue allocation on regional level in Peru. Instituto de Ingenieros de Minas del Perú (2011)

Until 2012 Australia had only decentralized revenue model where royalties were earned only by provinces. Several resource rich US states like North-Dakota, Wyoming and New Mexico allocate funds to state budgets and into permanent income funds. Indonesia is allocating since 1999 80% of its royalties to mining regions. In Ghana its 20% of revenues are directed to mining regions (ICMM, 2009).

3) Savings funds; Sovereign Wealth Funds

More than half of capital in 68 known global Sovereign Wealth Funds (SWF) are based on natural resource revenue. Investments of SWFs have raised some concerns due their size and potential political motivation. These concerns led to establishment of Santiago principles for best practices on SWF transparency and management developed by SWFs together with IMF and signed so far by 25 nations. Main natural resource of SWFs is oil and gas. Unique characteristic of oil and gas revenue is that the revenue stream can grow within few years several times creating a problem of efficient use of funds and its overheating effect on the economy even if there would be no rent seeking by officials and politicians. (Davies, et al., 2011). Substantial savings funds not generated by oil or gas are maintained by Chile, Peru, Botswana, Mongolia and US

state of Wyoming. Lücke (2010) shows how well established institutions can help to sustain public support for long-term savings of resource revenues.

4) Sovereign development fund (SDF)
Javier Santiso (2008) of OECD marked that several Sovereign Wealth Funds have evolved policies where substantial part of their portfolio is invested into domestic assets so that "they are key engines of development finance within their homelands, some very explicitly involved in national strategies of industrial diversification". Further he cites Malaysia's Khazanah, Kazakhstan's Kazyna, Mubadala from Abu Dhabi or Istithmar from Dubai and more conventional SWFs like Temasek Holdings of Singapore and Kuwait Investment Authority that have clear domestic and regional development related investment policies. Santiso argues that, "because of their mandates and objectives SDFs tend to look for secure investments and long-term returns."

3. Developed countries resource funds

A closer look at several resource funds in industrial countries is used for conclusions on most suitable factors of a resource model in a country with strong institutions. The countries to be reviewed were chosen based on data availability, research and variety of different settings. Funds presented are also some of the oldest in World, with the first established in the early 1970s. Thus, these funds have gone through a noteworthy learning curve and have established what may be called best practice. A thorough overview of active resource funds and their fund governance is available at the National Resource Governance Institute.

Alaska Permanent Fund was created in 1976. Since 1980 APF is managed by Alaska Permanent Fund Corporation (APFC). Assets worth $49.9 billion on June 2015 are distributed between stocks 36%, bonds 20%, real estate 12%, private equity 6%, others 30%. Stocks management is widely distributed between different funds: 30 different funds manage stocks, 8 funds for bonds, 6 manage real estate and 20 other type of investments by different funds. Depending on the term of the lease, either 25% or 50% of the revenues collected is deposited in the Permanent Fund. The remainder goes to the General Fund and the School Fund. Total income from oil and gas royalties and rents was $2.9 billion in 2014.

The APFC performs in-state investment within Fund's real estate portfolio but does no preference to investments in Alaska. After 5 year fund build-up period, from 1982 through 2013, the dividend program paid out about $18.8 billion to Alaskans through the annual distribution of dividend checks. In year 2012 $567 million was distributed among 646 805 Alaskan residents making per capita dividend 878 USD. The main motive to establish APFC was to address concern that majority of natural resource benefits are being reaped by non-Alaskans.(Goldsmith, 2010) Winderquist et al (2012) argue that unique resource dividends have contributed to the fact that Alaska is most economically equal of all 50 states in US and helped to increase of equality.

Alberta Heritage Savings Trust Fund (AHF) was created in 1976 with $1.5b initial allocation to AHF and initially 30 % of Alberta's non-renewable resource revenue was transferred to the Fund. Before establishment of AHF 2/3 of revenue flowed into general province budged and 1/3 to municipalities.

As Alberta experienced tough economic times in the early 1980s, 30% resource revenue allocation was reduced to 15 % and eventually cut to zero in 1987. However the size of the fund and its earnings have enabled annual payments to province budget totalling $344 million in 2012. By 2014 asset value of AHF had increased to $18 billion, giving 8.2% rate of return. Asset distribution was 53% global equities, 15% real estate, 10% alternative investments, 22% fixed income. Only 8% is invested in Canadian equities. (Alberta Heritage Savings Trust Fund, 2014)

In the 27 years that all investment yields have been diverted from the Fund to Alberta government revenues, the payout has been excess of $28b. Baena et al (2012) covers well how investment decisions were politically motivated or at least financially not robust with regards to loans to other provinces ($1.9bn), non-financial Capital Projects Division (3,5 bn) and majority to Alberta Investment Division (AID). “The primary use of AID was as a private placement banker for various provincial government- owned corporations, including Alberta Government Telephones. These loans totalled over half of AHF total size and many placements failed.” One major success however was saving of Syncrude Oil Sands project.

In 1997 AHF was restructured based on response by Albertans in 1995 survey. The Fund can no longer be used by government for direct economic development or social investment purposes. A new business plan was implemented, with a plan to increase long-term investments and avoid mistakes of previous decades. (Ascah, 2013)

Permanent Wyoming Mineral Trust Fund (PWMTF) was established in 1975 and receives about 40% of all Wyoming’s severance tax collections totalling 878 million in 2009. PWMTF market value in 2013 reached $6,3 billion. The PWMTF grew by $494 million in the 2011 fiscal year, at 10.2% increase. The fund is limited to allocate up to 55% of assets into equities. While domestic investments are not prohibited, funds stated objective is saving and revenue stabilization. (National Resource Revenue Institute, 2013)

The PWMTF contributed $215 million of the Wyoming state budget revenues in the 2011 fiscal year. In 2011 total of $1 billion in severance tax was collected with $0.44 billion from gas, $0.29 surface coal, $0.22 oil. Coal taxation rate was in 2011 thus 0.67USD per tonne. (Wyoming Department of Revenue, 2014) Resource revenue was distributed between Permanent Fund $377 million, general budget $240 million, $268 million to budget reserve, $23million Wyoming water development fund, $20 million to municipalities and $ 26 million to other environmental and development projects.

New Mexico Severance Tax Permanent Fund (STPF) was established by the legislature in 1973 to receive severance taxes collected on natural resources extracted from New Mexico lands. Severance tax revenues first pay the required debt service on state severance tax bonds that have funded various capital projects, and the remaining (approximately 12.5%) severance tax receipts are then transferred to the Severance Tax Permanent Fund. The STPF is diversified permanent fund except for its Economically Targeted Investments. STPF had assets of more than $4 billion in 2012 and Land Grant Permanent Fund (LTPF) leasing state lands for mineral development had assets of $10.8 billion. In 2012 both STPF and LTPF paid out to state budget and other beneficiaries about the same amount as they received and made in earnings on assets.

Total state revenues on resources other than oil and gas were $34,9 million for 2010 and $1 600 million from oil and gas. (New Mexico Taxation and Revenue Department, 2011)

New Mexico STPF has special NM Private Equity Investment Program funding investments that ”enhance the economic development objectives of the state; provided such investments offer a rate of return and safety comparable to other private equity investments currently available." This program has $259 million in net deployed capital, close to 5% of total STPF size. 28 funds have received commitments and invested in 62 New Mexico-based companies. In the period 1993 to 2003 NMPEIP made negative net returns, but since 2004 primary focus has been returns leading to 4,5% IRR of investments (New Mexico State Investment Council, 2015)

Scandinavian development funds

Three Scandinavian examples show that very developed economies either from resource revenues or other sources establish government investment funds to support equity and fixed asset investments in their domestic economy.

Largest SWF in the world is Norway’s Government Pension Fund Global with value of 771 billion USD by end of 2014. Notably, 36,5% of the total value has been achieved due to returns on investments. Much less known is Government Pension Fund Norway (GPFN) with assets valued 22,3 billion USD invested 85% in Norwegian and 15% Nordic region equities (60%) and fixed income assets (40%). Average annual gross return on the GPFN is calculated at 7.3 percent from January 1998 to yearend 2014. The fund is managed by specialized fund manager Folketrygdfondet with clear mandate not to invest more than 15% to any single company equity. Norwegian Ministry of Finance (2015)

Finnish Industry Investment (FII) is in 1995 established development fund with €53 million proceeds of the privatisation of state-owned companies. By year end of 2012 its investments and commitments were €718 million in 500 companies directly or through funds and in 2012 made €57 new investments and made €7,3 million in profit. Finnish Industry Investment (2015)

Swedish Sixth National Pension Fund was created by Parliament in 1996 with $1.57 billion payment which value to date has increased to $3 billion with +4.2% annual average return. The Sixth AP Fund invests in unlisted companies and private equity funds. 6AP has 40% of its assets in Nordic regions 60 companies direct equity, 28% in 280 different funds and 32% liquidity. Sixth AP Fund (2012)

What is also relevant is the portion of the revenue allocated between annual public budget and RF. Also relevant is the way RF is set up: its institutional independence, investment policy mandate and amount of payments out of the fund. Table 1 describes some basic characteristics of selected resource funds

Table 1. Characteristics of selected resource funds

	Alaska	Alberta	Wyoming	New Mexico	Norway
Share of resource revenue to RF	25%	5.25 or 50%*	40%	12.5%	100% (2014)
Share of earnings payment to the budget	37.5%**	0-70%	40%	100%	0%
Fund institutional independence	Independent corporation/ funds	Independent fund manager	State treasury management	State Investment Council	Public fund manager

* – dependent on resource revenue respectively below $10, $15 or above $15 billion
** – dividend payment to citizens

In conclusion, empirical evidence displays large variety how resource revenue funds have been set up in historical context and how some part of it is allocated to investments into domestic economy.

4. Case Estonia

Estonia is used as a model for an industrialised country with fairly high endowment of mineral resources and collections of resource revenue, yet with no resource fund. The main mineral deposit in Estonia is oil shale that has been mined and processed since 1916 in excess of 1 billion tons. Still reserves in excess of 3.4 billion tons at energy levels of 30 GJ/m2 are mineable. Oil shale is mainly being used for power generation (11 million tons in 2012) and increasingly for oil production (4 million tons in 2012). Given EU climate policy, balance of oil shale utilization is clearly moving in favour of oil production. Oil shale oil production in 2014 was 660 000 tons which is 11 391 barrels a day or 0.01 mbpd. There are active plans by companies to more than triple oil production by 2020 utilizing some 15 million tons of oil shale and to process the oil into EuroV class diesel fuel. (Steiger, 2013). This development remains conditional of oil prices and regulatory environment in Estonia.

Taxation of the oil shale sector occurs by means of environmental charges that are levied on each ton mined, mining water disposal, mining waste and in processing phase for atmospheric emissions, waste water disposal and depositing of oil shale ash. In total 70% of environmental charges received by the state are from the oil shale sector. Pro rata environmental charges have increased substantially (some 12 to 28 times) between 2002 and 2015, substantially impacting the production costs.

The main aim of applying environmental charges is to motivate companies to invest into production facilities with lower environmental impact and to use natural resources more efficiently and sustainably. A special public Fund for Environmental Investments (FEI) receives funds retained by the state and re-distributes these for environmental projects across the country, from waste and water management to renewable energy and environmental awareness, often as co-financing to capital from the EU's Structural Funds.

There have been several changes on the way charges are distributed, especially during the economic crisis of 2009-2010, when the state urgently needed additional funds. Current law fixes the absolute rate received by municipalities where mining takes place and the rate received, so their revenue will not increase even if the overall tax rate increases. Of the 97 million EUR collected as taxes to the country's total budget in year 2015, some 47 million are retained by the state for discretionary spending, 34 million EUR is forwarded to FEI and the remaining 16 million EUR is forwarded to municipalities (Rahandusministeerium, 2015).

The state additionally receives substantial revenues as 100% owner of AS Eesti Energia, a major oil shale miner that is also involved in power generation, power distribution and oil shale oil production. Eesti Energia mines and processes roughly 80% of the country's oil shale. Since 2005 Eesti Energia has contributed annual dividend revenues between 50 and 90 million EUR to the state budget.

Suitable resource fund selection for Estonia

Under the current setup of the Estonian resource revenue model several objectives of RFs are not met. Though FEI funds some renewable energy investments like biogas development, there is no return criteria for investments. Currently there is no revenue saving, thus there is no revue stream or assets if mining activity stops, which given European Union's climate policy is likely to happen for oil shale some time around 2050. Intergenerational fairness goal is met only so far as can be argued that general fiscal expenditure generates social capital.

Suitable revenue fund model should depending on base resource and development level of jurisdiction achieve following goals: a) value saving over time to achieve intergenerational fairness; b) insulate against price volatility and exchange rate pressures; c) improve fiscal discipline; d) capital allocation to and development of non-resource sectors.

To consider what resource revenue model is suitable for Estonia, four parameters appear most relevant from literature and previous section case studies:

a) size of public revenue stream relative to GDP – if the size of revenue stream would be large relative to GDP, it would suggest higher saving in international assets to avoid Dutch disease;
b) period of revenue stream – if the revenue stream is short term (few decades) it suggests higher saving ratio into liquid assets to ensure intergenerational equity and lower the risk of short term rent seeking;
c) economic development level of the country – if country economic development relative to region is lower it would suggest higher investment in assets contributing to domestic economic development and vice versa;
d) institutional development – if the institutional development of the country is strong enough and ensures transparency, it is less likely that investments in domestic assets would encourage rent seeking and corruption.

Table 2 gives overview of data on selected four factors in different jurisdictions and suggested suitable model. The way and variety how resource revenue is being collected seems to have little effect on way of revenue fund model. Norway considers for example also dividend revenue from Statoil S.A. as part of oil revenue and directs it

into Government Pension Fund. Factor that is relevant of course is whether stated resource revenue policy is well defined or not, but it is harder to measure or quantify.

Table 2. Resource fund factors in different jurisdictions

Region, Resource	Alaska oil	Wyoming oil, gas, coal	Alberta oil sands, oil, gas	New Mexico oil, gas	Estonia oil shale, etc (2015)
Revenue stream % GDP	$ 3 bn 6.7%	$ 1 bn 3.6%	$5 bn 2.7%	$1,6 bn 2%	€182 mln 1%
Period of revenue stream	50 years	50-100 years	100+ years	50-100 years	100+ years
Development level, GDP per capita in region	$45 665 110% US average	$ 47 898 115% US average	$ 49 562 159% Canada average	$ 34 133 82% US average	$ 20 700 67% EU average (2011, PPS terms)
Institutional development WB GI score[1] TI CPI score[2]	High 73	High 73	High 84	High 73	High 64
Suitable model	Fiscal with PIF	Fiscal w PIF	Fiscal w PIF	Mixed PIF/fiscal/ SDF	Mixed fiscal /SDF

1 – World Bank Governance Index
2 – Transparency International Corruption perception Index

Thus due to relatively small and long of revenue stream from oil shale and other minerals, due to lower relative development level and sufficient institutional development, Estonia would do well to both continue fiscal expenditure, but also add Sovereign Development Fund as revenue allocation. This is even more relevant if planned ad valorem oil shale royalty is introduced increasing fiscal variability.

Based on examples in above section, withdrawals from the fund should be limited to some proportion of the investment earnings. The result of such a revenue fund would be a sustainable increase in domestic equity market liquidity and improved access to lending capital. Also such a fund it would create intergenerational fairness and long term vision regarding exhaustible resources.

Estonian case shows that while there is currently some allocation of resource revenue, it is in fact all fiscally consumed and no saving occurs. However, Estonian institutional strength and relatively moderate economic development level suggest that the Development Fund option based on some resource revenue is advisable.

6. Conclusion

Resource funds are a valuable instrument that have evolved from a simple savings fund to a means of investment policy for diversifying and developing economies in a transparent way. This paper has shown that resource funds are not exclusive for developing oil and gas rich countries, but can be meaningful tools for other industrial countries with strong institutions, and contribute to effective capital allocation.

While resource funds have evolved in a particular historical context, key factors influencing the choice of the model depend on the nature of the resource, intensity of the revenue stream and development level of the country. Countries with strong institutions and not relatively intense revenue streams benefit from directing resource revenue to domestic capital investments. Particularly in Estonia, it makes sense to divert resource revenues into a Development Fund that can be used to improve equity and lending capital access to the private sector.

Further empirical research is necessary to analyse how a resource fund can best contribute to economic development of a resource rich country. All countries are well advised to have a long term plan for resource revenue flows and revenue utilization.

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NON-MARKET VALUE OF ESTONIAN SEMINATURAL GRASSLANDS: A CONTINGENT VALUATION STUDY

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Abstract

Seminatural grasslands i.e. the floodplain meadows, seashore meadows, wooded meadows, dry meadows, wooded pastures are the very traditional part of Estonian landscapes, which play an important role in the appearance of the landscape in general and also serve as an important habitat for many plant and animal species.

In order to preserve the seminatural grasslands continuous annual mowing and/or pasturing is needed. This activity is not economically profitable and needs subsidizing.

The authors of the work raise a hypothesis that the Estonian seminatural grasslands could be viewed as a valuable non-market environmental good for which a significant public demand exists. In order to find out the non-market value of the seminatural grasslands a contingent valuation study was carried out among the Estonian working-age population (size of the sample 1061 individuals). The average individual willingness to pay was 11.3 euros. During the study, the authors constructed the total demand function and discovered that the total annual demand for seminatural grasslands was 17.9 million euros.

Keywords: Seminatural grasslands, non-market value, contingent valuation, willingness to pay.

JEL classification numbers: Q1, Q5

1. Introduction

Due to the climate conditions, there are no natural grasslands in Estonia such as prairie in North America, pampas in South America, puszta in Hungary and steppe in southern Russia. This means that without continuous human activities there would be no typical Estonian landscape with open areas as inseparable parts: fields, pastures and meadows. A significant and most valuable part of open landscapes in terms of both nature protection and recreation are seminatural grasslands, the largest of them and most important types of landscape are coastal meadows, floodplain meadows, dry meadows and wooded meadows.

Seminatural grasslands are the oldest anthropogenic biological communities in Estonia, which have developed during a long period by scythe, axe, fire and grazing (Ehrlich, Habicht, 2001; Luhamaa et al., 2001). They require constant management in order to

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survive: mowing, grazing, brush cutting, etc. The above named seminatural grasslands are called seminatural because unlike cultural grasslands where cultivated hay is seeded and fertilised, species of natural grass plants grow on seminatural grasslands and are not fertilised. Just moderate human activity, which is mainly mowing and grazing, will ensure preservation of seminatural grasslands. Without any human impact, grasslands would start rapidly overgrowing and will lose their species diversity, and their aesthetic and recreational value. The same will happen in the event of excessively intense human impact where grasslands become cultivated and values characteristic of seminatural grasslands disappear.

Seminatural grasslands attained the maximum surface area at the end of the 19th century and early in the 20th century, covering nearly 2 million hectares then. That area started to diminish in the first half of the 20th century in connection with transition from extensive to intensive agriculture (Ehrlich, Habicht, 2001). Seminatural grasslands started to disappear especially fast after World War II, due to the diminishing of cattle breeding and collectivisation, as a result of which households lost interest in manually mowing small pieces of land. Mechanisation of collective agriculture accelerated the disappearance of seminatural grasslands because large plots of cultivated grasslands were more suitable for machine mowing, which, in addition to that they are easier to mow by machines, have also higher yields. The fast decrease in the area of seminatural grasslands as a result of the intensification of agricultural production was typical not only for Estonia but has happened virtually all over the world.

In 1992, the Council Directive on the conservation of natural habitats and of wild fauna and flora was adopted in the European Union (Council Directive 92/43/EEC of 21 May 1992), according to which seminatural grasslands are valuable and endangered habitats. From the point of view of nature conservation, the seminatural grasslands are considered valuable primarily due to the extraordinary diversity of life there (Ehrlich, Habicht, 2001). Many endangered and protected plant, animal and fungi species are associated only with seminatural grasslands (Palo, 1996; Pedmanson et *al.*, 1997; Kukk and Kull, 1997).

The primary reason for the diminishing area of seminatural grasslands is their insufficient management. To preserve seminatural grasslands they need to be maintained annually, which, as a rule, is not cost-effective. Hence, seminatural grasslands cannot without special measures compete with cultivated grasslands, because they have lower hay yields and higher production costs. To preserve seminatural grasslands a support system is required, without which seminatural grasslands would disappear rapidly from the landscape.

In Estonia, support for the management of seminatural grasslands is paid by the Estonian Agricultural Registers and Information Board (ARIB) and the Environmental Board. The support rates vary across types of seminatural grassland and activities planned there (maintenance or restoration). The support payments, however, may cover not all maintenance and restoration costs, and in the latter case, the principle is applied that the cost depends on the period during which the grasslands have not been maintained. Hence, the longer the grassland has not been maintained, the more expensive its restoration is because in that case mowing is preceded by brushwood cutting, which has a much higher per hectare cost. Moreover, the maintenance of

seminatural grasslands during a couple of years after the restoration is also more expensive than normally.

For example, in 2012, applications for the maintenance support were lodged for 26,576 hectares of seminatural grassland only, which is a very small figure compared to 1.8 million hectares at the beginning of the 20th century. Though it is probably unrealistic to restore all the previous seminatural grasslands, the establishment of the maintenance support rates and the aid eligible area (and hence also maintenance) should take into consideration the actual population demand for seminatural grasslands as a valuable environmental good.

This paper seeks to find out the Estonian adult population's demand for seminatural grasslands as an environmental good and through this the monetary equivalent of their non-market value.

The authors of this paper hypothesise that demand of the Estonian adult population for the maintenance of seminatural grasslands is higher than the area of seminatural grasslands currently maintained and restored under the current support system.

To test the hypothesis, they try to calculate demand of the Estonian adult population for seminatural grasslands. Considering that seminatural grasslands are a non-market environmental good, a contingent valuation method based study was conducted among a representative sample of Estonian adult population to find out the monetary equivalent of their value. A questionnaire was designed, where the respondents were asked to answer how much they are willing to pay annually for the preservation of seminatural grasslands. Based on the answers, a demand curve of Estonian adult population was drafted and with the help of the consumer surplus, an aggregate demand curve for seminatural grasslands was calculated. Additionally, they were asked to answer the questions that show their attitude toward seminatural grasslands, and fill in their gender, age, education and income level to investigate the effect of these indicators on the willingness to pay.

Since the respondents' willingness to pay represents a hypothetical payment made in a fictitious environment, then in order to minimise unrealistic willingness-to-pay amounts, this has been addressed in this questionnaire. The respondents were asked to mark the amount for the maintenance of seminatural grasslands as truthfully as possible, taking into consideration their possibilities, notwithstanding that it is a hypothetical situation and does not presume any direct payment.

The body of the paper comprises two interlinked sections. First, an overview of the distribution, value and protection of Estonian seminatural habitats is provided. The second part is about the survey conducted by the authors to find out the monetary equivalent of the non-market value of Estonian seminatural habitats and aggregate demand of Estonian adult population for seminatural habitats as an environmental good. The paper concludes with a summary and findings.

2. Distribution, value and protection of Estonian seminatural grasslands

2.1. Definitions

Seminatural grasslands are areas of natural biota, which have been continuously mown or used as pasture. These are areas where natural vegetation has been preserved and

human activity is mainly limited to mowing or grazing livestock, more seldom burning off dead grass. At the same time, fertilisers, sowing or ploughing are not used. Seminatural grasslands are also called heritage communities, since they have been influenced by our ancestors during a long period and human activity has been carried on from generation to generation. The image and values of heritage communities have developed by considerate management in respect to the nature during a long period. Like the name says, these are seminatural habitats, i.e. natural conditions and human activities both have a significant role. When the latter stops, the previously maintained areas grow into shrubs and woods (Kusmin *et al.,* 2011).

Seminatural grasslands differ from cultivated grasslands primarily by the initial natural diversity and extent of human activity. Contrary to seminatural grasslands, original natural vegetation has not survived in cultivated grasslands; it has been extensively altered by fertilisation, ploughing and land improvement. Though both of the grasslands are anthropogenic, cultivated grasslands have significantly stronger human influence (e.g. tillage). Cultivated communities also start developing toward natural habitats when human activity there stops (Tiina Talvi, Tõnu Talvi 2012, 3).

Seminatural grasslands are grouped according to humidity, soil structure or land use type. We know the following seminatural grasslands: wooded meadows and wooded pastures, floodplain meadows or flooded meadows, coastal meadows, dry meadows or alvars, grasslands on mineral soil and marsh meadows (Kusmin *et al.,* 2011).

2.2. Distribution of seminatural grasslands

There are different estimates of the total area of Estonian seminatural grasslands and their regional distribution. A reason for that may be mainly insufficient source data or variability in different databases, as well as different meadow classifications. Similarly, different databases provide different evaluations of low-value (extensively overgrown) and high-value (maintained or high potential for maintenance) areas of seminatural grasslands. The main sources on the area of distribution of seminatural grasslands are the Estonian Seminatural Community Conservation Association's database, Estonian Fund for Nature's nature conservation projects database, Natura 2000 database, land cadastre, and data of agricultural censuses (Kukk *et al.,* 2004).

The seminatural areas according to the European Council Habitats Directive are estimated to total at 130,000 hectares in Estonia; including 60-70% are of high value. Such figure was received by summing up the results of the Estonian Seminatural Community Conservation Association's database and of the Natura database, since these two databases coincide in the extent of less than 5%. The outcome has been adjusted with an expert assessment. The seminatural habitats were counted the most in Läänemaa and Saaremaa, in each approximately 24,000-26,000 hectares, and the least in Järvamaa, Ida-Virumaa and Põlvamaa, where the area of seminatural habitats is smaller than 2,000 hectares. However, an insufficient inventory has been made of grasslands in these counties and therefore the actual area might be slightly bigger. In the Habitats Directive, the concept of seminatural grassland covers more areas than only coastal meadows, grasslands on mineral soil, floodplain meadows, wooded meadows, marsh meadows and wooded pastures. Speaking only of the latter, their total area is approximately 81,000 hectares, including 60-70% of them valuable (Ibid.).

With the largest area in Estonia are floodplain meadows, which according to the Estonian Seminatural Community Conservation Association's database, Natura database and based on the expert assessment, cover approximately 20,000 hectares, 80% of which are of high value. Floodplain meadows are followed by coastal meadows with 18,000 hectares, 70% are regarded as high-value meadows. Dry meadows or alvars in Estonia can be found on 15,000 hectares, and 70% of them are considered valuable. Wooded meadows are the best-inventoried habitats, whereas they are found on approximately 8,000 hectares in Estonia (Ibid.). Their value, however, is disputable since probably a large share of this area is quite overgrown in reality. The area of wooded meadows is also suggested to be only 500 hectares, which include only mown and valuable wooded meadows (Paal 1998, 1040).

The area of seminatural grasslands peaked at the end of the 19th century and early in the 20th century, when they covered approximately 40% of the Estonian territory. Especially widespread were wooded meadows, grazed alvars and coastal meadows in West-Estonian coastal areas and islands. With agricultural development, the share of cultivated grasslands increased since new equipment came into use and land improvements were made. This quickened essentially the disappearance of seminatural grasslands in the 20th century. Depending on the application, meadows were turned into cultivated grasslands, arable land or forests. The neglected wooded meadows grew into mixed forests, coastal and floodplain meadows grew into reeds and bushes, alvars turned into dense juniper shrublands, and marsh meadows mostly grew into birch woods. The remaining seminatural grasslands continue overgrowing without management (Tiina Talvi, Tõnu Talvi, 2012, 5-6). The dynamics of seminatural grasslands is described in Figure 1.

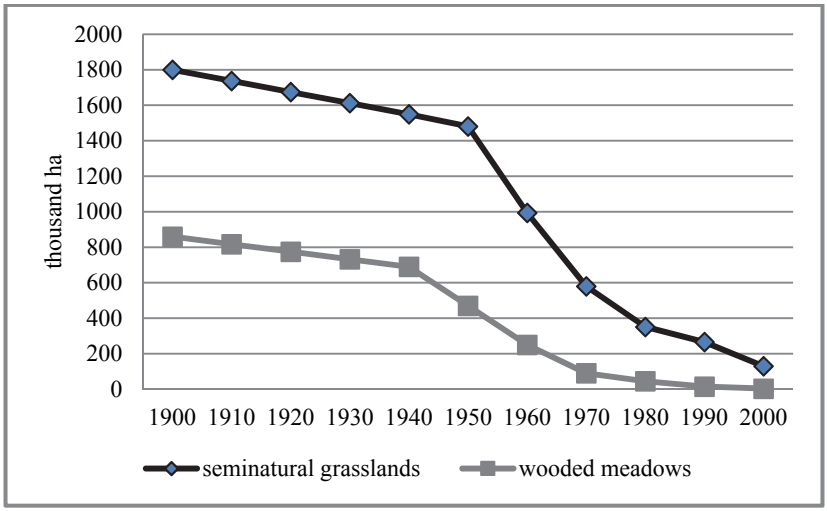

Figure 1. Dynamics of seminatural grasslands and wooded meadows in Estonia in the 20th century (thous. ha)

Source: Sammul *et al.,* 2008, 415

Figure 1 depicts that early in the 20th century, there were 1.8 million hectares of seminatural grasslands, including 0.86 hectares of wooded meadows; but early in the 21st century, there were only 130,000 hectares of seminatural grasslands left, 8,000 hectares of which were wooded meadows.

If to speak only of maintained seminatural grasslands that are in a good condition, then the figures are considerably smaller. According to ARIB, in 2012, applications for support for the maintenance of seminatural grasslands were submitted with regard to 26,576 hectares.

Disappearance of seminatural grasslands can be avoided by their competent management and insufficient amounts of support are available for the restoration and maintenance works.

2.3. Value of seminatural grasslands

Some types of seminatural grasslands have been mentioned as threatened habitats in the European Union Habitat Directive, whereas the main aim of the Directive is to contribute towards biodiversity, conservation of threatened species of fauna and flora, and their natural habitats (Council Directive 92/43/EMÜ).

Seminatural grasslands have a very high diversity of species. 40% (603 species) of all vascular plants growing in Estonia have been found in Estonian wooded meadows and one third of the directory of protected species are growing only on wooded meadows (Kukk *et al.* 2004, 73). In order to value the natural and cultural heritage of wooded meadows, at the initiative of the Estonian Seminatural Community Conservation Association, eight Estonian wooded meadows (Laelatu, Kalli-Nedrema, Mäepea, Allika, Tagamõisa, Loode, Koiva and Halliste) were inscribed on the UNESCO (*United Nations Educational, Scientific and Cultural Organization*) world heritage tentative list (Wooded meadows..., 2004).

The diversity of species is spectacular also in floodplain meadows, where 350 species of vascular plants are growing, and in coastal meadows and alvars, where respectively 290 and 263 species of vascular plants can be found, many of which are rare (Kukk *et al.* 2004, 74-76). In global scales, the small-scale diversity of species of Estonian seminatural habitats is very big: in addition to wooded meadows (76 species per square metre), 49 species per 1 square metre have been counted on alvars, 35 on coastal meadows and 39 on floodplain meadows. Diversity can be seen also in landscapes: in seminatural habitats, natural areas harmonically alternate with anthropogenic ones (Pärtel, 2003, 11).

The Red List of Threatened Species contains many seminatural ecosystem related organisms: 20% of fungi, 49% of lichen, 86% of vascular plants, 42% of invertebrates and 55% of vertebrate animals (Ibid., 8).

Heritage communities are, in addition to their natural diversity, also valuable as ambassadors of culture. There are few examples of how the nature and men are not counterworking but create something new and valuable in harmony. Seminatural grasslands are distinguished, for example, from valuable virgin forests, by connection to humans. The old constructions, cairns and stone fences on grasslands are also a significant part of cultural heritage (Kukk *et al.* 2004, 179). Aesthetic and recreational

values are not less important either. Being a stopover for migratory birds, grasslands attract numerous bird watchers from Estonia as well as from afar (Gren *et al.,* 1997, 12).

Directly economically beneficial values such as, for example, products of animals grazed on seminatural grasslands, cannot be ignored either. Free-range animal products are increasingly more valued in food industry. Owing to that, the situation of seminatural grasslands has started to improve in some regions. For example, in Spain where the well-known Iberian pigs roam freely outdoors and thereby contribute to the maintenance of grasslands (Hopkins, 2009). Seminatural grasslands can be well used in organic production, which today is growing increasingly more popular among both producers and consumers.

The value of seminatural habitats might be revealed also in using them for bioenergy production. Without respect to logical obstacles or alternative uses of biomass, 2% of Estonia's primary energy consumption could be replaced by bioenergy that comes from seminatural habitats. The biomass energy throughput depends on the type of seminatural grassland. With the greatest potential for biomass production among Estonian seminatural grasslands are floodplain meadows where annual average dry biomass yield per hectare is 5.7 tonnes, while the same indicator from wooded meadows is 1.6. The use of biomass for energy production would provide a motive for mowing seminatural grasslands and in that way, for their more extensive management (Heinsoo *et al.,* 2010).

So far, the value of seminatural grasslands has been studied mainly in the context of related biological species. Their use value has been explored less and their non-use value even to a lesser extent.

2.4. Protection of seminatural grasslands

Being a European Union member, protection of Estonian seminatural grasslands is concerned with European Union policies. The first piece of legislation historically which promotes protection of meadows was The Birds Directive of 1979. One aim of the Directive is to protect birds' habitats and hence it quite directly concerns the meadows. The Habitats Directive of 1992 is more concerned with the protection of seminatural grasslands: as a result, the Natura 2000 network of valuable and threatened habitats was established. Thanks to the Habitats Directive, the European Union member states can apply from the common budget of the Union for co-financing for the protection of threatened habitats. Additionally, the European Union requires the member states to work out agricultural environment programmes to make agriculture more protective of the nature. Many such programmes contain also measures for the management of meadows (Kukk *et al.,* 2004). A rural development plan has been developed in Estonia, where one focus is on making the management of seminatural grasslands more effective (Eesti maaelu arengukava... 2012). Protection of seminatural grasslands presumes their restoration and maintenance.

Protection of seminatural grasslands means preservation of human activity favourable to the nature, which would have a positive effect on the diversity and aesthetic value of grasslands. Human activity should be just enough: excessive human activity would spoil seminatural habitats and where human activity is absent, meadows gradually

overgrow and disappear. Of primary importance in the protection of grasslands today is to ensure an appropriate mowing and grazing regime (Kukk *et al.,* 2004).

Meadows can be legally protected by establishing protected areas. However, protected areas alone do not ensure that meadows will remain. Meadows need to be restored and maintained as well. Nowadays, the traditional use of meadows is not cost-effective and has to be arranged in both protected areas (e.g. Matsalu National Park) and outside. One of the most usual ways for doing this is applying for support for the maintenance or restoration of seminatural grasslands, which incurs a responsibility of the applicant to restore or maintain the grassland as required. Meadows on the state and nature protection organisations' lands are maintained also for nature protection purposes (Ibid.).

Heritage communities are maintained by mowing and/or grazing, and where necessary, the tree and shrub layers are thinned, branches fallen to the ground are gathered up and rocks are labelled. However, no chemicals are allowed in the heritage communities; they may not be pruned from the top; it is not allowed to plant introduced species, build roads there or in any other way damage the seminatural condition. Heritage communities are mown mostly once a year starting from July when the birds nesting season is over and many flowering plants finished blooming. It is important to use an appropriate method of mowing: to leave birds and animals an escape route (starting in centre or moving from edge to edge), and at the same time, grass may not be mown very short because this might have a negative effect on the diversity of vegetation. It is important not to leave hay lying on the ground too long but rake it together and carry away. As a rule, wooded, floodplain meadows and grassland on mineral soil are mown. On the other hand, wooded pastures, coastal and dry meadows and sometimes also marsh meadows are grazed. More suitable for grazing are small low-maintenance breeds such as Estonian horse, bovine animals and sheep, the first of which are not suitable in habitats that are not tread resistant (Kukk et al. 2004, 103-106).

Restoration and maintenance of heritage communities is a costly process and economically inexpedient. In order to protect heritage communities, support can be applied for their restoration and maintenance. Estonia as a European Union member state is in the scope of the common agricultural policy. Its aim is to ensure stability of the European Union internal market and income to agricultural producers, for the achievement of which many aid grants are paid. Both incomes and expenses of the common agricultural policy go through the general budget of the European Union (EL ühine põllumajanduspoliitika..., 2010). Measures of the common agricultural policy shall be implemented by the Estonian Agricultural Registers and Information Board (ARIB) (Euroopa Liidu ühise... §8).

In order to carry out the common agricultural policies, the Estonian Rural Development Plan 2007-2013 was prepared. The Development Plan seeks to contribute to increasing competitiveness of Estonian agriculture and forestry, improving the quality of life and environment in rural areas. In 2007-2013, Estonia could use 935 million euros to support agriculture, rural life and environmental development under the Development Plan (Eesti maaelu arengukava... 2012). 26.8 million euros from this were available for the maintenance support of seminatural habitats with the aim to preserve areas of high

natural value and biological and landscape diversity (Eesti maaelu arengukava... 2012, 161).

Table 1 provides the support payments by ARIB for the maintenance of seminatural grasslands in 2007-2012. A total of 22.9 million euros of support was paid out during these years from 26.8 million euros envisaged in the Estonian Rural Development Plan. The number of approved applicants has been increasing from year to year, which in 2011 and 2012 remained at the previous level. The area of seminatural grassland for the maintenance of which applications have been submitted has also been increasing. The area of wooded meadows for which maintenance support has been applied for has been steadily around 3% of total area indicated in applications.

Table 1. ARIB support payments for the maintenance of seminatural habitats in 2007–2012

Year of application	Number of approved applicants	Area of wooded meadow for which support has been applied for, ha	Total area applied for, ha	Payment, eur
2007	692	396	15 501	2 846 598
2008	712	508	18 780	3 351 795
2009	803	550	21 427	3 821 774
2010	869	727	23 500	4 089 010
2011	916	587	25 441	4 442 881
2012	913	622	26 576	4 353 613

Source: ARIB

Support for the maintenance of seminatural habitats can be applied for with regard to those habitats in the Natura 2000 area that have high natural value. Support for the maintenance of semi-natural habitats will not be paid for land with regard to which some other agricultural or nature protection support has been applied for. The support rate per hectare of wooded meadow is 238.07 euros a year and per hectare of other seminatural habitat 185.98 euros a year (Poolloodusliku koosluse hooldamise... §2, §3). The support rate for wooded meadows is higher since its maintenance requires a lot of manual labour and hence also the costs are higher.

Starting from the year of application, the applicant commits to maintain the seminatural grassland during five successive years, in compliance with the requirements such as frequency and time of mowing, grazing at sufficient stocking rate, prohibition of fertilisers, etc. Compliance with the requirements will be checked by the Environmental Board, ARIB and the Veterinary and Food Board (Poolloodusliku koosluse hooldamise... §3, §5, §7).

Indirectly related with the maintenance of seminatural grasslands is also support paid for grazing, since it enables to apply for support in areas that are not listed in the Natura

2000 network. Since the problem for Estonia is undergrazing rather than overgrazing, then grazing should be promoted (Eesti maaelu arengukava... 2012, 188-192). Support for grazing can be applied from ARIB in the amount of 51-13 euros per cattle or horse annually, and 9.20 euros per goat or sheep (Loomade karjatamise toetuse... §2).

In addition to ARIB, support for the maintenance of seminatural grasslands is provided by the Environmental Board under the Ministry of the Environment. For the maintenance of wooded meadows that are not among the Natura 2000 areas, a nature conservation subsidy in the amount of 199 euros per hectare can be applied for, for the maintenance of other meadows 147 euros per hectare (Loodushoiutoetuse taotlemise... §2). Table 2 provides an overview of supports paid for the maintenance of seminatural habitats.

Table 2. Subsidies and support for the maintenance of seminatural habitats

Support for the maintenance of seminatural habitats	Paying authority	Habitat location	Type of seminatural habitat	Support rate EUR/ha
Support for the maintenance of seminatural habitats	ARIB	Natura 2000 area	Wooded meadow	238.07
			other	185.98
Nature conservation subsidy	Environmental Board	outside Natura 2000 area	Wooded meadow	199.00
			other	147.00

Source: Poollooduslikukoosluse hooldamise... §3, loodushoiutoetuse taotlemise... §2

Both, support for the maintenance of seminatural habitats and nature conservation subsidy enable to apply for a larger amount of money for the maintenance of wooded meadows because due to more complicated nature conditions and more abundant manual work, their maintenance is more costly compared to other meadows. The support rates for the maintenance of seminatural habitats are higher than the rates of nature conservation subsidy because these are aimed at the Natura 2000 areas and are therefore regarded as more valuable. The share of nature conservation subsidies paid by the Environmental Board however is extremely small: in 2012, nature conservation subsidies were paid out for the maintenance of 108 hectares of seminatural grasslands.

3. Non-market value of Estonian seminatural grasslands

3.1. Economic methods for determining the value of non-market goods

Seminatural grasslands represent an environmental good that is not traded in the market and therefore has no market value. Diversity of seminatural grasslands or wellbeing from enjoying the beauty of grasslands cannot be expressed in market prices. However,

it is essential to determine the non-use value of environmental objects because this might be important in policy-making and financing, for example, establishing the support rates. The monetary value of environmental goods can be determined as a result of research where information is gathered regarding population's willingness to pay (*WTP*).

In general, there are three different ways to evaluate what people are willing to pay for non-market goods, including environmental goods (Abelson, 1996, 45):

1) By studying the prices people pay for substitute goods on different markets;
2) By studying expenditures people make on getting the goods, for example, transportation cost, expenditure of time in money terms, etc.;
3) By asking people how much they are willing to pay for a non-market good.

The two first options are based on preferences of how people actually behave; but the third is based on preferences revealed by their contingent behaviour. The environmental goods valuation methods are often grouped into two: the revealed preferences and stated preferences based method of valuation. The revealed preferences methods are based on consumers' willingness to pay or willingness to accept in an artificial environment. The stated preferences methods are based on individuals' actual behaviour in a real environment. The choice of method depends on the type of non-market good for which the monetary value is to be found and the kind of data used for that (Abelson, 1996, 45).

If the good for which monetary value is to be found is not tradable in the market, its value can be derived from the price of a tradable substitute good. For example, the value of well water not connected to the urban water supply system can be found through the tradable water price. Though the prices of substitute goods and services are a good source of information for identifying the willingness to pay, they are not sufficient to determine the value of non-market goods (Ibid.).

The stated preferences method is based on market prices of other goods in order to determine the value of non-market goods. For example, the value of a non-market good can be found through the costs incurred for consumption of this non-market good. These costs are indirect since such goods cannot be bought: for example, travel costs for the consumption of non-market goods. The travel costs method is used to derive the value of a non-market good through the cost of its consumption including, for instance, transport to the destination, entrance fees, opportunity costs of time. The travel costs method is used more frequently for determining the value of recreational areas (e.g. national parks). The method might be based on a survey conducted among actual or potential visitors of the recreational area (Hussen, 2000, 154-156).

There are also other ways to measure the value of non-market goods with the help of costs. One option is through restoration costs. In that case, costs incurred for the restoration of the situation preceding the environmental damage are measured (Abelson, 1996, 72). In this way, the costs incurred for the restoration of an overgrown seminatural grassland enable to find the value of this grassland. Costs incurred for the prevention of environmental damage also help find the value of a non-market good (Ibid., 72). In that case, costs incurred, for instance, for the maintenance of seminatural

grasslands to avoid their disappearance and to preserve animal and plant species there are measured.

The seminatural grasslands can be used in alternative ways. If these areas were used, for example, as arable land, market prices of agricultural produce could be used to find the value of seminatural areas through the opportunity cost measurement. Valuation with the help of costs, however, does not take into account the value offered by the seminatural grassland itself, especially as regards its species diversity and aesthetic and historical value.

The vicinity of seminatural grassland might be a significant factor in the real estate price formation. The environmental impact on real estate is studied by the hedonic price method, which helps to calculate the value of non-market goods from their impact on the sale or rental prices of real estate. The location of real estate, the specific aspects of neighbourhood and environmental quality are investigated for that purpose (Abelson, 1996, 61-62).

The stated preferences methods for determining the value of non-market goods are based on the impact of non-market goods, or absence of impact. In either case, the stated preferences based valuation method might not take into consideration all values of non-market goods. Often the actual value of objects is undervalued since this is not only incomes and costs expressed at current prices. The revealed preferences based valuation method is more comprehensive and takes into account, among other things, such values as aesthetic and historical value. Therefore, contingent valuation (CV) is the most appropriate method for determining the value of seminatural grasslands.

3.1.1. Determining the value of environmental goods with the contingent valuation method

The contingent valuation method is based on questionnaires designed to finding out population's willingness to pay for non-market goods. The questionnaire seeks to learn how much consumers are willing to pay for that their wellbeing would not deteriorate or how much should be compensated to consumers for loss in wellbeing (Pearce, Atkinson, 2006, 107). Contingent valuation indicates that payments are hypothetical and the respondents need not donate any real money. Therefore, it is important to explain to the respondents that notwithstanding the contingency of payment, they should state their willingness to pay as truthfully as possible and taking into consideration their possibilities. Since non-market goods have no real market, this will be created artificially, by asking consumers' willingness to pay. The contingent valuation method uses all consumers for measuring the value of a non-market object: willingness to pay can be expressed by both actual and potential consumers of the object (Hanemann, 1994).

The questionnaire helps to identify the respondents' attitudes toward the non-market object and their willingness to pay for preserving or compensation for not preserving that object. It is important how the questionnaire is designed. With open-ended questions no possible answers are suggested but the respondent is expected to write down his/her maximum willingness to pay for maintaining the object or minimum amount of money he/she is willing to accept to abandon it. With open-ended questions the respondent is not influenced by suggested values, however, in that case, unrealistic

results should be eliminated (Baarsma, 2000, 53-60). Open-ended questions have been used also to find out the willingness to pay for seminatural grasslands.

"Take-it-or-leave-it" questions can also be asked from respondents. In that case, consumers are asked whether they are willing to pay a certain amount for maintaining the survey object, whereas the price in each questionnaire is different and selected from among previously prepared price ranges. Another option is repeated questions, in the case of which consumers are expected to answer whether they are willing to pay a certain amount for maintaining the object. If a positive answer is given, the same question with a higher value is asked and so on until a negative answer is given (Handbook of.., 2005, 877-878).

In the payment card format, respondents are offered a card with a list of bids and are asked to choose one that they are willing to pay. In that case, the willingness to pay is more credible than with open-ended questions (presumes realistic multiple-choice answers); however, the respondents' choices are limited (Ibid.).

Contingent valuation is used mostly for environmental goods that are public goods. The method has been used for evaluating grasslands and recreational areas worldwide. In Italy, the recreational and nature conservation values of grasslands were investigated by introducing two scenarios: the current grassland and forest landscape, and hypothetical forest landscape without grasslands. The respondents were asked their annual willingness to pay for the project that would preserve grasslands. The results imply that most of the respondents approve of the project implementation and are willing to donate to the wellbeing of future generations (Marzetti *et al.,* 2011). In the Netherlands, the contingent valuation method was used to measure the value of paludified grasslands to decide how it would be most appropriate to finance their maintenance (Brouer *et al.,* 1998).

The contingent valuation method is the most preferred valuation methods of environmental goods, since it enables to measure the value the grassland will acquire due to its active users (people who go there for recreation, live in the vicinity, etc.), as well as passive users (people who are not directly in contact with the grassland but are still willing to pay for its maintenance). Hence, the contingent valuation method enables to more comprehensively determine the value of a grassland since it involves also consumers who are not using it. Additionally, the contingent valuation method takes into consideration the values of a seminatural grassland that other methods ignore. For example, willing to pay for a seminatural grassland are people who are not in any contact with the grassland but who still appreciate the historical value of the grassland. Just for these reasons, the contingent valuation method was used to study the willingness to pay of the Estonian adult population for the maintenance of Estonian seminatural grasslands. Willingness to pay enables to derive demand of the Estonian adult population for the maintenance of seminatural grasslands and to calculate the non-use value of seminatural grasslands.

3.2. Contingent valuation study in Estonia

3.2.1 Methodology

A contingent valuation survey was conducted to find out the willingness to pay of the Estonian adult population for the maintenance of seminatural grasslands and demand for them. For that purpose, a questionnaire was designed, where a random sample was asked to answer the questions that show the respondents' attitudes toward seminatural grasslands and estimate how much they are willing to pay annually for the maintenance of seminatural grasslands. Based on the answers, a demand curve of the Estonian adult population for grasslands was drawn up and total demand was calculated.

In addition to the questionnaire, the respondents had to indicate their sociometric data, which were used in regression analysis to identify which data influence the attitude toward seminatural grasslands and the willingness to pay for their maintenance. The econometric package *Gretl* was used for regression analysis. Indicators at the significance level of 5% were considered statistically significant, meaning that with 95% of probability the effect of the indicator on the answer was not accidental. In tables with results of regression analysis in this subchapter, the statistically significant variables are labelled with two (significance level 5%) or three asterisks (significance level 1%). One asterisk denotes the variables that are statistically significant at the level of 10%.

1078 people answered the questionnaire. The final sample contained all those 1061 respondents who had filled in all sociometric data (gender, education, age, income). Based on the sample, total demand of Estonian adult population for the maintenance of seminatural grasslands was derived.

The answers were analysed according to sociometric indicators of the respondents. The distribution of the respondents by gender, age, education and income is represented in Table 3. Data of Statistics Estonia on the Estonian adult population are also included.

In general, the distribution of the respondents according to sociometric indicators was satisfactory. Men accounted for 41% and women 59% of all respondents, whereas in total adult population men accounted for 45% and women 55%. The biggest difference from total Estonian population was in education, where 40% of the respondents had higher education (28% in the case of total population). Higher education includes professional higher education, bachelor's, master's and doctoral degrees. According to income level, respondents earning 601-770 euros per month accounted for the biggest proportion of the respondents.

The questionnaire contained four questions preceded by a short explanation of the matter of seminatural grasslands and an overview of the floodplain, coastal and wooded meadows. The questionnaire also mentioned the need to maintain grasslands to avoid their overgrowing and disappearance of habitats' species diversity. The following questions were asked:

1. Have you heard over the radio, TV or press anything about seminatural habitats?
2. Do you agree that Estonian seminatural habitats (floodplain meadows, coastal meadows, wooded meadows) are worth maintaining?
3. How do you rank the Estonian seminatural habitats (floodplain meadows, coastal meadows, wooded meadows) in order of importance?

4. If you agree that Estonian seminatural habitats should be maintained, then what is the amount of money you would donate annually for that purpose?

Table 3. Distribution of the respondents and Estonian adult population according to sociometric indicators

Indicator		Share of respondents, %	Share of Estonian adult population, %
Gender	male	40.7	44.9
	female	59.3	55.1
Education	primary (basic)	4.1	30.2
	secondary	27.5	23.4
	Secondary specialised	28.2	18.9
	higher	40.2	27.5
Age	18-23	11.0	10.2
	24-29	10.5	11.5
	30-39	19.5	17.1
	40-49	19.4	16.3
	50-59	20.5	16.6
	60-69	9.9	12.5
	over 70	9.2	15.8
Monthly average disposable income, €	<150	6.3	20.5
	151-300	8.3	
	301-450	17.7	19.9
	451-600	18.3	20.0
	601-750	19.0	20.1
	751-1000	16.8	19.5
	1001-1300	7.3	
	>1300	6.3	

Source: database of the Statistics Estonia, based on answers to author's questionnaire

The second and third questions seek to find out the respondents'' attitude toward seminatural habitats; the fourth question contributes to calculating the respondents' willingness to pay for the maintenance of habitats and deriving a demand curve of Estonian adult population for the habitats.

3.2.2 Estonian adult population's willingness to pay for the maintenance of seminatural grasslands

The fourth or last question asked from the respondents how much they would agree to pay annually for the maintenance of seminatural habitats. They were asked to state their willingness to pay as precisely as possible and considering their possibilities, notwithstanding that it is a hypothetical payment. The questionnaires with unreasonably high willingness to pay were removed from the sample and the missing willingness to pay was replaced by zero since in that case the respondent probably did not want to pay for the maintenance of seminatural grasslands.

72% of the respondents referred to positive willingness to pay, whereas 28% of the respondents were not willing to pay for the maintenance of seminatural grasslands. To examine the impact of sociometric data on the payment decisions, regression analysis was conducted where payment decision was a dependent variable, i.e. whether the respondent was willing to pay a bigger sum than zero for the maintenance of seminatural grasslands, or his/her willingness to pay was zero. The results of regression analysis are described in Table 4.

Table 4. Dependence of payment decision on sociometric data

Dependent variable: Payment decision Method: OLS					
Variable	*Coefficient*	*Std. Error*	*T-ratio*	*P-value*	
Const	1,3430	0,0720	18,6630	<0,00001	***
Gender	0,1387	0,0280	4,9611	<0,00001	***
Education	0,0623	0,0161	3,8711	0,00012	***
Age	-0,0143	0,0078	-1,8251	0,06827	*
Income	0,0048	0,0080	0,5969	0,55071	

Source: Compiled by the author

Table 4 shows that the statistically significant variables (significance level 5%) in the payment decision are gender and education. Surprisingly, income level does no influence the payment decision. When a respondent values seminatural grasslands and earns low income, he/she probably is willing to donate even a very small sum for their maintenance.

78% of women mentioned positive willingness to pay and 22% of female respondents were not willing to pay for the maintenance of seminatural grasslands. 63% of male respondents stated positive willingness to pay and 37% of men said their willingness to

pay was zero. Hence, female respondents are more willing to pay for the maintenance of seminatural grasslands.

Respondents' education is another factor that has effect on the decision-making between payment and non-payment for the maintenance of seminatural grasslands. Respondents with low educational level made a positive payment decision more rarely than people with higher educational level. Figure 2 demonstrates that the higher the educational level, the more respondents are willing to pay for the maintenance of seminatural grasslands. Among the respondents with primary or basic education, 53% are willing to donate for the maintenance of seminatural grasslands, among people with higher education this percentage is as high as 80.

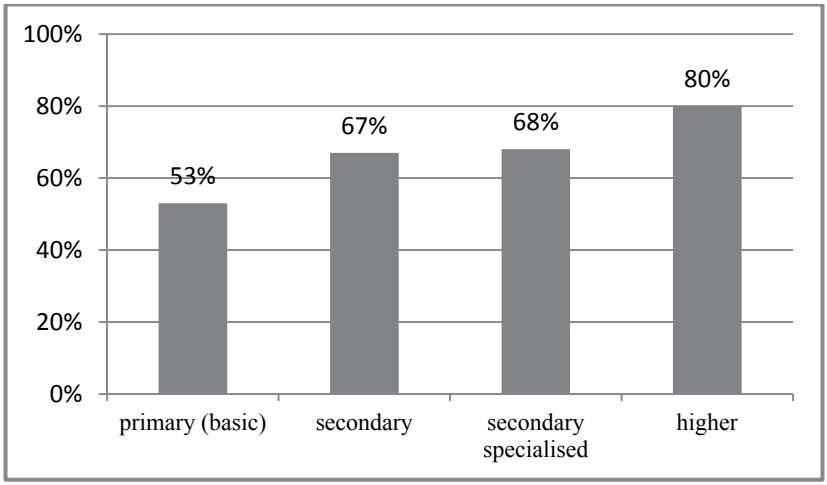

Figure 2. Proportion of positive payment decisions according to education (%)

Source: Compiled by the author

Next, the authors studied the dependence of the payment decision on the first question of the questionnaire. The first question inquired whether people have heard over the radio, TV or press anything about seminatural habitats. 56% of the respondents had heard about seminatural grasslands in the media. As given in Table 5, this is not a statistically significant variable in the payment decision making (significance level 5%). Hence, it is of no significance for the payment decision whether person has heard anything about grasslands and their condition in the media.

Table 5. Dependence of payment decision on questions 1 and 2

Dependent variable: Payment decision Method: OLS					
Variable	*Coefficient*	*Std. Error*	*T-ratio*	*P-value*	
Const	0,7860	0,0694	11,3325	<0,00001	***
Question 1	0,0486	0,0266	1,8292	0,06765	*
Question 2	0,3109	0,0240	12,9701	<0,00001	***

Source: Compiled by the author

The second question in the questionnaire inquired whether people agree that seminatural grasslands are worth maintaining. 81% of the respondents agreed. The regression analysis results in Table 5 demonstrate that answer to the second question is a significant variable in the payment decision making. 80% of those who agreed were also willing to pay for the maintenance of seminatural grasslands. Surprisingly, 18% of those who believed grasslands are not worth preservation were also willing to pay, mostly a very small sum indeed.

While the payment decision means choosing between two options (to pay or not to pay), the willingness to pay means whether and how much to pay. Hence, the results of investigating the impact of sociometric data on willingness to pay may be different. Average willingness to pay according to sociometric indicators is presented in Table 6.

Average willingness to pay for the maintenance of seminatural grasslands is 17.3 euros per respondent. Table 6 shows that female respondents have higher willingness to pay; according to education, people with higher education are more willing to pay; and according to age, 40-59 year old people are willing to pay the most. Additionally, the higher the income, the higher the willingness to pay.

The following regression model was built to test the impact of respondents' gender, education, age and income on willingness to pay:

$$\ln(WTP) = \alpha + \beta_1 G + \beta_2 \ln(age) + \beta_3 \ln(edu) + \beta_4 \ln(inc) + \varepsilon \quad (1)$$

where:

G – gender (fictive variable, 1= male, 2= female)
age – age (7 age groups starting from youngest)
edu – educational level (4 levels starting from lower)
inc – income (8 levels starting from lower)
ε – error term

Table 6. Respondents' annual average willingness to pay for the maintenance of seminatural grasslands according to sociometric indicators

Indicator		Average willingness to pay, €	Share in overall average, %
Gender	male	16.5	95.4
	female	17.9	103.5
Education	primary (basic)	8.9	51.4
	secondary	15.9	91.9
	secondary specialised	14.5	83.8
	higher	21.1	122.0
Age	18-23	14.8	85.5
	24-29	10.8	62.4
	30-39	18.4	106.4
	40-49	20.4	117.9
	50-59	20.3	117.3
	60-69	16.3	94.2
	over 70	13.2	76.3
Average monthly disposable income, €	<150	11.1	64.2
	151-300	12.8	74.0
	301-450	12.3	71.1
	451-600	15.6	90.2
	601-750	19.0	109.8
	751-1000	21.3	123.1
	1001-1300	21.3	123.1
	>1300	28.1	162.4
Average		17.3	100.0

Source: Compiled by the author

The results of regression analysis are presented in Table 7, according to which the statistically significant variables at the significance level of 5% are income, gender and education.

Table 7. Dependence of willingness to pay on sociometric indicators

Dependent variable: willingness to pay Method: TOBIT					
Variable	*Coefficient*	*Std. Error*	*Z*	*P-value*	
Const	-22,7574	6,7019	-3,3957	0,00068	***
Gender	6,7428	2,5672	2,6265	0,00863	***
Education	3,3550	1,4791	2,2684	0,02331	**
Age	-0,0893	0,7110	-0,1256	0,90005	
Income	2,5904	0,7387	3,5067	0,00045	***

Source: Compiled by the author

Women's average willingness to pay is 8.5% higher than the average willingness to pay of men. Respondents' monthly disposable income has a strong impact on the willingness to pay. This is demonstrated in Figure 3. People earning less than 150 euros are willing to pay for the maintenance of seminatural grasslands on average 11 euros, people earning 601-705 euros would pay on average 19 euros and people earning more than 1300 euros even 28 euros on average.

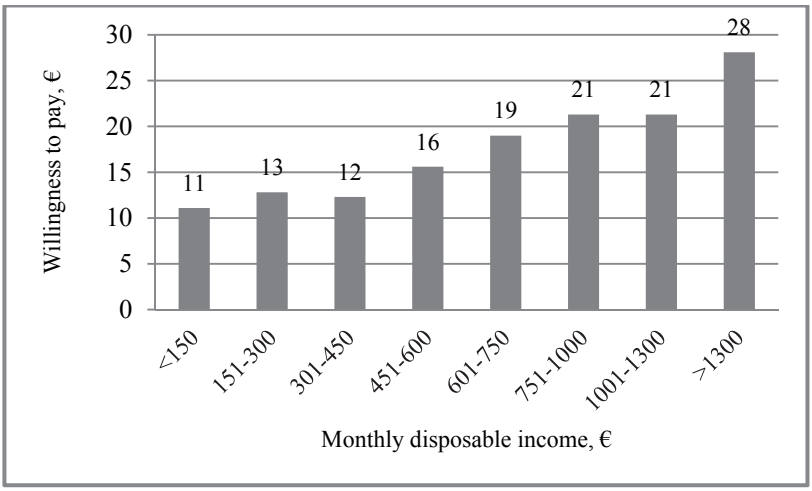

Figure 3. Dependence of willingness to pay (€) on monthly disposable income (€)

Source: Compiled by the author

Contrary to the payment decision, influence of the media on willingness to pay is considerable. The average willingness to pay of those respondents who had heard something about grasslands from the media is 21.5 euros, which is 24% higher than the average willingness to pay of all respondents. Those respondents who had not heard

anything about grasslands through the media were willing to pay 11.9 euros for the maintenance of seminatural grasslands, which is 31% smaller than the average willingness to pay of all respondents.

Table 8. Willingness-to-pay dependence on questions 1 and 2

Dependent variable: Willingness to pay Method: TOBIT					
Variable	*Coefficient*	*Std. Error*	*Z*	*P-value*	
Const	-70,6068	8,1423	-8,6716	<0,00001	***
Question 1	9,4226	2,5467	3,7000	0,00022	***
Question 2	23,3597	2,7782	8,4083	<0,00001	***

Source: Compiled by the author

Table 8 demonstrates that the answer given to question two is also statistically significant, or those who answered that seminatural grasslands are worth maintaining are also willing to pay more for them. The average willingness to pay is 19.9 euros a year, which is 15% higher than the average willingness to pay of all respondents. Those who think the seminatural grasslands are not worth preservation are still willing to donate annually an average of 2.5 euros, which is 86% smaller than the average willingness to pay of all respondents. Those respondents who could not say whether seminatural grasslands are worth preserving or not are willing to support their maintenance with an average of 8 euros per year.

The willingness to pay for the maintenance of seminatural grasslands survey revealed that 72% of the respondents stated positive willingness to pay in the questionnaire. The average willingness to pay for the maintenance of seminatural grasslands is 17.3 euros per respondent. The sociometric indicators of the respondents that most influence the willingness to pay are income, gender and education.

3.2.3. Demand of Estonian adult population for seminatural grasslands

The aggregate demand curve of Estonian adult population has been derived from the respondents' willingness to pay, which has been extrapolated to the Estonian adult population. The easiest way to find overall demand is to multiply the respondents' average willingness to pay, which is 17.3 euros, by the number of Estonian adult population. Such approach, however, is not the most perfect and might under- or overvalue overall demand. To get credible results, the aggregate demand curve is derived.

An exponential model with the following equation is used to find the aggregate willingness to pay:

$$WTP = \alpha e^{-\beta x} \quad (2)$$

where
WTP – willingness to pay,
x – number of people who are willing to pay at least that sum of money

α and β – parameters valued.

The model's determination coefficient is R^2=0.92, according to which the model has a high descriptiveness rating. The parameters α= 89.54 and β=0.005, and both parameters are statistically significant. Hence, we can write the demand curve as follows:

$$WTP = 89{,}544e^{-0{,}005x} \tag{3}$$

The demand curve received using the above equation is presented in Figure 4 where the vertical axis represents the willingness to pay (WTP) in euro, and the horizontal axis the Estonian adult population (thousands) who are willing to pay that much.

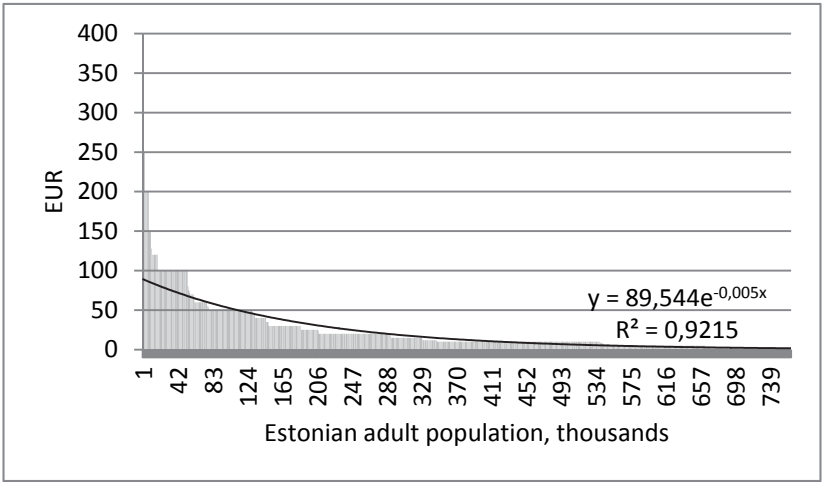

Figure 4. Demand curve of Estonian adult population for the maintenance of Estonian seminatural grasslands

Source: Compiled by the author

The demand curve in Figure 4 shows the price the respondents are willing to pay for the maintenance of seminatural grasslands. Demand of Estonian adult population for the maintenance of seminatural grasslands has been calculated through the consumer surplus, which in the figure is depicted by the area under the demand curve. This area represents the wellbeing of Estonian adult population they get when „consuming" seminatural grasslands.

The definite integral equation was used to calculate the consumer surplus (CS):

$$CS = WTP_T \int_{x_1}^{x_2} \alpha e^{-\beta x} = -\frac{\alpha}{\beta}(e^{-\beta x_2} - e^{-\beta x_1}) \cong \frac{\alpha}{\beta} \tag{4}$$

where x_1=0 and x_2 denote the number of population with positive willingness to pay.

Replacing parameter values α and β in the equation, we can calculate the consumer surplus of Estonian adult population:

$$WTP_T = \frac{\alpha}{\beta} = \frac{89{,}544}{0{,}005} \approx 17.9 \ million \ \ euros \quad (5)$$

Annual demand of Estonian adult population for seminatural grasslands as environmental goods is 17.9 million euros. Consequently, the non-use value of seminatural grasslands in money terms is 17.9 million euros a year.

4. Conclusions

The contingent valuation survey conducted among Estonian adult population with the aim to identify demand for seminatural grasslands received 1,078 responses. The final sample contained 1,061 people, those who had filled in their sociometric data.

72% of the respondents reported positive willingness to pay, i.e. they were willing to donate a larger sum than zero, whereas 28% of the respondents were not willing to donate for the maintenance of seminatural grasslands. The statistically significant variables in the payment decision making (to pay or not to pay) were gender and education. Surprisingly, income does not affect the payment decision.

The average willingness to pay for the maintenance of seminatural grasslands is 17.3 euros per respondent. The willingness to pay is influenced most by respondents' income, gender and education. The higher the income, the higher the willingness to pay: people earning less than 150 euros (disposable income) are willing to donate for the maintenance of seminatural grasslands on average 11 euros, people earning 601-705 euros are ready to pay on average 19 euros, and those earning more than 1300 euros on average as much as 28 euros. Females have higher willingness to pay: it is 3.5 percent higher than average and 8.5 percent (or 3.8 euros) higher than that of males. According to the educational level, people with higher education are willing to pay more: even 22% or 3.8 euros more than average.

An interesting fact is the effect of media on payment decisions and willingness to pay rate. 56% of the respondents had heard something about seminatural grasslands from media, whereas this has no particular effect of their payment decision. However, the media has notably influenced the size of donations. The average willingness to pay of such respondents who had heard something about grasslands from media is 21.5 euros, whereas the willingness to pay of other respondents was nearly two times smaller (11.9 euros). Hence, it is important to discuss the topic of seminatural grasslands in the media since this would increase awareness of people about the value of grasslands. This is evidenced by the higher willingness to pay of those respondents who had heard something about seminatural grasslands from media.

Demand of Estonian adult population for seminatural grasslands is derived based on the aggregate demand curve. The demand curve enables to calculate consumer surplus, which shows wellbeing of Estonian adult population they receive when „consuming" seminatural grasslands. By calculating the consumer surplus, annual demand of Estonian adult population for the maintenance of seminatural grasslands was figured out, which is 17.9 million euros. This can be interpreted as the non-use value of seminatural grasslands.

Based on the average maintenance cost of a grassland on mineral soil, floodplain, coastal and wooded meadow, which is 131 euros per hectare, for 17.9 million euros annually we can maintain approximately 136,640 hectares of seminatural grasslands. This would satisfy demand of Estonian adult population. According to ARIB, support for the maintenance of seminatural grasslands was applied for with regard to 26,579 hectares in 2012; additionally, support for the maintenance of another 108 hectares was applied from the Environmental Board. Demand of the Estonian adult population, however, would be maintenance of a four times larger area.

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IMPLEMENTATION OF THE THEORETICAL CONCEPT OF GREEN PROCUREMENT AND SUPPLIER SELECTION IN ESTONIAN SHIPBUILDING INDUSTRY

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Abstract

Industrial companies are to an increasing extent faced with requirements for better sustainability performance. Green market expands and green purchasing is regarded as a contribution to sustainable development. This paper examines impacts of implementing environmental management systems on enterprises' competitiveness in international supply chains at the example of Estonian ship-building enterprises. The theoretical concept of supplier selection process is used. The alignment problems of green procurement requirements and conditions are considered. The paper focuses on the relationships in the chain affecting the procurement and selection processes. The ship's chain and life cycle of the product specifics are also provided.

Keywords: Environmental Policy, Enterprise Strategy, Green Supplier Selection, Green Procurement, Green Purchasing, Maritime Industry.

JEL Classification: Q55; Q56; O25

Introduction

Industrial companies are to an increasing extent faced with requirements for better sustainability performance. Addressing life cycle sustainability in early design phases it is necessary to effectively and efficiently handle environmental, social and economic concerns. Green market expands and green purchasing is regarded as a contribution to sustainable development (Fet et al., 2013).

The whole industry is becoming more integrated and complex, and the resources used expedient. Since Estonia is a maritime country, we explore the growing renewable shipbuilding industry, which has many environmental developments.

Management of sustainability in ship design requires a methodology targeted towards physically large and complex systems with long life spans and multiple stakeholders. For the purpose of this paper, only the environmental aspects of sustainability are considered. This paper introduces and discusses the green supplier selection and green purchasing as environmental management tools and how in general they can be used to improve a system's environmental performance, corporate social responsibility to be environmentally friendly, ensure sustainable development and pure environment. A question is raised about Estonian possibilities to participate in the global competitive chains through the green supplier selection process.

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The paper analyses effects of implementing environmental management systems on enterprises' competitiveness in international supply chains and problems involved in alignment of green procurement requirements and conditions. An objective is to map the implementation of an environmental management system in ship-building enterprises, and based on that, their participation in international supply chains. The paper focuses on the relationships in the chain that affect the procurement and selection processes. It represents an analytical-conceptual approach as well as a pilot study on green procurement based on Estonian ship-building enterprises.

The theoretical concept of supplier selection process developed by Igarashi et al. (2013) in the Norwegian University of Science and Technology (NTNU) is used. The author explores the possibilities of and obstacles to implementing this concept. An in-depth empirical research, i.e. interviews with representatives of ship-building enterprises, is intended in next stages of the research.

Another aim is to explore how the green outsourcing companies could contribute to strengthening their competitiveness in the supply chain. What are the benefits of the green business strategy process for enterprises in the supply chains?

Estonian companies are mostly young, during the privatization process large enterprises were split up, new firms and foreign investments were small. In most cases they are outsourcing firms and produce intermediate goods (not high-value-added end-products) in value chains. Therefore, they do not have sufficient power to influence the product chains. Environmental regulations may be inhibiting the development of relatively small businesses. Estonian companies are only part of the chain, even if the end product is made here (e.g., log homes, furniture and other wood products), these are sold through the Nordic countries. In contrast, the shipbuilding industry is a relatively independent branch. Providers participating in important segments of a product's life cycle are represented locally. There are also a small number of focal final product companies.

The first section of this paper opens the background of green procurement and supplier selection. The second section focuses on the relationships that exist in the chain affecting the procurement and selection processes. The third section covers the environmental requirements in the supply chain. The fourth section provides an overview of the ship's chain and life cycle of the product specifics. The main part uses and supports Igarashi, de Boer and Fet's (2013) theoretical concept of green supplier selection process, which is based on 60 articles containing the keywords ´green procurement´, ´supplier selection´ and ´green purchasing´. Finally, utilisation sample of the GSS concept in Estonian shipbuilding industry is given.

Data for the research were taken from the Estonian Quality Association database. The shipbuilding and repair activities are sorted out from among the metal and engineering industries, based on the most commonly used environmental management standard ISO 14001. Additionally, for example, ABB, E-Profiil, Toci, and other known suppliers of important offshore installations and large shipbuilders, who have not separately mentioned the shipbuilding sector, were added. There are 155 shipbuilding companies in the Commercial Register, we met with a little more than twenty businesses, including four or five with an integrated shipbuilding chain from design to final completion of the

vessel (Balti Laevaremonditehas - BLRT, Ship repair company and marine offshore industry - SRC, Baltic Workboats - BWB, LTH Baas, Loksa Shipyard), which is a good indicator for small Estonia. The environmental management standard ISO 14001 was selected also because none of the metal and engineering industrial companies have implemented EMAS, the European Eco-Management and Audit Scheme. According to the Marine Strategy, shipbuilding business is divided into specialized ship construction and small vessels (mainly leisure ships and hobby boats) production. Although mainly large specialized ship construction, repair companies and subcontractors have an environmental management certificate, the entire sector is explored.

History of the green procurement and purchasing

The European environmental policy is based on the principle of precaution and prevention. The Maastricht Treaty in 1993 made the environment an official policy area. The Amsterdam Treaty (1999) imposed an obligation to integrate environment protection in all sectors of EU policy to promote sustainable development. In 2013, the Council and the Parliament established the Seventh Environment Action Programme for the period until 2020, including the EU climate and energy package in parallel with the development of the roadmap or promotion plan "Competitive low-CO2 emission economy by 2050". The Council of Europe has addressed the environmental management systems as risk management tools, which include the environmental challenges in the procurement procedures. Strong policies and programmes are expected to improve competitiveness of shipbuilding and ship repair industries in the future. In a number of maritime sectors, such as shipping, shipbuilding and offshore industry, the greener behaviour-altering technologies would create business and export opportunities, particularly as far as other countries are shifting towards sustainable development.

Therefore, business is facing ever increasing demands to act responsible, as reflected in the rise of interest in corporate social responsibility (CSR). These demands are not limited to single companies or single issues. The focus is now on the whole value chain from cradle to grave, covering economic, social, and environmental issues (Porter and Kramer, 2007). Accountability to external stakeholders is a key element of being responsible, which has implications for value chain reporting practices (Skaar and Fet, 2012).

Over the last two decades, environmental considerations have become a significant in purchasing (Min and Galle, 1997; Preuss, 2005). Today, both the public and private sector face increasing pressure to consider the environmental aspects in their purchasing policies from a growing number of government regulations, stakeholders and NGOs. This consideration of the environmental aspects is recognized as green purchasing and green procurement. As a result of green purchasing, companies and industries which provide environmentally friendly products and services, can receive more recognition for their efforts.

More firms are then likely to be motivated to design, produce and provide environmentally friendly products and services. Thus, the green market expands, and green purchasing is regarded as a contribution to sustainable development. The first green purchasing initiatives appeared during the 1980s and1990s (Dowlatshahi, 2000, Fet et al., 2013).

The definition according to the Green Council Organization (2015) puts together different aspects of green purchasing definitions: „Green purchasing involves identifying, selecting and purchasing products (i.e. goods and services) with significantly less adverse environmental impacts than competing products. Further, it involves considering the costs and environmental characteristics and performance of a product in all stages of its life-cycle, from product design, development and production/provision, through product use, to the ultimate handling (i.e. recovery, recycling, re-use and/or waste disposal) of whatever remains of the product at the end of its useful lifespan. Green purchasing policies held social and environmental responsibility".

Green purchasing has significant implications for the firms implementing it, especially when it comes to the criteria used in supplier selection. Until the early 1990s, purchasing policies, supplier selection and evaluation processes were dominated by criteria such as price, quality and delivery (Weber et al.,1991; Dowlatshahi, 2000). Green purchasing, however, requires the inclusion of environmental criteria in supplier selection, which leads us to the concept of green supplier selection (GSS) (Lamming and Hampson,1996; Noci, 1997). By "green" we refer to the environmental aspects within the sustainability concept. It should be noted that the environmental aspect is often mentioned as one of the three aspects of sustainability, the others being social and economic aspects. Selecting a supplier can be regarded as an important decision, not only in the sense of providing the purchasing organisation with the right materials, products or solutions at a competitive cost level, but also in the sense of improving its environmental performance, e.g., through avoiding hazardous materials or considering alternative solutions that require less materials and/or energy. A firm's environmental efforts will not likely succeed without integrating the company's environmental goals with its purchasing activities (Walton et al., 1998). However, GSS is often far from straightforward. There are multiple environmental criteria one could include, and the operationalization of these criteria into meaningful, practical and measurable variables often poses challenges, both for purchasers and suppliers (Jabbour and Jabbour, 2009; Lloyd, 1994).

Relationship systems in supply and value chains

According to Skaar et al. (2012), there are three different systems of interest that a CSR product declaration should take into consideration. The first system is the corporation, covering the activities of a single entity. This can be a corporation, a production site, or a business unit within a corporation. The second system is the extended supply chain. This is the traditional supply chain, defined as a 'network of connected and interdependent organisations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end users' (Skaar et al., 2012), extended to include the use and end of life stages. The third system is the product life cycle. Here the system consists of the individual processes in the value chain, and does not include the corporations. The term 'value chain' here refers collectively to the two last systems: the extended supply chain and the product life cycle. To what degree sub-systems (corporations for the extended supply chain and processes for the product life cycle) are included can vary from case to case, depending on which aspects we are investigating and how cut off criteria are defined (i.e. what is excluded from the system in order to reduce complexity). (Skaar and Fet, 2012).

According to Vachon and Klassen (2006), two different strategies of interaction in supply chain can be identified: (1) arm´s length, transactional based interactions and (2) cooperative, relational interactions. The arm´s length approach is characterized by maintaining short-term relationships with suppliers. In contrast, a cooperative approach tries to foster processes which lead to long-term operation enhancements. It includes designing contractual and informational mechanisms to align incentives, share information, increase commitment and generate common goals between buyers and suppliers. It is likely that a collaborative style is also favorable for inducing the implementation of green practices (Caniels et al., 2013).

Gereffi et al. (2005) proposed a typology of value chains governance patterns. According to Gereffi et al. (2005), three factors determine the lead firm´s choice of value chain governance: the complexity of the information evolved in the transactions, the possibility to codify that information, and the competence of the suppliers along the value chain. (1) Market based chains – low complexity of transactions, simple and easy codified products; (2) modular chains – characterized by highly codified links simplified by technical standards, where suppliers make products to a customer´s specifications and take full responsibility for process technology, (3) relational chains, characterized by complex transactions and highly idiosyncratic relationships, which are difficult and time-consuming to re-establish with new value chain partners, (4) captive chains, characterized by suppliers with low capabilities, dependent on larger, dominant buyers, who exert a high degree of monitoring and control, and (5) hierarchy, implying vertical integration when transactions are complex and not easy to codify and competence of suppliers is low.

Environmental requirements in supply chain

Typically, large buyers pass on ecological pressure along the supply chain to their suppliers, thus increasing the exposure of upstream supply chain members to environmental regulations (Noci and Vergandi, 1999). One approach to accomplish better environmental supplier performance is via diffusion of standardized environmental management systems such as ISO 14001 (Corbett and Krisch, 2001, Caniels et al. 2013). Focal companies might establish this as an order qualifier, which has to be met before a supplier is considered for an order at all (Min and Galle, 2001). The chain leader has the power to influence the environmental policies and strategies of its suppliers and dictate supplier participation in green supply chain activities (Caniels et al. 2013). Carter and Easton (2011) consider sustainability the licence to do business in the 21st century. To obtain this licence, sustainable practice must be implemented throughout the supply chain.

Caniels (2013) gives an example of the German automotive industry where original equipment manufacturers develop their own standards that usually go beyond the requirements of ISO, particularly when it comes to environmental issues. These green standards are defined by the end-product manufacturer, but sometimes they are developed together with key suppliers.

Sustainable life cycle in ship industry

Designing for the life cycle implies making use of the life cycle management toolbox to estimate, monitor and control the sustainability performance throughout the ship´s lifecycle. The life cycle approach can be described as an umbrella framework for the use of management practices and analytical tools through the application of tools for collecting, structuring, disseminating and managing information on the economic, environmental and social performances of product and service life cycles (Fet, et al., 2013).

There we can distinguish the process, the product, stakeholder or supply chain oriented approaches to be implemented in practice.

The environmental, product oriented life cycle assessment (LCA) (ISO, 2006) is the most extensive method for studying environmental impacts throughout a product's life cycle. It is structured in four main steps; (1) Goal and scope definition, (2) Inventory analysis, (3) Impact assessment, and (4) Interpretation. A ship´s product-oriented life cycle is described by the four main phases (Fet, 1997); project planning/design, construction/production, operation/maintenance and system retirement/scrapping, illustrated in Figure 1. This figure also indicates the time span for each main phase in the life cycle. A more detailed description of the activities in different phases is given on the right side in the figure.

However, before the engineering of a system takes place, it is important to have a good understanding of the mission of the system and its subsystems, an understanding of the life cycle performance of the system and the impact of the system in different life cycle stages (Fet, 1997). According to Fet (1997), stakeholders oriented life cycles have 6 simplified steps in the maritime industry: step 1. identify needs, step 2. define requirements, step 3. specify performances, step 4. analyse and optimize, step 5. design, solve and improve, step 6. verify, test and report.

The material flows and environmental key issues are found in every phase in the life cycle. In the sustainable development approach in the ship industry, environmental improvements along the value chain in the system life cycle should be sought. The environmental impacts are associated also with the provision of goods and services. The requirements of environmental performance in the ship industry are mostly set by the international and national authorities. Most of the maritime and ocean regulations pertaining to ships´ safety and environmental protection are established by international conventions and protocols. They are enforced by countries that assume responsibility for maintaining the standards under these conventions in their waters (Fet, 1997). The requirements are normally based on knowledge about the condition of the environment, but also economic interests are important issues to consider when requirements are formulated (Fet, 1997).

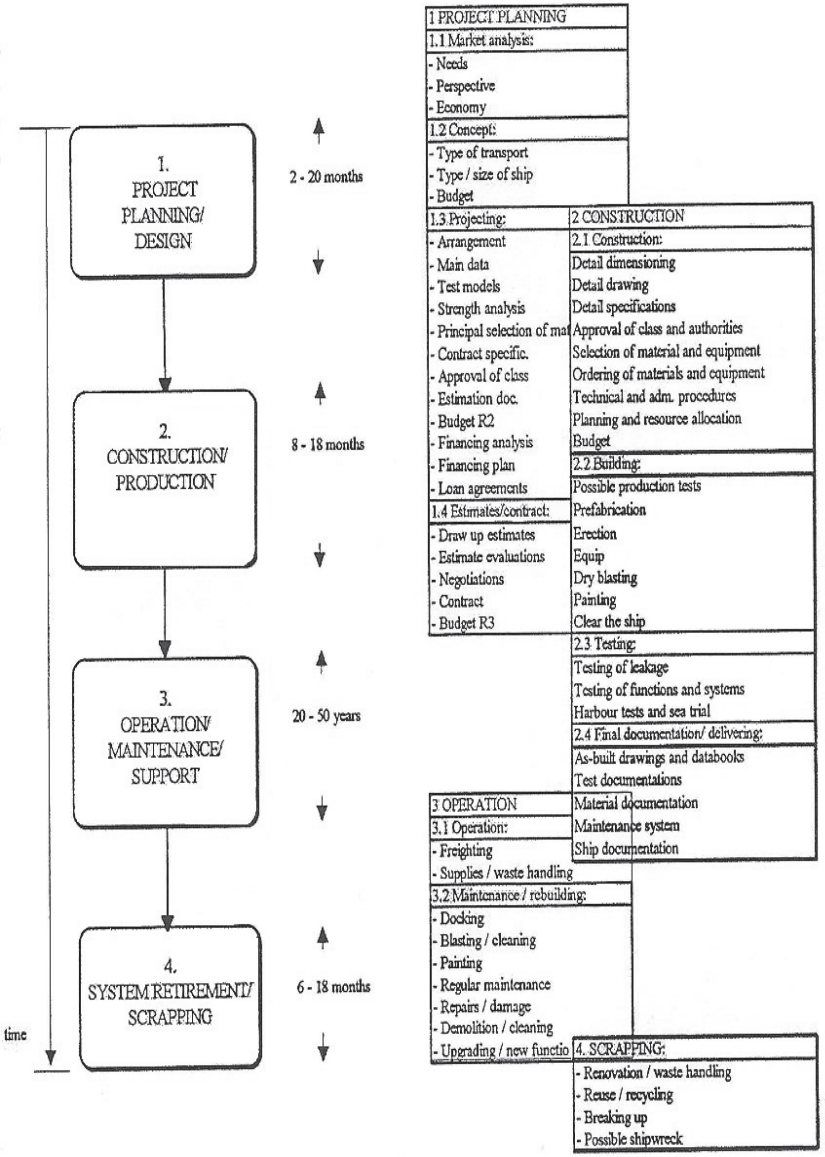

Figure 1. The life cycle of a ship described in four main phases. The right side of the figure describes the life cycle activities (Fet, 1997).

Conceptual model of green supplier selection decision-making process

Most organizations are both suppliers and customers in the supply chain, and thereby play a role in passing through environmental requirements throughout the supply chain. Research suggests that this process is not without challenges (Nawrocka, 2008; Preuss, 2002). Effective GSS must include an assessment of the wider organizational and inter-organizational context. In that way, the focal organization can become aware of its limitations and possibilities when it comes to greening the supplier selection process.

Igarashi, De Boer and Fet (2013) raise several questions. Is the purchasing organization aware of the power balance in the supply chain? Do suppliers understand and accept the green criteria put forward by the purchasing organization, and just as important, do the suppliers understand why the purchasing organization uses these criteria, i.e., do they understand the connection (alignment) between the green selection criteria and the overall green strategy of the purchasing organization? How much pressure can or should the purchasing organization exert on different suppliers to adapt to demands for more sustainability? Walker et al. (2008) find that suppliers not necessarily wish to share environmental information. But also, does the purchasing organization really understand the supplier's strategic view on "green", and how the supplier has aligned its functional strategies with this view? Is the purchasing organization aware of possible supplier initiatives, for example, voluntary and industry-specific certification (Walker et al., 2008)? The answers to these questions are likely to have implications for one or more of the first three dimensions. To answer these questions Igarashi et al. (2013) examined 60 papers they could find in the scientific literature using the search engines, and developed a theoretical GSS model, shown in Figure 2. They rely mainly on the GSS conceptual model that could be used in the manufacturing industry to assist in the implementation of decisions.

Key dimensions of GSS research should cover four dimensions: (1) "Alignment"– a conceptual, strategic dimension, aimed at providing a decision context and at securing alignment with the overall strategy, (2) "Tools"– a technical, operational dimension aimed at devising and choosing appropriate tools for information processing and decision support, (3) "Process" – an operational and processual dimension aimed at drawing appropriate attention to the interrelated stages in a GSS process, and (4) "Supply chain context" – a supply chain positioning dimension, also of strategic importance, and necessary for considering how to make effective green supplier selection decisions, given the power structure in the chain.

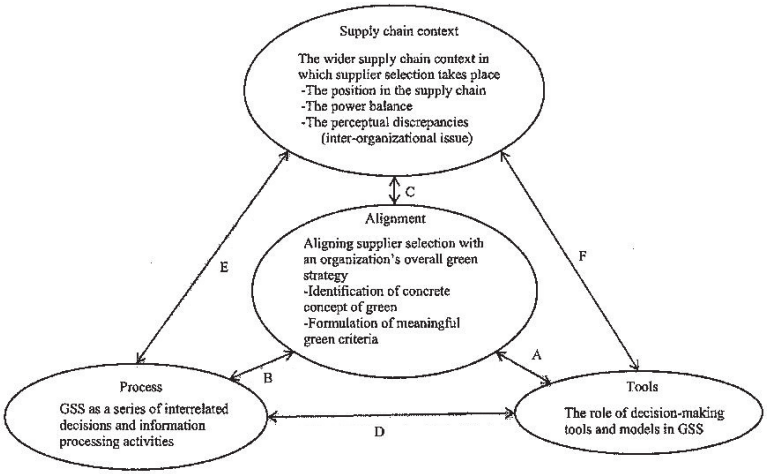

Figure 2. Green supplier selection (GSS) model (Igarashi et al., 2013)

An important feature of the conceptual model is the recognition of the interrelationships between the four key dimensions. Considering these relationships, both researchers and practitioners can achieve a more comprehensive and holistic approach to GSS (Igarashi et al., 2013).

The central dimension of the model, ´the alignment of supplier selection with the overall green strategy of the organization' (Igarashi et al., 2013), by definition has important implications for all three ohter dimensions. The outcome of the alignment process is an understanding of what "green" means for the organization, and, more specifically, is a basic set of green criteria for supplier selection that is relevant for the organization. Choosing and using of decision-making tools in GSS requires the specification of relevant green criteria and information about the decision-maker's preferences. Without knowing the results of the alignment process, i.e., what the relevant green criteria are, there will not be a clear basis for using a decision-model.

Decision-making tools are abstractions; they first become valuable when the decision-maker "feeds" them with data and preference information (relationship A in Fig.2). The basic set of green criteria that results from the alignment process will also provide the starting point for finding out in more detail which of the green criteria applies to the supplier sandwich, to the products and services purchased. The design of the selection process in terms of the various stages is also dependent on the results of the alignment process (relationship B in Fig. 2). The results of the alignment process are also likely to influence the assessment of the wider supply chain context. The assessment of the power balance in a supply chain is likely to be more precise if more is known about the particular issue at stake (relationship C in Fig. 2). While the above descriptions of the relationships A, B and C consider how the central "alignment" dimension influences the other three peripheral dimensions, based on actual experiences of the firm with

implementing GSS, important insights may be feedback to the central dimension of alignment. For example, as a result of applying certain decision tools for GSS in various stages of the supplier selection process, the insights obtained about the effectiveness of the GSS practice may lead to a "bottom-up" driven process of reconsidering or adjusting the green strategy of the firm and the ways purchasing can best contribute to that strategy. Furthermore, an important finding by Walker et al. (2008) in their analysis of drivers and barriers of environmental supply chain management concerns the strength of external drivers on a firm's overall green strategy and initiatives. Mapping of the wider supply chain context of GSS is therefore not only driven by the initial results of aligning supplier selection with the overall green strategy but is also likely to provide valuable insights in return, e.g. about external opportunities or barriers that may serve as input to the alignment process. Relationships A, B and C are bidirectional rather than one-directional (Igarashi et al., 2013).

More general reviews of the supplier selection literature (De Boer et al., 2001; Wu and Barnes, 2011), the different stages in the process require different types of decision support. For example, supplier qualification is typically about screening a larger set of potential suppliers for a smaller set of qualified suppliers. This sorting process is technically different from the ranking process typically found in the final selection stage. Therefore, depending on the particular stage in the selection process under consideration, different decision-making tools may be relevant. Conversely, when considering the adoption of a particular decision-making tool, it is important to consider which stage(s) in the selection process is (are) covered by this particular tool (relationship D in Fig. 2). The process dimension should also be seen in relation to supply chain context dimension. The supplier may not understand and know the way the purchasing organization uses the information provided by them in the supplier selection process. Therefore, from the perspective of the purchaser, it is important to consider more specifically if suppliers receive enough, and appropriate information in each of the stages of GSS, and how the gaps between the perceptions of suppliers and purchasers can be reduced in each stage (relationship E in Fig. 2) (Igarashi, et al., 2013). In a similar way, the choice for a particular decision-making tool and the supply chain context are related. Certain decision-making tools may require more detailed information and a higher degree of openness and collaboration from the suppliers. The lack of information sharing with suppliers is pointed out by Nawrocka (2008), Wolf and Seuring (2010) and Walker et al. (2008) as a possible barrier to green supply management. The willingness of suppliers to share information with the purchasing organization, or to spend resources on providing the information in the form requested by the purchasing organization, may depend on the power balance in the supply chain. Highly advanced decision-making tools requiring the gathering of specific data throughout the upstream supply chain may not be very suitable unless the purchasing organization is powerful enough to persuade suppliers to accept the use of this model (relationship F in Fig. 2) (Igarashi et al. 2013).

An appropriate balancing of the efforts is dedicated to each of the dimensions. Overemphasizing certain dimensions by writing elaborate "green strategy" documents without considering the appropriate decision tools for executing green supplier selection is unlikely to be effective. The same would be true for the opposite: spending a lot of resources on developing advanced systems for evaluating green criteria in

supplier tender may prove difficult without having a sense of direction in terms of how suppliers are supposed to contribute to the overall strategy of the organization. Both the operational decision tools and the green strategy of the organization should match the position and role of the organization in the supply chain (Fet, 2011, Igarashi, 2013).

Utilisation of the GSS concept in Estonian shipbuilding industry

According to the Marine Strategy, shipbuilding business is divided into specialized ship construction and small vessels (mainly the leisure and hobby ships) production. Although mainly large specialized ship construction, repair companies and subcontractors have environmental management certificates, the entire sector is explored. According to the Commercial Register, over 150 companies operate in boats and floating construction and repairing activities of ships and boats, but the environmental management standard is implemented just by 25 operators. The number of subcontractors who have not just only the shipbuilding business is bigger.

There are four largest shipbuilding enterprises, which employ most of the workers – 3000 employees (Estonian Maritime Policy 2011-2020). The largest in terms of turnover and employment is BLRT group companies, including Elme Metall. They are working on vessels of different size and purpose (tugs, barges, ferries, cargo ships, etc.), their construction, renovation and rebuilding. Among the largest shipbuilding businesses are also LTH Baas AS, SRC Ship Repair Company and Baltic Workboats Ltd.

Actively engaged in small ship construction are approximately 30 small and medium-sized enterprises. Small shipbuilding companies employ a total of approximately 430 workers. These are mainly domestic-owned firms, which are outsourcing manufactured ships, as well as make their own products (yachts, small working vessels, fishing boats, wooden boats, etc.); their products are mainly exported to the Nordic and other European countries. Most of the production is exported, estimated at over 90%.

Approximately 70% of the persons employed in this sector work in the ship construction enterprises in Saaremaa, promoting the activity of the logistically advantageous location, long traditions and strong inter-sectoral cooperation relationships with key individuals. Small Craft Construction accounts for nearly 20% of the total turnover of the industry in Saaremaa. Small shipbuilding industry, in fact, in addition to the economic aspect also has regional politic and socio-economic implications. Another important fact is that the shipbuilding has a wide range of outsourcing and maintenance network connections (Estonian Maritime Policy 2011-2020).

The GSS concept elaborated by Igarashi et al. (2013) is analysed at the example of Estonian shipbuilding industry. The question of the possibilities of and obstacles to implementing this concept is posed in this paper.

Alignment

The core of the GSS model is alignment of enterprise's green strategy development and establishment of green criteria. The ISO environmental management standard could be used as the basis in this case.

The environmental management standard ISO 14001 has been used as the most common benchmark. EMAS (the European Eco-Management and Audit Scheme) is not implemented by the Estonian metal and engineering firms. Mainly large specialized shipbuilding and repair companies have an environmental management certificate. It was justified by the desire to participate in international commodity chains.

The entire product chain is managed by, and the leading shipbuilding companies producing end-products are BLRT, BWB, SRC, LTH Baas and the Loksa Shipyard. Focal companies, except Loksa Shipyard, had an environmental management standard. There are approximately 25 shipbuilding subcontractors (the exact number is difficult to determine) who have the environmental management standard ISO14001. The environmental standard plays a role in the case of large-scale outsourcing activities. Companies set their objective to operate in the international market, where the conditions are determined by the chain's leading companies. Some outsourcers (e.g. E-Profiil) have the equipment, which is unique among the entire Baltic Sea region by the options. Their purpose is to be a reliable offshore sector and ship/machine construction companies whose success is based on the quality of services offered, staff competence and the high culture of entrepreneurship, and the sustainable resource use.

Also, there are companies with substantial amounts of outsourcing, which operate in the international market and meet the requirements of the environmental standards without having any official environmental standard systems. Procurements are obtained thanks to the production capacity and technical capabilities (e.g Loksa shipyard). Cooperative relations play a role in the production of small vessels, also captive relations. In international commodity chains the green criteria are used.

This opinion is also supported by other studies, such as the German car industry, which has actually stricter environmental requirements than the ISO standard requires.

A possibility as well as an obstacle is the requirements prescribed with international standards and/or supply chain based obligations. The requirements are a cornerstone for producers and suppliers, and help them create a solid system. The obstacles may be Estonian enterprises' small power in the supply chain as well as their limited opportunities to have a voice in establishing the requirements, especially in the captive chains represented primarily by small vessel industry

Selection process

The operating Estonian engineering companies offer high quality services with a competitive advantage, exact delivery, flexible pricing, and the modern type of production. The modular relations play an important role for subcontractors too.

The aim is to ensure that the customer purchase process and standards meet the requirements of high-quality materials and subcontracting services. It is therefore important to cooperate with suppliers to find the best solutions. Procurer is assessed regularly based on visits, audits, or other process parameters. The materials handling process is intended to ensure compliance with the requirements established for purchased materials, material traceability throughout the treatment process and the quality of the materials is maintained throughout the course of treatment. The treatment

goal is to ensure the identity of the products and avoiding damage to the entire processing cycle, from reception to product delivery.

For example, an excerpt from Estonia's most successful offshore outsourcing company's (E-Profiil) quality policy (Kõrgesaar, 2014), which have implemented the ISO environmental management standard: The aim is to ensure the quality of products in compliance with customer requirements, set standards and allow for third-party control of the entire process. The company uses a process for monitoring the external classifier (e.g. a customer representative). Organizations implement the environmental and project management system to ensure:

- Planning activities in accordance with agreements concluded with the client;
- Quality requirements for each phase of the project;
- Continuous communication and reporting progress of the project;
- Health and safety compliance;
- Environmental aspects under control;
- Access control to the customers throughout the process;
- Drawings and preparation of project documentation in accordance with customer requirements;
- Skilled labor and approved suppliers (materials and subcontractors);
- Changes the coordination of all interested stakeholders.

Such open environmental management and quality policy has given enterprises advantages in the choice-making process if to analyse their performance. However, what has this involved for enterprises (producers) themselves? Successful Estonian subcontracting enterprises are the “best in class”, but how much have they power in the supply chain and establishing the criteria? These might be the next research questions in a qualitative approach.

Decision making tools

The above example, the firm E-Profiil, has had continuous contracts and also the number of employees has increased from 34 to 245 since 1990s, unlike the Loksa shipyard without environmental management standard.

Loksa Ship factory is also an exporting company. The decisive factor has been the modular relations – plant capacity and the capability to build large specific details and ships. As well as E-Profiil have the equipment, which is unique among the entire Baltic Sea region. However, Loksa Shipyard have no continuous production orders, and the company has been forced to lay off hundreds of employees.

The example of Estonia is too small to make the major generalizations, and requires in-depth investigation.

One of the most relevant research questions is obtaining of information in the decision-making process, from the viewpoint of both supplier and producer. An in-depth analysis should also be conducted on the small vessel industry in Saaremaa: how have intersectoral relations developed there, and what are the environmental requirements imposed by focal enterprises. What is the role of different relationships (modular, captive etc.) in supply chains for production enterprises?

Speaking of support to green supplier companies, several companies have received investment subsidies, but a uniform national green supply business support system is missing. There is no uniform long perspective strategy in this field either. Requirements for enterprises and products are set by the chain as well as international requirements. The enterprises act based on those rules. Seeking to exploit the potential niches, for example, BLRT is planning a LNG combustion assembly to the vessels in compliance with the sulfur directive that came into force in 2015.

The literature (Fet, 1997, Norwegian …, 2013) showed that in practice, the Norwegian offshore and maritime sector is using deductions and repayments system to ensure the investments, developments and innovations are profitable, next to the environmental goals. In view of the Norwegian maritime sector capacity and success, this scheme could also be suitable for Estonia.

Conclusion

This paper presented a green supplier selection and green purchasing as environmental management tools and described how they can be used to improve a system's environmental performance. This paper examined impacts of environmental management systems on enterprises' competitiveness in international supply chains at the example of Estonian ship-building enterprises. The problems of alignment of green procurement requirements and conditions were discussed. The theoretical concept of supplier selection process developed by Igarashi et al. (2013) in Norwegian University of Science and Technology (NTNU) was used for that purpose. This is a pilot study to find the possibilities of implementing this model and the bottlenecks, and to identify further in-depth research problems.

The author identified which enterprises use the environmental management standard and their participation and relationships in International supply chains.

The Estonian maritime industry is divided into the special-purpose ship construction and boat and small vessel production companies. It was found that the ISO 14001 environmental management standard has been applied by large-scale outsourcing companies and ship builders, although the majority of the subcontractors produced small ships and boats. The environmental standard plays a role in the case of large-scale outsourcing activities. It is so not always, e.g. Loksa shipyard. This opinion is also supported by other studies, such as the German car industry, which has actually stricter environmental requirements than the ISO standard requires.

The model of Igarshi et al. (2013) underlined the importance of holistic approach.
The topic of alignment, streamlining, and harmonizing of the green supply system is the core of this concept. The first question that arose in this topic both theoretically and practically was how the decision-makers get information. Information is an important component of the GSS process. Companies declare green strategies. But, what it means exactly, how green the green strategy and goal are, might be unclear. Also, green means different things in different areas, including the shipbuilding sector under consideration. Every potential supplier should understand what green procurement means in terms of corporate strategy. In this paper the "milestone" is the popular environmental management standard ISO 14001. Various studies focus on the alignment by the typical environmental management standard ISO 14001, but the choice-making is not enough.

The technical standards and cooperative relations also are important. In Estonia are located some whole product chain companies, and the end-product producing leading shipbuilding enterprises, that most cases have implemented an environmental management system.

Slightly over 20 shipbuilding outsourcing companies have environmental management standard. Those companies view their opportunity and objective in operating in the international market.

Also there are companies with substantial amounts of outsourcing, which operate in the international market and meet the requirements of the environmental standards without having any official environmental standard systems. Procurements are obtained thanks to the production capacity and technical capabilities. Cooperative and captive relations play a role in the production of small vessels. The selection of subcontractors requires more than just an ISO 14001 environmental management standard. The role played by technical standards and modular relationships, as well as collaborative and cooperative relations is based on interactions. In international commodity chains the green criteria are used.

Power Balance in selection and decision making process. There are situations where small Estonian companies are "best in class", but in a large product chain they have little power. Large focal firms exploit this in their reputation and image building.

A number of questions arise which should be answered in the next stages of the research. The implementation of green environmental management and quality policy has given enterprises advantages in the choice-making process in terms of enterprise's effectiveness. However, how has this happened from the enterprise's (producer) own viewpoint? Successful Estonian sub-contracting enterprises are the "best in class," but how much power they have in supply chains and in establishing criteria? Could the same area firms help formulate coherent meaningful green criteria?

Additionally, in-depth analysis should be conducted on small vessel industry in Saaremaa: how have the relationships developed and what are the environmental requirements the focal firms have imposed on them? What is the role of different relationships (modular, captive etc.) in the supply chains from the aspect of production enterprises?

How to support the green business strategy, the green shipbuilding and outsourcings at the national level? *Avoid bureaucracy*. Environmental standards should not make the system more bureaucratic. The company must be able to focus primarily on its core business in order to maintain their effectiveness. Green Markets Strategy will be supported in obtaining a green procurement, and a more integrated and complex production system.

Ensure environmentally friendly investments. Green Strategy none- or low-waste cycle of the product and the product chain where almost all resource is used, reused, or recycled, should also be economically beneficial (some of the waste is sold to a new or other cycle). The growing development of this sector should not be prevented, but an integrated and complex production should be supported, which involves a smaller environmental impact, and hence increases Estonia 'green' manufacturing reputation.

Special-purpose shipbuilding companies are seeking to reach a higher level in the product chain. An advantage of Estonia's competitiveness may lie in the clean production.

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BEURTEILUNG DER WIRKSAMKEIT UND MÖGLICHE RISIKEN DER AKTUELLEN GELDPOLITIK DES EUROSYSTEMS

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Abstract

In the present article effectiveness and potential risks of recently implemented non-conventional monetary policy measures by the Eurosystem are discussed. The goal of research is to show that an additional use of non-conventional monetary policy measures is meaningless to stimulate lending behaviour of the banking system in the Euro-area. At the background of the state of conventional monetary policy today, which in short is characterized by unlimited and free of charge allotment possibilities of central bank money to monetary financial institutions, there exist no monetary policy restrictions which prevent lending behaviour of the banking system. So alternative intentions of the European Central Bank are discussed in this article, why non-conventional monetary policy measures had been implemented. In this context it is shown, that the use of single non-conventional monetary policy measures as well as the whole arrangements of the recently very expansive monetary policy involve considerable potential risks, which can inflict severe problems to monetary policy in the future.

Keywords: Monetary policy, European Central Bank, interest rates, paper currency, forward guidance, Quantitative Easing, exchange rate depreciation

JEL Classification: E49, E52; E58; E59; F33

I. Einleitung

Die aktuelle Geldpolitik des Eurosystems hat im Gefolge der internationalen Finanz- und Wirtschaftskrise seit 2008 sowie als Reaktion auf die europäische Schuldenkrise seit 2010 einen extrem expansiven Kurs eingeschlagen. Dazu hat das oberste Entscheidungsgremium des Eurosystems, der EZB-Rat, auch verschiedene sogenannte unkonventionelle Maßnahmen eingeführt, um die Wirksamkeit der Geldpolitik zu erhöhen. Eine zentrale Absicht der europäischen Geldpolitik ist es dabei, die verhaltene, zum Teil sogar rückläufige Kreditvergabe im Euro-Währungsraum anzuregen. Dahinter steht auch die Absicht, über eine mit der Belebung der Kreditvergabe einhergehende Belebung der Wirtschaftsaktivität, den Preisniveauanstieg möglichst schnell zurück nach oben an den mit der offiziellen Definition von Preisniveaustabilität verbundenen Wert zu führen. So strebt die EZB zur Gewährleistung ihres nach Artikel 127 des Vertrages über die Arbeitsweise der Europäischen Union (AEUV) vorgegebenen vorrangigen Zieles der Preisniveaustabilität mittelfristig einen Anstieg des sogenannten Harmonisierten Verbraucherpreisindex von unter, aber nahe 2% an, während die aktuellen Inflationsraten im Euro-Währungsraum z.B. in den Jahren 2013 und 2014 nur

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bei 1,3% und 0,4% lagen. Zudem ergaben sich für die Monatswerte von Dezember 2014 bis März 2015 sogar negative Inflationsraten, was z. T. als Ausdruck von Deflationsgefahren gewertet wurde und den Handlungsdruck der EZB noch erhöht hat. Im folgenden Beitrag wird deshalb den Fragen nachgegangen, ob insbesondere die im Rahmen der aktuellen Geldpolitik des Eurosystems ergriffenen unkonventionellen Maßnahmen geeignet erscheinen, die Kreditvergabe, also die Kreditnachfrage der Nichtbanken (Unternehmen und private Haushalte) oder das Kreditangebot der Geschäftsbanken, positiv zu beeinflussen und welche möglichen Risiken mit dem Einsatz derartiger geldpolitischer Maßnahmen verbunden sein können. Dazu wird zunächst ein Blick auf die konventionelle geldpolitische Steuerung des Eurosystems geworfen, um dann vor diesem Hintergrund, die Wirksamkeit und mögliche Risiken oder Probleme einzelner unkonventioneller Maßnahmen aufzuzeigen.

II. Die konventionelle geldpolitische Steuerung durch das Eurosystem

Die Geldpolitik des Eurosystems wird im Wesentlichen über die Deckung des sogenannten Zentralbankgeldbedarfes der Geschäftsbanken betrieben. Die Geschäftsbanken benötigen im Rahmen ihrer Geschäftstätigkeit, also bei der Kreditvergabe und bei der zum Teil auch daraus resultierenden Einlagenannahme, das Medium Zentralbankgeld. Das Zentralbankgeld umfasst dabei ganz allgemein das Bargeld, also die Banknoten und die Münzen, sowie Einlagen der Geschäftsbanken und der öffentlichen Hand bei der Zentralbank. Dieses Zentralbankgeld kann nur von der Zentralbank geschaffen und in Umlauf gegeben werden, d.h. die Zentralbank besitzt eine Monopolstellung, was die Entstehung von Zentralbankgeld anbelangt.

Die Geschäftsbanken benötigen im Rahmen ihres Kreditgeschäfts und ihres Einlagengeschäfts dieses Zentralbankgeld zum einen für Bargeldauszahlungen an ihre Geschäftskunden und zum anderen für die Mindestreservehaltung, die sie in Form von Pflicht- oder Zwangseinlagen bei der Zentralbank halten müssen. So sind die Banken im Euro-Währungsraum verpflichtet, in Höhe eines bestimmten Prozentsatzes bestimmter Kundeneinlagen ein Guthaben als Mindestreserve bei der EZB oder einer Nationalen Zentralbank (NZB) zu halten. Momentan beträgt dieser Mindestreservesatz seit Januar 2012 nur noch 1%, nachdem er davor von Anfang 1999 an durchgängig 2% betragen hatte. Beschaffen können sich die Geschäftsbanken neues bzw. zusätzliches Zentralbankgeld bei der Zentralbank. Dazu müssen sich die Geschäftsbanken bei der Zentralbank refinanzieren. Die Zentralbank wiederum, und damit die Geldpolitik, verfügt grundsätzlich über zwei Steuergrößen, um die Refinanzierung der Geschäftsbanken zu beeinflussen, bzw. um auf die Bereitstellung von Zentralbankgeld an die Kreditinstitute einzuwirken.

Die erste Steuergröße sind die Refinanzierungskosten, die die Zentralbank über die sogenannten Leitzinsen beeinflussen kann. Die zweite Steuergröße ist die Refinanzierungsmenge, also die Menge an Zentralbankgeld, die die Zentralbank den Geschäftsbanken bereitstellt.

Vereinfacht beschrieben verhält sich die Geldpolitik dabei wie folgt: Wenn die Zentralbank die Geschäftstätigkeit der Geschäftsbanken anregen oder stimulieren will, d.h. wenn sie die Kreditvergabe der Banken und über eine zunehmende Einlagenbildung auch das Geldmengenwachstum erhöhen möchte, so senkt sie die Leitzinsen und erhöht die den Banken bereitgestellte Menge an Zentralbankgeld. Im

Falle einer restriktiven Geldpolitik erhöht die Zentralbank ihre Leitzinsen und verknappt die Zugriffsmöglichkeiten der Banken auf Zentralbankgeld. Dabei kann die Zentralbank darauf setzen, dass die Geschäftsbanken die Leitzinsänderungen grundsätzlich auch zum Anlass nehmen, die Zinskonditionen gegenüber ihren Kunden in entsprechender Richtung anzupassen, was dann zumindest tendenziell auch auf die Zinskonditionen an den anderen Finanzmärkten, bis hin zum Kapitalmarkt, ausstrahlen dürfte. Bei diesem Durchwirken der von der Geldpolitik auf den Weg gebrachten Zinsimpulse von den Leitzinsen bis hin zu den Zinsen am Kapitalmarkt spricht man auch von der zinspolitischen Transmission bzw. vom sogenannten Zinskanal (vgl. *Görgens; Ruckriegel; Seitz* 2014, S. 282 ff.).

Im Rahmen ihrer aktuellen Geldpolitik hat die EZB jedoch ihre beiden Steuerungsparameter, die Refinanzierungsmenge und die Refinanzierungskosten, praktisch vollständig aus der Hand gegeben. Bereits seit Oktober 2008 teilt die EZB den Geschäftsbanken so viel Zentralbankgeld zu, wie diese von ihr haben wollen. Seit Oktober 2008 ist die EZB dazu bei der Zuteilung von Zentralbankgeld, die sie konkret über ihre wöchentlichen Hauptrefinanzierungsgeschäfte und über die monatlichen Längerfristigen Refinanzierungsgeschäfte abwickelt, zum sogenannten Mengentenderverfahren mit Vollzuteilung übergegangen. Damit werden den Banken die Beträge an Zentralbankgeld bereitgestellt, die sie bei der EZB anfordern. Allerdings müssen die Geschäftsbanken für das so beschaffte Zentralbankgeld Sicherheiten hinterlegen. Als Sicherheiten dienen in der Regel von der EZB als notenbankfähig eingestufte Wertpapiere. Da der EZB-Rat jedoch die Anforderungen an die Notenbankfähigkeit der zu hinterlegenden Sicherheiten mehrfach verringert hat (vgl. EZB 2013, S. 77 ff.), ergibt sich auch über dieses Kriterium praktisch keine Beschränkung der beschaffbaren Menge an Zentralbankgeld.

Ebenfalls seit Oktober 2008 hat die EZB ihre Leitzinsen bis zum September 2014, mit einer kurzzeitigen Gegenbewegung im April und Juli 2011, schrittweise und vor allem in recht kurzer Folge auf fast Null Prozent abgesenkt. Das bedeutet, dass mit der im September 2014 vom EZB-Rat beschlossenen Senkung des Hauptleitzinses im Eurosystem, also dem Satz der Hauptrefinanzierungsgeschäfte, auf 0,05 Prozent, die EZB das Zentralbankgeld eigentlich unentgeltlich an die Geschäftsbanken abgibt. D.h., die Geschäftsbanken verfügen damit über eine praktisch kostenlose und mengenmäßig unbegrenzte Beschaffungs- oder Zugriffsmöglichkeit auf das für ihre Geschäftstätigkeit erforderliche Zentralbankgeld. Zentralbankgeld ist damit für die Banken fast zu einem freien Gut geworden. Im Hinblick auf ihre Geschäftstätigkeit unterliegen die Geschäftsbanken damit seit nunmehr geraumer Zeit praktisch keiner geldpolitischen Restriktion mehr. Im klassischen oder konventionellen Sinne kann damit die Geldpolitik nicht mehr expansiver ausgerichtet werden.

Tatsächlich hat es die EZB aber nicht bei der unbegrenzten und praktisch kostenlosen Zugriffsmöglichkeit auf Zentralbankgeld für die Geschäftsbanken belassen, sondern sie hat auf diesen für die Geschäftsbanken geradezu paradiesischen geldpolitischen Zustand noch zusätzlich sogenannte unkonventionelle Maßnahmen in kurzer Abfolge draufgesattelt. Offenbar herrschte in der EZB die Meinung vor, dass sich die erwarteten Wirkungen ihrer bereits extrem expansiven Geldpolitik u. a. in Form von Zunahmen der Kreditgewährungen und eines Anstiegs der Preisniveauentwicklung nicht schnell

genug einstellen würden, so dass über weitere geldpolitische Maßnahmen nachgeholfen werden musste. Damit hat die EZB zum einen selbst erhebliche Zweifel an der hinreichenden Wirksamkeit ihrer klassischen Steuerungsparameter gefördert. Zum anderen hat die EZB damit in der Öffentlichkeit dem Eindruck Vorschub geleistet, dass die Handlungsmöglichkeiten der Geldpolitik wesentlich größer sind als bislang auf der Grundlage des konventionellen Instrumenteneinsatzes angenommen wurde. Deshalb wird im folgenden Kapitel der Frage nachgegangen, ob die unkonventionellen Maßnahmen, die die aktuelle Geldpolitik momentan sehr stark prägen, tatsächlich neue oder bessere Möglichkeiten eröffnen, die Kreditvergabe der Banken wirksamer zu beeinflussen, um dann auf diesem Weg das allgemeine Wirtschaftsgeschehen effizienter steuern zu können. Zudem wird auf die mit dem Einsatz dieser unkonventionellen Maßnahmen möglicherweise einhergehenden Risiken oder Probleme eingegangen.

III. Beurteilung des Einflusses unkonventioneller Maßnahmen der Geldpolitik auf die Kreditvergabe und Abschätzung der damit verbundenen Risiken oder Probleme

Zu den unkonventionellen Maßnahmen der Geldpolitik des Eurosystems gehören Leitzinsen von Null oder nahe Null bis hin zu negativen Leitzinsen, wie sie das Eurosystem z.B. für den Satz der Einlagenfazilität im Juni 2014 mit -0,1% und ab September 2014 mit -0,2% eingeführt hat. Ebenfalls zu den unkonventionellen Maßnahmen gehören längerfristige Orientierungen bzw. Zusicherungen über die zukünftige Ausrichtung oder Aufrechterhaltung der Zins- oder Geldpolitik, auch Forward Guidance genannt, sowie sogenannte Gezielte Längerfristige Refinanzierungsgeschäfte (GLRG), deren Nutzung explizit an den Nachweis von Kreditvergaben an die Nichtbanken gebunden sind. Schließlich zählen zu den unkonventionellen Maßnahmen insbesondere umfangreiche Ankäufe von Wertpapieren durch die Zentralbank, die auch als Quantitative Easing bzw. Quantitative Lockerungen bezeichnet werden. Letzteres hatte der EZB-Rat im Januar 2015 beschlossen, um darüber von März 2015 bis zumindest September 2016 für rund 60 Mrd. Euro pro Monat Wertpapiere anzukaufen, was einer angestrebten Gesamtsumme von rund 1,14 Billionen Euro entspricht. Gegenstand der folgenden Betrachtungen ist nun keine umfassende oder vollständige Analyse und Beschreibung der konkreten institutionellen Ausgestaltung dieser unkonventionellen Maßnahmen, sondern es werden nur Überlegungen angestellt, die sich vor dem Hintergrund der erreichten Ausrichtung der konventionellen Geldpolitik mit der grundsätzlichen Eignung dieser Maßnahmen, die Kreditvergabe zusätzlich zu beeinflussen, befassen.

Eine Absenkung des zentralen Leitzinses der EZB, also des Satzes der Hauptrefinanzierungsgeschäfte, auf Null oder nahe Null kann durchaus eine anregende Wirkung auf die Kreditvergabe, insbesondere auf die Kreditnachfrage, ausüben. Dies gilt dann, wenn Investoren und damit Kreditnachfrager dadurch ein klares Signal erhalten, dass mit weiteren Zinssenkungen definitiv nicht zu rechnen ist. Denn solange Investoren mit der Möglichkeit weiterer Zinssenkungen rechnen, kann das dazu führen, dass sie die Realisierung ihrer Investitionsprojekte und damit ihre Kreditnachfrage aufschieben oder zurückstellen, um dadurch auf noch günstigere Zinskonditionen zu warten (Attentismus). Allerdings stellt sich in diesem Zusammenhang die Frage, ob es dazu unbedingt Leitzinsen von Null oder nahe Null Prozent bedarf. Entscheidend ist,

dass den Marktteilnehmern das Erreichen einer definitiven Zinsuntergrenze schlüssig vermittelt wird.

Andererseits hat die EZB ihren Leitzins von 0,05% im September 2014 durch stufenweise Absenkungen auf 1,25% im November 2011 und 1,0% im Dezember 2011, über 0,75% im Juli 2012 und 0,5% im Mai 2013 sowie auf 0,25% im November 2013 und 0,15% im Juni 2014 angesteuert. Deshalb ist nicht damit zu rechnen ist, dass durch solche, zum Teil auch etwas hektisch anmutende Absenkungen, die zudem von jeweils bereits sehr niedrigen Ausgangsniveaus vorgenommen wurden, die Anzahl der Investitionsprojekte und damit die Kreditnachfrage spürbar zunehmen dürfte. Vor allem aber ist fraglich, ob Investitionsprojekte, die erst in einem Zinsumfeld rentabel werden, das sich bei Leitzinsen zwischen 1% und 0% ergibt, volkswirtschaftlich überhaupt sinnvoll und anstrebenswert sind, zumal solche Investitionen, die nur über entsprechend niedrige Ertragsaussichten bzw. interne Zinssätze verfügen, bereits bei geringfügigen (Leit-) Zinsanhebungen unrentabel werden und letztlich die längerfristigen Wachstumsperspektiven einer Volkswirtschaft schmälern (vgl. *Rohde* 2013, S. 149 f.). So ist zu erwarten, dass bei extrem niedrigen Zinsen zunehmend Unternehmen mit veralteten, bereits unter normalen Bedingungen wenig rentablen Geschäftsmodellen davon abgehalten werden, rechtzeitig nach ertragreicheren und damit wachstumsträchtigeren Geschäftsfeldern Ausschau zu halten. Die Anfälligkeit solcher Unternehmen gegen bereits geringfügige Zinserhöhungen dürfte zudem den öffentlichen Druck auf die Geldpolitik, die Niedrigzinspolitik aufrechtzuerhalten, um die ansonsten drohende, zunehmende Zahl an Unternehmensinsolvenzen zu vermeiden, erheblich erhöhen.

Wenn allerdings eine Zinsuntergrenze über die unkonventionelle Maßnahme der sogenannten Forward Guidance den Marktteilnehmern noch für einen längeren Zeitraum durch die EZB verlässlich zugesichert wird (vgl. Deutsche Bundesbank 2013, S. 31), dann spricht auch das Erreichen einer solchen Zinsuntergrenze nicht für eine schnelle Reaktion der Kreditnachfrage, zumal die Investoren dann keine Eile an den Tag legen müssen, um sich die normalerweise nur kurzfristig geltenden extrem niedrigen Zinsen schnellstmöglich zu sichern. In die gleiche Richtung zielt das Argument, dass mit der Fortdauer selbst extrem niedriger Zinsen die Wahrscheinlichkeit für das Aufkommen weiterer Zinssenkungserwartungen zunehmen dürfte. Dass dabei selbst Leitzinsen von Null Prozent nicht als definitive Zinsuntergrenzen angesehen werden, das zeigen Forderungen von namhaften Ökonomen (*Kenneth Rogoff* und *Larry Summers*), das Bargeld abzuschaffen, um auf diesem Weg den Zentralbanken mehr Spielraum für auch erheblich unter Null liegende Leitzinsen zu geben.(vgl. *FAZ* 2014, S. 17; *Rogoff* 2014). Durch die Abschaffung des Bargelds soll einmal unterbunden werden, dass die Banken den unter diesen Bedingungen negativen Einlagezinsen für ihre Überschussreserven auf den Zentralbankkonten durch Bargeldhaltung ausweichen. Zum anderen soll aber auch verhindert werden, dass die Nichtbanken, die dann ebenfalls zu erwartenden negativen Einlagezinsen, die die Geschäftsbanken daraufhin ihren Kunden abverlangen könnten, über eine verstärkte Bargeldhaltung umgehen können. Da Forward Guidance vor allem nur gegen das Aufkommen von Zinssteigerungserwartungen gerichtet ist, aber nicht die Möglichkeiten weiterer Zinssenkungen ausschließen soll, wird über Forward Guidance eher ein attentistisches Verhalten von Investoren bzw. Kreditnachfragern begünstigt.

Soweit Forward Guidance aber einen glaubwürdigen Beitrag zur Reduzierung der Unsicherheit über die weitere Leitzinsentwicklung liefert, kann sich das aber durchaus auch positiv auf die längerfristigen Zinssätze auswirken, sofern dadurch die längerfristigen Zinsen den von den Leitzinsen vorgegeben Kurs zumindest tendenziell folgen (vgl. *Deutsche Bundesbank* 2013, S. 31). Damit würde Forward Guidance zu einer Verbesserung der zinspolitischen Transmission beitragen und das Durchwirken der Zinsimpulse von den Leitzinsen hin zu den längerfristigen Kapitalmarktzinsen, die als besonders relevant für die Finanzierungs- und Kaufentscheidungen von Unternehmen und Haushalten und damit auch für die Kreditnachfrage angesehen werden, fördern (vgl. *Deutsche Bundesbank* 2013, S. 31). In diesem Zusammenhang weist die Bank für Internationalen Zahlungsausgleich (BIZ) jedoch auf ein generelles Problem von Forward Guidance hin, wenn sie betont, dass die voraussichtlichen Effekte von Forward Guidance auf die Erwartungsbildung und damit auf die längerfristigen Zinsen umso größer sind, je glaubwürdiger die gemachten Zinszusagen sind, wodurch jedoch umgekehrt die Risiken steigen, dass die Geldpolitik dadurch an flexiblen Reaktionsmöglichkeiten einbüßt (vgl. *BIZ* 2014, S. 101). Da nun grundsätzlich davon auszugehen ist, dass eine Zentralbank sich im Zweifel für die flexiblen Reaktionsmöglichkeiten beim Auftreten von plötzlichen Fehlentwicklungen entscheiden wird und wohl auch muss, ist zu erwarten, dass die Nutzung von Forward Guidance als unkonventionelle Maßnahme allenfalls vorübergehender Natur sein wird. Spätestens nach einem erstmaligen, vorzeitigen Abweichen von einer längerfristigen Zusage wird es schwer sein, erneute längerfristige Zusagen glaubwürdig zu vermitteln. Insgesamt dürften damit die Möglichkeiten, über Forward Guidance die Kreditvergabe positiv zu beeinflussen nicht besonders optimistisch einzuschätzen sein.

Ein kräftiges Sinken der Zinssätze auf ein niedriges Niveau und die durch Forward Guidance gesicherte oder zumindest unterstützte Gewährleistung, das Zinsniveau für einen längeren Zeitraum auf dem niedrigen oder einem sogar noch niedrigerem Niveau zu halten, kann aber auch zu erheblichen finanziellen Belastungen für die Unternehmen führen und auf diesem Weg zu einer Einschränkung von Investitionen und Kreditnachfrage beitragen. Dies ist dann der Fall, wenn Unternehmen auf der Passivseite ihrer Bilanzen längerfristige Rückstellungen, z.B. für Pensionsverpflichtungen, bilden müssen, deren Wertansätze sich durch die Diskontierung, und damit durch den sogenannten Barwert, der zukünftigen Auszahlungen bemessen. Dazu wird die Summe der Verpflichtungen mit einem an den Marktzinsen orientierten Diskontierungssatz abgezinst. Je niedriger nun die Diskontierungssätze sind, umso höher werden die bilanziellen Verpflichtungen der Unternehmen, „…ohne dass sich Anzahl sowie Art der eigentlichen Verpflichtungen verändert haben. Dies reduziert die Eigenkapitalquote vieler Unternehmen, so dass trotz geringer Zinssätze eine weitere Kreditaufnahme und damit eine Ausweitung des Investitionsvolumens unterbleiben.“ (*Pellens; Burekzai; Starke* 2015, S. 16).

Eine weitere unkonventionelle Maßnahme der Geldpolitik des Eurosystems sind die sogenannten Gezielten Längerfristigen Refinanzierungsgeschäfte, die im Juni 2014 vom EZB-Rat beschlossen wurden und erstmalig im September 2014 zum Einsatz gekommen sind und mit denen die EZB ausdrücklich die Kreditvergabe der Geschäftsbanken an den nicht finanziellen Sektor fördern will (vgl. *EZB* 2014, S. 24 ff.). Die Geschäftsbanken können auf diesem Weg Zentralbankgeld für einen Zeitraum

von längstens bis zu vier Jahren erhalten. Vorraussetzung ist allerdings, dass die Geschäftsbanken gegenüber einem festgelegten Referenzzeitraum zusätzliche Kredite an private Haushalte und Unternehmen gewähren. Ausdrücklich ausgenommen sind dabei jedoch Immobilienkredite an private Haushalte sowie Kredite an die öffentliche Hand. Während die ersten beiden Geschäfte dieser Art im September und im Dezember 2014 noch mit einem Refinanzierungszinssatz ausgestattet waren, der 10 Basispunkte über dem Satz der Hauptrefinanzierungsgeschäfte lag, stimmt der Zinssatz für diese Geschäfte seit März 2015 mit dem Satz der Hauptrefinanzierungsgeschäfte überein, beträgt also seitdem 0.05% und kommt damit wiederum einer praktischen kostenlosen Zuführung von Zentralbankgeld gleich, bzw. sehr nahe.

Vor dem Hintergrund von ohnehin unbegrenzten sowie praktisch kostenlosen Zugriffsmöglichkeiten der Geschäftsbanken auf Zentralbankgeld sind Gezielte Längerfristige Refinanzierungsgeschäfte allerdings keine besonders geeignete unkonventionelle Maßnahme, um die Kreditvergabe anzukurbeln. Sofern nämlich die Kreditvergabe der Geschäftsbanken in einem durch Leitzinsen von Null oder nahe Null Prozent geprägten niedrigen allgemeinen Zinsumfeld sowie bei mengenmäßig unbegrenzten Beschaffungsmöglichkeiten von Zentralbankgeld dennoch rückläufig ist oder stagniert, dann dürfte eine zusätzliche Beschaffungsmöglichkeit von Zentralbankgeld die Anreize zur Kreditvergabe nicht sonderlich erhöhen. Unter solchen Umfeldbedingungen ist eine rückläufige oder stagnierende Kreditvergabe des Bankensektors nicht auf eine zu knappe Liquiditätszufuhr der EZB, d.h. nicht auf einem Liquiditätsengpass im Geschäftsbankensektor zurückzuführen, sondern dahinter müssen andere Ursachen stecken. So könnte dies auf eine zu geringe Kreditnachfrage der Nichtbanken, ein zu geringes Eigenkapital der Banken oder aber auf zu hohe Risiken, die in den vorhandenen Kreditengagements stecken, zurückzuführen sein. Dabei handelt es sich dann jedoch um solche Ursachen, auf die die Geldpolitik jedenfalls nicht mit einer zusätzlichen Liquiditätsbereitstellungsmöglichkeit für die Geschäftsbanken einwirken kann.

Schließlich besteht beim Einsatz von Gezielten Längerfristigen Refinanzierungsgeschäften auch das Risiko, dass die Geldpolitik von ihrer bislang globalen Ausrichtung auf das Wirtschaftsgeschehen zu einer selektiven Beeinflussung der Geschäftstätigkeit des Bankensystems übergeht, indem sie die Bereitstellung von Zentralbankgeld nur an bestimmte, aus ihrer Sicht gewünschte Kreditgeschäfte koppelt. Ungewünschte Kredite, wie im aktuellen Fall die Immobilienkredite an private Haushalte oder Kredite an den Staat, berechtigen dagegen nicht zum günstigen Bezug von Zentralbankgeld. Hier besteht die Gefahr, dass die Geldpolitik zunehmend unter öffentlichen Druck geraten kann, das Spektrum ungewünschter Kredite auszuweiten, bzw. gesellschaftspolitisch besonders förderungswürdige Kredite zu bevorzugen, womit die Geldpolitik leicht in den Dunstkreis einer ordnungspolitisch bedenklichen Investitionslenkung geraten kann.

Das im Januar 2015 vom EZB-Rat verabschiedete Ankaufprogramm für Wertpapiere, mit dem die EZB im März 2015 begonnen hat, vorerst bis zumindest September 2016, monatlich für rund 60 Mrd. Euro Wertpapiere anzukaufen gehört im Rahmen der unkonventionellen Maßnahmen der Geldpolitik zur Kategorie des Quantitativen Easing bzw. der Quantitativen Lockerungen. (vgl. *EZB* 2015, S. 17 ff.) Mit Quantitative Easing

werden im Rahmen der Geldpolitik zwei Absichten verfolgt. Zum einen soll darüber den Geschäftsbanken zusätzliches Zentralbankgeld zugeführt werden. Und zum anderen sollen damit Zinssenkungen in den (Kapital-)Marktsegmenten herbeigeführt werden, aus denen die Wertpapiere angekauft werden. Diese beiden Absichten, die mit Quantitative Easing verbunden werden, sind unter den gegenwärtigen geldpolitischen Rahmenbedingungen praktisch nicht geeignet, die Kreditvergabe zu erhöhen. Den Geschäftsbanken zusätzliches Zentralbankgeld bereitzustellen, ergibt nämlich bei mengenmäßig unbegrenzten und zudem kostenlosen Zugriffsmöglichkeiten auf Zentralbankgeld keine zusätzlichen Anreize für die Banken, die Kreditvergabe zu erhöhen, denn unter solchen Bedingungen ist diese ohnehin nicht durch die Angebotsseite begrenzt.

Zu bedenken ist dabei auch, dass die Geschäftsbanken ihr Kreditgeschäft grundsätzlich nicht über den direkten Einsatz von Zentralbankgeld abwickeln, sondern, mit wenigen Ausnahmen, das Zentralbankgeld praktisch erst im Nachgang ihrer Kreditvergabe benötigen, nämlich dann, wenn es zu Barauszahlungen kommt oder wenn aus den Krediten letztlich Kundeneinlagen im Bankensystem entstehen, die der Mindestreservepflicht unterliegen. Die Ausnahmen, bei denen die Geschäftsbanken direkt Zentralbankgeld für die Kreditvergabe nutzen könnten, sind Bargeldkredite an Nichtbanken, die jedoch nicht zum üblichen Bankgeschäft zählen, sowie Kredite von Banken an die öffentliche Hand. Bei letzteren würden Geschäftsbanken zum Zentralbankgeld zählende Einlagen im Eurosystem im Kreditwege an den Staat übertragen oder auf diesem Weg zu Lasten ihrer Zentralbankgeldguthaben eine Anleihe vom Staat erwerben. Das durch die Anleihekäufe bei den Banken geschaffene Zentralbankgeld würde somit an den Staat abfließen und den Bestand an Zentralbankgeld im Geschäftsbankensystem reduzieren. Darüber hinaus kann eine einzelne Bank Zentralbankgeldguthaben auch für den Interbankenzahlungsverkehr nutzen, wobei sich aber dadurch der Umfang an Zentralbankgeld im Bankensystem nicht verändern würde.

Wie aus den Bedingungen für die Nutzung der Gezielten Längerfristigen Refinanzierungsgeschäfte jedoch hervorgeht, gehört die Kreditvergabe an den Staat nicht zu den Kreditgeschäften, die die EZB momentan für wünschenswert oder besonders förderungswürdig hält. Dies nicht zuletzt auch deshalb, weil die Direktkreditvergabe des Eurosystems an die öffentliche Hand ohnehin gesetzlich untersagt ist und es somit auch nicht unbedingt zu den Aufgaben der Geldpolitik gehört, die Staatsverschuldung auf indirektem Weg zu erleichtern oder zu fördern. Letztlich ist aber festzuhalten, dass der Auslöser für das Kreditgeschäft der Banken nicht ein Bestand an zusätzlich bereitgestelltem Zentralbankgeld ist, sondern entscheidend dafür ist für die Geschäftsbanken eine mengenmäßig hinreichende und sichere sowie eine jederzeitig flexibel nutzbare Beschaffungsmöglichkeit von Zentralbankgeld, wie sie z.B. in den Ländern der Eurozone über die momentane Ausgestaltung der Hauptrefinanzierungsgeschäfte und der Längerfristigen Refinanzierungsgeschäfte mit der jeweiligen Vollzuteilung gegeben ist. Eine zusätzliche Bereitstellung von Zentralbankgeld über die Ankäufe von Wertpapieren ergibt somit geldpolitisch nur dann einen Sinn, sofern den Banken ein anderweitiger Zugang zum Zentralbankgeld verwehrt ist.

Auch die zweite Absicht, mit Quantitative Easing die Zinsen in den Marktsegmenten des Kapitalmarktes zu senken, aus denen die Wertpapiere angekauft werden, und dadurch die Investitionstätigkeit und die Kreditvergabe anzuregen, verspricht unter den Gegebenheiten im Euro-Währungsraum keinen durchschlagenden Erfolg. Dies liegt zum einen an den bereits zu Beginn des Kaufprogramms im März 2015 historisch niedrigen Kapitalmarktzinsen in den Euroländern, einschließlich der sogenannten Problem- oder Peripherieländer. Eine Ausnahme bildet dabei Griechenland, das wegen der sich über das gesamte erste Halbjahr 2015 noch hinausgehend hingezogenen, verwirrenden Verhandlungen zur Abwehr einer drohenden Staatsinsolvenz als Sonderfall zu betrachten ist. Insofern vermag die EZB durch die Wertpapierkäufe allenfalls noch marginale Zinssenkungen herbeiführen, durch die jedoch keine spürbaren Wirkungen ausgelöst werden dürften.

Darin ist wohl auch ein Unterschied zu dem oft als erfolgreich angepriesenen drei Quantitative Easing-Programmen der Federal Reserve Bank zu sehen, die zwischen 2008 und 2014 bei wesentlich höheren langfristigen Zinsen, nämlich zwischen 3% und 4% bei den 10-jährigen Staatsanleihen und 5%-6% bei den langfristigen Hypothekenzinsen und bis an 7% heranreichende Zinsen für Unternehmensanleihen, eingesetzt wurden und zu Zinssenkungen von bis zu einem Prozentpunkt geführt haben sollen (vgl. *Illing* 2015, S. 143 ff.). Im Vergleich zur Europäischen Währungsunion unterscheidet sich die Situation in den USA aber noch in einem anderen sehr wichtigen Punkt. Während in den USA ein kapitalmarktbasiertes Finanzsystem vorherrscht, weil z.B. die Unternehmensfinanzierungen sehr stark über die Kapitalmärkte abgewickelt werden, herrscht in Europa ein eher bankbasiertes Finanzsystem vor, in dem sich die Unternehmen schwerpunktmäßig über Bankkredite finanzieren. Nach Berechnungen des Instituts der deutschen Wirtschaft nahmen z.B. im Jahr 2013 die Unternehmen im Euro-Währungsgebiet nur 16.6 Prozent ihres Fremdkapitals über die Emission von Kapitalmarktpapieren und 83,4 Prozent über Bankkredite auf, während in den USA der Anteil der Anleihefinanzierung der Unternehmen 75,5 Prozent betrug (vgl. Institut der deutschen Wirtschaft 2014, S. 4 f.). Insofern beeinflusst Quantitative Easing über spürbare Zinssenkung am Kapitalmarkt die Finanzierungssituation der Unternehmen in den USA unmittelbarer und wohl auch stärker, als das bei Kapitalmarktzinssenkungen in Europa der Fall ist, insbesondere auch dann, wenn solche Zinssenkungen in Europa aufgrund der erreichten historischen Tiefststände nur marginal ausfallen. Auch sei darauf verwiesen, dass die Federal Reserve Bank, wenn diese im Rahmen von Quantitative Easing Staatsanleihen erwirbt, ausschließlich bonitätsmäßig hochwertige Wertpapiere aus dem eigenen Land kauft, während die EZB, entsprechend dem Kapitalbeteiligungsschlüssel der nationalen Zentralbanken am Grundkapital der EZB, grundsätzlich Wertpapiere von allen Eurostaaten erwirbt, die höchst unterschiedliche Bonitätseinstufungen aufweisen.

In diesem Zusammenhang muss man bei Vergleichen des Einsatzes von Quantitative Easing zwischen den USA und Europa letztlich auch bedenken, dass im Federal Reserve System Zentralbankgeld an das Bankensystem ohnehin schwerpunktmäßig über den Ankauf von Wertpapieren läuft und damit grundsätzlich immer auf Dauer bzw. endgültig zugeführt wird, während im Eurosystem die Zentralbankgeldbereitstellung im Wesentlichen über befristete Transaktionen durchgeführt wird. Im Rahmen befristeter Transaktionen wird Zentralbankgeld also grundsätzlich immer nur zeitlich

begrenzt zur Verfügung gestellt. Deshalb stellt Quantitative Easing in den USA durchaus eine normale Ergänzung der geldpolitischen Steuerung dar, über die den amerikanischen Banken noch zusätzliches Zentralbankgeld zugeführt wird, das diese dann zunächst als Überschussreserven halten. Allerdings muss man sich auch dabei die Fragen stellen und beantworten, wo die Grenzen für den Aufbau solcher Zentralbankgeldreserven liegen, und wie diese Überschussreserven durch die Geldpolitik im Bedarfsfall auch schnell und ohne große Nebenwirkungen wieder abschöpft werden können. Bei befristeten Transaktionen ergibt sich nach Ablauf der Fristen automatisch eine Rückführung der zugeführten Zentralbankgelder. Quantitative Easing kommt im Eurosystem deshalb eher einem Systemwechsel in der Zentralbankgeldbereitstellung gleich. Jedenfalls stellt eine endgültige oder dauerhafte Bereitstellung von Zentralbankgeld über Quantitative Easing in einem gleichzeitig bestehenden System einer mengenmäßig unbegrenzten, allerdings befristeten Zentralbankgeldbereitstellung keineswegs eine sinnvolle, sondern allenfalls eine überflüssige Ergänzung dar.

Ein besonders gravierendes Risiko der massiven Wertpapierkäufe des Eurosystems kann darin gesehen werden, dass die EZB dadurch zur Blasenbildung an den Vermögensmärkten selbst aktiv beiträgt. Denn durch die massiven Anleihekäufe werden die ohnehin bereits völlig überhöhten Anleihekurse zusätzlich in die Höhe getrieben. Dadurch kann eine erforderlich werdende Umkehrung in der Geldpolitik erschwert werden, weil ggf. notwendige Zinserhöhungen bereits zu einem Platzen der Vermögenspreisblasen führen oder zumindest einen substanziellen Beitrag für eine solche Entwicklung liefern können. Insbesondere ist aber nicht auszuschließen, dass es durch die bei Zinssteigerungen einsetzenden Wertpapierkurssenkungen zu einem erneuten Wertberichtigungs- oder Abschreibungsbedarf im Geschäftsbankensektor kommen kann und die Stabilität des Finanzsektors, wie bereits im Zuge der internationalen Finanz- und Wirtschaftskrise 2008 und 2009, neuen Erschütterungen oder Belastungen ausgesetzt wird. Während man also normalerweise von den Zentralbanken bzw. der Geldpolitik erwartet, dass diese das Entstehen von Preisblasen verhindern, trägt die Geldpolitik über Quantitative Easing selbst zur Blasenbildung an den Vermögensmärkten aktiv bei. Aber auch indirekt trägt die EZB durch ihre über die Anleihekäufe gestützte Niedrigzinspolitik zur Blasenbildung an den Vermögensmärkten bei. So liefert sie ein Umfeld, in dem sich die Kapitalanleger zunehmend renditeträchtigeren und damit grundsätzlich auch risikoreicheren Anlageformen zuwenden: „Auf der Suche nach einem Renditeplus treiben Investoren nach und nach die Kurse in anderen Anlageformen immer weiter nach oben, so dass auch dort die Ertragschancen abnehmen. Damit steigt bei einer längeren Niedrigzinsphase auch die Gefahr von Vermögenspreisblasen…“ (Bargel 2013, S.6).

Zudem kann insbesondere die EZB in einem solchen Umfeld aus hoher zusätzlicher Zentralbankgeldbereitstellung durch Wertpapierkäufe und extrem niedrigen Zinsen durchaus in ernste Interessenskonflikte geraten, da die EZB seit November 2014, neben ihrem vorrangigen Ziel der Gewährleistung von Preisniveaustabilität, nunmehr auch in der Bankenaufsicht eine zentrale Verantwortung übernommen hat (vgl. *Deutsche Bundesbank* 2014, S. 45 ff.). Hier stellt sich u. a. die Frage, ob die EZB den im Falle einer zur Gewährleistung von Preisniveaustabilität erforderlichen Zinserhöhungen auch dann Priorität einräumen wird, wenn sie im Rahmen ihrer Aufsichtsfunktion erkennen

sollte und befürchten muss, dass die damit verbundenen Wertpapierkurssenkungen ernsthafte Gefahren für die Solvenz einzelner, systemrelevanter Banken und damit für die Stabilität des gesamten Bankensystems heraufbeschwören könnten.

Schließlich ergibt sich aus dem Quantitative Easing des Eurosystems auch dann ein Problem, wenn durch die regelmäßigen und umfangreichen Wertpapierkäufe, die Liquidität an den entsprechenden Finanzmärkten sinkt. Dies kann dann der Fall sein, wenn durch das dominante Auftreten der EZB als Käufer von Wertpapieren sich z. B. die sogenannten Marktmacher aus den betroffenen Marktsegmenten zurückziehen, die normalerweise eigene Bestände an diesen Wertpapieren halten und im bestimmten Umfang sowohl als Käufer, als auch als Verkäufer auftreten und damit die Marktsegmente liquide halten. Durch solche Marktmacher werden normalerweise Kurs- und Zinsschwankungen eingedämmt. Mit sinkender Liquidität an den Finanzmärkten, man spricht dann auch vom Austrocknen der Märkte, kann es als Folge von Angebots- und Nachfrageänderungen dagegen zu einer erhöhten kurzfristigen Volatilität der Zins- und Kursentwicklungen kommen. Die sehr plötzlich aufgetretenen, erheblichen Renditesteigerungen an den europäischen Anleihemärkten im Mai und Anfang Juni 2015 wurden z. T. jedenfalls mit der mangelnden Liquidität erklärt: „Darüber hinaus trocknen die Märkte aus, da kaum noch Titel unter Investoren gehandelt werden. Diese Entwicklung wird durch die EZB-Käufe verschärft. Die Folgen der geringen Liquidität waren in den vergangenen Tagen am Anleihemarkt mit den enormen Kursschwankzungen zu beobachten.“. (*FAZ* 2015, S.29)..

Wenn also insgesamt die eigentlichen Absichten von Quantitative Easing, nämlich den Banken zusätzliches Zentralbankgeld in hohem Umfang bereitzustellen und marginale Zinssenkungen an den Kapitalmärkten herbeizuführen, unter den institutionellen Gegebenheiten der geldpolitischen Steuerung im Eurosystem sowie vor dem Hintergrund der ohnehin bereits historisch niedrigen Zinsen im Euro-Währungsraum, eigentlich gar nicht benötigt werden, dann ist es deshalb auch eher unwahrscheinlich, dass auf diesem Weg die Kreditvergabe substanziell erhöht oder angeregt werden kann. Zu einem solchen Ergebnis, dass mit Quantitative Easing die Kreditvergabe nicht verstärkt wird, kommt auch eine empirische Studie über den Einsatz von Quantitative Easing im Vereinigten Königreich, in der zusätzlich auch auf gleichlautende Ergebnisse anderer internationaler Untersuchungen verwiesen wird (vgl. *Butt; Churm; McMahon; Morotz; Schanz* 2014).

Deshalb stellt sich die Frage, ob die eigentlichen Stoßrichtungen, die die EZB mit dem Einsatz von Quantitative Easing verfolgt, nicht in andere Richtungen zielen. Ein Ziel könnte es dabei sein, die Banken, bzw. deren Bilanzen, von risikobehafteten Wertpapieren zu entlasten, um auf diesem Weg die Möglichkeiten der Banken, wieder mehr Kredite gewähren zu können, zu verbessern. In diesem Fall strebt die EZB mit dem Ankauf und der Übernahme der Wertpapiere einen Risikotransfer von den Geschäftsbanken zur EZB an, um den Banken wieder mehr Freiräume für das Kreditgeschäft zu verschaffen. Allerdings ist fraglich, ob mit einer solchen Risikoübernahme nicht der Bereich der eigentlichen Geldpolitik bereits verlassen wird. Denn das Signal, was den Banken mit einem derartigen Risikotransfer vermittelt wird, ist fatal. So wird den Banken signalisiert, dass sie bei ihrer Kreditvergabe nicht mehr die erforderliche Sorgfalt hinsichtlich der Risikobeurteilungen an den Tag legen

müssen, da notfalls die EZB bereitsteht, solche Risiken zu übernehmen. Ob eine auf diese Weise angeregte Kreditvergabe der Banken jedoch wünschenswert ist, die nicht mehr durch eine hinreichende eigenverantwortliche Risikofolgeabschätzung der Banken gekennzeichnet ist, darf allerdings bezweifelt werden.

Ebenfalls nicht mehr zweifelsfrei vom geldpolitischen Mandat gedeckt wäre es, wenn die EZB mit ihren Anleihekäufen den Geschäftsbanken das Zentralbankgeld praktisch nur dafür bereitstellt, damit diese das Zentralbankgeld unmittelbar dazu verwenden, neu emittierte Anleihen direkt vom Staat zu erwerben. Formal wäre Quantitative Easing damit zwar noch keine Form der eigentlich verbotenen, direkten Kreditvergabe der EZB an den Staat, weil die Anleihen am Sekundärmarkt, d.h. über die Geschäftsbanken, und nicht am Primärmarkt, d.h. von den Emittenten, gekauft werden. Faktisch kommt das jedoch einer unmittelbaren Finanzierung der Staatsverschuldung durch die EZB, zudem zu künstlich gedrückten Zinsen, aber doch sehr nahe. Wobei die Zinsbelastungen der Staaten, deren Anleihen die EZB letztlich aufgekauft hat, auch noch dadurch verringert werden, dass die dann an die EZB zu zahlenden Zinsen über die späteren Gewinnausschüttungen der EZB an die Staaten zumindest zum Teil wieder zurückfließen. Auf jeden Fall würde die Geldpolitik auf diesem Weg die Staatsverschuldung spürbar erleichtern und damit letztlich auch fördern. Das Risiko dieser Maßnahme der massiven Staatsanleihekäufe besteht dann letztlich auch darin, dass die Konsolidierungserfordernisse verschuldeter Staaten als weniger dringlich eingestuft werden, was letztlich zu einer Hinauszögerung der für einen geringeren staatlichen Kreditfinanzierungsbedarf notwendigen Strukturreformen führt.

Eine andere Stoßrichtung, die die EZB nicht nur mit Quantitative Easing, sondern generell mit dem expansiven Einsatz ihrer unkonventionellen Maßnahmen verfolgen könnte und wohl auch verfolgt, ist in angestrebten Abwertungen des Euro-Wechselkurses zu sehen, um auf diesem Weg die preisliche Wettbewerbsfähigkeit der Unternehmenswirtschaft in der Eurozone zu verbessern (vgl. *Rohde* 2014, S. 126 ff.). Vor dem Hintergrind der stark diskutierten und seit Juni 2014 im Eurosystem in immer schnellerer Folge implementierten unkonventionellen Maßnahmen der Geldpolitik wertete sich z. B. der bilaterale nominale Wechselkurs des Euro gegenüber dem US-Dollar in der sogenannten Mengennotierung von 1,3953 US-$ für einen Euro am 8. Mai 2014 auf 1.0552 US-$ für einen Euro am 13. April 2015 erheblich ab. Auch der effektive Wechselkurs des Euro, also der Wert des Euro gegenüber den Währungen einer Gruppe von 19 Ländern sowie einer Gruppe von 38 Ländern, verzeichnete in diesem Zeitraum sowohl nominal, als auch real deutliche Abwertungen (vgl. *Deutsche Bundesbank* 2015, S. 19).

Eine Abwertung des Euro verteuert zum einen die Preise der Importgüter in Euro gerechnet. Dieser Effekt ist der EZB in zweifacher Hinsicht willkommen. Einerseits trägt er im Falle von notwendigen, kurzfristig nicht substituierbaren Einfuhren zur importierten Inflation bei, was helfen sollte, die momentan sehr niedrigen Inflationsraten im Euro-Währungsraum tendenziell zu erhöhen und somit den für die Preisniveaustabilität angestrebten Wert des Preisanstiegs von unter, aber nahe 2% tendenziell wieder zu erreichen. Andererseits würde sich infolge einer Verteuerung der Güter, die nicht unbedingt zu den notwendigen Importprodukten zählen, über den damit verbundenen Rückgang der Importnachfrage die wirtschaftliche Lage in den

importkonkurrierenden Wirtschaftsbereichen der Eurozone verbessern und damit über einen Anstieg der Investitionstätigkeit letztlich auch die Kreditnachfrage erhöhen. Zum anderen führt eine Abwertung des Euro zu einer Verbilligung der Exportgüter der Eurozone, gerechnet in Fremdwährung. Dadurch wird die Produktionstätigkeit des Exportsektors der Eurozone gefördert. Letztlich führt eine Abwertung somit zu einer Verbesserung der preislichen Wettbewerbsfähigkeit sowohl des Exportsektors, als auch der importkonkurrierenden Sektoren der Eurozone, was dann die gesamtwirtschaftliche Nachfrage, einschließlich der Kreditnachfrage, und tendenziell auch den Preisauftrieb in die gewünschten Richtungen beeinflussen sollte.

Wie sind nun die Absichten, über den expansiven Einsatz unkonventioneller Maßnahmen der Geldpolitik auf Abwertungen der Wechselkurse zu setzen zu bewerten? Zunächst muss klar sein, dass die über Abwertungen erzielte erhöhte preisliche Wettbewerbsfähigkeit von Unternehmen sich nur rein rechnerisch über den geänderten Wechselkurs ergibt. D. h. die erhöhte preisliche Wettbewerbsfähigkeit fällt den Unternehmen praktisch durch Nichtstun in den Schoß und muss nicht über eigene Anstrengungen, etwa über Kostensenkungs- und Innovationsstrategien, hart und nachhaltig erarbeitet werden. Die Gefahr ist, dass die Unternehmen dadurch zu schläfrig oder zu träge werden, um dauerhaft im harten internationalen Wettbewerb bestehen zu können. Spätestens mit der Umkehrung der Wechselkursentwicklung wendet sich die preisliche Wettbewerbsfähigkeit zum Nachteil der Unternehmen. Dies würde den Ruf nach erneuten Wechselkursabwertungen laut und drängend werden lassen und brächte das Eurosystem wieder unter Handlungsdruck, den Expansionsgrad ihrer Geldpolitik weiter zu verschärfen. Je offenkundiger und je aggressiver man diesen Weg beschreitet, sich über Abwertungen wirtschaftliche Vorteile, und zwar letztlich auf Kosten der anderen Länder, zu verschaffen, umso mehr ist mit entsprechenden Gegenmaßnahmen der anderen Länder zu rechnen. Damit begibt man sich, wie auch die Bank für Internationalen Zahlungsausgleich (BIZ) in ihrem 85. Jahresbericht aus dem Jahr 2015 warnend hervorhebt, in die Gefahr von Abwertungswettläufen und zu weltweit immer lockereren geldpolitischen Bedingungen (vgl. *BIZ* 2015, S. 12). Diese explizite Warnung der BIZ deutet darauf hin, dass heute eben nicht nur das Eurosystem seine Hoffnungen auf Abwertungen legt, sondern, dass diesen Weg momentan viele Staaten verfolgen, was die BIZ fürchten lässt: „Einmal mehr könnte der kurzfristig erzielte Erfolg teuer erkauft sein“ (*BIZ* 2015, S.12).

So war es eine zentrale Erkenntnis aus der großen Weltwirtschaftskrise 1929-1931, dass Wechselkurse, insbesondere gezielt herbeigeführte Abwertungen der Wechselkurse, ein untaugliches und vor allem sehr gefährliches Instrument der Wirtschaftspolitik darstellen, wenn auf diesem Weg versucht wird, wirtschaftliche Probleme eines Landes letztlich auf Kosten anderer Länder zu lösen. In diesem Zusammenhang spricht man auch von einer sogenannten beggar my neighbor policy: „Zu einer solchen beggar my neighbor policy gehört eine bewusst zugelassenen oder herbeigeführte Abwertung der eigenen Währung (…). In den dreißiger Jahren geschah dies. Die Länder übertrafen sich gegenseitig in Abwertungen. Der Abwertungswettlauf führte schließlich zum Zusammenbruch des internationalen Währungssystems.“ (*Köhler*, 1983, S. 226).

Es waren genau diese Folgen, die die Mitglieder des Internationalen Währungsfonds (IWF) veranlasst haben, sich in den bis heute gültigen und im Laufe der Jahre mehrfach

ergänzten Statuten des IWF (Articles of Agreement) darauf zu einigen, den Wechselkurs nicht als Instrument der Wirtschaftspolitik einzusetzen. So heißt es in Artikel 1, in Verbindung mit Absatz 3, wörtlich: „The purposes of the International Monetary Fund are: …(iii) To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation." (*IMF* 2011, S. 2).

Soweit das Eurosystem also versucht, mit dem Einsatz von Quantitative Easing, bzw. allgemein mit dem expansiven Einsatz von unkonventionellen Maßnahmen, über Abwertungen die Wirtschaftsaktivität, die Kreditvergabe und schließlich auch die Preisniveauentwicklung innerhalb der Länder der Eurozone zu beeinflussen, so hat es sich damit auf einen mehr als fragwürdigen Weg begeben, der jedenfalls keine nachhaltige Lösung der Probleme verspricht, sondern eher neue Risiken und Handlungszwänge heraufbeschwört. Wechselkursabwertungen sind zudem kein Weg, das internationale Vertrauen in eine Währung zu festigen. „Mit einer sogenannten Weichwährung, wie man Währungen auch bezeichnet, die permanent unter Abwertungsdruck stehen, lässt sich auf Dauer kein Vertrauen in die Wirtschaftskraft eines Währungsraumes schaffen und aufrechterhalten." (*Rohde*, 2014, S. 127).

Solche Erkenntnisse haben auch viele europäische Staaten in dem Zeitraum vor der Gründung der Europäischen Währungsunion gewonnen, als sie trotz häufiger Abwertungen ihrer nationalen Währungen gegenüber der Deutschen Mark dennoch nicht in der Lage waren, ihre wirtschaftlichen Schwächen gegenüber der Wirtschaft der Bundesrepublik Deutschland nachhaltig abzubauen oder zu verringern. Die in dieser Zeit wiederholt gemachten Erfahrungen, u. a. von Frankreich oder Italien, dass Wechselkursabwertungen letztlich kein taugliches Mittel zur Lösung nationaler Wirtschaftsprobleme waren, bildeten durchaus auch einen der Grundpfeiler für die Schaffung des Euro. Mit der Einführung der einheitlichen europäischen Währung wurde bewusst auf den Wechselkurs als ein wirtschaftliches Instrument verzichtet. Verwiesen sei in diesem Zusammenhang auch auf die drei baltischen Staaten, die trotz gravierender wirtschaftlicher Probleme in ihrer Transformationszeit bis zur Einführung des Euro kein einziges Mal auf eine Abwertung ihrer Wechselkurs zur Lösung ihrer wirtschaftlichen Schwierigkeiten gesetzt haben.

Abschließend betrachtet dürfte eines der Hauptrisiken der aktuellen Geldpolitik des Eurosystems aber wohl in den nachhaltigen Gewöhnungseffekten liegen, die durch die Dauerhaftigkeit der extrem expansiven Ausrichtung zu erwarten sind. Je länger die Zinsen auf dem erreichten außergewöhnlich niedrigen Niveau gehalten werden und je länger das für die geldpolitische Steuerung eigentlich unverzichtbare Zentralbankgeld den Charakter eines sogenannten freien Gutes beibehält, um so mehr wird so ein Zustand praktisch als Normalität eingestuft und um so schwieriger dürfte ein Abrücken von einem solchen vermeintlichen Normalzustand werden. Dies gilt auch deshalb, weil ein solches Abrücken immer mit gewissen Verwerfungen an den Finanzmärkten verbunden sein wird. Die Bank für Internationalen Zahlungsausgleich kommentiert diesbezüglich in ihrem Jahresbericht 2014/15 deshalb auch sehr besorgt: „Es ist zutiefst beunruhigend, wenn das Undenkbare zum Normalfall zu werden droht." (BIZ 2015, S. 7). Denn „..die Wahrscheinlichkeit, dass es zu Turbulenzen kommen wird, nimmt weiter zu, wenn die gegenwärtigen außergewöhnlichen Bedingungen fortdauern." (BIZ

2015, S. 27). Das liegt nicht zuletzt auch daran, dass aufgrund der außergewöhnlich lang andauernden Phase der gegenwärtigen extrem expansiven Geldpolitik „…viele, die heute an den Märkten aktiv sind, nicht aus eigener Erfahrung wissen, wie man auf steigende Zinsen (und begrenzte Zugriffsmöglichkeiten auf Zentralbankgeld, Anm. d. Verf.) reagiert – das letzte Mal waren sie noch gar nicht dabei." (Borio 2015, S.15). Das kann dazu führen, dass die Marktteilnehmer die Risiken eines Abweichens vom Status Quo höher einschätzen, als die letztlich wesentlich gravierender ausfallenden Risiken, die mit einer anhaltenden Fortdauer dieses Zustandes verbunden sind. Dadurch erhöht sich zwangsläufig der Druck auf die Geldpolitik, an der extrem expansiven Ausrichtung festzuhalten, bzw. sogar den Expansionsgrad noch zu steigern, sofern erste Anzeichen von Turbulenzen sichtbar werden. Mit einem zu langen Festhalten an einem extrem expansiven geldpolitischen Kurs, dessen Notwendigkeit im vorliegenden Beitrag eher kritisch beurteilt wurde, beraubt sich die Geldpolitik zudem ihrer zukünftigen Reaktionsmöglichkeiten, die im Falle des Auftretens von erneuten Krisen gefragt sind oder wie es die BIZ bildhaft ausgedrückt hat: „Was bringt eine Kanone, die alles Pulver verschossen hat." (BIZ 2015, S. 27).

IV. Zusammenfassung

Im Gefolge der internationalen Finanz- und Wirtschaftskrise sowie als Reaktion auf die europäische Schuldenkrise hat das Eurosystem mit seiner Geldpolitik einen extrem expansiven Kurs eingeschlagen. Zunächst wurde gezeigt, dass das Eurosystem im Rahmen seiner konventionellen geldpolitischen Steuerung, also über die Refinanzierungskosten und die Refinanzierungsmenge, einen maximalen Expansionsgrad vorgegeben hat, indem es den Hauptleitzins praktisch auf Null (0,05%) reduziert hat und den Geschäftsbanken über das Standardtenderverfahren mengenmäßig unbegrenzt Zentralbankgeld zuführt (Mengentenderverfahren mit Vollzuteilung). Da das Eurosystem aber offenbar von der hinreichenden Wirksamkeit des maximal möglichen Expansionsgrades der konventionellen Geldpolitik nicht überzeugt war, wurden zusätzlich sogenannte unkonventionelle Maßnahmen eingeführt.

Zu diesen unkonventionellen Maßnahmen zählen z.B. Leitzinsen von Null bzw. negative Leitzinsen, Forward Guidance, um den Marktteilnehmern eine verlässliche Zusicherung über die Fortdauer eines eingeschlagenen geldpolitischen Kurs zu gewähren, sogenannte Gezielte Längerfristige Refinanzierungsgeschäfte, mit denen die Zentralbankgeldbereitstellung an die Bedingung einer zusätzlichen Kreditvergabe der Banken gekoppelt werden soll und schließlich Quantitative Easing, d.h. die Bereitstellung von zusätzlichem Zentralbankgeld über den Ankauf von Wertpapieren in Verbindung mit einer angestrebten Senkung der Kapitalmarktzinsen.

Insgesamt wurde in dem Beitrag eine eher kritische Einstellung zu den erhofften Wirkungen der unkonventionellen Maßnahmen der Geldpolitik herausgearbeitet. Dies gilt insbesondere für die verfolgte Anregung der Kreditvergabe. Im Kern liegt das daran, dass die unkonventionellen Maßnahmen, die grundsätzlich darauf abzielen, dem Geschäftsbankensystem zusätzliches Zentralbankgeld zuzuführen, vor dem Hintergrund des erreichten Expansionsgrades der konventionellen Geldpolitik des Eurosystems, eigentlich gar nicht benötigt werden. Wenn die Banken nämlich bereits eine praktisch kostenlose und mengenmäßig unbegrenzte Zugriffsmöglichkeit auf Zentralbankgeld haben, dann wird nicht klar, welcher Anreiz dann noch von zusätzlichem

Zentralbankgeld für ihre Geschäftstätigkeit ausgehen soll. So ist, jedenfalls unter den institutionellen Gegebenheiten der geldpolitischen Steuerung des Eurosystems, ein zentraler Bestimmungsgrund für die Geschäftstätigkeit der Banken im Eurosystem nicht etwa ein mehr oder weniger hoher Bestand an Zentralbankgeld, sondern eine von den Banken als hinreichend angesehene sowie jederzeitig verfügbare Beschaffungsmöglichkeit an Zentralbankgeld. Und in dieser Hinsicht unterlag das Bankensystem bereits durch die konventionelle Geldpolitik des Eurosystems praktisch keiner Liquiditätsbeschränkung mehr. Im Hinblick auf die mit Quantitative Easing zusätzlich angestrebten Zinssenkungen wurde, vor dem Hintergrund der bereits zu Beginn dieses Programms erreichten historisch extrem niedrigen Kapitalmarktzinsen in den Euroländern, der Sinn allenfalls noch für möglich erachteter marginaler Zinssenkungen für die Investitionstätigkeit und für die Kreditvergabe ebenfalls in Frage gestellt.

Deshalb wurde in dem Beitrag auch der Frage nachgegangen, ob das Eurosystem vielleicht noch andere Absichten mit dem starken Einsatz der unkonventionellen Maßnahmen verfolgt. Als Möglichkeiten wurden dabei ein beabsichtigter Risikotransfer von den Geschäftsbanken zur EZB, eine indirekte Förderung und Finanzierung der Staatsverschuldung sowie eine Abwertung des Euro-Wechselkurses jeweils kritisch beleuchtet.

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ALCOHOL EXCISE DUTIES IN THE EUROPEAN UNION

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Abstract

Alcohol taxation plays an important role in the alcohol policies of countries in the European Union. Alcohol excise duties are not a very significant part of government budgets; however, they form consumer behaviour, limit access to alcohol products and correct market externalities.

The paper analyses the level and structure of alcohol excise duties in European countries. In the EU, the levels of alcohol excise duties are harmonized across the member states. Nevertheless, there is significant variety in the alcohol tax rates. The paper highlights the correlations between alcohol tax rates and interprets alcohol tax rate design across EU countries.

Keywords: alcohol excise, taxation, European Union

JEL Classification Codes: H2; H310; O52

Introduction

Alcohol taxes are not the most important part of a government's budget. General interest in alcohol excise duties is clearly a minor issue; for example, compared with the fiscally highly significant income or consumption. However, the *rationale* for alcohol taxation is manifold. In general, the purpose of alcohol taxation is to diminish the negative externalities generated by abusive alcohol consumption. Its other purpose is to collect revenues for the public budget. In the European Union context, the goal of alcohol taxation is also to avoid harmful cross-border trade and consumption, and unify activities to implement EU alcohol policies.

Alcohol taxes are often a sensitive social issue for society because alcohol consumption generates various negative externalities. Excessive alcohol consumption causes health problems, traffic accidents and anti-social behaviour. It is difficult to directly measure the real monetary cost from abusive alcohol consumption, despite the fact that related problems and outcomes are rather visible. Alcohol taxes play an important role in regulating consumer behaviour and limiting excessive consumption of alcoholic beverages. Alcohol taxes limit consumer access to alcohol and direct them to other consumption alternatives.

Over the centuries, governments have used their power to tax alcohol production and consumption. In today's context, alcohol taxation plays a minor role in comparison with other consumption taxes as a revenue source. In earlier times, alcohol taxation was related exclusively to the collection of money for the state budget; in later times alcohol taxation has become considered a kind of compensatory mechanism. Revenues

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collected from alcohol duties are channelled towards coping with the negative outcomes of alcohol consumption.

This paper focuses on the role of alcohol excise duties in European Union countries and generalizes the logic of designing the structure of alcohol excise duties for these countries. We have information about the requirements for harmonizing excise duties and the unified rates for alcohol taxes. How do different EU countries actually tax alcohol products and what are the differences among the member states? The purpose of the paper is to provide a general overview of alcohol excise duties in the EU and emphasize the correlations between the alcohol excise rates.

There are many different taxes imposed on alcohol. In this article only excise duties on alcohol are considered, as VAT-type taxes remain out of the scope of the study. In essence, excise duties are *per unit* taxes – the basis for taxation is calculated as the content of alcohol in a specific measurable unit (e.g. alcohol content *per hectolitre*). In this case, the tax is proportional to the particular amount of a product produced (sold), regardless of its price.

The paper is structured in a following way. In the first part, a theoretical overview of the rationale behind alcohol excises is presented, especially emphasizing alcohol taxation and its impact on different economic subjects. In order to understand the state of alcohol taxation in Europe, it is also critical to introduce the general EU regulatory framework on excise duties. All countries in the EU have to cope with these regulatory requirements.

In the second part of the paper, trends in alcohol excise tax levels across EU countries and the structure of those revenues are analysed. Within this framework, the paper brings out the role of excise duties in government budgets, characterizes various alcohol excise duties and specific patterns in the taxation of alcohol.

The third part draws correlations between alcohol taxation and the socio-economic characteristics of different countries. The purpose of this analysis is to demonstrate the "patterns" of alcohol taxation.

There are different collections of statistical data on various aspects of alcohol consumption and taxation. In this paper, different sources of data are combined and processed; mostly from *Eurostat* and the EU Commission Tax Database and publications.

Theoretical framework for alcohol taxation

There is a strong theoretical and moral basis for alcohol taxation. To be precise, in the context of this paper, only excise duty type taxes are considered alcohol taxes, and not the other taxes imposed on alcohol as a consumer good.

First, alcohol taxation is based on regulatory needs. Alcohol consumption is considered a "sin" activity, which causes negative externalities for society. It causes various health problems, traffic accidents, anti-social behaviour and many other negative social issues for society. Therefore, tax on alcohol is considered an instrument that can correct those market inefficiencies. Such a tax is also known as a Pigovian tax. Therefore, alcohol taxation "improves resource allocation by internalizing the external cost" related to

alcohol consumption and "discourage the … productions considered harmful" (Gnossen 2011, p. 279).

Excise taxes are considered "sin taxes", and therefore, are easily accepted by the public at large. As a market correcting vehicle, alcohol taxes may also be considered a socially "fair" tax. Society may easily allow "selective and intentionally discriminative" characteristics on those taxes (Gnossen 2011, p. 278). To reduce abusive consumption is the "main rationale for taxing alcohol beverages more heavily than other products" (Tax and Policy 2007, p. 5).

Therefore, alcohol excises are "intentionally discriminative" to calibrate the taxation burden on alcohol users (Gnossen 2011). The correction process is to be at least twofold – first, to limit alcohol consumption, and second, to collect money in order to cope with negative externalities (Saar 2011).

The second reason for taxing alcohol is purely fiscal. Alcohol as a consumer good is often rather price inelastic, which makes it a proper basis for taxation. As alcohol production and trade is strictly regulated and heavily controlled by governments, burdening alcohol with taxes is also relatively easy. There are a limited number of legal alcoholic beverage producers and their monitoring is not overly difficult.

However, in the European context, alcohol taxation is not fiscally very capable. On average it covers 0.5–3% of general government revenues (see above).

However, despite the practical rationale for imposing taxes on alcohol, there are also clear limitations for burdening alcohol with taxes. Overtaxing of alcohol consumption may cause very severe negative outcomes for society. Those negative aspects are grounded in economic theory. Alcohol taxes do not consider horizontal equity concerns and are not related to individuals' ability to pay (Taxation and Policy, 2007, p. 5). Alcohol taxes are also often rather regressive, burdening a larger percentage of the income of low-income persons than upper level income earners (ibid, p. 5).

Other negative aspects of alcohol taxes are purely socio-economic. These negative consequences are commonly known as illicit trade and increases in the consumption of alcohol-consisting surrogates.

In conclusion, a good alcohol tax can correct and is fiscally capable and provides a good balance between raising revenue and influencing social behaviour.

European Union regulatory framework

The EU as a whole is the most intensive *per capita* alcohol consuming region in the world. All negative aspects related to excessive alcohol consumption are quite visible there. Therefore, it is rather natural to expect that the EU alcohol policies and taxation focus on regulating consumption and limiting the negative socio-economic consequences. These focus on reducing harmful drinking and its consequences, lowering underage alcohol consumption and protecting young people and raising awareness of the impact of hazardous alcohol consumption (European Parliamentary Research Service Homepage).

Taxation performs a traditional role in limiting access and the affordability of alcoholic consumer products. The taxation of alcohol is an important aspect of the EU alcohol

policy, but not the most important. According to the EU Council study, "only a minority of Member States consider health issues a significant determinant when fixing duty rates" and "the vast majority of Member States do not consider that health and social aspects should be a major determinant in setting rates" (Heather and Liolios).

However, there is a rather specific purpose in the taxation of alcohol in the EU. Most alcohol products are subject to common rules and regulations. In particular, the EU harmonizes the principles of alcohol taxation and excise duty rates over all member countries very strictly. There are actually two EU Directives from 1992, which continue to regulate alcohol excise duties – Council Directive 92/83/EEC on the harmonization of the structures of excise duties on alcohol beverages and Council Directive 92/84/EEC on the approximation of the rates of excise duty on alcohol and alcoholic beverages (Council Directives accordingly). Later on have been taken attempts to modify those Directives; however, the efforts have not been succeeded (Jones and Liolios).

The purpose of such requirements is to avoid harmful tax competition among the member states and distortions of cross border trade activities. Therefore, the European Union alcohol taxation regulation provides a unique example of a unified cross-border taxation system in the region with 28 different countries and a population of over half a billion. However, involving so many different countries also generates various problems and creates a need to consider the specific situation of many countries. Therefore, a broad range of the issues in alcohol production and consumption in Europe must be considered.

First, the production of alcoholic beverages is an important industry. It provides jobs and income for millions of people and generates revenue for farmers, producers and retailers.

Second, the availability and affordability of alcohol products is an important component of many other economic activities. It is related to tourism, retailing and entertainment.

The third aspect to emphasize is that alcohol consumption is also a part of society's everyday culture. Cultural traditions, lifestyles and festivities that are several thousands of years old are often related to alcohol consumption. Clearly, alcohol taxation should also be sensitive to those issues.

The EU Council Directive forces member countries to establish minimal excise duties (EU Council) over all standardized alcoholic beverages. Mostly, the alcohol excise duty rates depend on the alcoholic strength by volume of a particular type of alcoholic beverage.

Specific exceptions exist and reduced excise duties are given to certain types of alcohol. The EU excise duty regulations try to also take into consideration the cultural and economic particularities of the member states, and therefore, provide non-standard solutions for alcohol excise. For example, zero tax rates are allowed on wine in many countries.

Also, as we shall indicate below, Member States have rather different sets of alcohol taxes, although grounded on the standardized set from the EU alcohol taxation requirements.

Alcohol consumption in the EU

As stated above, Europeans consume rather high quantities of alcoholic beverages in comparison to the rest of the world. There are many factors that determine alcohol consumption patterns and levels (Heath, 2000; Barton 2007). Among them should be mentioned society's alcohol drinking customs, traditions, cultural heritage, education levels, religion, media and many other factors (Houghton & Roche 2001). Furthermore, there are many stereotypes about drinking patterns and habits in different nations; for example, Southern Europeans drink a lot of wine; Central Europeans beer and Northern Europeans strong alcohol. However, a detailed analysis of the factors that might define the levels of alcohol consumption *per capita* remains outside the scope of this study.

Another set of factors determining alcohol consumption is related to regulatory frameworks and the accessibility of alcoholic beverages. High alcohol prices, limited opening hours for alcohol shops and efficient drinking age controls all help reduce alcohol consumption.

In order to start analysing alcohol taxation in Europe, a general picture of alcohol consumption by EU member state is presented (Table 1). The table ranks countries by alcohol consumption measured as pure alcohol in litres *per capita*.

Table 1. Recorded alcohol consumption (15+ years), litres of pure alcohol *per capita*, 2010

6.1-8.9	9.0-10.2	10.3-10.7	10.8-11.6	11.7-12.0
Italy	Romania	UK	Hungary	France
Iceland	Netherlands	Slovenia	Portugal	Ireland
Sweden	Finland	Denmark	Slovakia	Austria
Malta	Latvia	Belgium	Germany	Czech R.
Greece	Spain	Croatia	Estonia	Lithuania
Cyprus	Bulgaria	Poland	Luxembourg	

Source: WHO Global Information System on Alcohol and Health; authors' calculation and grouping

There are manifold differences in alcohol consumption levels *per capita* over the region. The highest consumption amounts are measured in Lithuania, Czech Republic and Austria. By contrast, the lowest quantity of alcohol is consumed in Italy, Iceland and Sweden. The difference in alcohol consumption between those groups is as high as two times.

At the same time, the table does not provide a clear-cut and easy to interpret picture of alcohol consumption patterns across EU countries. It is difficult to intuitively identify characteristics that might explain the difference in the level of alcohol consumption among these groups (e.g. new or old EU country; cultural background of alcohol consumption (wine or beer drinking countries) or geographical location (Northern or Southern Europe)). As the correlation analyses below demonstrate, alcohol consumption levels do not actually correlate with any set of studied socio-economic indicators.

The system for alcohol excise duties in the EU

There are surprisingly many excise type taxes related to alcohol in the European countries. In principle, it does not make any difference if there exists one law that includes all tax excise rates or separate laws for every type of alcohol. However, the variety of separate taxes provides an overview of the development of alcohol excise duties and emphasizes the particularities of alcoholic tax objects in each country. For example, some member states have raised separate taxes on sparkling wine or *alcopops.*

In general, there are two types of alcoholic beverage – beer and ethyl alcohol –which must be burdened with excise duties in every single member country. Intermediate products are usually covered by the excise duty that covers ethyl alcohol taxation. In addition, countries have the right to set a zero tax rate on wine products. Therefore, in many countries excise tax on alcohol does not exist. Those are mostly wine producing countries from Southern and Central Europe.

Table 2 demonstrates that EU countries use various sets of excise taxes. Several countries have introduced even up to 6 or 7 different excise duties; that is, there exist separate tax regulations for every taxable alcoholic product. Countries tax sparkling wine or different beverages with alcohol content separately.

Another set of countries are satisfied with just one single tax law, which includes a list and the rates imposed for different alcoholic beverages.

Furthermore, alcohol excise duties reflect the particularities of the legal system, the historical development of alcohol taxation and specific characteristics of tax administration in certain countries.

Table 2. Alcohol excise duties and the number of taxes in use

	No of taxes	Alcohol excise duties
Czech R.	7	Alcohol (2); beer (2); wine (2); fees on sale of alcohol drinks
Belgium	6	Brandy; consumption of alcohol and brandy; fermented sparkling drinks; fermented fruit juices; beer; intermediary products
Luxembourg	6	Consumption of alcoholic beverages and spirits (imported); imported alcoholic beverages; imports of beers; fermented fruit beverages; fermented sparkling beverages; alcopops
Portugal	6	Imported ethyl alcohol; imported alcoholic beverages; imported beer; ethyl alcohol; alcoholic beverages; beer
Austria	5	Spirit; Special duty on alcoholic drinks; beer; sparkling wine; wine
Bulgaria	4	Alcohol (2); beer (2)
Lithuania	4	Alcoholic beverages; wine and sparkling wine; beer; other alcoholic beverages
Denmark	3	Beer; wine; spirits; alcoholic soft drinks
Germany	3	Spirits; sparkling wine; beer duty
Spain	3	Alcohol; beer; intermediate products
Cyprus	3	Sparkling wines; spirits; beer
Poland	3	Spirits; beer; wine and other fermented beverages
Slovakia	3	Alcohol; beer; wine
Sweden	3	Imported alcoholic beverages; alcoholic beverages; profits of fiscal monopoly
UK	3	Beer; wines and cider; spirits
Ireland	2	Imported alcohol; domestic alcohol
Greece	2	Beer; alcoholic drinks
Croatia	2	Alcohol; beer
Italy	2	Beer; Spirits
Latvia	2	Alcohol; beer
Hungary	2	Alcohol production duty (2)
Malta	2	Beer; Spirits
Netherlands	2	Alcohol (2)
Estonia	1	Alcohol
France	1	Alcohol
Romania	1	Ethylic alcohol, intermediate products, fruit wine and beer
Slovenia	1	Alcohol and alcoholic drinks
Finland	1	Alcoholic beverages
Iceland	1	Excise on alcohol
Norway	1	Tax on alcohol

Source: author's calculations and European Commission's DG Taxation and Customs Union; NTLs (national tax lists)
http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_strures/article_5985_en.htm

Budget revenues from alcohol excise duties

In Table 3, countries are ranked on the basis of revenue in GDP from alcohol excise duties.

Table 3. Excise taxes in GDP, 2012

0.05%-0.14%	0.15%-0.19%	0.20%-0.27%	0.28%-0.64%	0.65%-1.17%
Italy	Cyprus	Romania	Hungary	Latvia
Luxembourg	France	Denmark	Bulgaria	Poland
Austria	Belgium	Greece	Sweden	UK
Portugal	Malta	Croatia	Slovakia	Finland
Spain	Netherlands	Slovenia	Ireland	Lithuania
Germany		Czech R	Iceland	Estonia

Source: author's calculations and European Commission's DG Taxation and Customs Union; NTLs (national tax lists) and Eurostat Homepage

Comparisons of receipts from alcohol excise duties in GDP across EU countries fluctuate across a rather large range. Higher revenue groups receive more than 20 times more in this regard compared to lower revenue groups.

In general, excise duties are a minor part of government revenues; for example, in order of magnitude they are less than income taxes. As a percentage of GDP, revenues from excise duties are range from 0.05% (Italy, Luxembourg, Austria) to 1.15% in Estonia and Finland. The group collecting highest revenues from alcohol is geographically rather concentrated – most are from the Nordic-Baltic region. In some countries *(e.g.* Estonia or Lithuania), alcohol excises are a rather influential source of public finance.

A similar situation is visible if we look at alcohol taxes as a percentage of total taxes (Table 4.)

Table 4. Excise taxes in total taxes, 2012

0.15%-0.35%	0.36%-0.59%	0.60%-0.80%	0.81%-1.76%	1.77%-3.62%
Italy	Belgium	Greece	Hungary	UK
Luxembourg	France	Romania	Czech R.	Iceland
Austria	Denmark	Slovenia	Bulgaria	Poland
Germany	Cyprus	Croatia	Slovakia	Latvia
Portugal	Netherlands	Sweden	Finland	Lithuania
Spain	Malta		Ireland	Estonia

Source: author's calculations and European Commission's DG Taxation and Customs Union; NTLs (national tax lists) and Eurostat Homepage

The extent to which public finances rely on alcohol excise duties tends to be lowest in Mediterranean countries – less than one third of a percentage point. By contrast, the Estonian government budget receives almost 4% of its revenues from alcohol excise duties. Alcohol taxation revenues are also high in the other Baltic states and Poland and the UK. Perhaps here we can identify a pattern of alcohol taxation – wine drinking and producing countries receive less revenues from alcohol than countries where the consumption of strong liquors is more common. Usually, wine producing countries keep their excise duties on wine low or even at zero. At the same time, strong alcohol is heavily taxed in all EU countries.

Once again, alcohol excise duties are not an overly significant source of revenues, despite some exceptions. At the same time, alcohol taxation is a rather visible issue and often generates heated debate.

Structure of alcohol revenues

In general, excise duties are a minor part of government revenues; for example, in order of magnitude they are smaller than income taxes. However, receipts from alcohol excise duties compared with GDP across EU countries fluctuate within a rather sizeable range (see Tables 3 and 4).

The following table (Table 5) provides an overview of the structure of excise revenue across Europe. It is evident that one third of the EU countries do not receive revenues from wine products at all. In two thirds of the countries, excise duties from wine are less than 20%. Zero tax on wine products is mainly established in Southern and Central European countries. Logically, the main revenue from excise duties in those countries comes from beer or strong alcohol taxes. At the same time, Nordic countries and those of the British Isles receive more than one third of their excises from wine tax.

Table 5. Structure of revenue from alcohol taxes by country, % of total*

Beer				
11%-21%	21%-28%	28%-38%	39%-46%	48%-78%
France	Estonia	Denmark	Cyprus	Italy
Luxembourg	Slovakia	Bulgaria	Czech R.	Austria
Latvia	Sweden	Poland	Portugal	Romania
Lithuania	Greece	UK	Finland	Slovenia
Malta	Spain	Ireland	Hungary	Croatia
Germany	Belgium	Netherlands		
Wine				
0%		1%-4%	4%-24%	27-41%
Croatia	Austria	Romania	France	Ireland
Italy	Portugal	Slovakia	Lithuania	Netherland
Cyprus	Bulgaria	Czech R.	Estonia	Belgium
Spain	Greece	Hungary	Latvia	UK
Malta	Luxembourg	Poland	Germany	Sweden
		Slovenia	Finland	Denmark
Strong alcohol (ethyl)				
20%-31%	32%-40%	51%-63%%	65%-70%	71%-85%
Slovenia	Netherlands	Hungary	Germany	Spain
Croatia	Finland	Italy	Lithuania	Greece
UK	Sweden	Portugal	Bulgaria	Slovakia
Denmark	Romania	Czech R.	Estonia	Malta
Ireland	Belgium	Cyprus	Latvia	France
	Austria	Poland		Luxembourg

Source: EU Commission, Directorate-General Taxation and Custom Union, excise Duty Tables (Tax receipts); author's calculations
*countries are ranked

Beer and ethyl alcohol revenues are high in those countries where wine tax is low or zero. Beer tax revenue is high in wine-making countries like Italy, Slovenia and Croatia. Accordingly, other wine producing countries like France, Greece or Spain

receive the highest amount of their alcohol excise from strong alcohol taxes. Beer tax revenues are low in the Baltic countries and Germany; ethyl alcohol excise tax revenues are low in the UK, Denmark and Ireland.

Excise duty rates

As shown above, the EU has established minimum compulsory rates for different types of alcohol. Table 6 ranks and distributes European countries into groups according to the level of alcohol excise duties.

Surprisingly, there are actually enormous differences across Europe. Beer excise duties vary from 1.9 in Bulgaria to 32 euros *per hl/degree* of alcohol in the finished product in Finland.

Table 6. Alcohol excise duty rates, EUR, 2013

Beer, per hl/degree of alcohol of finished product Minimum excise duty adopted by the Council 1.87 EUR				
1.9-3.5	3.6-5.4	5.5-7.2	7.3-23.5	23.6-52.7
Bulgaria Germany Luxembourg Romania Lithuania Czech Republic	Slovakia Malta Poland Belgium Austria Croatia	Hungary Latvia Cyprus Estonia Greece Italy	France Denmark Slovenia Netherlands Sweden Ireland	Portugal UK Spain Finland (32.1) Norway Iceland
Wine, Excise duty per hectolitre Minimum excise duty adopted by the Council 0 EUR				
0		3.7-84.6	84.7-334.0	334.1-703
Bulgaria Germany Luxembourg Romania Czech R. Slovakia Malta Austria	Greece Italy Slovenia Portugal Spain Croatia Hungary Cyprus	France Poland Belgium Latvia Lithuania	Estonia Netherlands Denmark Sweden	UK Finland Ireland (424.8) Norway
Ethyl alcohol, excise duty per hectolitre Minimum excise duty adopted by the Council 550 EUR or 1000 EUR per hl of pure alcohol				
562-1,064	1,065-1,291	1,292-1,642	1,643-3,534	3,535-8,999
Bulgaria Croatia Spain Italy Cyprus Luxembourg	Romania Slovakia Czech R. Hungary Austria Portugal	Lithuania Germany Slovenia Latvia Poland Malta	Estonia Netherlands France Denmark Belgium Greece	UK Ireland Finland Sweden (5,866.0) Iceland Norway

Source : EU Commission, Directorate – General Taxation and Custom Union, Excise Duty Tables, July 2014

Note: as Iceland and Norway are not EU countries, they are indicated separately under the highest tax rate for EU countries.

The situation is interesting if we look at wine taxation in these countries. About half of the EU countries do not tax wine with excise duties at all. In this context, wine production is clearly taxed more lightly than other alcohol products. At the same time, wine excise duties are rather high in the British Isles and in the Nordic countries.

Similar to beer, excise duties on ethyl alcohol differ across Europe by a factor of more than 10. The UK, Ireland and Nordic countries use the top tax rates; Southern European countries have the lowest taxes on strong alcohol.

In general, EU authorities establish the minimum levels for excise tax duties. The situation, where one type of alcohol product (i.e. wine) is taxed rather differently to other alcohol products is somehow controversial according to universal logic, where comparable products are taxed similarly. If countries allow excise duties on wine to stay as low as zero, the burden on alcohol excise duties relies solely on other types of producers/consumers. Therefore, the question of whether such a situation is acceptable for the other types of alcohol producers arises.

In the EU countries, the number of registered alcohol producers is rather limited – particularly concerning beer and strong alcohol producers. Usually, alcohol producers have well-organised associations that represent the interests of certain types of alcohol producers. Hypothetically, those interest groups generate regulatory competition, which brings excise tax rates closer to each other.

Correlations between alcohol excise duty rates

The EU as an economic union harmonizes and regulates alcohol taxation in all member countries. Despite these harmonized alcohol excise duty levels, the member countries implement their own individual taxation policies.

Table 7 presents some correlations between alcohol taxation and specific indicators.

As the table shows, there is no significant correlation between the amount of alcohol consumption *per capita*, a country's income level *per capita* and total taxation in GDP. Actually, the amount of alcohol consumption does not correlate with any indicator provided in Table 7. That is, the richer countries or those with a higher tax level do not consume more alcohol *per capita* in comparison with lower income or lower tax countries. Alcohol consumption depends on many factors, as mentioned above, but in general, the influence of alcohol excise duties on alcohol consumption is insignificant.

Table 7. Correlations between alcohol excise duties and economic indicators, 2012

	GDP *per capita,* euros	Total taxes, in GDP, %	Alcohol consumption per capita, litres ethyl	Alcohol excise duties compared with GDP, %	Alcohol excise duties in total tax revenues, %
GDP *per capita,* euros	1				
Total taxes in GDP, %	0,616**	1			
Alcohol consumption *per capita,* litres ethyl	-0,018	-0,150	1		
Alcohol excise duties compared with GDP, %	-0,252	-0,375*	0,137	1	
Alcohol excise duties in total tax revenues, %	-0,338	-0,527**	0,200	0,975**	1
Ethyl alcohol excises in total alcohol excise revenues	0,677	0,091	0,729	0,959	0,577
Wine excises duties in total alcohol excise revenues	0,439*	0,433*	-0,057	0,217	0,107
Beer excise duties in total alcohol excise revenues	-0,279	0,045	-0,081	-0,195	-0,229

** – Correlation is significant at the 0.01 level (2-tailed)
0* – Correlation is significant at the 0.05 level (2-tailed).
Source: EU Commission, Directorate-General Taxation and Custom Union, excise Duty Tables and Eurostat; authors calculations
See descriptive statistics in Appendix 1

Alcohol excise duties compared with GDP correlate negatively with total taxation levels. That is, countries with a high total tax ratio are burdening their societies relatively less with alcohol taxes. A higher tax ratio generally exists in those countries with higher income levels. However, a statistically insignificant negative correlation between *per capita* GDP levels and alcohol taxes compared with GDP levels is also visible.

The ratio of alcohol excise duties to total taxes correlates strongly and negatively with a country's total taxation. The lower the total tax ratio in a country, the more it collects consumption taxes as well as alcohol excise duties. At the same time, the ratio of

alcohol excise duty to total taxes does not correlate with any type of alcohol revenues in total alcohol tax revenues.

If we look at how the alcohol tax structure relates to other socio-economic indicators, it is interesting that a large revenue share from wine taxes correlates with the country's GDP level and total tax burden. To put this simply, countries with higher GDP levels also have higher excise duties on wine.

At the same time, the share of taxes on beer and strong alcohol does not correlate with any indicator in the table. Why a similar relationship is also not statistically significant in the case of beer and strong alcohol is difficult to interpret.

As stated above, about half of the EU countries do not tax wine at all. Those countries are all Southern or Central European countries (Table 5). Countries with large wine industries can provide their domestic winemakers a more favourable tax regime in comparison with other alcohol producers. At the same time, countries in the Nordic-Baltic region and the British Isles have established significantly higher tax rates on wine products.

But how does wine tax relate to taxes on other types of alcohol? Table 8 presents the correlations between excise levels for different alcohol types.

Table 8. Correlations between alcohol excise duty rates, 2012

	Wine excise duties in total alcohol excise revenues, %	Beer excise duty, EUR	Wine excise duty, EUR
Wine excise duties in total alcohol excise revenues, %	1		
Beer excise duty, EUR	0,478*	1	
Wine excise duty, EUR	0,772**	0,685**	1
Ethyl alcohol excise duty, EUR	0,741**	0,786**	0,876**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
Source: EU Commission, Directorate-General Taxation and Custom Union, excise Duty Tables and Eurostat; author's calculations

As the table depicts, there is a very strong and positive correlation between the level of various alcohol excise duties and different types of alcohol. That is, if a country taxes wine with a low or zero rate, it also taxes other alcohol types at low rates. Similarly, if in a country has relatively high tax rates on strong alcohol and beer, it also has high excise duties on wine.

How should such an outcome be interpreted? One would expect just the opposite situation – countries with a zero or low tax rate on wine may increase excise duties on

other types of alcohol products to compensate for the absence of public revenues from wine taxes. If countries prefer for certain reasons to keep tax rates low on wine, why not by the same logic tax beer and ethyl alcohol relatively higher?

The correlation between the relative levels of alcohol excise duties on wine and other types of alcohol does not prove that low excise duties on wine also drives down tax rates on other types of alcohol. To demonstrate such a relationship requires a more specific and detailed study of alcohol policies and political decision-making in general, which goes beyond the focus of the current study.

However, a hypothetical explanation for such an outcome might be as follows: the closeness of the relative alcohol excise duties is a product of fierce regulatory competition between producers and other interested groups (e.g. tourism, retailers). By regulatory competition, we mean that interest groups influence political and administrative decision-makers, which leads them to adopt certain regulations and tax laws concerning alcohol products.

It is politically and economically difficult to tax various types of alcohol producers very differently. Different alcohol producers are usually well-organized and able to forcefully present their interests to regulators. Eventually, such regulatory competition equalizes the relative excise duties on different types of alcohol products. Once again, the explanation and generalization of details of political practices in alcohol taxation requires further specific studies.

Summary

Alcohol taxation is an economically important and socially sensitive issue in most European Union countries. This paper studies the share of alcohol duties in total taxes compared with GDP levels. In general, alcohol excise duties are a rather minor part of public sector revenues, despite there being some exceptional countries (*e.g.* Estonia) with a high proportion of alcohol taxation revenues in their budgets. The correlation analysis demonstrates that the relative tax burden on alcohol products does not correlate with the country's GDP level per capita; in addition, there is no correlation between tax burden and alcohol consumption levels *per capita* in the EU member countries.

Alcohol excise duties are harmonized across the EU countries, the main principles of which are fixed by special EU Commission directives. The Directives goals are to prevent harmful cross border tax competition within the EU and support effective alcohol policies. Despite harmonized alcohol excise tax rates in the EU, the range of actual alcohol excise duties vary significantly across the countries.

However, there is a significant feature of alcohol taxation in Europe – the EU Directives allow for the exceptional treatment of wine, for which the excise rate may be established as low as zero. Such a situation provides a substantial "degree of freedom" in designing the country's alcohol tax system. One may expect that "zero wine tax rate countries" increase their alcohol excise rates on other types of alcohol to compensate for the lack of public revenues from wine taxation. However, the correlation analyses demonstrate that alcohol tax rates are rather correlated – low wine tax clearly correlates positively with low tax rates on other alcohol products as well (and *vice versa*).

A hypothetical interpretation of the results of the correlation analyses might be that regulatory competition exists among different types of alcohol producers in the EU countries. Eventually, such regulatory competition results in equalizing the relative alcohol excise rates on different alcohol products. However, the (economic and political) process of alcohol excise rate equalization requires further detailed study.

Appendix 1. Data used in correlations, descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness
Alcohol consumption per capita, pure alcohol equivalent, litres	29	6,1	12,9	10,09	1,74	-,74
Alcohol excise duties collected in relation to GDP, %	29	0,07	1,17	0,34	0,264	1,38
Alcohol excise duties in total taxes, %	29	0,15	3,62	1,00	,85	1,41
Wine excise duties in total tax revenues, %	28	0,0	41,1	9,9	13,3	1,22
Ethyl alcohol excise duties in total tax revenues, %	28	20,6	85,2	53,3	19,8	-0,10
Beer excise duties in total tax revenues, %	28	11,2	77,9	35,1	17,0	1,00
Wine excise duty rate per hectolitre, EUR	28	0	425	68,34	121,3	1,94
Beer *per* hl/degree of alcohol in finished product	29	1,92	52,70	11,1900	11,7	1,96
Ethyl alcohol excise duty per hectolitre	29	562	6652	1944,59	1538,54	1,95

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KOKKUVÕTTED

ZUSAMMENFASSUNGEN

SUMMARIES

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Seit dem Beginn der Finanzkrise sind die Zinsen in Europa kontinuierlich gesunken. Der Zins für die Einlagefazilität hat die Nulllinie im Juli 2012 erreicht – und liegt inzwischen darunter. Gleichzeitig sinkt die Inflationsrate in der Währungsunion weiter – Prognosen sehen sie für das Jahr 2015 nur knapp im positiven Bereich liegen wird.

Die EZB befindet sich in einer Situation, die für viele Jahrzehnte nur eine sehr untergeordnete Rolle in politischen und akademischen Diskussionen gespielt hat: Sie muss deflationäre Tendenzen bekämpfen. Angesichts der anhaltenden Problemen in Japan und dem zu Beginn des neuen Jahrtausends in den USA drohenden Verfall des allgemeinen Preisniveaus entstehen die damit verbundenen Fragen nicht völlig neu – der europäische Kontext ist es aber.

Das Paper widmet sich den veränderten Rahmenbedingungen der geldpolitischen Transmission. Im Zentrum stehen potentielle Asymmetrien, die sowohl die relative Bedeutung als auch die Funktionsweise der einzelnen Transmissionsmechanismen betreffen können. Dabei werden der Kreditkanal, der Vermögenspreiskanal, sowie der Zinskanal und der im Rahmen der keynesianischen Liquiditätsfalle relevante „Fiskalkanal" betrachtet. Zentrales Augenmerkt liegt schließlich auf der Frage, wie die EZB in dieser Phase das Vertrauen der Märkte erhalten kann, dass die Gefahren abgewehrt werden können. Basis für die Untersuchung sind die Maßnahmen mit denen in der Vergangenheit Glaubwürdigkeit und Commitment unter Beweis gestellt wurden.

Der Vermögenspreiskanal gilt unter normalen Rahmenbedingungen als hoch relevant für die Übertragung geldpolitischer Impulse, aber nicht nutzbar. Erwartungen vor allem kurzfristig anstehender Zinsänderungen haben eine hohe Relevanz für Vermögenspreise. Deshalb würde die Zentralbank schnell Gefahr laufen, sich in die Abhängigkeit der Finanzmärkte zu begeben, würde sie Vermögenspreisen einen expliziten Platz in ihrer geldpolitischen Strategie einräumen. Ähnlich verhält es sich grundsätzlich auch bei den Devisenkursen, die aber vor allem aufgrund der beggar-thy-neighbour Effekte gezielter Abwertungen als Zwischenziel ungeeignet sind. Ungeachtet dieser Probleme werden Abwertungen in der Literatur als mögliche Strategie kleiner Länder diskutiert, wenn Ausnahmesituationen dies erfordern. Auch in der Eurozone tritt durch die starke Abwertung des Euro gegenwärtig eine Entlastung ein – dies allerdings nach eigenem Bekunden unerwartet für die EZB.

Die Bedeutung des Kreditkanals beruht vor allem auf Effekten, die die Wirkung von Zinserhöhungen begleiten – und in diesen Phasen stabile Zusammenhänge zwischen Zinsen und Kreditvergabe stören können. Es gibt jedoch keinerlei Hinweise, dass bei Erreichen der Nulllinie ein besonderer Effekt im Sinne des Kreditkanals ausgelöst wird.

[1] Den vollständigen Text des Artikels „Beurteilung der Wirksamkeit und mögliche Risiken der aktuellen Geldpolitik des Eurosystems" findet der Leser auf der beigefügten CD.

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Die Funktionsweise des Zinskanals bei Erreichen eines Zinsniveaus von Null ist Gegenstand der keynesianischen Liquiditätsfalle – und damit der älteste Hinweis auf potentielle Asymmetrien in der Transmission. Der Zusammenhang zwischen (kurzfristigen) Zinsen und Liquidität löst sich in diesem Moment auf und der klassische Wirkungsmechanismus der Geldpolitik versagt. Abhilfe kann in dieser Situation nur eine von akkomodierender Geldpolitik begleitete expansive Fiskalpolitik sein. Dies entspricht einer Finanzierung staatlicher Defizite durch die Zentralbank und senkt die Zinsen über alle Fristen der Zeitstruktur. Der umfangreiche Ankauf von Anleihen durch die EZB kann als Teil einer solchen Strategie interpretiert werden. Die damit verbundene Liquiditätszufuhr am Geldmarkt ist an der umfangreichen Inanspruchnahme der Einlagefazilität durch den Geschäftsbankensektor erkennbar. Dass die Maßnahmen das Zinsniveau im langfristigen Bereich senken, ist in der gegenwärtigen Situation zumindest sehr plausibel.

Neben diesem keynesianischen Kanal besteht die Möglichkeit, die langfristigen Zinsen im Rahmen der Erwartungstheorie der Zinsstruktur zu beeinflussen. Wenn die langfristigen Zinsen dem Durchschnitt der erwarteten kurzfristigen entsprechen, können glaubwürdige Ankündigungen der Zentralbank das langfristige Zinsniveau beeinflussen. Ein Niedrigzinskurs der Zentralbank senkt das langfristige Zinsniveau. Wegen des engen Instrument-Ziel-Zusammenhangs von Refinanzierungssatz und Inflationsrate gibt es in der Kommunikation einen engen Zusammenhang zwischen beiden Größen: Die Entschlossenheit der Zentralbank in Bezug auf das angestrebte Inflationsziel lässt Rückschlüsse auf den zinspolitischen Kurs zu.

Vor dem Hintergrund von Inflationsraten, die sich am oberen Rand des Inflationsziels bewegen, ist der Zusammenhang von Inflationsaversion der Zentralbank und zinspolitischem Kurs seit den einflussreichen Arbeiten von Kydland/Prescott, Barro/ Gordon und Rogoff diskutiert worden. Die Arbeiten legen einen „inflationary bias“ der Geldpolitik nahe, der nur durch Regelbindung und glaubwürdiges Commitment in der Geldpolitik bekämpft werden kann. Mit der Bekanntgabe geldpolitischer Ziele, der Offenlegung ihrer Strategien und der Betonung ihrer Abneigung gegen drohende Inflation haben Zentralbanken seitdem den Anstieg der Inflationsraten über ein wünschenswertes Niveau hinaus bekämpft. Ein mögliches Element dieser Kommunikationsstrategie sind Inflationsprognosen der Zentralbanken, ihre Relevanz für die Zinserwartungen an den Märkten ist empirisch belegt. Sowohl die Deutsche Bundesbank als auch später die EZB haben ihre Risikoaversion gegenüber hohen Inflationsraten immer auch dadurch zum Ausdruck gebracht, dass ihre Prognosen im Vergleich zu denen anderer Institute hoch ausfielen.

In der aktuellen Situation sollte das Ziel des Abwendens einer Deflation Vorrang vor der Sorge um einen potentiellen inflationären Bias in der Geldpolitik haben. Mehr noch: Die EZB sollte nach Wegen suchen, die Öffentlichkeit von ihrem Willen konsequent niedriger Zinsen zu überzeugen. Wenn man die Rolle der Inflationsprognosen für die Gewinnung von Glaubwürdigkeit voraussetzt, würde dies heißen, dass die Prognosen der EZB relativ niedrig im Vergleich zu denen anderer Prognostiker ausfallen sollten. In dieser Arbeit wurden daher die Prognosen der EZB mit denen ausgewählter anderer Institutionen (Europäische Kommission, OECD, Institut für Weltwirtschaft) verglichen. Dabei hat sich ergeben, dass die Prognosen der

EZB für das jeweils nächste Jahr (signifikant) höher sind als die der anderen. Dem Vergleich liegen approximative 90% Intervalle der EZB- Prognosen und die Punktprognosen der jeweils anderen Institutionen für den Zeitraum seit Anfang 2011 zugrunde. T-Tests auf Gleichheit der durchschnittlichen Prognosen bestätigen das Ergebnis: Die EZB durchschnittliche EZB Prognose weicht von den anderen systematisch nach oben ab.

Das asymmetrische Verhalten der EZB in Bezug auf die kommunikative Bekämpfung hoher Inflationsraten ist also nach wie vor sichtbar erkennbar, obwohl diese Strategie eindeutig in einem Szenario mit relativ hohen Inflationsraten angemessen ist. Die Zeitverzögerung in der Übertragung geldpolitischer Impulse legt nahe, dass insbesondere die Prognosen für das jeweils nächste Jahr für die Erwartungsbildung über den zinspolitischen Kurs relevant sind. Gerade bei diesen liegen aber die Prognosen der EZB in nahezu allen Fällen signifikant oberhalb des Niveaus der anderen Institute. Gleichzeitig haben Studien anderer Autoren den Zusammenhang von Inflationsprognosen der Zentralbank und Zinserwartungen an den Märkten nachgewiesen.

Abschließend liegt es nahe, der EZB zu empfehlen, den eigenen Inflationsprognosen im Rahmen ihrer Kommunikationsstrategie ein stärkeres Gewicht zu geben und den Märkten hiermit zu signalisieren, dass die Risiken anhaltend sehr niedriger Inflationsraten erkannt werden. Dies könnte ein relativ preiswerter Weg sein, die Zinsen über die gesamte Zeitstruktur niedrig zu halten und so in den Bereich der angestrebten Inflationsrate nahe zwei Prozent zurück zu kehren.

RESSURSITULU MUDEL ARENENUD RIIGILE: EESTI KAASUS[1]

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Inimkond vajab ja kasutab iga-aastaselt suures koguses erinevaid loodusvarasid. Ammenduvate maavarade kasutamine sõltub oluliselt nende kasulikkusest ühiskonnale ja saadava tuluvoo rakendamise tõhususest. Maavaradest saadava avaliku tulu kogumiseks, tulude jagamiseks ja tulufondide haldamiseks on mitmeid mudeleid. Eesti kaasuse käsitlus võimaldab näha, et sobiva ressursitulu mudeli valik sõltub mitmetest karakteristikutest. Efektiivne ja jätkusuutlik ressursitulu mudel võib peale jätkusuutliku tuluvoo pakkumise anda ka täiendava majandusliku efekti. Antud artikli eesmärk on leida konkreetse riigi jaoks konkreetsetes tingimustes sobiva ressursitulufondi valimiseks sobivad parameetrid. Sobivaim on selline fondi mudel, mis võimaldab saavutada maksimaalset heaolu pikema perioodi jooksul.

1. osas tutvustatakse ressursitulufondide teoreetilist põhjendust. 2. osas esitatakse peamisi ressursitulu jaotuse mudeleid. 3. ja 4. osa käsitlevad arenenud riikide arengufonde ja tehakse järeldused ressursitulu fondi mudeli valiku sobivuse parameetrite kohta. 5. osas kaalutakse Eesti põlevkivi sektorit, keskkonnatasusid ning soovitatakse vastavalt osades 3 ja 4 esitatud parameetritele sobivat mudelit Eestile. Kokkuvõtte annab soovitused tulevasteks uuringuteks ressursitulu fondide osas.

1. Teoreetiline ülevaade

Enamus ressursitulu kirjandusest käsitleb fossiilkütuseid arenenud riikides kui inimkonna üht suurimat varandust ning globaalse kaaluga vara. Suur osa arutlusest keskendub niinimetatud ressursineedusele, mis on põhjustatud kohaliku valuuta väärtuse tõusust, investeeringute vähenemisest teistes sektorites ja põhjustab fiskaalset sõltuvust, konflikte, korruptsiooni ja poliitilise võimu monopoliseerumist (Sachs, Warner, 2001). Probleemsed näited on Kamerun, Liibüa, Iraak, Venezuela, Mehhiko (Rey, 2011).

Sellest ressursineedusest üle saamiseks rajasid sel ajal Kuveiti valitsenud Briti võimud 1953. aastal Kuveidi Investment Authority, mis oli üks esimesi kaasaegseid riiklikke heaolufonde (Sovereign Wealth Fund -SWF). Täna haldavad enam kui 68 riiklikku või USA osariigi fondi SWF varasid 5,3 triljoni USD väärtuses. 58% nende tuludest tuleb fossiilsete kütuste ja ligi 10% teistest maavarade tuludest. Ülejäänud osa tulust moodustab mitte-maavaralise vara müük (erastamised, maamüük). Nafta ja gaasi tulufondide peamine põhjus on väga suur tulude maht suhteliselt lühikese aja jooksul (20-30 aastat) konkreetsest maardlast.

[1] Fulltext article „Resource Revenue Model for a Developed Country: Case Estonia“ can be found on the CD attached.

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Tsani (2012) annab põhjaliku ülevaate ressursitulufondide poolt ja vastuargumentidest. Ressursitulufondide loomise peamiste põhjustena tuuakse välja (Tsani, 2012; Baena et al., 2012):

1. Muuta eelarvetulud sõltumatuks hindade volatiilsusest ja valuutakursi survetest;
2. Parandada fiskaalset stabiilsust seades fiskaalsetele otsustajatele enesepiirangud;
3. Saavutada tulude säästmist ning põlvkonnaülest õiglust;
4. Fondid aitavad korruptsiooni, läbipaistmatu, politiseeritud juhtimise vastu;
5. Kapitali jaotus maavara välistesse sektoritesse;
6. Keskkonnaparandus kui kapitalipaigutus.

Ressursitulufondide teoreetiline raamistik tuleb Milton Friedmani 1957. aastal sõnastatud püsitulu hüpoteesist (Permanent Income Hypothesis - PIH), mis rakendatuna ressurstuludele võimaldab lühiperioodi ressursitulust saadava hüve tasandada pikas perioodis saadavaks püsituluvooks. Vältimaks majanduse ülekuumenemist avalike tulude ja erasektori investeeringute kombinatsioonis ning saavutamaks püsituluvoogu, investeerib ressursitulufond varadesse globaalselt vastavalt kaasaegsele portfelliteooriale. PIH klassikalist rakendust kasutab Norra globaalne riigi pensionifond, mille varade väärtus ületab 800 mld USD.

Mitmed analüüsid on väitnud, et püsituluvoo siht on optimaalne vaid teatud tingimustel ning ei sobi enamustele arenevatele riikidele või naftast ja gaasist erinevatele tuluallikatele (Collier and Venables, 2008; Van der Ploeg and Venables, 2009). Arenevates riikides, kus on tugevad institutsioonid ‚on põhjendatud suurema majandusliku tulemi saavutamiseks enam investeerida avalikesse teenustesse või riigi erasektorisse. Seega osutab kirjandus, et riigi arengutase ja institutsionaalne võimekus on olulised kriteeriumid.

2. Ressursifondi mudelid

Maavarade maksustamise meetodid ja tasemed on üle maailma väga varieeruvad (Otto, 2006). Nafta puhul kasutatakse eranditult *ad valorem* põhiseid *royalty* tasusid ning nende efektiivne maksumäär (World Bank ja IMF poolt defineeritud kui otsesed maksutulud suhtes teenitud kasumisse) on keskmiselt 60-70% (IMF 2012). Märksa töö- ja kapitalimahukama rauamaagi ja teiste metallimaakide puhul on see 40-60% (Otto, 2006).

Järgnev loend toob peamised eristuvad ressursitulu mudelite tüübid:

1) Fiskaalse mudeli puhul laekuvad kõik ressursitulud otse riigieelarvesse. Näiteks Suurbritannia, Taani, Iiri, Austraalia ja Kanada provintsid peale Alberta;
2) Segamudeli puhul laekub oluline osa riigieelarvesse ja ülejäänud kas piirkondlikkusse või keskkonna- või haridusfondi või ka teatud stabiilsusfondi. Hea näide on Peruu, kus tulud jaotuvad kõigi nimetatud sihtfinantseeringute vahel. (Bedoya, 2012)
3) Säästufondide/suveräänsete heaolufondide korral laekub enamus või kogu tulu suveräänsesse heaolufondi. Maailmas on 68 sellist fondi, mis on enda tegevuse iseregulatsiooniks vastu võtnud Santiago põhimõtted;
4) Suveräänsed arengufondid, mis investeerivad, et aidata kodumaal või lähiriigis kaasa majandusarengule. (Santiso, 2008) Näited on Malaisia Khazanah fond, Kazakhstani Kazyna fond, Mubadala fond Abu Dhabis või Istithmar Dubais.

3. Arenenud riikide ressursitulufondid

Siinkohal vaatleme mitut USA osariigi ja Kanada Alberta provintsi ressursitulufonde, millest valitud parameetrite kokkuvõte on toodud tabelis 1.

Algse 1,5 mld USD sissemaksega 1976. aastal rajatud **Alberta Heritage Savings Trust Fund (AHF) tulud** laekusid algselt 30% maavaradest, kuid seda mida? kärbiti pidevalt. Algusaastatel tegi fond mitmeid poliitiliselt laetud otseinvesteeringuid, mis ebaõnnestusid. 1997. aastal teostati põhjalik reform ning 2012. aastaks oli fondi maht kasvanud 26 mld USD juurde andes 8,2% tootluse juures ligi 800 mln USD väärtuskasvu. Fondi tuludest 344 mln USD suunati Alberta provintsi eelarvesse.

Permanent Wyoming Mineral Trust Fund saab 40% osariigi nafta, gaasi ja kivisöe kaevandustuludest ning investeerib peamiselt aktsiatesse ja võlakirjadesse.

1976. aastal loodud **Alaska Permanent Fund** varade maht oli 2013. aastal 45 mld USD, mis jagunes aktsiate, võlakirjade, kinnisvara ja investeerimisfondide vahel. Fond püüab leida kinnisvarainvesteeringuid osariigi piirides.

New Mexico Severance Tax Permanent Fund'il on eraldi erakapitalil põhinev investeerimisfond mahus 260 mln USD, mille kaudu investeeritakse erakapitali fondidesse. Fond on investeerinud üle 62 New Mehhiko osariigi ettevõtte omakapitali. Kuna erakapitali fondidesse on kaasatud täiendavat kapitali, on saavutatud algse kapitali 6,6 kordne võimendus ja saavutatud kokku 1,9 mld USD investeeringuid ettevõtetesse.

Tabel 1. Valitud ressursitulufondide oluliste parameetrite tabel

	Alaska	Alberta	Wyoming	New Mexico
Ressursifondi laekuv ressursi-tulude osa	25%	5, 25 või 50%	40%	12,5%
Eelarvesse maks-tav tootluse osa	37,5%	0-70%	40%	100%
Institutsionaalne sõltumatus	Sõltumatu asutus/ fondid	Sõltumatu fondihaldur	Osariigi rahandus-osakond	Osariigi investeeringute nõukogu

4. Eesti kaasus

Eesti peamine maavara on põlevkivi, mida on 1916. aastast kaevandatud 1 miljard tonni elektri ja õli tootmiseks. Geoloogilised varud on endiselt üle 3 mld-t. Kuigi praegu kasutatakse põlevkivi elektri tootmiseks, siis õli tootmine on kasvanud jõudsamalt.

Siiski jääb täna õlitoodangu maht 660 000 tonni juurde aastas, mis on ligi 12 000 barrelit päevas ehk 0,01 miljonit barrelit päevas (võrdluseks: Põhja-Dakota tootmine 2014. aastal oli ligi 1 mld bbl päevas). Keerulises regulatiivses ja naftahinna turukõikumiste keskkonnas ei ole reaalne tootmismahu kasv isegi kui on arendatud uue põlvkonna tehnoloogiad õli tootmiseks.

Eestis on seni põlevkivi maksustatud kaevandatud tonni põhiselt, kuigi *ad valorem* süsteem on välja töötamisel. Peale selle maksustatakse küllalt kõrgelt kaevandusvett, jäätmete ladestamist ja atmosfäärilisi emissioone. Keskkonnatasud on tõusnud eri aastatel 5 kuni 20% võrra ja võrreldes 2002. aastaga on 2015. aastaks tõus teatud tasuliikidel 12 kuni 28 kordne Keskkonnatasude jaotus on: 35% otse riigieelarvesse, 50% keskkonnainvesteeringute keskusele (KIK) ja 15% omavalitsustele, kus toimub kaevandamine. KIK teostab keskkonnaalaseid investeeringuid üle kogu riigi. Olles 100% omanik ettevõttes Eesti Energia, saab riik ettevõtte kasumist täiendavat tulu.

Kaaludes, milline ressursifondi mudel on sobiv Eesti jaoks, osutuvad kirjandusest ja juhtumitest kõige olulisemaks järgmised parameetrid:

a) ressursitulu suuruse suhe SKPsse – kui ressursitulu suhe SKPsse on suur, tuleb suurem osa säästa, et vältida majanduse ülekuumenemist;
b) ressursitulu periood – kui ressursitulu saamise periood on suhteliselt lühike (mõned dekaadid), tuleb enam säästa tagamaks enamat ülepõlvkonnalist õiglust ja vältimaks lühiajalisi riske;
c) riigi majanduslik arengutase – kui riigi majanduslik arengutase on madal, siis soosib see investeerimist kohalikesse varadesse või kulutusi riigi eelarvesse kui aga arengutase on kõrgem, siis on primaarsem säästmin,
d) institutsionaalne areng – kui riigi institutsionaalne areng on piisavalt kõrge on vähem tõenäoline, et investeeringutega kodumaistesse varadesse kaasneb korruptsioon või ebaefektiivsus.

Seega tulenevalt suhteliselt väikesest ressursitulu mahust, pikaajalisest tuluvoost, suhteliselt madalamast majanduslikust arengutasemest ning kõrgest institutsionaalsest arengutasemest osutub Eestile sobivaimaks fiskaalne mudel, mida võiks integreerida suveräänse arengufondiga. Viimasesse võiks suunata kuni 50% ressursitulust, eriti selle hinnast sõltuva ja fiskaalset volatiilsust tekitava osa. Selline kombinatsioon võimaldaks lühiperspektiivis panustada eelarve kaudu elanike heaolusse ning teha investeerimisfondide kaudu siseriiklikkusse majandusse pikaajalisi investeeringuid säästes olulise osa väärtusest ka tulevastele põlvedele.

Tabel 2. Ressursitulu faktorid eri jurisdiktsioonides

	Alaska Nafta, gaas	Wyoming Nafta, gaas, süsi	Alberta Nafta, gaas, nafta-liivad	New Mexico Nafta, gaas	Eesti põlevkivi
Tulu maht % GDP	$ 3 bn 6,7%	$ 1 bn 3,6%	$5 bn 2,7%	$1,6 bn 2%	€180 mln 1%
Tuluvoo periood	50 aastat	50-100 aastat	100+ aastat	50-100 aastat	100+ aastat
Arengutase, SKP per capita piir-konnnas	$45 665 110% USA keskmi-sest	$ 47 898 115% USA keskmi-sest	C$ 49 562 159% Kanada keskmi-sest	$ 34 133 82% USA keskmi-sest	$ 26 999 71% EU keskmisest (2014, PPS)
Institutsio-naalne areng WB GI skoor[3] TI CPI skoor[4]	Kõrge 73	Kõrge 73	Kõrge 84	Kõrge 73	Kõrge 64
Sobiv mudel	Fiskaalne + püsitulu-fond	Fiskaalne + püsitulu-fond	Fiskaalne + püsitulu-fond	Sega/ arengu-fond	Sega-fiskaalne/ arengufond

5. Kokkuvõte

Maavarade kasutamine on oluline ühiskondliku ja akadeemilise diskussiooni teema tagamaks kaasaegse ühiskonna heaolu. Tööjõu- ja kapitalitulude maksustamisel on ka maavarade puhul vajalik leida tuluvoo maksimeerivad individuaalselt sobivad lahendused. Maavaradest teenitavad tulud võivad sobival juhtimisel tagada täiendava tulu varade planeeritud haldamise korral. Kõik ressursitulu teenivad riigid peaks omama terviklikku plaani ammenduvate ressursside tulude rakendamiseks, et piiratud perioodis saadavad tuluvood võimaldamaks hüvesid ühiskonnale võimalikult pikas perioodis. Täiendavat uurimist väärib millised ressursitulu fondimudelid maksimeerivad ühiskonna hüve majandusarengu kaudu.

[3] World Bank Governance Index http://info.worldbank.org/governance/wgi/sc_country.asp
[4] Transparency International Corruption perception Index http://cpi.transparency.org/cpi2012/results/

EESTI POOLLOODUSLIKU ROHUMAA TURUVÄLINE VÄÄRTUS: TINGLIKU HINDAMISE UURING [1]

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Sissejuhatus

Lähtuvalt klimaatilistest tingimustest ei ole Eestis looduslikke rohumaid, nagu seda on preeria Põhja-Ameerikas, pampa Lõuna-Ameerikas, pusta Ungaris ja stepp Lõuna - Venemaal. See tähendab, et ilma pideva inimtegevuseta ei oleks olemas Eestile tüüpilist maastikku, mille lahutamatuks osaks on avatud alad: põllud, karjamaad ja heinamaad. Nii looduskaitseliselt kui rekreatsiooni seisukohalt kõige väärtuslikuma osa avatud maastikust moodustavad poollooduslikud rohumaad, milledest suurima pindalaga on rannaniidud, luhaniidud, puisniidud ja aruniidud. Poollooduslikud rohumaad on Eesti vanimad inimtekkelised bioloogilised kooslused, mis on pika aja jooksul kujunenud peamiselt niitmise ja karjatamise tulemusena (Ehrlich, Habicht, 2001; Luhamaa et al., 2001). Eelpoolnimetatud poollooduslikke rohumaid nimetatakse poollooduslikeks sellepärast, et erinevalt kultuurrohumaadest, kuhu külvatakse kultuurheina seemet ja mida väetatakse, kasvavad poollooduslikel rohumaadel loodulikud heintaimede liigid ja neid ei väetata. Küll aga vajavad kõik Eestis esinevad poollooduslike rohumaade tüübid regulaarset majandamist niitmise, karjatamise ja võsa lõikamise näol, sest vastasel juhul asenduksid need kooslused sõltuvalt tingimustest kas võsa või metsaga.

Poollooduslike rohumaade pindala saavutas oma maksimumi 19.sajandi lõpul ja 20. sajandi algul, ulatudes peaaegu 2 miljoni hektarini. Pindala hakkas vähenema 20. sajandi esimesel poolel seose üleminekuga ekstensiivselt põllumajanduselt intensiivsele (Ehrlich; Habicht, 2001). Eriti kiiresti hakkasid poollooduslikud rohumaad kaduma pärast Teist Maailmasõda, kui põllumajanduse mehhaniseerimise tulemusena kadus majapidamistel huvi väikeste maalappide käsitsi niitmise vastu. Poolloodusulike rohumaade pindala kiire vähenemine seoses põllumajandusliku tootmise intensiivistumisega ei ole iseloomulik ainult Eestile vaid on toimunud praktiliselt kõikjal Euroopas. 1992. aastal võeti Euroopa Liidus vastu Loodusdirektiiv (Council Directive 92/43/EEC of 21 May 1992), mille kohaselt on poollooduslikud rohumaad väärtuslikud ja ohustatud elupaigad.

Tänaseks on poollooduslike rohumaade pindala kahanemise põhjuseks eelkõige nende vähene majandamine. Poollooduslike rohumaade säilitamiseks on vajalik nende igaaastane hooldamine, mis aga üldjuhul ei ole majanduslikult kasumlik. Nii ei suuda poollooduslikud rohumaad ilma spetsiaalsete meetmeteta kultuurrohumaadega konkureerida, olles nii madalama heina tootlikkusega kui ka suuremate tootmiskuludega.

[1] Fulltext article „Non-market Value of Estonian Seminatural Grasslands: A Contingent Valuation Study“ can be found on the CD attached.

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Poollooduslike rohumaade säilitamiseks on vajalik toetussüsteem, ilma milleta poollooduslikud rohumaad kaoksid maastikupildist kiiresti. Eestis maksavad poollooduslike rohumaade majandamiseks toetusi Põllumajanduse Registrite ja Informatsiooni Amet (PRIA) ning Keskkonnaamet. Toetuse määrad erinevad poollooduslike rohumaa liikide ning planeeritavate tegevuste (hooldamine või taastamine) lõikes. Näiteks 2012. aastal taotleti poollooduslike rohumaade hooldamise toetust kõigest 26 576 hektari poollooduslikku rohumaa hooldamiseks, mis on väga väike osa võrreldes 20. sajandi alguse 1,8 miljoni hektariga.

Kuigi poollooduslike rohumaade kunagise pindala taastamine on ilmselt ebarealistlik eesmärk, tuleks nii majandamise toetusmäärade kehtestamisel kui toetatava (ja seega ka majandatava!) pindala valikul arvestada elanike tegeliku nõudlusega poollooduslike rohumaade kui väärtusliku keskkonnakauba järele. Käesoleva uuringu eesmärk ongi välja selgitada Eesti täisealise elanikkonna nõudlus Eesti poollooduslike rohumaade kui keskkonnakauba järele ning leida seeläbi poollooduslike rohumaade turuvälise väärtuse rahaline ekvivalent. Arvestades, et poollooduslike rohumaade puhul on tegemist turuvälise keskkonnakaubaga, siis viidi nende väärtuse rahalise ekvivalendi väljaselgitamiseks läbi tingliku hindamise (*contingent valuation*) meetodil põhinev uuring eesti täisealise elanikkonna suhtes representatiivse valimi hulgas ja saadud tulemused ekstrapoleeriti eesti täisealisele elanikkonnale.

Eesti poollooduslike rohumaade levik, väärtus ja kaitse

Euroopa Liidu Loodusdirektiivi järgseid poollooduslikke alasid on Eestis kokku hinnanguliselt 130 000 hektarit. Kõige rohkem on pärandkooslusi loendatud Läänemaal ja Saaremaal, mõlemas maakonnas umbes 24000-26000 hektarit. Kõige vähem on neid alasid Järvamaal, Ida-Virumaal ja Põlvamaal, kus pärandkoosluste pindala jääb alla 2000 hektari. Kõige suurema pindalaga on Eestis lamminiidud, mida on pärandkoosluste kaitse ühingu andmebaasi, Natura andmebaasi ja eksperthinnangu alusel kokku umbes 20 000 hektarit, millest kõrget väärtust omavad 80%. Lamminiitudele järgnevad levikult rannaniidud 18 000 hektariga, millest 70% loetakse kõrge väärtusega niitudeks. 15 000 hektarit leidub Eestis looniite ehk alvareid ning neist väärtuslikeks loetakse 70%. Kõige paremini arvele võetud kooslused on puisniidud, samas leidub neid Eestis umbes 8 000 hektarit (Kukk *et al.,* 2003). Nende väärtus on aga vaieldav, kuna arvatavasti on suur osa pakutud pindalast tegelikkuses üsna kinnikasvanud (Paal, 1998, 1040). Heas seisundis olevate ja regulaarselt majandatavate poollooduslike rohumaade pindala on aga märksa väiksem. PRIA andmetel taotleti 2012. aastal poollooduslike rohumaade hooldamise toetust 26 576 hektari poollooduslike rohumaade hooldamiseks. Poollooduslike rohumaade kadumise aitab ära hoida nende oskuslik majandamine ning taastamis- ja hooldustöödeks ettenähtud piisavas suuruses toetused.

Poollooduslike rohumaade erinevad liigid on nimetatud ohustatud elupaigatüübina Euroopa Liidu Loodusdirektiivis, mille ülesanne on säilitada looduse mitmekesisust, kaitstes ohustatud looma- ja taimeliike ning nende elupaigatüüpe (Nõukogu Direktiiv 92/43/EMÜ). Poollooduslikud rohumaad on liigiliselt väga mitmekesised. Eesti puisniitudelt on leitud 40% (603 liiki) kõigist Eestist kasvavatest soontaimedest ning kolmandik kogu kaitstavate liikide loendist kasvab just puisniitudel (Kukk *et al.,* 2004, 73). Tähelepanuväärne on liigirikkus ka lamminiitudel, kus kasvab 350 liiki soontaimi,

ning rannaniitudel ja loopealsetel, kus leidub vastavalt 290 ja 263 liiki soontaimi, millest paljud on haruldased (Kukk *et al.,* 2004, 74-76). Punane raamat, kuhu kantakse haruldased ja ohustatud liigid, sisaldab hulgaliselt poollooduslike ökosüsteemidega seotud organisme: 20% seentest, 49% samblikest, 86% soontaimedest, 42% selgrootutest loomadest ja 55% selgroogsetest loomadest. Seni ongi poollooduslike rohumaade väärtust uuritud peamiselt nendega seotud bioloogiliste liikide kontekstis ja vaid üksikud tööd on pühendatud Eesti poollooduslike rohumaade sotsiaalsele ja majanduslikule väärtusele (näit Ehrlich, Habicht, 2001). Seni ebapiisav uuritus ei tähenda aga, et poollooduslike rohumaade sotsiaalsed ja majanduslikud väärtused oleksid bioloogiliste väärtustega võrreldes ebaolulised, sest poollooduslikud kooslused on lisaks looduslikule mitmekesisusele väärtuslikud ka kultuurikandjate poolest, olles heaks näiteks sellest, kuidas loodus ja inimene ei tööta teineteise vastu, vaid loovad kooskõlas midagi uut ja väärtuslikku. Eesti poollooduslike rohumaade kaitset reguleerib Euroopa Liidu poliitika. Ajalooliselt esimene õigusakt, mis soodustab niitude kaitset, on linnudirektiiv 1979. aastast. Rohkem on poollooduslike rohumaade kaitsega seotud loodusdirektiiv 1992. aastast, mille tulemusel loodi Natura 2000 väärtuslike ja ohustatud elupaikade võrgustik. Tänu loodusdirektiivile on võimalik Euroopa Liidu liikmesriikidel taotleda liidu ühisest eelarvest ohustatud elupaikade kaitseks kaasrahastamist. Lisaks kohustab Euroopa Liit liikmesmaid välja töötama põllumajanduse keskkonnaprogramme, mille abil muuta põllumajandus loodushoidlikumaks. Poollooduslike rohumaade kaitse kujutab endast loodusele soodsa inimtegevuse alalhoidmist, mis mõjub positiivselt nii rohumaade mitmekesisusele kui esteetilisele väärtusele. Inimtegevust peab olema täpselt parasjagu: liigne inimtegevus rikub poollooduslikud kooslused ning olematu inimtegevuseta kasvavad need ajapikku kinni ja kaovad sootuks. Tänapäeval on rohumaade kaitse puhul esmatähtsaks sobiva niitmis- ja karjatamisrežiimi tagamine (Kukk *et al.,* 2004). Pärandkoosluste taastamine ja hooldamine on kulukas protsess ning majanduslikult ebaotstarbekas. Et aga pärandkooslusi kaitsta, on võimalik nende taastamiseks ja hooldamiseks taotleda toetusi. Euroopa Liidu liikmesriigina kuulub Eesti ühise põllumajanduspoliitika rakendusalasse. Selle eesmärk on tagada Euroopa Liidu siseturu stabiilsus ja põllumajandustootja sissetulek, mille saavutamiseks makstakse mitmeid toetusi. Nii ühise põllumajanduspoliitika tulud kui ka kulud liiguvad läbi Euroopa Liidu ühise eelarve (Ühise põllumajanduspoliitika... 2010). Ühise põllumajanduspoliitika abinõusid rakendab Eestis Põllumajanduse Registrite ja Informatsiooni Amet (PRIA) (Euroopa Liidu ühise... §8). Lisaks PRIA-le jagab poollooduslike rohumaade hooldamiseks toetusi ka Keskkonnaministeeriumi haldusalas tegutsev Keskkonnaamet.

Eesti elanikkonna maksevalmidus poollooduslike rohumaades säilitamiseks

Poollooduslike rohumaade näol on tegemist keskkonnakaubaga, millega turul ei kaubelda ning millel seega puudub ka turuväärtus. Poollooduslike rohumaade liigirikkust või heaolu, mida saadakse rohumaade ilu nautides, ei saa turuhindades väljendada. Keskkonnakaupadele on rahalist väärtust võimalik leida läbi uuringute, mille kaudu kogutakse andmed inimeste maksevalmiduse (*WTP – willingness to pay*) väljaselgitamiseks. Sellist lähenemist nimetatakse tingliku hindamise meetodiks (ingl. K. *contingent valuation method*). hindamise meetod kasutab küsimustikku, mille abil selgitatakse välja inimeste maksevalmidus turuvälise kauba eest. Küsitluse eesmärk on teada saada, palju tarbijad on valmis maksma, et nende heaolu ei halveneks või palju

peaks tarbijatele kompenseerima heaolukahju eest. (Pearce, Atkinson, 2006, 107) Tinglik hindamine viitab sellele, et maksed on hüpoteetilised ning reaalselt vastajad rahast loobuma ei pea. Tingliku hindamise meetod on teiste keskkonnakaupade hindamismeetodite kõrval eelistatum, kuna selle abil saab hinnata väärtust, mida omandab rohumaa nii selle aktiivsete kasutajate tõttu (inimesed, kes käivad seal lõõgastumas, elavad läheduses jne), kui ka passiivsete kasutajate tõttu (inimesed, kes rohumaaga otseselt kokku ei puutu, kuid on siiski selle olemasolu eest valmis maksma). Seetõttu võimaldab tingliku hindamise meetod mitmekülgsemalt rohumaa väärtust hinnata, kuna hõlmab ka seda mittekasutavaid tarbijaid. Lisaks arvestab tingliku hindamise meetod poollooduslikku rohumaa selliseid väärtusi, mille teised meetodid kõrvale jätavad. Näiteks on poollooduslikku rohumaa eest valmis maksma inimesed, kellel ei ole rohumaaga mingit kokkupuudet, kuid kes hindavad sellegipoolest rohumaa ajaloolist väärtust. Just nimetatud põhjustel kasutati tingliku hindamise meetodit uurimaks Eesti täisealise elanikkonna maksevalmidust Eesti poollooduslike rohumaade säilitamise eest.

Selgitamaks välja Eesti täisealise elanikkonna maksevalmidust poollooduslike rohumaade säilitamise eest ning nõudlust nende järele, viidi läbi tingliku hindamise meetodil põhinev uuring. Selleks koostati küsimustik, milles paluti juhuslikult moodustatud valimil vastata küsimustele, mis näitavad vastajate suhtumist poollooduslikesse rohumaadesse ning määratleda, kui palju nad oleksid nõus aastas maksma poollooduslike rohumaade säilitamise eest. Vastuste põhjal moodustati Eesti täisealise elanikkonna nõudluskõver rohumaade järele ning arvutati kogunõudlus.

Küsitlusele vastas 1078 elanikku. Lõplikusse valimisse jäi 1061 vastajat, kelle ankeedid olid korrektselt täidetud. Küsitlusankeet koosnes neljast küsimusest, millele eelnes lühike selgitus poollooduslike rohumaade olemusest ning ülevaade luha-, ranna- ja puisniitudest. Ankeedis toodi välja ka rohumaade hooldamise vajadus, et hoida ära niitude kinnikasvamine ning liigirikaste koosluste kadumine.

Küsitlus koosnes järgmistest küsimustest:
1. Kas olete kuulnud raadio, televisiooni või ajakirjanduse vahendusel midagi poollooduslikest kooslustest?
2. Kas olete nõus, et Eesti poollooduslikud kõlvikud (jõeluhad, rannaniidud, puisniidud) vääriksid säilitamist?
3. Kuidas reastaksite Eesti poollooduslikud kõlvikud (jõeluhad, rannaniidud, puisniidud) tähtsuse järjekorras?
4. Kui Te nõustute, et Eesti poollooduslikke kõlvikuid tuleks säilitada, siis millise summa Te aastas selle heaks annetaksite?

Neljanda ehk viimase küsimusena taheti vastajatelt teada, kui palju nad oleksid aastas nõus maksma poollooduslike kõlvikute säilitamise eest. Küsitlusankeedis paluti maksevalmidus määrata võimalikult täpselt ja vastavalt võimalustele, olenemata sellest, et tegemist on hüpoteetilise maksega. Küsitlusele vastajatest 72% märkisid ankeeti positiivse maksevalmiduse, samal ajal kui 28% vastanutest ei olnud nõus poollooduslike rohumaade säilitamise eest makset tegema. Uurimaks sotsiomeetriliste andmete mõju makseotsusele, koostati regressioonanalüüs, kus sõltuvaks muutujaks on makseotsus ehk kas vastaja on poollooduslike rohumaade säilitamise eest nõus maksma nullist suurema summa või on tema maksevalmidus null. Makseotsuse kujunemisel on

statistiliselt olulisteks muutujateks (olulisusnivool 5%) sugu ja haridustase. Üllatuslikult ei mõjuta sissetulekutase makseotsuse tegemist.

Küsitlusankeedi teises küsimuses uuriti, kas inimesed on nõus, et poollooduslikud rohumaad vääriksid säilitamist. 81% vastajatest olid sellega nõus. Regressioonanalüüsi tulemustest nähtub, et teise küsimuse vastus on oluline makseotsuse tegemisel.

Kui makseotsus tähendab valimist kahe võimaluse vahel (kas maksta või mitte maksta), siis maksevalmidus tähendab otsustamist kas ja kui palju maksta. Keskmine maksevalmidus poollooduslike rohumaade säilitamise eest on 17,3 eurot vastaja kohta. Kõrgem maksevalmidus on naissoost isikutel, haridustaseme poolest on nõus rohkem maksma kõrgharidusega isikud ning vanusegruppidest on kõige rohkem nõus maksma 40-59 aastased isikud. Lisaks selgub, et mida kõrgem sissetulek, seda suurem maksevalmidus.

Koostati järgmine regressioonmudel kontrollimaks vastajate soo, hariduse, vanuse ja sissetuleku mõju maksevalmiduse suurusele:

$$\ln(WTP) = \alpha + \beta_1 G + \beta_2 \ln(age) + \beta_3 \ln(edu) + \beta_4 \ln(inc) + \varepsilon \quad (1)$$

kus:

G – sugu (fiktiivne muutuja, 1= mees, 2= naine)
age – vanus (7 erinevat vanusegruppi alustades nooremast)
edu – haridustase (4 erinevat taset alustades madalamast)
inc – sissetulek (8 erinevat taset alustades madalamast)
ε – vealiige

Regressioonanalüüs näitab, et olulisusnivool 5% on makse valmiduse suuruse suhtes statistiliselt olulisteks muutujateks vastajate sissetulek, sugu ja haridustase.

Eesti täisealise elanikkonna kogunõudluse väljaselgitamiseks konstrueeriti kogunõudluskõver, mis on tuletatud küsitlusele vastanute maksevalmidusest ja mida on üldistatud Eesti täisealisele elanikkonnale.

Kogumaksevalmiduse leidmiseks on kasutatud eksponentsiaalset mudelit, mille võrrand on järgmine:

$$WTP = \alpha e^{-\beta x} \quad (2)$$

kus:

WTP – maksevalmiduse suurus,
x – inimeste arv, kes on nõus vähemalt selle summa maksma
α ja β – hinnatavad parameetrid.

Mudeli determinatsioonikoefitsient R^2 = 0,92, mille järgi on mudelil kõrge kirjeldusvõime. Parameeter α = 89,54 ja β = 0,005 ning mõlemad parameetrid on statistiliselt olulised. Seega saame nõudluskõvera kirjutada järgmisel kujul:

$$WTP = 89{,}544 e^{-0{,}005x} \quad (3)$$

Eeltoodud valemi põhjal saadi nõudluskõver, mis näitab hinda, mida küsitlusele vastajad on poollooduslike rohumaade säilitamise eest nõus maksma. Eesti täisealise elanikkonna nõudlus poollooduslike rohumaade säilitamise järele on leitud läbi tarbijate hinnavaru, mida joonisel tähistab nõudluskõvera alla jääv ala. See ala näitab Eesti täisealise elanikkonna heaolu, mida nad saavad „tarbides" poollooduslikke rohumaid.

Tarbija hinnavaru (CS- *consumer surplus*) arvutamiseks on kasutatud määratud integraali valemit:

$$CS = WTP_T \int_{x_1}^{x_2} \alpha e^{-\beta x} = -\frac{\alpha}{\beta}(e^{-\beta x_2} - e^{-\beta x_1}) \cong \frac{\alpha}{\beta} \quad (4)$$

kus $x_1 = 0$ ja x_2 tähistab positiivse maksevalmidusega elanike arvu.

Asendades valemisse parameetrite α ja β väärtused saame arvutada Eesti täisealise elanikkonna hinnavaru:

$$WTP_T = \frac{\alpha}{\beta} = \frac{89{,}544}{0{,}005} \approx 17{,}9 \ \textit{miljonit eurot} \quad (5)$$

Eesti täisealise elanikkonna aastane nõudlus poollooduslikku rohumaa kui keskkonnakauba järele on 17,9 miljonit eurot. Sellest tulenevalt on poollooduslike rohumaade mitteutilitaarne väärtus rahaliselt väljendatuna 17,9 miljonit eurot aastas.

Kokkuvõte

Töö eesmärgiks oli välja selgitada Eesti poollooduslike rohumaade (peamiselt luhaniidud, rannaniidud, puisniidud, alvarid) kui turuvälise keskkonnakauba rahaline ekvivalent. Selleks viidi läbi tingimusliku hindamise (*contingent valuation*) uuring, mille sihtrühmaks oli Eesti tööealine elanikkond.

Keskmine maksevalmidus poollooduslike rohumaade säilitamise eest on 17,3 eurot vastaja kohta. Maksevalmiduse suurust mõjutavad kõige rohkem vastajate sissetulek, sugu ja haridustase. Mida kõrgem sissetulek, seda suurem maksevalmidus: kui alla 150 eurot (neto) teenivad inimesed on poollooduslike rohumaade säilitamise eest nõus maksma keskmiselt 11 eurot, siis vahemikus 601-705 eurot teenivad isikud maksavad keskmiselt 19 eurot ning üle 1300 euro teenivad isikud juba keskmiselt koguni 28 eurot. Kõrgem maksevalmidus on naissoost isikutel, kes ületavad keskmise maksevalmiduse 3,5 protsendiga ning meeste maksevalmiduse 8,5 protsendi ehk 1,4 euroga. Haridustaseme poolest on nõus rohkem maksma kõrgharidusega isikud, kes maksavad keskmisest koguni 22% ehk 3,8 eurot rohkem.

Huvitava asjaoluna võib välja tuua meedia mõju makseotsusele ja maksevalmiduse suurusele. Küsitlusele vastanutest 56% olid poollooduslikest rohumaadest meedia vahendusel kuulnud, samas ei avalda see erilist mõju makseotsuse tegemisele. Samas aga mõjutab meediast poollooduslike rohumaade kohta kuulmine oluliselt vastajate maksevalmiduse suurust. Selliste vastajate, kes olid meedia vahendusel rohumaadest midagi kuulnud, keskmine maksevalmidus on 21,5 eurot, samas kui teiste vastajate maksevalmidus oli peaaegu poole väiksem (11,9 eurot). Seega on meedias poollooduslike rohumaade temaatika kajastamine oluline, kuna tänu sellele teadvustavad

inimesed paremini rohumaade väärtust. Seda näitab ilmekalt selliste vastajate kõrgem maksevalmidus, kes on meediast midagi poollooduslike rohumaade kohta kuulnud.

Eesti täisealise elanikkonna nõudlus poollooduslike rohumaade järele saadakse tuletades kogunõudluskõver. Nõudluskõvera abil on võimalik arvutada tarbijate hinnavaru, mis näitab Eesti täisealise elanikkonna heaolu, mida nad saavad „tarbides" poollooduslikke rohumaid. Arvutades tarbija hinnavaru, saadakse Eesti täisealise elanikkonna aastane nõudlus poollooduslike rohumaade säilitamise järele, milleks on 17,9 miljonit eurot. Seda saab tõlgendada kui poollooduslike rohumaade turuvälise väärtuse rahalist ekvivalenti. Kui võtta aluseks aru-, lammi-, ranna- ja puisniidu keskmine hooldamise maksumus, milleks on 131 eurot hektari kohta, siis saaks 17,9 miljoni euro eest hooldada ligikaudu 136 640 hektarit poollooduslikke rohumaid aastas. See vastaks Eesti täisealise elanikkonna nõudlusele. PRIA andmete kohaselt taotleti 2012. aastal toetust 26 579 hektarit poollooduslike rohumaade hooldamiseks, millele lisandub Keskkonnaametilt taotletud 108 hektari hooldamine. Eesti täisealise elanikkonna nõudlus oleks aga neli korda suurema ala hooldamine.

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Tööstusettevõtted on aina enam silmitsi kasvavate keskkonnanõuetega. Kogu tööstus on muutumas integreeritumaks, komplekssemaks ja säästlikumaks. Kuna Eesti on mereriik taastuva, kasvava ja areneva laevaehitustööstusega, võtame käesolevas artiklis vaatluse alla laevaehituse elutsükli ja tooteahela. Laevaehitus on Eestis suhteliselt iseseisev haru ning toote elutsükli lülides osalevad olulised pakkujad on kohapeal esindatud. Äriregistri andmetel tegutseb Eestis laevade ja ujuvkonstruktsioonide ehituse ning laevade ja paatide remondi tegevusaladel kokku üle 150 ettevõtte. Samuti on siin väikese majandusega riigi kohta mitu suurt lõpptoodet pakkuvat ettevõtet. Laias plaanis jaguneb Eesti laevatööstus suurte eriotstarbeliste laevade ehituseks ja väikelaevade tootmiseks. Keskkonnajuhtimisstandardi on rakendanud 25 suuremat tegijat. Nende hulgas ka metallitööstuse ja masinaehituse allhankeettevõtted, kellele laevaehitus on oluliseks, kuid mitte ainsaks tegevusalaks.

Artiklis uuritakse keskkonnajuhtimissüsteemide rakendamise mõju ettevõtete konkurentsivõimele rahvusvahelistes tooteahelates ning käsitletakse rohelise hanke nõuete ja tingimuste ühtlustamise problemaatikat. Uuritakse Igarashi et al. (2013) Norra Tehnikaülikoolis (NTNU) välja arendatud rohelise tarnija valiku kontseptsiooni rakendamise võimalusi Eesti laevaehitustööstuses. Tegemist on analüütilis-kontseptuaalse käsitlusega, kuid ühtlasi rohelise hanke teemalise pilootuuringuga Eesti laevaehitusettevõtete põhjal. Uuringu eesmärk on „kaardistada" keskkonnajuhimissüsteemide kasutamine laevaehitusettevõtetes, ning sellest lähtuvalt nende osalemine ja suhted rahvusvahelistes tooteahelates. Sügavam empiiriline käsitlus, sh intervjuud laevaehitusettevõtete esindajatega on plaanis edaspidi uuringu järgmistes etappides.

Artiklis keskendutakse tooteahelas eksisteerivatele suhetele, mis mõjutavad hanke ja valiku protsesse. Antakse ülevaate laeva tooteahela ja elutsükli spetsiifikast. Teoreetilises osas toetutakse Igarashi et al (2013) tarnijate valiku kontseptuaalsele mudelile, mis rõhutab holistilise lähenemise tähtsust ja mida võiks kasutada tootmistööstust abistavate otsuste rakendamisel. Mudeli aluseks on 60 temaatilise teadusartikli läbi töötamine, mida oli võimalik leida teaduskirjanduse otsingumootorite abil.

Rohelise tarnija valiku kontseptsiooni keskmeks on ühtlustamine (*alignement*), mis on vajalik ettevõtete rohelise strateegia kujundamisel ning roheliste kriteeriumite kehtestamisel nii tooteahelates kui valdkonnale standardeid ja nõudeid esitades.

Uuringus võtsin „verstapostiks" levinud keskkonnajuhtimisstandardi ISO 14001.

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[1] Fulltext article „Green procurement and supplier selection process in theory and practice. The example of Estonian shipbuilding industry" can be found on the CD attached.

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ISO 14001 keskkonnajuhtimise standardi on rakendanud peamiselt suurte eriotstarbeliste laevade ehitajad ja suuremahuliste allhangete tegijad, kuigi allhankena toodetakse ka suurem osa väikelaevu ja paate.

Uuringust selgus, et keskkonnastandard mängib rolli peamiselt suuremahuliste allhangete puhul ja seda ka mitte alati. Keskkonnajuhtimise ühtlustamise tüüpilisest standardist ISO 14001 valiku tegemisel üksi ei piisa. Olulised on tehnilised võimalused (võimsused), standarditel põhinevad modulaarsed suhted ning kooperatiivsed koostöösuhted.

Eestis on ettevõtteid, kes teevad olulisi allhankeid, opereerivad rahvusvahelisel turul, omamata ametlikku keskkonnajuhtimise standardit. Suuri hankeid saadakse tänu tootmise võimsusele ja tehniliste võimalustele. Siiski on edukamad ja stabiilsemad olnud keskkonnajuhtimistandardit omavad ettevõtted nii lõpptootjate kui allhankijate osas. Samas on Eesti näide liiga väikese esindatusega, ning vajaks edasist uurimist, et teha põhjalikumaid üldistusi. Väikelaevade tootmises mängivad kindlalt rolli koostöö suhted.

Rohelise tarnija valiku protsessi oluline komponent on informatsiooni hankimine. Antud teemat uurides kerkis esile küsimus, kuidas saavad tarnijad ja otsustetegijad informatsiooni. Ettevõtted deklareerivad rohelise strateegia kasutamist, aga mida see konkreetselt tähendab, võib jääda ebaselgeks. Samuti tähendab „roheline“ erinevates valdkondades erinevaid asju. Ühtlustamine ja süsteemi harmoniseerimine on vajalik, et kõik tarnijad saaksid ühtemoodi aru nii eesmärgist kui sellest, mida tähendab roheline strateegia vaadeldavas valdkonnas. Rahvusvahelistes tooteahelates on rohelised kriteeriumid kasutusel. Keskkonnajuhtimisstandardit omavad laevaehituse ettevõtted on eesmärgistanud võimaluse selle abil opereerida rahvusvahelisel turul.

Nii võimaluseks kui takistuseks mudeli rakendamisel on see, et nõuded on ette antud kas rahvusvaheliste standardite ja/või tooteahelast tulenevate nõuetega. Nõuded on verstapostiks tootjatele ja tarnijatele ning aitavad luua ühtset süsteemi. Takistuseks võib olla kohalike ettevõtete nõrk positsioon tooteahelas ning kaasa rääkimise võimaluse piiratus nõuete kehtestamisel. Eriti puudutab “vangistatud” (*captive*) ahelaid, mida esineb eeskätt väikelaevatööstuses, kus üks ettevõte domineerib tugevalt teise üle. Ka suuremate edukate Eesti allhanke ettevõtete puhul kerkib küsimus, kui palju on neil tegelikku võimu tooteahelates toimuvaid protsesse mõjutada ja kriteeriumite kehtestamisel? Milliseid eeliseid on avatud keskkonnajuhtimis- ja kvaliteedipoliitika ettevõttele andnud valikuprotsessis? Kuidas on see toimunud tootmisettevõtte vaatepunktist?

Üks olulisemaid edasisi uurimisküsimusi on info hankimine otsuse tegemise protsessis, seda nii hankija kui tarnija seisukohast.

Samuti vajaks sügavamat kvalitatiivset analüüsi Saaremaa väikelaevaehitustööstus. Kuidas on kujunendud koostöö ja võrgustikulised suhted ning milliseid keskkonnanõudeid fokaalettevõtted neile esitavad. Milline roll on erinevatel suhetel (modulaarsed, jt.) tarneahelates tootmisettevõtte enda seisukohast?

Need võiksid olla järgmised uurimisküsimused kvalitatiivsel lähenemisel.

Keskkonnastandardite kehtestamine ei tohiks süsteemi bürokraatlikumaks muuta. Efektiivsuse säilitamiseks peab ettevõte saama keskenduda eeskätt oma põhitegevusele. Roheline strateegia peaks olema toeks turgude leidmisel, hanke saamisel, tootmissüsteemi integreeritumaks ning komplekssemaks muutumisel.

Mitmed ettevõtted on saanud küll investeeringutoetusi, kuid ühtne riiklik keskkonnasõbralike tootmisettevõtete toetussüsteem ja pikaajaline strateegia puudub. Tingimused Eesti ettevõtetele pannakse paika väljastpoolt nii rahvusvaheliste organisatsioonide poolt kehtestatud keskkonnanõuetega kui ka tooteahelast tulenevate nõuetega. Nendest lähtuvalt ettevõtted ka tegutsevad. Püütakse ära kasutada võimalikke nišše. Roheline strateegia, jäätmevaba tootetsükkel ja tooteahel, kus peaaegu kogu ressurss ära kasutakse, peaks majanduslikult tasuv olema. Riik saaks tagada keskkonnasõbralike investeeringute tasuvuse maksusoodustustega. Kuidas seda täpsemalt rakendada nõuaks samuti edasist uurimist omaette teemana.

Eriotstarbeliste laevaehitus- ja allhankeettevõtete eesmärk on tõusta tooteahelas kõrgemale tasemele. Kokkuvõtteks, kasvava sektori puhul ei tohiks selle arengule teha takistusi, vaid toetada jäätmevaba integreeritud ja komplekssет tootmist, mis omaks väiksemat keskkonnamõju, ning seeläbi Eesti kui „rohelise“ keskkonnasõbraliku tootjamaa mainet tõsta. Eesti konkurentsivõime eelis võib seisneda just puhtas tootmises.

ASSESSMENT OF EFFECTIVENESS AND POTENTIAL RISKS OF THE EUROSYSTEMS RECENT MONETARY POLICY[1]

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Recent monetary policy of the Eurosystem has been taken a more and more softer line of monetary policy accommodation in the last few years to overcome a sharp drop in economic activities within the member countries of the Euro currency area. This sharp drop in economic activities has been following both the international financial and economic crisis since 2008 as well as the European debt crisis since 2010. Declared intention of the Governing Council of the Eurosystem to ease the monetary policy stance more broadly by implementing several non-conventional monetary policy measures is to stimulate credit expansion rates of the monetary financial institutions (MFIs) as well as to push up actually low inflation rates in line with an expansion of economic activity within the member countries of the Eurozone to secure its primary objective. This primary objective of the ECB is to be valid, if inflation rates could be maintained below, but close to 2% in medium terms, which was not the case in the last two years, when inflation rates amounted to 1,3% in 2013 and 0.4% in 2014, and will be expected to be 0.3% in 2015. So it has to be discussed if the implemented non-conventional monetary policy measures are suitable measures to force credit business as well as to give enough upward pressure to commodity prices within the Eurozone countries.

To assess effectiveness of non-conventional monetary policy measures one first has to take a look on the conventional monetary policy measures to see if non-conventional monetary policy measures are a suitable supplement. There exist two navigation or steering instruments for conventional monetary policy. One is the key interest rate, which reflects the costs of obtaining central bank money by the MFIs whenever they use the refinancing operations of the ECB. The other instrument is the quantity of central bank money allotted by the ECB. In this respect the actual situation within the Eurosystem can be characterized in short by free and unlimited allotment of central cank money. So if obviously there exists no shortage of central bank money within the Eurosystems banking system, the question has to be answered what kind of supplemented help for the monetary policy of the ECB can be expected by using non-conventional monetary policy measures. In the cases of outright purchases of sovereign bonds, or more general in the case of quantitative easing (QE), which, beside its intended influences on long term interest rates, especially are directed to allot additional central bank money to the banking system, the question has to be raised why such additional allotment of central bank money should be helpful to make monetary policy

[1] Den vollständigen Text des Artikels „Beurteilung der Wirksamkeit und mögliche Risiken der aktuellen Geldpolitik des Eurosystems“ findet der Leser auf der beigefügten CD.

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more effective. The same is true for the non-conventional measure of the so called targeted longer-term refinancing operations (TLTRO), because the intention of that monetary policy instrument too is to allot additional central bank money to the banking system.

In addition it seems to be very doubtful if there will be great success in reducing long-term interest rates in the member countries of the Euro area by using quantitative easing (QE). Beside the allotment of additional central bank money the second intention of QE is to drop long-term interest rates within the segments of the capital markets where the central bank is buying bonds. But at the background of historical very low interest rate levels within the member countries of the Euro area (except Greek, which is a special case) already at the time, when the ECB started with QE in March 2015, there is no great chance of additional and significant drops of interest rates by using QE. In this respect there exists a substantial difference to the situation in the USA, where assessing of QE is very positive, because of very much higher interest rates at the starting point of implementing QE, which then could have been dropped significantly.

In the article there are discussed two other aspects too, which prove that the conditions of using QE are quite different in the USA than in the Euro area. First point is that the financial behaviour of US-enterprises is mainly market based, while it is dominantly bank based for EU-enterprises. So if investment finance is needed changing interest rates on bond markets by QE are less important for European enterprises than for US-enterprises. Second point is that allotment of central bank money by the Federal Reserve System will be enforced already by outright purchases of bonds, i. e. by non-reversed transactions and thus in the same way as QE is to be enforced, while allotment of central bank money by the Eurosystem in normal times will be enforced quite different by reversed transactions. So QE is a fundamental change of system in the liquidity-providing process of the ECB. And by using QE the ECB threatens its existing advantage of an automatic liquidity-absorbing mechanism, which is involved in the process of reversed transactions.

Furthermore different risks of very low interest rate levels are discussed in this article. In this context a critical view will be thrown on the role of forward guidance as another non-conventional monetary policy measure used by central banks to ensure low interest rate levels for an extended period of time. In the whole it will be shown that especially in the case of the ECB there exist no convincing reasons to use non-conventional measures in such a intensity and for such a long time to increase effectiveness of monetary policy. So other intentions of using non-conventional measures are discussed here, which have to be put in order outside the narrow sphere, that is associated with monetary policy. For example to aspire to risk transfers from the balance sheet of commercial banks to the balance sheet of the ECB by outright purchases of bonds, or to circumvent the legal ban to grant credits directly to the public sector by putting commercial banks to grant these credits and pass them to the ECB after a short time, or to force depreciation of the Euro foreign exchange rate, to improve economic situation within the member countries of the Euro currency area and to force imported inflation.

Last but not least one of the main risks of using non-conventional can be seen in lasting habituation effects, which will be the result of the durability of that kind of monetary policy. A monetary policy, which can be characterized by extremely low interest rates

and by unlimited and free of charge allotment possibilities of central bank money for the monetary financial institution. The longer such a situation will last, the more it becomes some kind of normality for the market participants and the greater will be the pressure of avoiding an exit strategy. And at the end, monetary policy will loose its future reaction possibilities, which will become necessary in cases of renewed economic crisis situations.

ALKOHOLI MAKSUSTAMINE EUROOPA LIIDUS[1]

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Alkohoolsete jookide maksustamine ei ole valitsussektori eelarve kõige olulisem komponent. Samas on alkoholi maksustamine sageli väga tundlik probleem paljudele ühiskonnarühmadele – nii tarbijatele kui tootjatele. Alkoholimaksud mängivad olulist rolli tarbijate käitumise kujundamisel ja ülemäärase alkoholitarbimise piiramisel.

Aktsiis on reeglina spetsiifiline maks, mis on suunatud konkreetsete, suhteliselt väikesearvulise hulga kaupade koormamiseks. Alkoholi eripärase maksustamise põhjendusi on erinevad. Üldine alkoholi maksustamise eesmärk on vähendada negatiivseid välismõjusid; teiseks peamiseks eesmärgiks on koguda tulu riigieelarvesse. Euroopa Liidu kontekstis on alkoholi maksustamise eesmärgiks ka vältida negatiivseid protsesse piiriüleses kaubanduses ja ühtlustada ELi alkoholipoliitika tegevusi.

Sajandite jooksul on riikide valitsused kasutanud võimust tulenevat jõudu maksustada alkoholi tootmist ja tarbimist. Tänases kontekstis on alkoholi maksustamise vähemtähtis tuluallikas võrreldes teiste tarbimismaksudega või tulumaksudega. Varasematel aegadel oli alkoholi maksustamise seotud üksnes raha kogumisega riigieelarvesse; hilisem periood on alkoholi maksustamise eesmärgiks on ka kompensatsioonimehhanismi loomine negatiivsete välismõjude korvamiseks.

Antud artikkel keskendub alkoholiga seotud aktsiisimaksude rollile Euroopa Liidu riikides. Üldteada on aktsiisimaksude harmoneerimise nõuded ja ühtsete miinimummäärade kehtestamine. Artiklis analüüsitakse EL aktsiisimaksude taset ja struktuuri ning nende seoseid ühiskondade sotsiaalmajandusliku arenguga. Käsitletakse ainult alkoholi aktsiisimakse; VAT tüüpi alkoholiga seotud maksud on analüüsist välja jäetud.

Artikli esimeses osas antakse teoreetiline ülevaade alkoholiaktsiisi eesmärkidest; teises osas analüüsitakse alkoholi aktsiisimaksude trende ja taset EL riikides; kolmas osa toob välja korrelatiivsed seosed alkoholi maksustamise ja riikide sotsiaal-majanduslikke näitajate vahel. Analüüsi eesmärgiks on tuua välja üldised "mustrid" alkoholi maksustamine EL riikide lõikes.

Alkoholi maksustamise teoreetiline raamistik

Alkoholi maksustamise aluseks on olemas tugev teoreetiline ja moraalne alus. Esiteks alkoholi maksustamise põhjenduseks regulatiivseid vajadused. Alkoholi tarbimine põhjustab negatiivseid välismõjusid ühiskonnale – toob kaasa erinevad tervise-probleemid, liiklusõnnetused, antisotsiaalse käitumise ja paljud teised negatiivsed sotsiaalsed ning majanduslikud mõjud kogu ühiskonnale. Alkoholi maksustamist peetakse vahendiks, millega vähendada turu ebaefektiivsust. Selline maks on tuntud ka Pigou maksuna.

[1] Full text article „Alcohol taxation in the European Union“ can be found on the CD attached

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Aktsiisid loetakse moraalsetest alustest lähtudes "patumaksuks" ja on seetõttu kergesti aktsepteeritav laiema üldsuse poolt. Sellest lähtudes peetakse alkoholi makse ka sotsiaalselt õiglaseks maksuks. Tegemist on maksudega, mis on „selektiivsed ja tahtlikult diskrimineerivate“ omadustega (Gnossen, 2011. p.278).

Teine põhjus maksustamise alkohol on puhtalt fiskaalne. Alkoholi tarbimine on sageli väikese hinnaelastsusega ning seega Ramsey loogikast lähtudes sobiv baas maksustamiseks. Alkoholi tootmine ja kauplemine on rangelt reguleeritud ning seega on alkoholi koormamine maksudega on suhteliselt lihtne.

Vaatamata praktilisele vajadusele alkoholimaksude kehtestamiseks, on teiselt poolt olemas ka selged sotsiaalmajanduslikud piirangud alkoholi maksudega koormamisel. Alkoholimaksud ei jälgi sageli horisontaalse võrdsuse põhimõtteid ega ole seotud indiviidide maksevõimega. Alkoholimaksud on sageli regressiivse iseloomuga, koormates madalatululisi rohkem kui suurema sissetulekuga indiviide.

Mitmed negatiivseid aspektid alkoholi maksustamisega on seotud sotsiaalmajanduslike asjaoludega. Kõrged alkoholimaksud toovad kaasa suureneva salakaubanduse, illegaalse alkoholitarbimise suurenemise ja maksupettuste.

Kokkuvõtvalt võib öelda, efektiivne alkoholi maksustamine peaks sätestama tasakaalu avaliku sektori tuluvoo ja alkoholi tarbimise aktsepteeritava sotsiaalse käitumismustri vahel.

Euroopa Liidu reguleeriv raamistik

Euroopa Liidus tervikuna on alkoholi tarbimine suhteliselt kõrge intensiivsusega võrreldes muu maailmaga. Kõik negatiivsed aspektid, mis on seotud liigse alkoholi tarbimisega, on siin selgelt nähtavad. Seega on üsna loomulik eeldada, et EL-i alkoholi- ja maksupoliitika keskendub alkoholi tarbimise reguleerimisele ja negatiivsete välismõjude leevendamisele. EL-i alkoholipoliitika keskendub siiski eelkõige tarbijate harimise, alkoholi kuritarvitamise, kättesaadavuse ja muude sellega seotud probleemide lahendamisele. Alkoholi maksustamise rolli EL-i poliitikates ei nähta kindlasti peamise tegurina, kuid siiski olulise aspektina.

Siiski on olemas ka üsna spetsiifiline eesmärk alkoholi maksustamisel EL-is. Nimelt, EL ühtlustab väga rangelt alkoholi maksustamise põhimõtteid ja aktsiisimaksude määrad kõikide liikmesriikide lõikes. Euroopa Liidu direktiivid sunnivad liikmesriike kehtestama minimaalsed aktsiisimäärad kõikide standardiseeritud alkohoolsed jookide rühmade lõikes.

Nimetatud nõuete eesmärk on vältida kahjulikku maksukonkurentsi liikmesriikide vahel, samuti tagada maksutulu Euroopa institutsioonide eelarvetesse. Seetõttu on Euroopa Liidu alkoholi maksustamise regulatiivne raamistik ainulaadne näide ühtsest piiriülesest maksustamise süsteemist 28 erineva riigi lõikes. Samas tekitab nii suur riikide hulk mitmesuguseid probleeme ja erivajadusi mitmesuguste erisuste kehtestamiseks.

Esiteks, alkohoolsete jookide tootmine on oluline tööstusharu, mis annab tööd ja sissetulekut miljonitele inimestele ning toob tulu põllumajandussektorile, tootjatele ja jaemüüjatele.

Teiseks, alkoholitoodete kättesaadavus ja taskukohasus riikides on seotud paljude teiste majandusharude toimimisega. See on seotud näiteks turismisektoriga, jaemüügi ja meelelahutustööstusega.

Kolmas aspekt on see, et alkoholi tarbimine on osa Euroopa ühiskondade kultuuritavadest.

Seega, alkoholi maksustamine Euroopa Liidus püüab olla tundlik kõikide nende nimetatud aspektide suhtes.

Alkoholi aktsiisimaksud süsteem ja maksulaekumised EL-is

Euroopa riikides on kehtestatud üllatavalt palju erinevaid aktsiisimakse alkoholile. Need maksud katavad kõiki 4 peamist alkoholitüüpi – õlu, vein, kange alkohol ja vahetooted. Alkoholi aktsiisimaksumäärad on seatud sõltuvusse alkoholi sisaldusest teatud mahuühiku kohta.

Eristaatuses maksustamise seisukohalt on veinitooted – riikidel on õigus kehtestada veinitootjatele null-määraga aktsiisimaks. Pea pooltes EL riikides selle tagajärjel veinitooteid ei maksustata aktsiisidega üldse. Tegemist on peamiselt Lõuna- ja Kesk-Euroopa riikidega, kus veinitootmine on oluliseks tegevusvaldkonnaks.

Alkoholiaktsiiside laekumisel on riikide lõikes on üpris suured erinevused. Erinevus suurema ja väiksema tululaekumistega riikide vahel (aktsiiside laekumise maht võrreldes SKP-ga) on riigiti enam kui 20 kordne. Nii näiteks on aktsiisitulud vahemikus 0,05% (Itaalia, Luksemburg, Austria) kuni 1,15% Eestis, Leedus ja Soomes, võrreldes SKT-ga. Rühma kõrgeimad tululaekumised alkoholimaksudest on geograafiliselt üsna kontsentreeritud – enamik neist riikidest asuvad Põhjala-Balti regioonis. Mõnes riigis (nt Eestis ja Leedus) alkoholiaktsiisi laekum riigieelarvele üsna mõjukas sissetulekuallikas.

Riigirahanduse sõltuvus alkoholiaktsiisidest on madalaim Vahemere regiooni maades, kus aktsiiside laekumised moodustavad vaid ühe protsendikolmandiku riigi kogumaksudest. Sellest oluliselt erinev on aga näiteks Eesti olukord, kus valitsussektori eelarve saab lausa ligi 4% oma tuludest alkoholi aktsiisimaksudest. Kõrge on alkoholimaksudest saadav tulu ka teistes Balti riikides; samuti Poolas ja Suurbritannias. Siinkohal võib märgata teatud iseloomulikku tunnust – veinitootjad (tarbivad) maad koguvad vähem alkoholimakse kui riigid, kus kange alkoholi tarbimine on rohkem levinud.

Kuigi on kehtestatud harmoneeritud aktsiismäärad kõikidele liikmesriikidele, on tegelikud erinevused alkoholitüüpide aktsiisimäärades väga suured. Näiteks õllele kehtestatud aktsiis on Bulgaarias 1,9 eurot *hl/°alc* kohta Bulgaarias, samas küündib see 32 euroni *hl/°alc* kohta Rootsis.

Olukord on veelgi huvitavam veini maksustamisel. Umbes pooltes ELi riikides ei maksusta veini üldse aktsiisidega; seega on veinitootmine selgelt vähem maksustatud kui muud alkoholitooted. Samal ajal, veiniaktsiisi tulud on üsna suured Briti saartel ja Põhjamaades.

Sarnaselt õllega on ka kange alkoholi maksumäärad Euroopas erinevad enam kui 10 korda. Suurbritannia, Iirimaa ja Põhjamaad on kehtestanud kõrgeimad maksumäärad; Lõuna-Euroopa riikides on lisaks veinile kehtestatud madalamad maksud ka kangele alkoholile.

Aktsiisimaksud kokku moodustavad suhteliselt väikese osa riigi kogutuludest. Maksude laekumise struktuur näitab, et üks kolmandik ELi riikidest ei saa veiniaktsiisidest üldse tulu. Kahel kolmandikul riikidest on aktsiisilaekumised veinist väiksemad kui 20%. Nullmaksuga veinimaad on peamiselt loodud Lõuna- ja Kesk-Euroopa riigid. Loogiliselt nende riikide peamised aktsiisitulud saadakse õlle või kange alkoholi maksustamisest.

Alkoholimaksud ja majandusnäitajad

Analüüs näitab, et puudub oluline korrelatiivne seos alkoholi tarbimise taseme, riigi sissetulekute ja kogumaksustamise taseme vahel. Jõukamates või kõrgema maksukoormusega riikides ei tarbita sugugi alkoholi elaniku kohta enam võrreldes madalama sissetulekuga või madalama maksukoormusega riikides. Alkoholiaktsiiside tase ei ole statistiliselt oluline tegur, mis mõjutaks alkoholi tarbimise kogust konkreetses riigis.

Alkoholiaktsiiside laekumine on negatiivses korrelatsioonis kogumaksude tasemega SKP-ga võrreldes, mis tähendab, et kõrgema maksukoormusega riikides on alkoholimaksude osakaal kogumaksutuludes suhteliselt väiksem. Sarnaselt korreleerub alkoholi aktsiisimaksude suhe kogumaksudesse tugevalt ja negatiivselt riikide maksukoormuse tasemega.

On huvitav märkida, et riikide suuremad eelarvelaekumised veiniga seotud aktsiisimaksudest on korrelatsioonis riigi SKP taseme ja üldise maksukoormusega; samal ajal samasugune korrelatsioon õlle ja kange alkoholi puhul puudub. Teiselt pool on aga olemas ka väga tugev ja positiivne korrelatsioon erinevate alkoholitüüpide aktsiisitasemete vahel.

Seda võiks tõlgendada järgmiselt - kui veini aktsiisimaks on madal või lausa null, siis viib see ka teiste alkoholitüüpide aktsiiside tasemed madalamaks. Sellist järeldust võiks põhjendada regulatiivse konkurentsiga erinevate alkoholitootjate vahel. Kui ühe alkoholi aktsiisimaks on väga madal, siis pole mitmesugustel põhjustel võimalik väga erinevalt maksustada ka teisi alkoholi liike. Kui veini aktsiisimaks on lubatud hoida nulltasemel, siis konkurents erinevate alkoholitootjate ja muude huvigruppe vahel (nt. turism, jaemüüjad) hoiab lõppkokkuvõttes madalal ka õlle- ja veiniaktsiisi.

Kokkuvõtteks

Alkoholi maksustamine on majanduslikult oluline ja sotsiaalselt tundlik teema kõikides Euroopa riikides. Alkoholiaktsiisid peaksid kujundama tarbijate käitumist, vähendama alkoholitarbimisest tulenevaid negatiivseid välismõjusid ja kompenseerima alkoholi poolt tekitatud sotsiaalseid kahjusid. Euroopa Liidu kontekstis lisandub veel sellel vajadus alkoholiaktsiise ühtlustada, et ära hoida kahjutoov piiriülene konkurents.

Vaatamata alkoholiaktsiiside harmoneerimisele on nende tase liikmesriikides üsna erinev. Samuti on erinev aktsiisidest saadavad maksutulud võrreldes SKP-ga ja kogumaksutuludega. Selle peamiseks põhjuseks on spetsiifiline erikord veinitoodete maksustamisel. Nimelt on veini lubatud maksustada ka nullmääraga. Neis riikides, kus veinitooted on maksustatud nullmääraga, on madalad ka muule alkoholile kehtestatud aktsiisimäärad. Samas ei sõltu alkoholi tarbimine *per capita* alkoholimaksude suhtelisest tasemest ega ühiskonna jõukusest SKP arvestuses.

KROONIKA

CHRONIK

CHRONICLE

PROFESSOR VELLO VOLT
(18.10.1928 – 26.10.2014)
IN MEMORIAM

Vello Volt sündis 18. oktoobril 1928. aastal Tartus. Saatuse poolt sai ta kaasa võimaluse 86 aastat oma andekust ja võimeid arendada ning teadmisi üliõpilastele jagada.

Eesti teadlane, tuntud majandusanaüütik, üliõpilaste ja kolleegide poolt armastatud ning spordilembeline õppejõud Vello Volt lahkus meie seast 26. oktoobril 2014 Tallinnas.

Teadmiste põhipagasi omandas Vello Volt järgmistes haridusasutustes:

- **1936–1940** õppis ta Tartu 2. algkoolis kuni neljanda klassi lõpuni. Seejärel, 1940. aastal, sai järgmiseks kooliks Tartu 5. algkool.
- **1941–1942** järgnesid õpingud Tartu 15. algkoolis, kus algkooliaastad ka lõppesid.
- **1943–1945** jätkas ta õpinguid Tartus, Hugo Treffneri Gümnaasiumis, kuni perekonna kolimiseni Paidesse. Sealses keskkoolis jätkus õppimine veel üks aasta.
- **1946–1948** jätkusid õpingud Tallinna 2. keskkoolis. Sealt saadud lõputunnistuse järel sooritas ta sisseastumiseksamid Tallinna Polütehnilise Instituudi (TPI) majandusteaduskonna rahandusharusse.
- **1948–1952** õppis Vello Volt edukalt TPI-s, mille lõpetas kiitusega diplomiga ning talle omistati ökonomisti kvalifikatsioon.

1951. aastal alustas Vello spordiajakirjaniku tööd ajalehe Noorte Hääl juures kirjandusliku kaastöötaja ametikohal. 1954. aastal määrati ta Noorte Hääle spordiosakonna juhatajaks. Oleks võinud oodata, et seal see karjäär jätkub, kuid Vello põhiharidus ja majandushuvi viisid ta 1959. aasta 10. märtsil Tallinna Kalinini rajooni Rahandusosakonna riigitulude inspektuuri vanemökonomisti ametikohale.

1959. aasta oktoobris asus Vello Volt õppima TPI aspirantuuri (tänane doktorantuur). Tema teaduslikuks juhendajaks sai professor, juriidiliste teaduste doktor Juhan Vaabel, kes oli selle aspirantuurikoha spetsiaalselt Vello Voldi jaoks organiseerinud. Väitekirja teemaks sai „Eesti NSV tööstuse käibevahendid“.

Aspirantuuriperiood kujunes Vello Voldile erakordselt töörohkeks. Sel perioodil oli tal oma vastloodud perekonna jaoks majaehitus alles pooleli. Ehitusmaterjalide hankimiseks tuli Vellol aspirantuurist saadava väikese stipendiumi kõrvale päeviti assistendina TPI statistika ja raamatupidamise kateedris lisa teenida. Õhtuti töötas ta ajakirjanikuna Õhtulehes. Dissertatsiooni kirjutamiseks jäid öötunnid.

1960. aastal toodi Tartu Riikliku Ülikooli majandusteaduskond Tartust Tallinnasse, TPI koosseisu. Tööd tuli sellega hulgaliselt juurde, kuid raha töö eest mitte piisavalt.

Tollane kateedrijuhataja Juhan Vaabel rakendas topelttööle aspirandid. Vello Voldi ülesandeks sai majandusanalüüsi lugemine üliõpilastele statistika ja raamatupidamise kateedris. Rängaks läks loengute ettevalmistamine algajale õppejõule – vähemalt neli tundi ühe loengu katmiseks. Raamatuid, isegi venekeelseid, peaaegu ei olnud. Iseloomulik, et just Vello Volt oli üks neist inimestest, kes oma edu pidi viimaseni ise välja võitlema ja võitma. **Majandusteaduste kandidaadi dissertatsiooni teemal „Eesti NSV tööstuse käibevahendid" kaitses Vello Volt Tartus 18. juunil 1964.** Arvukalt kogunes selle tööga ka majandusteaduslikke artikleid.

Oma järgneva teadusliku töö suunaks valis Vello Volt matemaatiliste meetodite rakendamise majanduslikus analüüsis. Tema teaduslike tööde alusel iseloomustas Tallinna Tehnikaülikooli (endine TPI) majandusteaduskonna statistika ja raamatupidamise kateedri tolleaegne juhataja akadeemik Uno Mereste Vello Volti, kui majandusprobleemide uute metodoloogiliste lähenemisviiside otsijat ning teadlast, kes oskuslikult seostas tööstusökonoomikat ja statistikat, töötas süvitsi ning tulemuslikult matemaatiliste meetodite rakendamise probleemidega ettevõtete majandusliku efektiivsuse arvestamisel.

Mõned olulisemad sündmused järgnevas Vello Voldi karjääris:
1974. aastal valiti majandusteaduste kandidaat Vello Volt konkursi korras TPI statistika ja raamatupidamise kateedri dotsendi ametikohale.
1976. aastal täiendas ta oma majanduslikke teadmisi Moskva Statistika Instituudis.
1977. aastal valiti majandusteaduste kandidaat, dotsent Vello Volt konkursi korras TPI raamatupidamise kateedri juhataja-dotsendi ametikohale.
1981. aastal läbis Vello Volt täienduskursuse Moskva Rahanduse Instituudis.
1984. aastal ilmus dotsent Vello Voldi sulest õpik – "Tööstusettevõtte majandusanalüüs". Kuni selle raamatu ilmumiseni olid kõrgkoolis õppetööks olemas vaid üksikud eestikeelsed brošüürid erinevate teemade kohta. Kindlasti segas tudengitel aine omandamist ka mitmete autorite erinev õppeaine käsitlusviis, samuti ilmnes aegumisi. Nii oli raske saada ülevaadet majandusanalüüsist kui tervikust. Uues õpi-kus püüdis autor neid vigu parandada, täiendades õpikut oluliselt:

- vaadeldi üle kõik vajalikud majandusanalüüsi teoreetilised ja praktilised küsimused,
- süvendati teguranalüüsi käsitlust,
- uudse näo said majandusanalüüsiga seostatud tehniliste uuenduste ja töökorralduse majanduslik efekt ning majandustegurite seosanalüüs,
- toodi välja majandusanalüüsi seisukohalt olulisemate majandusnäitajate algoritmid.

Raamatu kirjutamisel püüdis autor jälgida majanduse eriainete (raamatupidamise, majandusanalüüsi ja krediidi) õppeprogramme kõrgkoolis. Suur väärtus oli arvukate näidete kasutamisel. Põhiliseks teabeallikaks oli ettevõtte aastaruanne, kuid viidatud oli ka muid informatsiooniallikaid. See tegi õpiku kasutatavaks ka praktikute käsiraamatuna. Retsensendid ja kriitikud andsid õpikule väga positiivse hinnangu ning soovitasid autoril valminud töö alusel taotleda majandusteaduste professori kutset. Selline taotlus sisaldas peale kõrgkooliõpiku kirjutamise ka viit aastat tööd professori kohusetäitja ametikohal ning esinemisi üleliidulistel teaduskonverentsidel. Segastel põhjustel TPI-s nende nõuete täitmine Vello Voldil ei õnnestunud. Tuli otsida uusi teid teemade avamise ja rakendamise kohta ning leida teisi võimalusi.

1982. aastal oli Eesti Majandusjuhtide Instituut (EMI) võrdsustatud kõrgkooliga. Vello Volt nägi selles võimalust katsetada professori nimetuse taotlemist EMIs ning kandideeris sinna professori kohusetäitja ametikohale. Instituudi direktor Nikolai Ozerov ning kateedrijuhataja Raoul Renter olid tema ületuleku ettepanekuga kahel käel nõus. Kui nõutav aeg professori kohusetäitjana täis sai, taotleti talle Moskva Kõrgemast Atestatsioonikomisjonist (VAK) professori nimetust. Vastus tuli jaatav koos nõudega Venia legendi pidamiseks mõnes tunnustatud kõrgkoolis. Selliseks kõrgkooliks määrati Leningradi Rahanduse ja Krediidi Instituut. Teemaks võttis Vello Volt Eesti Vabariigi Raamatupidamise seaduse. Tulemus: kateedrijuhatajad kiitsid toreda loengu eest, lisades et sellise õpiku eest oleks juba varem pidanud professoriks saama. Tore tunne olevat Vellol küll olnud. **Temast sai VAK-i kvalifikatsioonitunnistusega Eesti Vabariigi eluaegne professor**.

Vello Voldi poolt avaldatud teadustööde loetelu perioodidel 1962–1965 ja 1966–2003 oli igati eeskujulik ning tähelepanuväärne. Neile lisandus hulk tema poolt toimetatud trükiseid aastatel 1964 kuni 1994.[1]

1991. aastal algas Eestis auditeerimine. Eesti Vabariigi taasiseseisvumisel alustati kohe halduss truktuuride loomisega. Vello Voldi seisukoht oli, et ka majanduses tuleb luua uus kontrollorganite süsteem. Esialgu oli paljude majandusinimeste vastuseis suur, sest veel mäletati hästi selliseid Nõukogude Liidu aegseid kontrollorganeid nagu SORVO, Kontrollrevisjoni Valitsus ja Rahvakontroll. Rahandusministeeriumi suhtumine oli aga teine. Sealt tuli ettepanek ka Eestis muus maailmas juba hästi töötav audiitortegevus korraldada. Vastava eelnõu väljatöötamisele kulutas Vello Volt palju aega. See eelnõu jõustati algul rahandusministri määrusega, hiljem järgnes sellele ka vastav seadus.

1991. aastal asutasid Vello Volt, Peeter Riit ja Andres Root esimesena Eestis audiitorfirma: "Riit-Root-Volt". Klientidest puudust ei olnud, sest kõigil kolmel osanikul oli TPI raamatupidamise kateedri taust ning suur osa ettevõtete pearaamatupidajatest olid just seal oma majandushariduse saanud. Ikka veel kahtlevalt suhtusid kohalikku audiitorfirmasse Eestisse investeerinud välisfirmad. Huvi loodud audiitorfirma vastu hakkasid aga tundma välismaa audiitorfirmad. Peeter Riidal olid head suhted Soome audiitorfirmaga KPMG ja selle firmaga saadi renomee parandamise, aga ka kogemuste laiendamise huvides ühinemise osas kokkuleppele. Loodi firma KPMG Estonia AS. Järgnesid vajalikud stardirahad ja õpitoetused. Soome kolleegid ennustasid uue ühinenud firma paar-kolm esimest tööaastat kahjumlikeks. Tegelikult saadi kasumit juba esimesel aastal, millest samal aastal maksti tagasi soomlaste poolt antud stardirahad. Praegu on KPMG Estonia töötajate arv Eestis juba saja ringis.

Vello Voldi ettevõtmistega kaasnes aastaid ka sisukas sporditegevus. Tema eluloolisi andmeid on avaldatud Eesti Vabariigi teatmeteostes: „Eesti spordi biograafiline leksikon" (2001) ja „Kes on kes Eesti majanduses" (2005).

[1] Nimetatud teadustööde ja trükiste loetelu on avaldatud kogumiku – Majandusanalüüs, majandusarvestus, maksundus ja auditeerimine. Rahvusvahelise konverentsi kogumik, 6.-7.11.2008. Toimetaja: Jaan Alver. Tallinn: Tallinna Tehnikaülikool, 2008, 389 lk. – artiklis: Majandusteadlane Vello Volt – 80. (koostaja: Inga Lõokene), lk. 313-317.

Alates 1949. aastast osales ta TPI kehalise kasvatuse kateedris jäähokimeeskonna loomisel ning tegeles samas edasi ka instruktori ja treenerina. Uisutamisega oli ta alustanud süstemaatiliselt juba Tartus kuuendas klassis tolleaegse nimeka kehalise kasvatuse õpetaja ja kunagise kiiruisutaja Artur Kink'i käe all, kes õpetas ridamisi välja vabariigi tippu kuuluvaid sportlasi. Tegevsportlasena oli see mees olnud jalgpalli- ja jääpallimeeskonna kapten ja Eesti ringkondade meistreid jääpallis. Sealt siis ka Vellol need esimesed õiged juhised jäähokiks, aga ka jalgpalliks. Jäähoki harrastus jätkus ka Tartus Treffneri gümnaasiumis. 1947. aastal õnnestus Vellol tulla Eesti meistriks kiiruisutamises. Hiljem Tallinnas Albert Leichneri käe all jäähokiga tegeledes pälvis Vello 1948. aastal Eesti koolinoorte meistri tiitli ning 1949. aastal Tallinna meistri tiitli.

Suureks armastuseks oli Vellole alati olnud korvpall, kuigi ta tunnistas, et tema füüsis oleks paremini jalgpallimänguks sobinud. Tõsisemad kokkupuuted korv-palliga toimusid Vellol Tallinnas (1944) Harjuoru staadionil, kus treener Joann Lõssov oma noori, kes olid juba NSV Liidu noortemeistrid, treenis. Vello mäletas, et kui "Lõss" ta esimest korda mängima kutsus, siis ega ta meeskonnas teistele palju alla ei jäänud, kiiruses aga oli nii mõnestki üle. Nii sai temast korvpallur. TKSÜ (Tallinna Koolinoorte Sportliku Ühingu, mida tollal juhatas Klaus Mikko), meistrivõistlustel võitsid nad kõiki keskkoole. Rohkem tuli vaeva näha Arhitektuuri- ja Ehitustehnikumiga. Sel talvel võisteldi selle kooliga seitse korda ja võideti vaheldumisi. 1948. aasta Nõukogude Liidu noorte korvpalli meistrivõistlustel oli ta Tallinna 2. Keskkooli meeskonnas üks pronksivõitjatest. Aastast 1959 sai Vellost TPI Korvpalliklubi "Kapa" liige. Aastatel 1956-1960 kuulus ta Korvpallisektsiooni- föderatsiooni presiidiumi.

Tennisega olid aga lood sellised, et suurem osa tööst sai Vellol tehtud iseseisvalt teiste tähelepaneliku jälgimise, katse ja eksituse meetodil. Treenereid, kelleni tenni-sehuvilise rahakott oleks küündinud, oli väga vähe ja vilunumad mängijad tegelesid meelsamini iseendaga. Ainus tund tennisetreeneriga tema elus tuli liitri piima eest. Esimest mängu alustas Vello naabripoisiga Tartus Toomemäe väljakutel, kus partner kohe ka punktide arvestust nõudis. Mõistagi tuli kaotus. Üle võrgu läks Vellol aga hulga palle. Vello oli nobe tähelepanekutest õppima ja edaspidi ei kaotanud ta naabripoisile enam ainsatki mängu. Mängida tuli nn. "klopferiga" (see oli ainus võimalik nimetus kusagilt hangitud viletsale reketile) ja pallide "tervise" hoidmiseks liimiti neile ise kummiliimiga "uued riided selga". Raskustele vaatamata tulid siiski ka tulemused. 1943. aastal tennise meistrivõistlustel Tallinnas pälvis ta üksikmängus hõbemedali ja paarismängus (koos Ants Kuusikuga) saadi noortemeistriteks. Paraku lõppes tenniseharrastus Tartus ruttu, sest Punaarmee lähenedes kaevati tennisevälja-kutest kaevikud läbi.

Palju huvitavaid mälestusi oli Vellol ka ujumise, kergejõustiku ja male harrastami-sest ning võistlustest. Tasuks tuli ka hulk karikaid, mis keldrisse maeti-peideti, kuid mille varanduseotsijad okupatsiooni ajal välja kaevasid ja ära viisid. Optimistina reageeris Vello sellele nii: „Ega nad midagi väärtuslikku ei saanud – kergplekist karikad!" Ajaloolisest seisukohast siiski kahju!

Iseloomustades Vello Volti, on tema endised üliõpilased ja kolleegid valdavalt ühi-sel arvamusel, et tegemist oli väga asjaliku, konkreetse, täpse ja targa õppejõuga. Ta hindas vaistlikult ja oskas suurepäraselt rakendada pedagoogilisi nippe õppeaine eluliseks muutmisel seda huvitavate praktiliste näidetega sidudes. Hindamise töö eeldab lisaks

teadmistele ka suurt loomupärast südameheadust ja kannatlikku meelt. Tudengid pidasid seda algaja assistendi juures loomulikuks, kuid mõjuvalt avaldusid need iseloomujooned hiljem kateedrijuhataja töös, kes sageli kujunes piksevardaks juhtkonna ja kateedri vahel. Negatiivsete emotsioonidega teaduskonna juhtkonna koosolekutelt naasnud, sulgus Vello sageli sõnatult oma kabinetti ja väljus sealt poole tunni pärast jälle naeratavana.

Nüüd meenutame Vello Volti kui toredat ja head inimest, rõõmsameelset õppejõudu ja erudeeritud majandusteadlast, spordilembelist innustajat ning samas imetleme ka tema saavutusi. Vello ise pidas oma olulisemaks saavutuseks 30-aastast õppejõu-staaži ja lektoriks olemist paljudel kursustel. Loomulikult oli ta väga rahul ka selle-ga, et võis audiitorluse rajamisele Eesti Vabariigis kaasabi osutada.

Märts-aprill 2015

Inga Lõokene
endine pikaajaline kolleeg,
Tallinna Tehnikaülikool

PROFESSOR VELLO VOLT
(18.10.1928–26.10.2014)
IN MEMORIAM

Vello Volt wurde am 18. Oktober 1928 in Tartu geboren. Das Schicksal hat ihm ein langes Leben geschenkt, er wurde 86 Jahre alt. Er konnte seine Begabung und Fähigkeiten voll entfalten und sein Wissen den Studenten weitergeben. Seine Schulzeit (1936-1948) verbrachte er in Tartu und Tallinn. 1948-1952 studierte Vello Volt Finanzwesen an der Fakultät für Wirtschaftswissenschaften der damaligen Polytechnischen Hochschule Tallinn (heute Technische Universität Tallinn). Sein Abschluss wurde mit *cum laude* bewertet. 1959 begann er mit seiner Doktorarbeit und promovierte in Tartu am 18. Juni 1964. Als Wirtschaftswissenschaftler war für ihn charakteristisch, dass er ständig auf der Suche nach neuen methodologischen Herangehensweisen für wirtschaftliche Probleme war. Sein besonderes Augenmerk galt den Zusammenhängen zwischen Industrieökonomik und Statistik.

Im Jahre 1984 veröffentlichte Vello Volt das Lehrbuch "Wirtschaftsanalyse für Industriebetriebe". Bis zum Erscheinen des Buches wurde die genannte Thematik anhand vereinzelter Broschüren unterrichtet, es fehlte eine einheitliche estnischsprachige Abhandlung. Die Studenten hatten die unterschiedliche Herangehensweise der Autoren und die teils überholten Inhalte als sehr störend empfunden. Es war schwierig, einen vollständigen Überblick über die Wirtschaftsanalyse zu bekommen. Vello Volt aber hat ein Lehrwerk geschaffen, wo alle theoretischen und praktischen Aspekte der Wirtschaftsanalyse behandelt wurden. Zusätzlich wurde die Faktorenanalyse einer genaueren Betrachtung unterzogen, die Methodik der verbindenden Analyse zwischen dem wirtschaftlichen Effekt von technischen Neuerungen und Arbeitsorganisation und den anderen Wirtschaftsfaktoren modernisiert, die Algorithmen wichtiger wirtschaftlichen Kennzahlen erläutert. Beim Verfassen des Buches hat der Autor Studienprogramme verschiedener Wirtschaftsfächer (Buchhaltung, Wirtschaftsanalyse, Kreditwesen) berücksichtigt. Eine große Praxisnähe macht das Lehrwerk besonders wertvoll. Dank vielen Beispielen anhand von Jahresberichten und anderen Quellen konnten Wirtschaftspraktiker es als Handbuch benutzen. Im Jahre 1982, als Vello Volt am Institut für Estnische Wirtschaftsmanager (Eesti Majandusjuhtide Instituut – EMI) tätig war, wurde er zum Professor ernannt.

1991 gründeten Vello Volt, Peeter Riit und Andres Root die Wirtschaftsprüferfirma "Riit–Root–Volt", damit waren sie Branchenvorreiter in der wiederhergestellten Republik Estland. Alle drei waren am Lehrstuhl für Buchhaltung der Tallinner Technischen Universität tätig gewesen, dort haben auch die meisten Chefbuchhalter estnischer Unternehmen ihre Ausbildung bekommen. Das waren die Anfänge der Firma. Heute heißt sie „KPMG Estonia" mit rund hundert beschäftigten.

Professor Vello Volt war als Wirtschaftsanalytiker sehr geschätzt und unter Studenten und Kollegen allgemein beliebt. Er starb am 26. Oktober 2014.

Inga Lõokene

PROFESSOR VELLO VOLT
(18.10.1928–26.10.2014)
IN MEMORIAM

Vello Volt was born in Tartu on 18 October 1928. The fate provided him the opportunity to develop his talents and abilities for 86 years and share his knowledge with students. He acquired his basic knowledge in the primary schools and secondary schools of Tartu and Tallinn in 1936–1948. In 1948–1952 he studied the speciality of finance in the Faculty of Economics of the Tallinn Polytechnical Institute (the current Tallinn University of Technology, TUT) and graduated with the diploma *cum laude*. In 1959, V. Volt started post-graduate studies (current doctoral studies) at the Tallinn Polytechnical University. He defended the thesis of a Candidate of Economics (PhD) on 18 June 1964 in Tartu. He has been characterised as a searcher for new methodological approaches to economic challenges and as a researcher who skilfully combined industrial economics with statistics.

In 1984, V.Volt published the textbook *Tööstusettevõtte majandusanalüüs* (Business Analysis of Industrial Enterprises). Until publishing of that textbook, these subjects had been taught in institutions of higher education only on the basis of a few brochures published in Estonian. Different treatments of the same subjects by different authors, also outdated materials had been confusing for students. Thus it had been difficult to obtain a comprehensive overview of business analysis. V.Volt, however, reviewed all necessary theoretical and practical issues of business analysis; presented a more in-depth treatment of factor analysis; the economic effect of technical innovations and work procedures and the analysis of interrelations of economic factors acquired a new approach; algorithms of the main economic parameters from the aspects of business analysis were presented. The authors wrote the book according to the study programmes of subjects of economics (accounting, business analysis and credit) in institutions of higher education. The use of numerous examples was of great value. The main source of information was the annual report of an enterprise but also other sources were referred to. This made the textbook usable as a manual also for practitioners.

In 1982, the Estonian Institute of Economic Leaders (EMI) had the status of an institute of higher education and Vello Volt saw this change as an opportunity to apply for the position of a professor at EMI and applied for the post of an acting professor there. When the required period of service as an acting professor ended, the position of a professor was applied for him from the Higher Attestation Committee in Moscow. The decision was positive and V. Volt became a lifetime professor of the Republic of Estonia with the qualification certificate from the Higher Attestation Committee.

In 1991, Vello Volt, Peeter Riit and Andres Root established Riit–Root–Volt, the first audit office in the Republic of Estonia. All three had the background of the Chair of Accounting of the Tallinn Polytechnical Institute and also a large number of chief accountants of Estonian enterprises had acquired their education in economics there. It became a basis for the new company. The current name of the audit office is KPMG Estonia and it has approximately a hundred employees in Estonia.

Professor Vello Volt as an esteemed business analyst and academic loved by his students and colleagues passed away on 26 October 2014.

Inga Lõokene

KAHEKÜMNE KOLMAS RAHVUSVAHELINE MAJANDUSPOLIITIKA TEADUSKONVERENTS, KOLMANDAT KORDA JÄNEDAL

2.–4. juulini 2015 toimus Eestis XXIII rahvusvaheline majanduspoliitika teaduskonverents „Majanduspoliitika Euroopa Liidu riikides – aasta 2015“ ning juba kolmandat korda Jäneda mõisakompleksis (kakskümmend esimest konverentsi toimusid Värskas). Konverentsi töökeelteks olid traditsiooniliselt eesti ja saksa keel (nendest tehti ka järeltõlge). Osa ettekandeid toimus inglise keeles ilma tõlketa.

Konverentsi avas neljapäeval, 2. juuli pärastlõunal, konverentsiseeria algataja ning XXIII konverentsi peakorraldaja-koordinaator **Matti Raudjärv** (Tartu Ülikool /TÜ/, Pärnu kolledž). Sellele järgnes **plenaaristung**, mis oli täielikult kohaliku omavalitsuse temaatikale pühendatud ja seda juhatas **Sulev Mäeltsemees** (Tallinna Tehnikaülikool /TTÜ/), tehes ühtlasi ka esimese pikema ettekande teemal *„Üleriigiline kohaliku omavalitsuse üksuste liit – üks või enam?“*. Teise pikema ettekande tegi **Janno Reiljan,** kaasautoriks Annika Jaansoo (mõlemad TÜ) – *„Pendelränne kui Eesti kohaliku omavalitsuse finantside mõjutaja“*. Ettekannetele järgnesid küsimused ja diskussioonid. Esindatud olid ka kohaliku omavalitsuse üksuste juhid-spetsialistid Vara vallavanema **Väino Kivirüüt**i isikus.[1]

Reedel, 3. juulil toimus neli pooleteise tunnist istungit (igas kolm põhjalikku ja huvitavat ettekannet koos küsimuste-diskussioonidega). Hommikupoolset **esimest istungit** juhatasid **Claus-Friedrich Laaser** ja **Klaus Schrader** (mõlemad Kieli Maailmamajanduse Instituut, Saksamaa LV). Ettekanded olid:

- **Armin Rohde** (saksa keeles; Greifswaldi Ülikool, Saksamaa LV) – *„Risikopotenziale der aktuellen Geldpolitik des Eurosystems“,*
- **Karen Cabos** (inglise keeles; Lübecki Rakendus-ülikool, Saksamaa LV) – *„Monetary Policy at the Zero Lower Bound“* ja
- **Klaus Schrader, Claus-Friedrich Laaser** (inglise keeles) – *„Challenging the Baltic states´ trade relations with Russia: caught in path depandencies?“*.

Teist istungit juhatas **Armin Rohde** (Greifswaldi Ülikool), kes osales meie konverentsil juba kuueteistkümnendat korda (mitmeid kordi koos oma doktorantidega). Ettekanded olid järgmistelt autoritelt:

- **Viljar Veebel** (eesti keeles, Kaitseväe Ühendatud Õppeasutused), kaasautoriks Raul Markus (TTÜ) – *„Majandussanktsioonid kui rahvusvaheline survemeede?“*,
- **Matti Raudjärv** (eesti keeles, TÜ) – *„Eesti kui Euroopa Liidu liikmesriigi majandus- ja kaubandussidemed, sh Ukraina ja Venemaaga“* ja
- **Jelena Rootamm-Valter** (eesti keeles; TÜ, Narva kolledž) – *„Venemaa turistide käitumismuutused ja nende mõju Eesti piiriäärsele majandusele (Ida-Virumaa näitel)“*.

Pärastlõunane **kolmas istung** oli **Janno Reiljan**i (TÜ) juhatada. Ka siin toimus kolm ettekannet:

[1] Lääne-Nigula vallavanem Mikk Lõhmus kui esimese ettekande kaasesineja ja konverentsile kavandatud osaleja, jäi välislähetuse tõttu paraku Jänedale saabumata.

- **Vija Melbārde** (saksa keeles; Vidzeme Rakendusülikool, Läti) – *„Human kapital research: regional aspects“,*
- **Karin Lindroos** (inglise keeles, TTÜ) – *„Rohelise hanke ja tarnija valiku protsessi teoreetilise kontseptsiooni rakendamine Eesti laevaehitustöös-tuses“* ja
- **Viktor Trasberg** (inglise keeles, TÜ) – *„Alkoholi maksustamine Euroopa Liidus“*.

Reedese päeva viimast, **neljandat istungit** juhatas **Sirje-Ilona Pädam**[2] (TTÜ) ning siin oli esimene ettekanne: **Helli Lepasaar**, kaasautoriks Üllas Ehrlich (eesti keeles, mõlemad TTÜ) – *„Eesti poollooduslikud kooslused kui väärtuslik keskkonnakaup“*. Seejärel tegi ettekande **Tea Nõmmann** (inglise keeles, Stockholmi Keskkonna Instituudi Tallinna Keskus /SEI Tallinn/), kaasautoriks Sirje-Ilona Pädam (TTÜ) – *„Sotsiaalne kasu mere naftareostuse vältimisest: Eesti näide“* ning viimasena esines **Sirje-Ilona Pädam** (inglise keeles, TTÜ) teemal *„Keskkonnapoliitika ja välismõjud Eestis“* [3]

Järgnes konverentsi lõpetamine **Matti Raudjärv**e poolt. Tänati osalejaid, ajakirja „Eesti majanduspoliitilised väitlused“ artiklite autoreid, retsensente, toimetajaid, tõlke ja kõiki, kes konverentsi õnnestumisele kaasa aitasid. Ühtlasi ergutati autoreid oma artikleid lõpetama ning kutsuti kõiki ka järgmisel, 2016. aastal XXIV konverentsil osalema.

Lisaks konverentsitööle oli ka vaba aeg sisustatud: neljapäevane õhtusöök toimus mõisa hotelli kaminasaalis Tapa valla mandoliiniorkestri[4] poolt esitatud väga hea kavaga muusika saatel. Reede õhtu veedeti spordi-sauna-jalutus- või (ja) vestlus-programmis osaledes. Laupäeva hommikupoolikul külastati loodusprogrammi raames Vargamäe kirjanduslikku talu ja talumuuseumi, kus giid kohalike talude ja seal elanud inimeste elu ning kohalikku ajalugu tutvustas. Seejärel külastati XIII–XIV sajandist pärit Järva-Madise kirikut[5] ja kirikuaeda. Pärast lõunasööki Jänedal Musta Täku Tallis oli konverentsi programm täielikult ammendatud ning osalejad lahkusid Jänedalt sooviga järgmisel, 2016. aastal taas, siis juba 26. konverentsil kohtuda.

Tallinnas, Pirita-Kosel; juulis, 2015

Matti Raudjärv

[2] Esialgse kava kohaselt pidi istungit juhatama Üllas Ehrlich. Tema välislähetuse tõttu tuli teha aga asendus.

[3] Algselt oli neljandale istungile kavandatud ka saksa kolleegi Eckhard Freyeri (Merseburgi Ülikool, Saksamaa LV) ettekanne – „Aspects of Euro-Crises: problem-states and ethical-historical perspectives“. Paraku ettekandja aga haigestus ning konverentsil ei osalenud.

[4] Vestluses selgus, et Tapa valla mandolistid hõlmavad rohkem kui neljandiku kõigist Eesti avalikest mandoliinimängijatest.

[5] Järva-Madise kirik on ehitatud arvatavasti 13. sajandi lõpus. Algkavatisse kuuluvad ühelööviline kahe võlvikuga pikihoone, kitsam nelinurkne koor koos käärkambriga ja lõunaeeskoda; kirik on võlvitud tõenäoliselt 14. sajandi alguses, läänetorn on ehitatud 1858. Barokkstiilis kantsli on teinud L. Heissmann (E. Thiele kujud) 1650. aastate alguses, 1680. aastail valminud altar pärineb C. Ackermanni töökojast (ENE, 4. kd. Tallinn: Valgus, 1989, lk. 167.)

DIE DREIUNDZWANZIGSTE INTERNATIONALE WISSENSCHAFTSKONFRENZ ÜBER WIRTSCHAFTSPOLITIK – DAS DRITTE MAL IN JÄNEDA

Vom 2.–4. Juli 2015 fand in Estland die XXIII. Internationale Wissenschafs-konferenz über Wirtschaftspolitik statt. Die Konferenz wurde schon das dritte Mal im Gutshof Jäneda durchgeführt und trug diesmal den Titel „Die Wirtschaftspolitik in der EU im Jahre 2015". Die traditionellen Konferenzsprachen waren auch diesmal Estnisch und Deutsch mit Konsekutivübersetzung. Einige Vorträge wurden in englischer Sprache ohne Übersetzung gehalten.

Die Konferenz begann am Donnerstag, den 2. Juli. Das Eröffnungswort am Nachmittag sprach **Matti Raudjärv** (College Pärnu der Universität Tartu), der Initiator der Konferenzreihe und Hauptveranstalter der XXIII. Konferenz. Darauf folgte die Plenarsitzung, die vollständig der Thematik der kommunalen Selbstverwaltungen gewidmet war und von **Sulev Mäeltsemees** (Technische Universität Tallinn) moderiert wurde. Er hielt auch den ersten längeren Vortrag zum Thema „*Der Verband der kommunalen Selbstverwaltungen auf der Staatsebene – nur einer oder mehrere?"*. Das zweite längere Referat stammte von **Janno Reiljan, (**Koautorin Annika Jaansoo, beide Universität Tartu) – *„Pendelwanderung als Einflussfaktor bei den Finanzen kommunaler Selbstverwaltungen in Estland"*. Darauf folgte eine lebhafte Diskussionsrunde.

Am Freitag, den 3. Juli fanden vier anderthalbstündige Sitzungen statt. Die erste Sitzung am Vormittag moderierten **Claus-Friedrich Laaser** und **Klaus Schrader** (beide Institut für Weltwirtschaft, Deutschland). Es wurden folgende Vorträge gehalten:

- **Armin Rohde** (Universität Greifswald, Deutschland) **–** *„Risikopotenziale der aktuellen Geldpolitik des Eurosystems"*,
- **Karen Cabos** (Fachhochschule Lübeck, Deutschland) – *„Monetary Policy at the Zero Lower Bound"*,
- **Klaus Schrader, Claus-Friedrich Laser –** *„Die Baltischen handels-beziehungen zu Russland: Pfadabhängigkeiten trotz EU-Integration?"*.

Die zweite Sitzung moderierte **Armin Rohde**, der schon das sechzehnte Mal an der Konferenz teilnahm. Während dieser Jahre hat er oft auch seine Doktoranden mitgebracht.

Es wurden folgende Referate vorgetragen:

- **Viljar Veebel** (Estnische Verteidigungsakademie), **(**Koautor Raul Markus, Technische Universität Tallinn) – *„Die Wirtschaftssanktionen als Mittel der internationalen Druck?"*
- **Matti Raudjärv** – *„Estland als Mitglied der Europäischen Union und seine Wirtschafts- und Handelsbeziehungen, darunter auch zu Russland und der Ukraine"*
- **Jelena Rootamm-Valter** (College Narva der Tartuer Universität) – *„Änderungen im wirtschaftlichen Verhalten russischer Touristen und ihre Auswirkungen auf die Wirtschaft der Grenzregionen Estlands am Beispiel des Landkreises Ida-Virumaa"*

Am Nachmittag fand die dritte Sitzung unter der Moderation von **Janno Reiljan** statt**.** Auch dann gab es drei Vorträge:

- **Vija Melbārde** (Fachhochschule Vidzeme, Lettland) – *„Erforschung des Humankapitals: regionaler Aspekt“*,
- **Karin Lindroos** (Technische Universität Tallinn) – *„Die Anwendung der theoretischen Konzeption von grüner Beschaffung und der Wahl der Lieferer in der estnischen Werftindustrie“*,
- **Viktor Trasberg** (Universität Tartu) – *„Die Besteuerung von Alkohol in der Europäischen Union“*.

Die vierte und die letzte Sitzung am Freitag moderierte **Sirje-Ilona Pädam** (Technische Universität Tallinn). Folgende Referate waren zu hören:

- **Helli Lepasaar (**TUT) – *„Halbnatürliche Biotope in Estland als wertvolles Umweltgut“*,
- **Tea Nõmmann** (SEI Tallinn) – *„Sozialer Nutzen bei der Vermeidung der Ölverschmutzung des Meeres am Beispiel von Estland“*,
- **Sirje-Ilona Pädam** (TUT) – *„Umweltpolitik und Außeneinflüsse in Estland“*.

Danach ergriff **Matti Raudjärv** das Schlusswort. Er bedankte sich bei den Teilnehmern, den Autoren der Zeitschrift „Estnische wirtschaftspolitische Gespräche“, Rezensenten, Redakteuren, Dolmetschern und allen denjenigen, die zum Gelingen der Konferenz mitgeholfen haben. Es wurde auch angeregt, die Beiträge für die zweite Ausgabe der Zeitschrift fertigzustellen. Auch wurde allen Teilnehmern die Einladung für die nächste, die XXIV. Konferenz im Jahre 2016 ausgesprochen.

Zusätzlich zur Konferenzarbeit wurde auch an die Freizeitgestaltung gedacht. Am Donnerstagabend begeisterte das Mandolinenorchester der Gemeinde Tapa alle Zuhörer. Der Freitagabend war den sportlichen Unternehmungen und Gesprächsrunden gewidmet. Am Samstagvormittag konnte man an der Besichtigung des literarischen Freilichtmuseums Vargamäe und der Kirche in Järva-Madise teilnehmen.

Im Juli-August 2015

Matti Raudjärv

THE TWENTY THIRD INTERNATIONAL SCIENTIFIC CONFERENCE ON ECONOMIC POLICY, FOR THE THIRD TIME AT JÄNEDA

The XXIII International Scientific Conference on Economic Policy "Economic Policy in the EU Member States – 2015" was held in Estonia from 2 to 4 July 2015 and already for the third time in the buildings of the Jäneda Manor. The working languages of the conference were traditionally Estonian and German (with also consecutive interpretation from these languages). Some presentations were delivered in English without interpretation.

The conference was opened in the afternoon of Thursday, 2 July by **Matti Raudjärv** (University of Tartu (UT), Pärnu College), the initiator of the series of conferences and main organiser/coordinator of the XXIII Conference. This was followed by the **plenary meeting** which was fully dedicated to the subject of local government issues and was chaired by **Sulev Mäeltsemees** (Tallinn University of Technology, TUT) who made also the first longer presentation on the subject *"The Association of Local Authorities – One or More?"*. The second longer presentation was made by **Janno Reiljan** with Annika Jaansoo as the co-author (both from the University of Tartu) – *"Commuting as a factor in local public finance in Estonia"*. The presentations were followed by questions and discussions.

Four sessions of 1.5 h each were held on Friday, 3 July. The **first session** in the morning was chaired by **Claus-Friedrich Laaser** and **Klaus Schrader** (Kiel Institute for the World Economy, Germany). The presentations were:

- **Armin Rohde** (University of Greifswald, Germany) **–** *"Potential Risks of Recent Monetary Policy of the Eurosystem"*,
- **Karen Cabos** (University of Applied Sciences of Lübeck, Germany) – *"Monetary Policy at the Zero Lower Bound"*,
- **Klaus Schrader, Claus-Friedrich Laser –** *"Challenging the Baltic states' trade relations with Russia: caught in path dependencies?"*.

The **second session** was chaired by **Armin Rohde** who participated already for the 16th time at our conference (for several times with his doctoral students). The presentations were from the following authors:

- **Viljar Veebel** (Estonian National Defence College) – *"Economic Sanctions as an International Retaliatory Measure?"*,
- **Matti Raudjärv** – *"Economic and trade relations of Estonia as a EU member state, incl. with Russia and Ukraine"*,
- **Jelena Rootamm-Valter** (UT, Narva College) – *"Changes in Ecomomic Behavior of Russian Tourists and their Influence on Estonian Border-Area Economy (Case of Ida-Viru-maa)"*.

The **third session** held in the afternoon was chaired by **Janno Reiljan**. It consisted of three presentations as well:

- **Vija Melbārde** (University of Applied Sciences of Vidzeme, Latvia) – *"Human kapital research: regional aspects"*,
- **Karin Lindroos** (TUT) – *"Implemantation of the theoretical concept of green procurement and supplier selection in estonian shipbuilding industry"*,

- **Viktor Trasberg** (UT) – *"Alcohol excise duties in the European Union"*.

The last, **fourth session** held on Friday was chaired by Sirje-Ilona Pädam (TUT) and the following presentations were made:

- **Helli Lepasaar (**TUT) – *"Seminatural communities of Estonia as valuable environmental good"*,
- **Tea Nõmmann** (SEI Tallinn) – *"Societal Benefits of Avoiding Marine Oil Pollution: Estonian case study"*,
- **Sirje-Ilona Pädam** (TUT) – *"Environmental policy and externalities in Estonia"*.

The conference was closed by **Matti Raudjärv**. The participants, authors of papers in the journal "Estonian Discussions on Economic Policy", peer reviewers, editors, interpreters and everybody who contributed to the success of the conference were thanked. Authors were also encouraged to finish their papers and everybody was invited to participate also in the next, XXIV Conference in 2016.

In addition to conference work, the programme also included spare time activities: cultural programme on Thursday evening (Mandolin Orchestra of the Tapa Rural Municipality), sports and talks programme on Friday and nature programme on Saturday (Vargamäe Literary Farm Museum and Järva-Madise Church).

Welcome to Jäneda from 30 June to 2 July 2016!

In Tallinn, in July-August 2015

Matti Raudjärv
Initiator of the series of conferences and main organiser/coordinator
of the XXIII conference

MAJANDUSPOLIITIKA TEADUSKONVERENTSID EESTIS (1984–2015 … 2018)

WISSENSCHAFTLICHE KONFERENZEN ÜBER WIRTSCHAFTSPOLITIK IN ESTLAND (1984–2015 … 2018)

SCIENTIFIC CONFERENCES ON ECONOMIC POLICY IN ESTONIA (1984–2015 … 2018)

I	1984	Ühiskondliku tootmise intensiivistamise probleemid Eesti NSV-s
II	1994	Majandusteadus ja majanduspoliitika Eesti Vabariigis
III	1995	Majanduspoliitika teooria ja praktika Eesti Vabariigis
IV	1996	Aktuaalsed majanduspoliitika küsimused Euroopa Liidu riikides ja Eesti Vabariigis /I ja II/ Aktuelle wirtschaftspolitische Fragen in den Ländern der Europäischen Union und in der Republik Estland /I und II/ Topical Problems of the Economic Policy in the Member States of the European Union and the Republic of Estonia /I and II/
V	1997	Eesti Vabariigi majanduspoliitika ja integreerumine Euroopa Liiduga Die Wirtschaftspolitik der Republik Estland und die Integration mit der Europäischen Union Economic Policy of the Republic of Estonia and Integration with the European Union
VI	1998	Eesti Vabariigi integreerumine Euroopa Liiduga – majanduspoliitika eesmärgid ja abinõud Die Integration der Republik Estland mit der Europäischen Union – Ziele und Mittel der Wirtschaftspolitik Integration of the Republic of Estonia into the European Union – Goals and Instruments of Economic Policy
VII	1999	Eesti Vabariigi majanduspoliitika ja Euroopa Liit Wirtschaftspolitik der Republik Estland und die Europäische Union Economic Policy of the Republic of Estonia and the European Union
VIII	2000	Eesti Vabariigi majanduspoliitika tulemuslikkus ja Euroopa Liit Wirksamkeit der Wirtschaftspolitik der Republik Estland und die Europäische Union Effectiveness of the Economic Policy of the Republic of Estonia and the European Union
IX	2001	Harmoniseerimine ja vabadus Eesti Vabariigi majanduspoliitikas integreerumisel Euroopa Liiduga Harmonisierung und Freiheit der Wirtschaftspolitik Estlands in EU-Integrationsprozess Harmonisation and Freedom in the Economic Policy of Estonia integrating with the European Union

X	2002	Euroopa Liiduga liitumise mõju Eesti majanduspoliitikale Die Integration der Europäischen Union und ihre Wirkungen auf die Wirtschaftspolitik Estlands Effect of Accession to the European Union on the Economic Policy of Estonia
XI	2003	Eesti majanduspoliitika teel Euroopa Liitu Die Wirtschaftspolitik Estlands auf dem Weg in die Europäische Union Estonian Economic Policy on the way towards the European Union
XII	2004	Eesti majanduspoliitilised perspektiivid Euroopa Liidus Wirtschaftspolitische Perspektiven Estlands als Mitglied der Europäischen Union Economic Policy Perspectives of Estonia in the European Union
XIII	2005	XIII majanduspoliitika teaduskonverents Die XIII wirtschaftspolitische Konferenz 13th Scientific Conference on Economic Policy
XIV	2006	XIV majanduspoliitika teaduskonverents Die XIV wirtschaftspolitische Konferenz 14th Scientific Conference on Economic Policy
XV	2007	Eesti majanduspoliitika – kolm aastat Euroopa Liidus Die Wirtschaftspolitik Estlands – drei Jahre in der Europäischen Union Economic Policy of Estonia – three Years in the European Union
XVI	2008	Majanduspoliitika Euroopa Liidu riikides – aasta 2008 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2008 Economic Policy in the EU Member States – 2008
XVII	2009	Majanduspoliitika Euroopa Liidu riikides – aasta 2009 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2009 Economic Policy in the EU Member States – 2009
XVIII	2010	Majanduspoliitika Euroopa Liidu riikides – aasta 2010 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2010 Economic Policy in the EU Member States – 2010
XIX	2011	Majanduspoliitika Euroopa Liidu riikides – aasta 2011 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2011 Economic Policy in the EU Member States – 2012
XX	2012	Majanduspoliitika Euroopa Liidu riikides – aasta 2012 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2012 Economic Policy in the EU Member States – 2012
XXI	2013	Majanduspoliitika Euroopa Liidu riikides – aasta 2013 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2013 Economic Policy in the EU Member States – 2013
XXII	2014	Majanduspoliitika Euroopa Liidu riikides – aasta 2014 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2014 Economic Policy in the EU Member States – 2014
XXIII	2015	Majanduspoliitika Euroopa Liidu riikides – aasta 2015 Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2015 Economic Policy in the EU Member States – 2015

NB! Järgmine majanduspoliitika teaduskonverents toimub / Die nächste wirtschaftspolitische Konferenz findet start / The next scientific conference on economic policy will be held:

XXIV 30.06 – 2.07.2016 (Eesti-Estland-Estonia):
Majanduspoliitika Euroopa Liidu riikides – aasta 2016
Die Wirtschaftspolitik in den EU-Mitgliedsstaaten 2016
Economic Policy in the EU Member States – 2016

Täpsem informatsioon alates oktoobrist-novembrist 2015 / Genauere Informationen ab Oktober-November 2015 / More detailed information from October-November 2015: www.mattimar.ee

XXV 29.06 – 1.07.2017 (Eesti-Estland-Estonia):
Majanduspoliitika Euroopa Liidu riikides – aasta 2017
Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2017
Economic Policy in the EU Member States – 2017

XXVI 28. – 30.06.2018 (Eesti-Estland-Estonia):
Majanduspoliitika Euroopa Liidu riikides – aasta 2018
(Eesti Vabariik – 100)
Die Wirtschaftspolitik in den EU-Mitgliedsstaaten – 2018
(Republik Estland – 100)
Economic Policy in the EU Member States – 2018
(Republic of Estonia – 100)

INFORMATSIOON ajakirja toimkonnalt

Käesolev rahvusvaheline teadusajakiri-publikatsioon ilmub aastast 2007 (üks number aastas) ja aastast 2011 (kaks numbrit aastas).[1] Ajakiri arenes välja järjepidevuse alusel aastatel 1984–2006 ilmunud teadusartiklite kogumikest. Artiklite temaatika on seni hõlmanud paljude riikide majanduspoliitikat ning selle valdkondi nii ühe kui ka mitme riigi näitel ning nende omavahelistes suhetes ja võrdlustes. Lisaks Eestile on avaldatud artiklites uuritud paljude riikide majanduspoliitikat nagu **Georgia, Hiina, Iirimaa, Inglismaa, Jaapan, Kanada, Kreeka, Leedu, Läti, Rootsi, Saksamaa, Slovakkia, Šveits, Tšehhi, Ukraina, Ungari, USA, Venemaa.** Vähemal määral on käsitletud ka mitmeid teisi riike. Kajastust on leidnud järgmiste piirkondade, ühenduste või valdkondade majanduspoliitika: Euroopa ja Euroopa Liit, Euroopa Liidu regioonid, Euroopa rohelised pealinnad, Balti riigid ja Skandinaavia regioon, Ida- ja Kesk-Euroopa, Põhja-Euroopa, OECD-riigid jmt.

Lisaks traditsioonilistele majanduspoliitika valdkondadele on artiklites kajasta-mist leidnud ka avaliku sektori rahandus; regionaalne areng ja kohalike omavalit-suste arenguprobleemid, eelkõige haldusreformi vajadused ja võimalikud suunad; Euroopa Liidu finantssüsteem; Euroopa Liidu toetusmehhanismid ja -mudelid; raha-poliitika ja valuutakursid; euro-ruumi probleemid; finants- ja majanduskriis; majanduse globali-seerumine; ettevõtluse arengut toetavad erinevad majanduspoliitikad; J.M. Keynesi seisukohad ja paljud teised kompleksvaldkonnad.

Seni on avaldatud artiklite autorid esindanud järgmisi riike: **Austria, Eesti, Hiina, Läti, Saksamaa, Slovakkia, Tšehhi, Ungari, Venemaa.** Lisaks nimetatud riikidele olid enne 2007. aastat avaldatud artiklite autorite kaudu esindatud ka **Belgia, Leedu, Poola, Prantsusmaa ja Soome.**

Ajakirja toimkond soovib, et ajakirjas käsitletavate artiklite majanduspoliitiline geograafia laieneks tulevikus veelgi. Ajakirjas avaldatud artikleid kajastavad ja levi-tavad seni järgmised rahvusvahelised andmebaasid: DOAJ, EBSCO, EconBib, ECONIS, ESO, SSRN.

Lugupidamisega ning edukate koos- ja kaastöösoovidega
Teie ajakirja toimetus

[1] Aastatel 2007–2014 oli ajakirja ingliskeelne nimetus „Discussions on Estonian Economic Policy“. Eeskätt täpsuse, sh artiklite senise kajastuse ja ka edaspidise laiema majandus-poliitilise geograafia huvides täpsustasime aastast 2015 ajakirja nime ning selleks on nüüd inglise keeles – „Estonian Discussions on Economic Policy“. Ajakirja eesti- ja saksakeelne nimi jäi endiseks, ühtlasi on säilinud publikatsiooni järjepidevus.

INFORMATION des Redaktionsteams

Das vorliegende internationale Wissenschaftsmagazin erscheint seit 2007 (ein Mal pro Jahr) und seit 2011 (zwei Mal pro Jahr).[1] Die Zeitschrift hat ihre Ursprünge in den Sammelbändern von wirtschaftswissenschaftlichen Beiträgen, die in den Jahren 1984-2006 kontinuierlich erschienen. Die Thematik umfasst die Wirtschaftspolitik verschiedener Länder mit ihren vielfältigen Bereichen. Man geht vor allem auf die jeweiligen wirtschaftlichen Verflechtungen mit anderen Nationen ein und vergleicht sie untereinander. Neben Estland gibt es noch eine Reihe von anderen Ländern, die in den Artikeln auf ihre Wirtschaftspolitik hin untersucht werden wie **China, Deutschland, England, Georgien, Griechenland, Irland, Japan, Kanada, Lettland, Litauen, Russland, Schweden, die Schweiz, die Slowakei, Tschechien, Ukraine, Ungarn, die USA.** Im geringeren Umfang sind auch einige andere Länder in Beiträgen vertreten. Ebenso ist die Wirtschaftpolitik aus Sicht größerer und kleinerer Regionen thematisiert worden, z. B. Europa und die Europäische Union, einzelne Regionen der Europäischen Union, Europas Grüne Hauptstädte, die Baltischen Staaten und Skandinavien, Mittel- und Osteuropa, Nordeuropa, OECD-Staaten u.a.m.

Zusätzlich zu den klassischen Feldern der Wirtschaftspolitik wird in den Artikeln auch auf folgende Themengebiete eingegangen: Finanzwesen der öffentlichen Hand, regionale Entwicklung und Entwicklungsprobleme der kommunalen Selbstverwaltungen, Notwendigkeit einer Verwaltungsreform und mögliche Reformwege, Finanzsystem der EU, EU-Förderungsmechanismen und ihre Modelle, Geldpolitik und Währungskurse, Probleme der Eurozone, Finanz- und Wirtschaftskrise, Globalisie-rung der Wirtschaft, wirtschaftspolitische Instrumente zur Unternehmensförderung, Standpunkte von J.M. Keynes.

Unsere Autoren kommen aus **China, Deutschland, Estland, Lettland, Öster-reich, Russland, der Slowakei, Tschechien, Ungarn**. Vor 2007 sind Beiträge auch von **belgischen, finnischen, französischen, litauischen und polnischen** Autoren erschienen.

Der Wunsch des Redaktionsteams ist, dass sich der Autorenkreis geographisch weiter vergrößert. Die im Magazin publizierten Beiträge sind in folgenden interna-tionalen Datenbanken verfügbar: DOAJ, EBSCO, EconBib, ECONIS, ESO, SSRN.

Wir hoffen auf eine weitere erfolgreiche Zusammenarbeit
Ihr Redaktionsteam

[1] In den Jahren 2007–2014 lautete der englische Titel des Magazins „Discussions on Estonian Economic Policy“. Im Interesse der Genauigkeit und der breiteren geographischen Dimension der Beiträge wurde 2015 der englische Titel in „Estonian Discussions on Economic Policy“ geändert. Der Titel des Magazins in estnischer und deutscher Sprache blieb unverändert, gleichzeitig ist die Kontinuität der Zeitschrift erhalten geblieben.

INFORMATION from the editorial team

This international research journal (publication) has been published since 2007 (once a year) and 2011 (twice a year).[1] The journal developed as a successor of collections of research papers published in 1984–2006. The subjects of the papers have covered economic policies and their subject areas of many countries on the basis of case studies from one or several countries and considering their mutual relations and comparisons. Besides Estonian economic policy, the papers have treated economic policies of many countries, such as **Canada, China, Czech Republic, Georgia, Germany, Greece, Hungary, Ireland, Japan, Latvia, Lithuania, Russia, Slovakia, Sweden, Switzerland, Ukraine, United Kingdom, U.S.A.** Also other countries have been studied to a lesser extent. Economic policies of the following regions, associations or subject areas have been treated: Europe and the European Union, EU regions, European green capitals, the Baltic States and the Scandinavian region, Eastern and Central Europe, Northern Europe, OECD countries, etc.

In addition to traditional areas of economic policy the papers have treated also the issues of finances of the public sector; regional development and development problems of local municipalities, above all the need for and possible directions of the administrative reform; the financial system of the EU; the support structures and support models of the EU; monetary policy and currency exchange rates; Eurozone problems; financial and economic crisis; globalisation of the economy; different economic policies to support business development; positions of J.M. Keynes, and many other complex areas.

Authors of papers published until now have represented the following countries: **Austria, China, Czech Republic, Estonia, Germany, Hungary, Latvia, Russia, Slovakia.** Besides the above-mentioned countries also **Belgium, Finland, France, Lithuania** and **Poland** were represented by authors of papers published before 2007.

The editorial team would like to see in the future an even broader geography of economic policy of papers published in the journal. Papers published in this journal are presented and distributed by the following international databases: DOAJ, EBSCO, EconBib, ECONIS, ESO, SSRN.

With best wishes and looking forward to successful cooperation and contributions,
Editorial Team of the journal

[1] In 2007–2014 the English name of the journal was „Discussions on Estonian Economic Policy". Above all, for more accuracy concerning the topics of papers published until now, including in the interests of broader geography of economic policy in future, we specified the name of the journal from 2015 and it will be „Estonian Discussions on Economic Policy" in English. The name of the journal in German and Estonian remained the same, and the continuity of the publication was maintained.