RIZIKA ODHADU ÚSPĚŠNOSTI INVESTICE PŘI ALTERNATIVNÍM SCÉNÁŘI VÝVOJE EKONOMIKY

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Úvod

Investiční činnost je v podnikové praxi považována za rozhodující prvek akcelerace ekonomického rozvoje firmy ve všech jejích formách. Současné podmínky pro plánování investičních akcí nejsou vůbec jednoduché a poslední roky končící první dekády 2. tisíciletí přinesly do těchto procesů další prvky nejen nejistoty, ostatně to je pro investování symptomatické téměř vždy, ale byly nastoleny i nové a dlužno říci nečekané skutečnosti, jako např. poruchy na světových finančních trzích s dopady do téměř všech ekonomik světa, vyjma snad skupiny BRICS, kurzové výkyvy a v neposlední době i dluhové krize rozkolísávající i dosud stabilní ekonomiky. Tyto „efekty" dosud nebyly odstraněny a jejich řešení je v nedohlednu. Pro malý a střední podnik v českém ekonomickém rozměru jsou tyto poruchy relativně významné, zvláště s přihlédnutím k exportní orientaci našeho hospodářství a navázanosti řady firem na tato exportní odvětví. Dopady výše zmíněných nových „efektů" však působí i na firmy s převažujícím tuzemským určením, neboť trh odběratelů je silně provázán a chová se spíše senzitivně než racionálně.

1. Zásady investičního rozhodování

Ve většině výrobních společností dochází k momentu, kdy je především management společnosti postaven před rozhodnutí, zda má dále rozšiřovat svůj podnik a realizovat určitou investici nebo ne. To souběžně s tím nese řadu mnohostranných činností, které se v praxi nazývají kapitálové plánování. S tímto rozhodnutím však také souvisí riziko a nejistota jako významný atribut většiny lidských aktivit a tyto faktory je třeba zvažovat a integrovat do přípravy investičních projektů, jejich hodnocení a rozhodování o přijetí či zamítnutí. Kvalitní příprava a tvorba odůvodněných scénářů pak zvyšuje pravděpodobnost úspěšnosti zamýšlených projektů a může přispět i k lepším výsledkům než plánovaným. 6], [3], [1].

Investicí se rozumí pořízení hmotného i nehmotného majetku. Při plánování investičního projektu se předpokládá zvýšení peněžních příjmů během delšího časového období a zvýšení tržní hodnoty společnosti. Peněžní výdaje, u kterých se předpokládá návratnost delší než jeden rok, se nazývají kapitálovými výdaji.

V současné praxi rozlišujeme kapitálové výdaje na pořízení nehmotného investičního majetku, kapitálové výdaje na pořízení hmotného investičního majetku, výdaje na pořízení finančního majetku dlouhodobé povahy.

Kapitálovým výdajem na pořízení finančního majetku se rozumí zejména peněžní výdaje, které jsou vkládány do dlouhodobých cenných papírů, jako jsou např. obligace nebo dlouhodobé směnky. Do finančního majetku se řadí i majetkové cenné papíry, např. akcie.

Investiční majetek je možné pořídit různými způsoby:

- koupí,
- investiční výstavbou, která může probíhat dodavatelským způsobem, nebo ve vlastní režii,
- finančním leasingem,
- darováním.

Jakým způsobem se společnost rozhodne investiční majetek pořídit a z jakých zdrojů ho bude financovat, má velmi podstatný vliv na jeho budoucí přínos.

Investiční rozhodování má oproti provoznímu rozhodování své specifické rysy. Prvním charakteristickým znakem je dlouhý časový horizont, příprava a realizace má vliv na hospodaření společnosti několik let. Dlouhý časový

úsek sebou přináší rizika možnosti odchýlení od původních očekávaných příjmů z realizovaného projektu. Profinancování investice velmi často vyžaduje jednorázové vklady, které přesahuje možnosti společnosti. Investování majetku je úzce spojeno se zaváděním nových technologií, případně nových výrobků a dalších inovací. [2]

1.1 Příprava investičních projektů

Zvolení investičního cíle ve společnosti je spojeno s vypracováním příslušného investičního projektu, jehož realizovatelnost je třeba posoudit. Základem pro toto rozhodnutí a posouzení je vypracování prováděcí studie. Týká se především velkých investičních projektů a zajišťuje všechny důležité informace technické, obchodní a finanční.

Dle Valach, J. a kol. 13 by prováděcí studie měla zahrnovat následující položky:

- Souhrnný přehled hlavních výsledků shrnutých do celkové charakteristiky investičního projektu.
- Zdůvodnění a vývoj projektu – dokazuje především potřebnost projektu, a to z hlediska technického i ekonomického. Například přínos pro zabezpečení poptávky, pro nové možnosti zahraničních trhů a zdokonalení výroby.
- Kapacita trhu a produkce se soustřeďuje na rozbor stávajícího trhu a věnuje pozornost plánu do budoucna. Analyzuje konkurenci, substituční výrobky, ceny výrobku a hodnotí kvalitu.
- Materiálové vstupy rozebírají náročnost na základní materiály, hodnotí situaci na trhu, cenové podmínky, popřípadě možnost náhrady nebo využití polotovarů ve výrobě.
- Hodnocení celkové lokalizace a prostředí investičního projektu má význam především u velkých projektů, kdy je nutné dodržet ekologická nařízení, investici směrovat co nejvíce k dostupným zdrojům a surovinám.
- V organizačním projektu a plánu realizace se posuzují otázky konkrétního uspořádání ve výrobě při realizaci investice. Zaměřují se na otázky ohledně zaměstnanců, na zásobování, uspořádání ve výrobě apod.
- Finančně ekonomické vyhodnocení je závěrečnou částí prováděcí studie. Je významnou součástí a má pro společnost zásadní význam. Zde je vyhodnocena finanční náročnost dané investice z hlediska investičních nákladů, trvalého zvýšení oběžného majetku, náklady na počáteční přípravu, apod. Základem pro finančně ekonomické vyhodnocení je finanční analýza společnosti. 7

1.2 Financování investičních projektů

V současné době mají podniky na výběr různé možnosti financování svého investičního záměru. V této době, tj v období nejistoty možného návratu ekonomické recese, jsou dále naznačené zdroje ovlivňovány tímto „přízrakem“ a použití externích zdrojů je tak značně determinováno postojem těchto poskytovatelů zdrojů k budoucímu vývoji, přesněji k jejich ocenění tohoto rizika a neochotě jej podstupovat.

1.2.1 Interní zdroje financování

Interní neboli vnitřní financování se uskutečňuje z prostředků vytvořených vlastní činností podniku. Existují tři druhy interních zdrojů:

- financování ze zisku po zdanění a uhrazení dividend,
- financování ze zisku po zdanění a uhrazení dividend spolu s odpisy dlouhodobého majetku a jeho prodeje,
- financování z rezervních fondů.

Financování ze zisku je nejpoužívanější forma financování investic, i když výše zisku závisí na mnoha okolnostech. Jedna velmi podstatná a společností neovlivnitelná skutečnost je, v jaké fázi hospodářského cyklu se nachází národní hospodářství. V období stagnace nebo krize jsou zisky nižší. Pokud společnost podniká i v zahraničí je zisk ovlivněn i ekonomikami daných zemí. K financování plánovaných záměrů není ale možné zisk použít v plné výši. Podniky musí počítat s odvodem daní, tvorbou rezerv a popřípadě dalšími závazky.

Odpisy v daném období vyjadřují náklady spojené s opotřebením a znehodnocením investičního majetku. Nejsou zdrojem zisků, ale z hlediska reálných peněžních toků představují určitý druh příjmů. Jsou použity na obnovu dlouhodobého majetku podniku. Výše odpisů je určena druhem použité odpisové metody, oceněním odepisovaného dlouhodobého majetku a výši odpisových sazeb.

Za ostatní vlastní zdroje se ještě považuje prodej strojů, budov a dlouhodobého majetku. Prodej je však povětšinou doprovázen snížením hodnoty majetku společnosti.

1.2.2 Externí zdroje financování

Jakékoliv zdroje financování pořizované do podniku zvenčí nazýváme externí zdroje. Ty mohou pocházet od jiných podniků, investorů, pojišťoven, bank a dalších subjektů.

Mezi vnější financování se zahrnuje financování z vlastních zdrojů (tj. základním kapitálem) a cizích zdrojů (tj. cizím dlouhodobým kapitálem a krátkodobými cizími zdroji). Výhodou vnějšího financování je schopnost reagovat na potřebné změny podnikového majetku přesněji, než je tomu u zdrojů interních.

Financování z vlastních zdrojů je financováním ze základního kapitálu společnosti a je dlouhodobým zdrojem podniku. Jedná se o vklady společníků (peněžité i nepeněžité). Nákladem základního kapitálu jsou dividendy nebo podíly společníků na zisku. Pokud porovnáme náklady spojené s cizím a základním kapitálem, náklady na základní kapitál jsou většinou vyšší, ale poskytují nezanedbatelnou míru jistoty pro společnost.

Pokud není dostatek zdrojů a společnost nechce využít financování z cizích zdrojů, je možnou variantou financování investice navýšení základního jmění vklady společníků (peněžitými i nepeněžitými), případně emisí akcií u akciové společnosti. V krajním případě lze využít vkladu tichého společníka, kde však platí specifická pravidla.

Financování z cizích zdrojů je dluhem, který je společnost nucena splatit v předem stanovené lhůtě. Cizí kapitál dělíme do několika skupin:

- dlouhodobé a střednědobé úvěry,
- obligace,
- dodavatelské a krátkodobé úvěry,
- zvláštní formy financování (faktoring, forfaiting, leasing). [4], [9]

2. Případ vybrané společnosti

Následující výběr společnosti byl proveden na základě představení středně malé „dynamické“ firmy s jedním vlastníkem a několika zaměstnanci, která představuje typický regionální podnik s blízkým průmyslovým dodavatelským zázemím včetně kvalifikované pracovní síly. Tato firma je schopna v krátkém období reagovat jednak na poptávku spotřebitelů potřebnou inovací výrobních zařízení a jednak na nabídku státního programu jako certifikovaného systému. [11]

2.1 Výrobní program společnosti

Společnost BETA s.r.o., ve které bylo provedeno hodnocení investičního záměru, se zabývá vývojem a výrobou regulačních jednotek topných systémů. Tyto jednotky umožňují kombinovat vytápění pomocí solárních systémů, tepelných čerpadel, krbových vložek, vytápění peletkami a dalšími možnými alternativními zdroji vytápění. Regulační jednotka umožní v největší možné míře využít k vytápění alternativní topné zdroje. Až v okamžiku, kdy není možné využít levné zdroje, dochází k vytápění objektu elektrickým topením. Tento systém neřeší pouze ekonomickou stránku klienta, ale i významně přispívá k ochraně životního prostředí. Systém je zaregistrován ve státním programu Zelená úsporám, čímž může uspořit zákazníkovi část nákladů se zavedením topného systému.

Jelikož v posledních letech firma zaznamenala výrazný finanční posun, chtěla by rozšířit svůj výrobní program. Kromě regulačních jednotek topného systému chce společnost v příštím roce začít vyrábět tepelná čerpadla, která byla ve společnosti také vyvinuta. K zavedení nové výroby proto potřebuje rozšířit výrobní prostory, zajistit výrobní zařízení a přijmout nové zaměstnance.

2.2 Segmentace trhů, konkurence

Společnost se orientuje především na konečné tuzemské zákazníky, ti tvoří cca 40 % obratu společnosti. Další skupinou jsou montážní firmy, které systémy montují konečným zákazníkům, tato skupina tvoří cca 35 % obratu. Poslední skupinou zákazníků jsou velkoobchody, které začaly regulační jednotky odebírat během loňského roku a tvoří cca 25 % obratu. Podobnou segmentaci zákazníků společnosti očekává i u nově zaváděného výrobku – tepelného čerpadla. Firma by výhledově chtěla svoje výrobky nabídnout i na zahraniční trh. Z tohoto důvodu se nedávno zúčastnila výstavy AQUATHERM 2010, kde se prezentovala se svým programem nízkoenergetického vytápění. V průběhu roku 2011 má společnost v plánu otevřít vlastní maloobchodní prodejnu.

Při zvažování nového investičního projektu je třeba zvážit i konkurenční prostředí. Tepelná čerpadla na českém trhu nabízí firmy, které tato tepelná čerpadla přímo vyrábí. Mezi ně patří například firmy Hot Jet, TZP. Dalšími prodejci tohoto sortimentu jsou pak například firmy IVT,

Niebe, Stiebel Electron, které na náš trh dodávají tepelná čerpadla zahraniční výroby.

3. Vyhodnocení plánovaného investičního projektu

Vybraná hodnocená společnost BETA s.r.o. plánuje novou investici –zavedení výroby tepelných čerpadel, vyvinutých ve společnosti. Jedná se o tepelná čerpadla „země-voda“, která tepelnou energii čerpají z vrtu nebo z plošného zemního kolektoru. Součástí tepelného čerpadla je i výše zmíněná regulační jednotka (stávající výrobek společnosti), která dokáže řídit provoz tepelného čerpadla, zároveň umožní propojení tepelného čerpadla s dalšími alternativními zdroji vytápění a řídí ekonomický provoz celého topného systému.

Pro zavedení výroby je třeba pořídit další výrobní zařízení, rozšířit stávající provozní prostory a přijmout nové zaměstnance, kteří by prováděli montáž tepelných čerpadel.

Potřebným výrobním zařízením je osazovací linka pro plošné spoje. V současné době společnost využívá externího dodavatele, který zajišťuje toto osazování. Vzhledem k očekávanému nárůstu prodeje nového čerpadla se zdá ekonomicky výhodnější pořízení vlastního stroje. Pořizovací cena linky je 1.200 tis. Kč.

Pro výrobu tepelných čerpadel bude třeba najmout nové zaměstnance. Doposud výroba regulačních jednotek probíhala pouze v režii majitele firmy, případně externích firem. Vzhledem k očekávanému odbytu bude třeba výrobu čerpadel zajistit zaměstnanecky. Očekává se, že bude nutno zaměstnat 2–3 nové pracovníky dělnické profese.

3.1 Změny v tržbách společnosti dle alternativního scénáře vývoje ekonomiky

Současné metody hodnocení efektivnosti investičních projektů se opírají o prognózu kapitálových výdajů a očekávaných peněžních příjmů investice. Stanovení předpokládaného peněžního toku z investic je nejobtížnější úkol kapitálového plánování a investičního rozhodování. Jestliže prognóza není reálná, pak i celé rozhodování o výběru nejvhodnější varianty projektu je nepřesné.

Velikost očekávaných kapitálových výdajů a peněžních příjmů je ovlivněna celou řadou faktorů, jejichž spolehlivý předpoklad na delší období je obtížný. Jedná se například o vývoj cen, vývoj kurzů, aj. Zároveň je potřeba počítat s jejich změnami, které velmi výrazně mohou ovlivnit hodnocení projektu. Proto je nutné při plánování očekávaných kapitálových výdajů a peněžních příjmů počítat s rizikem odchylného vývoje od předpokladu. [9]

Plánovaný investiční záměr, který byl popsán v kapitole 3., by měl významně zvýšit tržby společnosti. Aby byly posouzeny všechny možné varianty vývoje, je nutno při hodnocení variant financování kalkulovat s několika variantami nárůstu tržeb dle očekávané tržní situace. S přihlédnutím k výše naznačeným alternativám budou vytvořeny a následně analyzovány **3 scénáře vývoje hospodaření společnosti.**

Bude posouzen vývoj hospodaření společnosti:

1) při stabilní ekonomické situaci v národním hospodářství,
2) dále očekávaný stav v případě ekonomické expanze,
3) nakonec i scénář při recesi.

Kalkulovaná průměrná prodejní cena jednoho čerpadla byla podle předběžné kalkulace stanovena na 125 tis. Kč. V následující tabulce č. 1 jsou uvedeny předpokládané prodeje v následujících pěti letech pro všechny uvažované varianty ekonomického vývoje národního hospodářství. Základní cena výrobku ve výši 125 tis. Kč je uvažována jen v roce 2011. V dalších letech se cena bude vyvíjet v návaznosti na uvažovanou variantu hospodářského vývoje celé ekonomiky.

Ad 1) Při stabilní ekonomické situaci společnost předpokládá každoroční nárůst odběrů čerpadel ve výši 10 %, přičemž je uvažován i meziroční nárůst ceny za jedno čerpadlo o 5 %.

Ad 2) Při expanzi se očekává meziroční nárůst odběrů o 25 %, nárůst ceny za jedno čerpadlo o 10 %.

Ad 3) Při recesi je nárůst počtu prodaných čerpadel o 5 % a nárůst ceny čerpadla o 1 % ročně. Nárůst tržeb při recesi vývoje ekonomiky se očekává vzhledem k tomu, že se jedná o nový výrobek a lze předpokládat, že i při recesi je společnost schopna docílit nárůstu tržeb vzhledem k postupnému zavádění výrobku na trh.

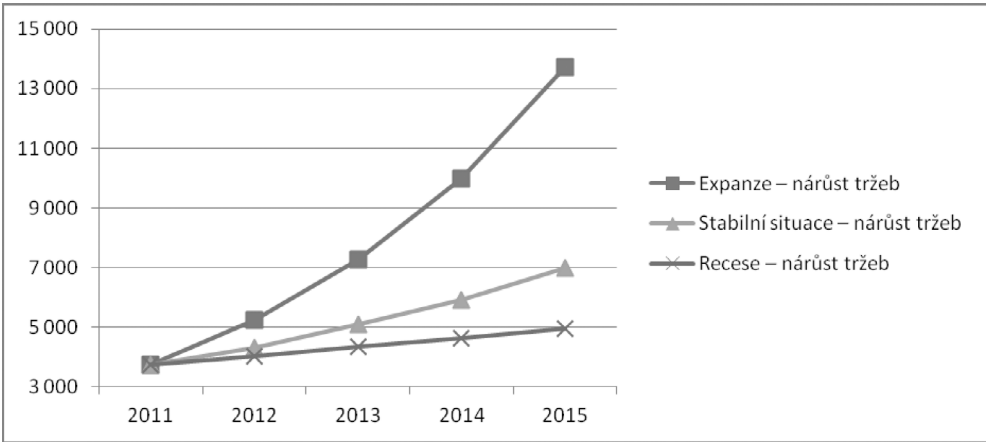
Tab. 1: Plánovaný vývoj tržeb společnosti (počet v ks, tržby v tis. Kč)

	2011	2012	2013	2014	2015
Expanze – počet čerpadel	30	38	48	60	75
Expanze – nárůst tržeb	3 750	5 225	7 260	9 983	13 726
Stabilní situace – počet čerpadel	30	33	37	41	46
Stabilní situace – nárůst tržeb	3 750	4 331	5 099	5 933	6 989
Recese – počet čerpadel	30	32	34	36	38
Recese – nárůst tržeb	3 750	4 040	4 335	4 636	4 943

Zdroj: vlastní zpracování

Následující obrázek zobrazuje výše uvedené nárůsty tržeb společnosti

Obr. 1: Plánovaný vývoj tržeb



Zdroj: vlastní zpracování

3.1.1 Analýza plánovaného vývoje při stabilní ekonomické situaci

Při stabilní ekonomické situaci je v propočtech kalkulováno s nárůstem cenové hladiny o 5 % ročně. Tento nárůst je v plánu zahrnut v některých položkách aktiv a pasiv (nárůst stavu zásob, pohledávek a závazků). Do výkazu zisku a ztrát se promítne předpokládaný 5% nárůst nájemného, mzdových nákladů, nákladů na služby. S novou výrobou samozřejmě také vzrostou variabilní náklady na tepelná čerpadla, které se odvíjí od počtu prodaných kusů (náklady na materiál a zpracování), kalkulovaný variabilní náklad na 1 čerpadlo roste meziročně o 5 %. Nárůst výnosů při stabilní ekonomické situaci byl uveden v tabulce 1.

Tab. 2: Analýza plánovaného vývoje při stabilní ekonomické situaci (v tis. Kč)

Rok	2011	2012	2013	2014	2015	Celkem
Počet čerpadel	30	33	37	41	46	**187**
Nárůst tržeb	3 750	4 331	5 099	5 933	6 989	**26 102**
Nárůst nákladů bez nákladů na investice	3 146	3 584	4 155	4 775	5 555	**21 215**
Nárůst variabil. nákladů	2 670	3 084	3 631	4 224	4 976	**18 585**
Nájemné za prostory	*90*	*95*	*99*	*104*	*109*	***497***
Mzdové náklady	*386*	*405*	*425*	*447*	*469*	***2 132***
Náklady na investici						
Bez investice – dodavatelsky	**220**	**247**	**281**	**318**	**365**	**1 431**
Náklady na služby osazování	150	173	204	237	280	**1 044**
Náklady na stávající výrobu	70	74	77	81	85	**387**
Pořízení na úvěr	**316**	**300**	**283**	**266**	**249**	**1 414**
Úroky	76	60	43	26	9	**214**
Odpisy	240	240	240	240	240	**1 200**
Pořízení na leasing – splátka	**270**	**270**	**270**	**270**	**270**	**1 350**
Akontace – nákl. daného roku	80	80	80	80	80	**400**
Splátka stroje	190	190	190	190	190	**950**

Zdroj: vlastní zpracování

3.1.2 Analýza plánovaného vývoje při expanzi ekonomiky

Dalším uvažovaným vývojem pro porovnání vhodného financování je analýza společnosti při expanzi ekonomiky. V tomto období je předpokládán největší nárůst počtu kusů prodaných čerpadel a to o 25 % ročně, zároveň se také uvažuje nárůst ceny o 10 %, tím se celkový nárůst tržeb zvýší cca o 38 % ročně. Zároveň je nutné uvažovat nárůst nákladů o 10 % ročně. Tento nárůst se projeví u stejných položek rozvahy a výkazu zisku a ztrát.

Vzhledem ke skutečnosti, že od roku 2014 převýší očekávaný počet vyrobených čerpadel 50 ks, bylo nutno předpokládat se zaměstnáním dalšího pracovníka, tj. mzdové náklady od roku 2014 jsou kalkulovány na 3 zaměstnance.

Tab. 3: Analýza plánovaného vývoje při expanzi (v tis. Kč)

Rok	2011	2012	2013	2014	2015	Celkem
Počet čerpadel	30	38	48	60	75	**251**
Nárůst tržeb	3 750	5 225	7 260	9 983	13 726	**39 943**
Nárůst nákladů bez nákladů na investice	3 146	4 244	5 745	7 998	10 752	**31 885**
Nárůst variabil. nákladů	2 670	3 720	5 169	7 108	9 773	**28 440**
Nájemné za prostory	*90*	*99*	*109*	*120*	*132*	***549***
Mzdové náklady	*386*	*425*	*467*	*770*	*848*	***2 895***
Náklady na investici						**0**
Bez investice – dodavatelsky	**220**	**286**	**375**	**492**	**652**	**2 025**
Náklady na služby osazování	150	209	290	399	549	**1 598**

Tab. 3: Analýza plánovaného vývoje při expanzi (v tis. Kč)

Rok	2011	2012	2013	2014	2015	Celkem
Náklady na stávající výrobu	70	77	85	93	102	**427**
Pořízení na úvěr	**316**	**300**	**283**	**266**	**249**	**1 414**
Úroky	76	60	43	26	9	**214**
Odpisy	240	240	240	240	240	**1 200**
Pořízení na leasing – splátka	**270**	**270**	**270**	**270**	**270**	**1 350**
Akontace – nákl. daného roku	80	80	80	80	80	**400**
Splátka stroje	190	190	190	190	190	**950**

Zdroj: vlastní zpracování

3.1.3 Analýza plánovaného vývoje při recesi ekonomiky

Nejen v minulých dvou letech jsme byli svědky hospodářské krize a s tím spojené recese ekonomiky, ale její recidiva je možná i v této době či budoucnosti. Proto je při hodnocení investice vhodné uvažovat také o situaci ekonomické stagnace. I přes tento uvažovaný vývoj není předpoklad úplné stagnace prodeje. Jelikož se u firmy BETA s.r.o. jedná o nový výrobek, lze očekávat nárůst v počtu prodaných kusů s tím, jak bude výrobek zaváděn na trh. Předpokládá se ale navýšení prodaných kusů pouze o 5 % a nárůst cen velmi nepatrný, pouze 1 % ročně. Tento mírný nárůst cen o 1 % ročně lze očekávat i u jednotlivých nákladových položek.

Tab. 4: Analýza plánovaného vývoje při recesi (v tis. Kč)

Rok	2011	2012	2013	2014	2015	Celkem
Počet čerpadel	30	32	34	36	38	**170**
Nárůst tržeb	3 750	4 040	4 335	4 636	4 943	**21 705**
Nárůst nákladů bez nákladů na investice	3 146	3 357	3 572	3 791	4 015	**17 881**
Nárůst variabil. nákladů	2 670	2 876	3 087	3 301	3 519	**15 454**
Nájemné za prostory	*90*	*91*	*92*	*93*	*94*	***459***
Mzdové náklady	*386*	*390*	*394*	*398*	*402*	***1 969***
Náklady na investici						**0**
Bez investice – dodavatelsky	**220**	**232**	**245**	**258**	**271**	**1 225**
Náklady na služby osazování	150	162	173	185	198	**868**
Náklady na stávající výrobu	70	71	71	72	73	**357**
Pořízení na úvěr	**316**	**300**	**283**	**266**	**249**	**1 414**
Úroky	76	60	43	26	9	**214**
Odpisy	240	240	240	240	240	**1 200**
Pořízení na leasing – splátka	**270**	**270**	**270**	**270**	**270**	**1 350**
Akontace – nákl. daného roku	80	80	80	80	80	**400**
Splátka stroje	190	190	190	190	190	**950**

Zdroj: vlastní zpracování

4. Navržení vhodného financování

Jako možné zdroje financování pro investiční záměr ve společnosti BETA s.r.o. připadají v úvahu dlouhodobý bankovní úvěr nebo leasing. Obě varianty byly porovnány s možností nepořízení investice a řešení osazování součástek dodavatelsky. 10

4.1 Hodnocení pro stabilní ekonomickou situaci

Z plánovaného vývoje společnosti pro jednotlivé varianty financování, uvedené v kapitole 3.1, byly vypočteny finanční ukazatele uvedené v tabulkách č. 5 až 7.

Tab. 5: Finanční ukazatele pro variantu nerealizování investičního záměru

Bez investice	2011	2012	2013	2014	2015
Rentabilita VK	3,5 %	7,7 %	8,2 %	15,1 %	21,3 %
Rentabilita celkového vloženého kapitálu	1,5 %	3,2 %	3,5 %	6,7 %	10,7 %
Doba obratu zásob	141	137	133	123	113
Doba obratu pohledávek	22	32	31	28	26
Likvidita 2stupně (pohotová)	36,9 %	31,2 %	31,0 %	36,7 %	45,4 %
Likvidita 3stupně (běžná)	150,7 %	155,3 %	152,3 %	165,1 %	188,5 %
Zadluženost 3stupně (celková zadluženost)	59,4 %	57,9 %	57,6 %	53,6 %	46,7 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	42,66	98,75	114,24	238,13	403,65
Půjčka společníka (v tis. Kč)	1 300,00	1 300,00	1 400,00	1 350,00	1 200,00

Zdroj: vlastní zpracování

Tab. 6: Finanční ukazatele pro variantu financování bankovním úvěrem

Úvěr	2011	2012	2013	2014	2015
Rentabilita VK	-4,3 %	4,6 %	8,7 %	18,9 %	26,6 %
Rentabilita celkového vloženého kapitálu	-1,6 %	1,4 %	2,9 %	7,3 %	12,7 %
Doba obratu zásob	141	137	133	123	113
Doba obratu pohledávek	22	32	31	28	26
Likvidita 2stupně (pohotová)	31,8 %	27,6 %	28,9 %	36,3 %	44,1 %
Likvidita 3stupně (běžná)	145,6 %	145,4 %	150,2 %	164,7 %	187,2 %
Zadluženost 3stupně (celková zadluženost)	70,8 %	68,9 %	65,2 %	58,1 %	47,0 %
Úrokové krytí	-1,7	0,1	2,3	12,5	67,5
Zisk (v tis. Kč)	-50,67	54,46	109,19	273,86	486,38
Půjčka společníka (v tis. Kč)	1 300,00	1 400,00	1 400,00	1 350,00	1 200,00

Zdroj: vlastní zpracování

Tab. 7: Finanční ukazatele pro variantu leasingového pronájmu

Leasing	2011	2012	2013	2014	2015
Rentabilita VK	-0,6 %	6,1 %	9,4 %	18,7 %	25,9 %
Rentabilita celkového vloženého kapitálu	-0,3 %	2,2 %	3,6 %	8,0 %	13,2 %
Doba obratu zásob	141	137	133	123	113
Doba obratu pohledávek	22	32	31	28	26
Likvidita 2stupně (pohotová)	28,4 %	26,2 %	27,1 %	31,9 %	46,9 %
Likvidita 3stupně (běžná)	126,0 %	132,9 %	137,3 %	160,3 %	198,3 %
Zadluženost 3stupně (celková zadluženost)	64,0 %	62,9 %	61,0 %	53,8 %	44,4 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	-7,43	75,41	125,28	286,38	498,21
Půjčka společníka (v tis. Kč)	1 600,00	1 600,00	1 600,00	1 350,00	1 100,00

Zdroj: vlastní zpracování

Z porovnání poměrových ukazatelů jednotlivých variant vyplývá, že v případě předpokladu stabilní ekonomické situace by pro společnost byla výhodná varianta financování jak úvěrem, tak i pomocí leasingu. Podle zisku společnosti i dle rentability celkového vloženého kapitálu by bylo možné usuzovat na variantu leasingového financování. 12 Tam je ale nutné vzít v úvahu vysokou první splátku, na kterou nemá společnost v současné době vlastní zdroje. V plánu je zdrojem pro tuto akontaci navýšení půjčky společníka do firmy. Pokud by tato splátka nebyla financována tímto bezúročným vkladem společníka, byla by výsledovka zatížena dalšími úrokovými náklady, které by ovlivnily vyhodnocené ukazatele. V případě bezúročného vkladu společníka zde vznikají náklady ztracené příležitosti, se kterými nebylo kalkulováno v propočtech jednotlivých ukazatelů. Nejhůře zde vychází varianta, kdy je osazování řešeno dodavatelským způsobem.

Ukazatele pro dobu obratu zásob a dobu obratu pohledávek jsou pro všechny varianty financování totožné, nemají tak význam při posuzování nejvhodnější varianty financování.

Likvidita druhého i třetího stupně je stabilní a podobná pro všechny navržené varianty. Likvidita druhého stupně je nižší než doporučená spodní hranice, likvidita třetího stupně je u varianty bez pořízení investice a u úvěru v doporučeném limitu, pouze u leasingu je v prvních třech letech pod spodní doporučenou hranicí.

Vývoj těchto ukazatelů je zpracován do obrázku 2 na straně 47.

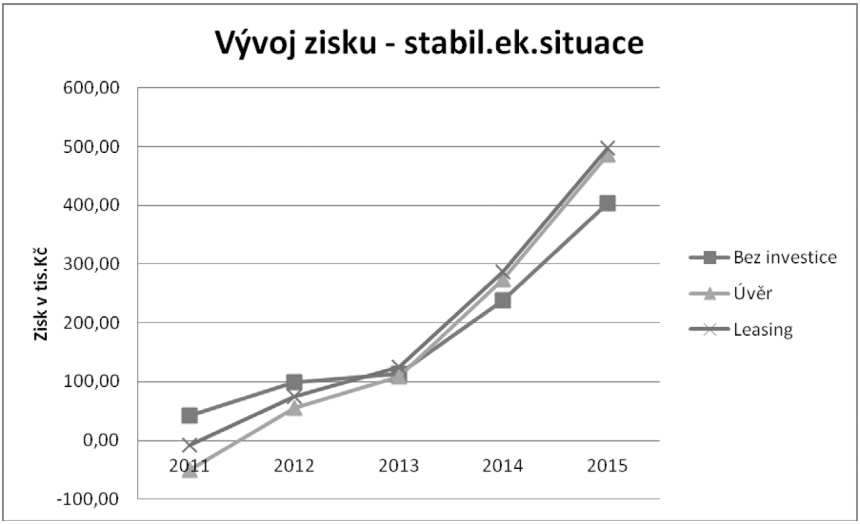
Z tohoto obrázku jednoznačně vyplývá, že nejméně vhodné by bylo investiční záměr nerealizovat. Varianty uvěrového a leasingového financování jsou z hlediska vyhodnocení zisku velmi podobné. V případě, že by měla společnost více vlastních zdrojů, které by pokryly akontační splátku, bylo by navrženo financování přes leasingovou společnost.

4.2 Hodnocení pro očekávanou ekonomickou expanzi

Podklady pro výpočet ukazatelů pro hodnocení v expanzivním vývoji ekonomiky byly opět čerpány z analýzy plánovaného vývoje společnosti, která byla sestavena podle parametrů uvedených v kapitole 3.1.

Následující tabulky č. 8 až 10 shrnují výsledky provedené analýzy pro jednotlivé zvolené varianty financování projektu – tj. výsledky finanční analýzy pro nerealizovaný investiční záměr, pro pořízení investice na bankovní úvěr a pro případ využití leasingového financování.

Obr. 2: **Nárůst zisku společnosti pro jednotlivé varianty stabilní ekonomické situace**



Zdroj: vlastní zpracování

Tab. 8: **Finanční ukazatele pro variantu nerealizování investičního záměru**

Bez investice	**2011**	**2012**	**2013**	**2014**	**2015**
Rentabilita VK	3,5 %	22,1 %	32,2 %	34,1 %	42,4 %
Rentabilita celkového vloženého kapitálu	1,5 %	9,7 %	16,8 %	22,0 %	33,8 %
Doba obratu zásob	141	121	106	88	72
Doba obratu pohledávek	22	29	24	20	17
Likvidita 2stupně (pohotová)	36,9 %	34,3 %	45,2 %	78,2 %	237,7 %
Likvidita 3stupně (běžná)	150,7 %	169,5 %	205,9 %	318,7 %	650,4 %
Zadluženost 3stupně (celková zadluženost)	59,4 %	53,3 %	43,2 %	28,2 %	14,0 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	42,66	308,61	594,79	880,21	1 629,18
Půjčka společníka (v tis. Kč)	1 300,00	1 200,00	1 000,00	500,00	0,00

Zdroj: vlastní zpracování

Tab. 9: Finanční ukazatele pro variantu financování bankovním úvěrem

Úvěr	2011	2012	2013	2014	2015
Rentabilita VK	-4,3 %	23,4 %	38,1 %	40,7 %	47,3 %
Rentabilita celkového vloženého kapitálu	-1,6 %	7,7 %	17,0 %	26,3 %	39,0 %
Doba obratu zásob	141	121	106	88	72
Doba obratu pohledávek	22	29	24	20	17
Likvidita 2stupně (pohotová)	31,8 %	30,7 %	43,9 %	105,2 %	312,7 %
Likvidita 3stupně (běžná)	145,6 %	162,2 %	227,0 %	467,4 %	725,4 %
Zadluženost 3stupně (celková zadluženost)	70,8 %	63,6 %	47,2 %	24,2 %	12,7 %
Úrokové krytí	-1,7	4,3	15,7	44,0	233,7
Zisk (v tis. Kč)	-50,67	303,56	683,71	1 090,06	1 998,79
Půjčka společníka (v tis. Kč)	1 300,00	1 250,00	800,00	100,00	0,00

Zdroj: vlastní zpracování

Tab. 10: Finanční ukazatele pro variantu leasingového pronájmu

Leasing	2011	2012	2013	2014	2015
Rentabilita VK	-0,6 %	24,0 %	37,5 %	39,9 %	46,5 %
Rentabilita celkového vloženého kapitálu	-0,3 %	9,5 %	18,8 %	27,4 %	39,1 %
Doba obratu zásob	141	121	106	88	72
Doba obratu pohledávek	22	29	24	20	17
Likvidita 2stupně (pohotová)	26,6 %	30,6 %	39,7 %	94,8 %	326,5 %
Likvidita 3stupně (běžná)	126,6 %	146,2 %	200,4 %	416,4 %	739,1 %
Zadluženost 3stupně (celková zadluženost)	63,4 %	57,7 %	42,4 %	21,2 %	12,5 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	-7,43	324,52	699,80	1 102,59	2 010,62
Půjčka společníka (v tis. Kč)	1 550,00	1 500,00	1 000,00	200,00	0,00

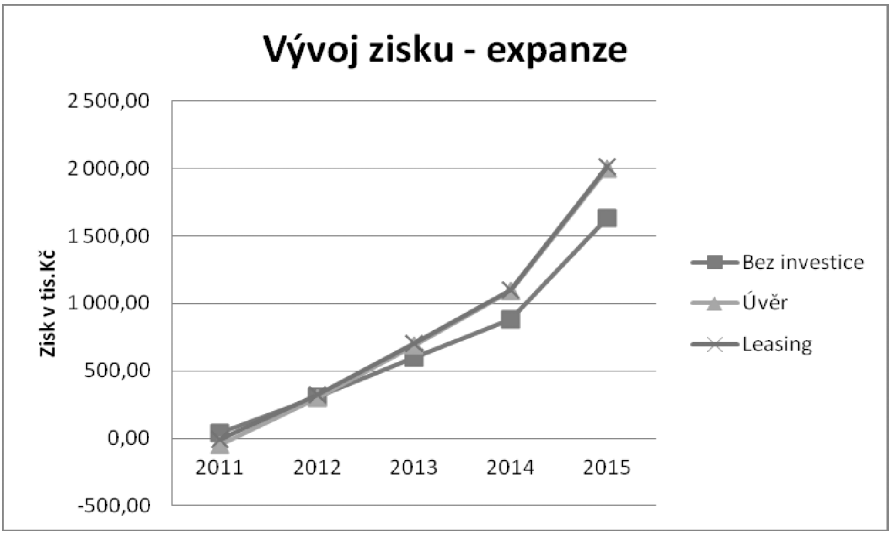
Zdroj: vlastní zpracování

Po provedení finanční analýzy při expanzivním vývoji ekonomiky by opět byla společnosti doporučena varianta financování pomocí prostředků získaných z bankovního úvěru. Ukazatele vychází velmi podobně u obou variant financování v případě realizace plánovaného projektu.

4.3 Hodnocení pro očekávanou ekonomickou recesi

Posledním očekávaným vývojem hospodářské situace společnosti byla recese. Jak již bylo uvedeno výše, společnost předpokládá i přes celkovou ekonomickou stagnaci nárůst tržeb o 5 % z důvodu zavádění nového výrobku na trh. Nepředpokládá se tedy, že by se výrobek na trhu v období recese vůbec neprodával.

Obr. 3: **Nárůst zisku společnosti pro jednotlivé varianty při expanzi**



Zdroj: vlastní zpracování

Tab. 11: **Finanční ukazatele pro variantu nerealizování investičního záměru**

Bez investice	**2011**	**2012**	**2013**	**2014**	**2015**
Rentabilita VK	3,5 %	2,9 %	-2,5 %	-0,3 %	1,1 %
Rentabilita celkového vloženého kapitálu	1,5 %	1,2 %	-1,0 %	-0,1 %	0,4 %
Doba obratu zásob	141	143	143	137	132
Doba obratu pohledávek	22	34	33	31	30
Likvidita 2stupně (pohotová)	36,9 %	31,5 %	27,5 %	28,3 %	27,6 %
Likvidita 3stupně (běžná)	150,7 %	152,5 %	142,7 %	141,2 %	138,3 %
Zadluženost 3stupně (celková zadluženost)	59,4 %	58,8 %	60,8 %	61,6 %	62,0 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	42,66	35,96	-31,71	-3,92	13,83
Půjčka společníka (v tis. Kč)	1 300,00	1 300,00	1 400,00	1 450,00	1 500,00

Zdroj: vlastní zpracování

Tab. 12: Finanční ukazatele pro variantu financování bankovním úvěrem

Úvěr	2011	2012	2013	2014	2015
Rentabilita VK	-4,3 %	-2,0 %	-6,7 %	-2,8 %	0,2 %
Rentabilita celkového vloženého kapitálu	-1,6 %	-0,6 %	-2,0 %	-0,8 %	0,1 %
Doba obratu zásob	141	143	143	137	132
Doba obratu pohledávek	22	34	33	31	30
Likvidita 2stupně (pohotová)	31,8 %	27,1 %	26,5 %	26,1 %	23,8 %
Likvidita 3stupně (běžná)	145,6 %	141,8 %	136,0 %	133,6 %	124,7 %
Zadluženost 3stupně (celková zadluženost)	70,8 %	70,2 %	70,5 %	69,5 %	68,7 %
Úrokové krytí	-1,7	-1,2	-2,0	0,8	14,3
Zisk (v tis. Kč)	-50,67	-22,78	-73,06	-28,96	2,46
Půjčka společníka (v tis. Kč)	1 300,00	1 400,00	1 500,00	1 550,00	1 700,00

Zdroj: vlastní zpracování

Tab. 13: Finanční ukazatele pro variantu leasingového pronájmu

Leasing	2011	2012	2013	2014	2015
Rentabilita VK	-0,6 %	-0,2 %	-4,9 %	-1,5 %	1,3 %
Rentabilita celkového vloženého kapitálu	-0,3 %	-0,1 %	-1,7 %	-0,5 %	0,4 %
Doba obratu zásob	141	143	143	137	132
Doba obratu pohledávek	22	34	33	31	30
Likvidita 2stupně (pohotová)	26,6 %	25,7 %	25,0 %	25,5 %	25,1 %
Likvidita 3stupně (běžná)	126,6 %	129,6 %	124,7 %	128,1 %	130,7 %
Zadluženost 3stupně (celková zadluženost)	63,4 %	64,1 %	66,4 %	66,3 %	65,5 %
Úrokové krytí	X	X	X	X	X
Zisk (v tis. Kč)	-7,43	-1,83	-56,97	-16,44	14,29
Půjčka společníka (v tis. Kč)	1 550,00	1 600,00	1 700,00	1 650,00	1 600,00

Zdroj: vlastní zpracování

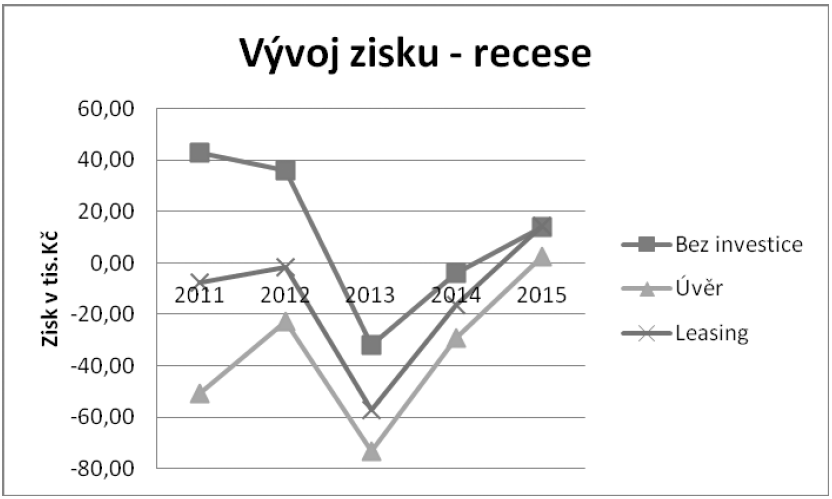
Při porovnání ukazatelů za předpokladu recese v hospodářském vývoji bylo společnosti navrženo řešit osazování komponentů dodavatelským způsobem, jelikož důležité ukazatele finanční analýzy u obou variant financování investičního záměru vychází pro firmu nepříznivě. Záporné hodnoty vlastního i celkového vloženého kapitálu jsou způsobené záporným hospodářským výsledkem, který se u obou variant předpokládá po dobu čtyř let. Nepatrný zisk při financování úvěrem je zaznamenán až v pátém roce, totéž i v případě leasingového pronájmu. Toto je pro malou společnost nepřijatelné.

Z výše uvedeného obrázku 4 je patrná ztráta společnosti v prvních čtyřech letech při realizaci investičního záměru u obou dvou vybraných způsobů financování.

Závěr

Rozhodnutí o realizaci investičního záměru je velmi náročnou, zodpovědnou a téměř vždy i riskantní činností, jejím zdůvodněním bývá

Obr. 4: Nárůst zisku společnosti pro jednotlivé varianty při recesi



Zdroj: vlastní zpracování

potřeba růstu firmy, obrana před jinými rozvíjejícími se firmami či expanze do dalších segmentů trhu. Tento krok byl v případě posuzování investičního záměru vybrané firmy hodnocen z pohledu dvou možných variant financování v porovnání s variantou nerealizování projektu. Tyto varianty pak byly ještě jednotlivě posuzovány pro tři rozdílné ekonomické situace hospodářského vývoje.

Při předpokládaném standardním nebo expanzivním vývoji ekonomiky bylo společnosti navrženo financování bankovním úvěrem při uvažovaném cca 7% úroku. Úroková sazba vychází z průměrných sazeb podnikatelských úvěrů různých bankovních společností na našem trhu. Majiteli společnosti byla dána možnost výběru i leasingového pronájmu, kde ukazatelé rentability a návratnosti kapitálu vycházely lépe, ale na začátku financování by byl nutný vklad majitele společnosti ve výši akontace a první splátky leasingu, to však nebylo v důsledku nedostatečných vlastních zdrojů možné.

Zajímavé závěry vyplynuly při předpokladu recesního hospodářského vývoje ekonomiky. Z vypočítaných ukazatelů vycházejících z finanční analýzy vyplynulo pro společnost jako nejvýhodnější podnikatelský záměr vůbec neuskutečnit. Nízký nárůst tržeb a velmi malý předpokládaný vzestup cen by nebyl schopen společnosti zatížené úvěrem nebo leasingovým pronájmem přinést ani minimální zisk. Pro společnost by bylo nejvýhodnější zajišťovat osazování plošných spojů výrobků dodavatelským způsobem. V tomto případě při snížení reálného prodeje pod hranici 5 %, která byla v analýze recese uvažována, je možné operativně zúžit i výrobní program společnosti bez rizika ohrožení existence společnosti.

Analýza několika scénářů možného vývoje ekonomiky doporučila realizovat investiční záměr pro dva její optimální stavy, tj stav stability a expanze. Pro případný recesní vývoj nelze investici doporučit, lze zvážit pouze tzv. dodavatelský způsob. Doporučení pro realizaci optimálních stavů přesto riziko nenaplnění očekávaných efektů plně neeliminuje a to vždy zůstává součástí celkové odpovědnosti vlastníka firmy.

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Abstract

RISK ESTIMATION SUCCESSFUL OF INVESTMENT BY ALTERNATIVE SCRIPT OF DEVELOPMENT ECONOMY

Ivan Jáč

The goal of the Article is focused on evaluating an investment project as a planned project. The first charter concerns a theoretical part, in which there are described a theory of decision making on investment, investment projects and their preparations and possibilities how to make a financial analysis by means of ratio indexes. Then there are listed theoretical possibilities, how to evaluate the investment project and possibilities how to finance the investments. The second chapter concerns the description of a company BETA s.r.o., the companyįs production schedule and its position in the market. In this part there are described the fundamental indexes of financial analysis in detail concerning the existing business of this company. In the third part of this paper there is an introduction of a planned investment project and examination of financial advantages of individual options by means of analyzing the ratio indexes of expected business development. There were analyzed 2 alternatives how to finance the investments by means of a bank credit and a leasing in comparison with supplier solution without a need of execution of investment. All of those alternatives were consequently evaluated on a model of the economical growth, recession or stable development of national economy.

In the last part there are compared individual alternatives how to finance the investment project and there is a recommendation for optimal alternative how to execute the investment project.

The analysis selected alternatives show for two possibilities of finance the investment project, bat the responsibility of this project stay by proprietor firm with the propability of risk achieve success a planned project.

***Key Words**: investment project, financial analysis, bank credit, leasing, economical growth, recession, stable development, national economy, responsibility, proprietor.*

***JEL Classification**: M40, M50.*

example, the monthly return for a three-month holding period is based on an equally-weighted average of portfolio returns from this month's strategy, last month's strategy, and the strategy from two months ago.

VI. Hypotheses

If the pattern of the past period stock returns continue in the same direction over the next period, then we form momentum portfolio by deducting returns of loser portfolio (low return stocks) from returns of winner portfolio (high return stocks) in the holding period. Therefore, the null hypothesis (H_0) and the alternative hypothesis (H_1) can be developed as follows.

$$H0: E\left(R_{W,t+K} - R_{L,t+K}\right) = 0$$

$$H1: E\left(R_{W,t+K} - R_{L,t+K}\right) > 0$$

Where

$R_{W, t+K}$ = Winners` returns in the next period (holding period)

$R_{L, t+K}$ = Losers` returns in the next period (holding period),

t + K = Holding period (months),

K = Number of months.

The null hypothesis indicates that winners and losers have the same expected returns in the holding period while the alternative hypothesis indicates that expected returns of winners are higher than that of losers in the holding period.

VII. Test of Significance

The significance of the momentum and contrarian profits is measured using the t-statistics and the t – values are computed as follows.

$$t = \frac{E(R_{W,t} - R_{L,t})}{\sqrt{Var(W-L)_t / n}} \qquad (3)$$

3. Empirical Results

3.1 Overall Sample

Table 1 presents the result of all the portfolios for 16 strategies. Each month stocks are ranked and grouped into three portfolios on the basis of their returns over the previous 3, 6, 9 and 12 months and held for 3, 6, 9 and 12 months. Results of all the portfolios are indicated with winners (P1) and losers (P3) together with winner minus loser momentum portfolios (P1-P3). In panel A portfolios are formed immediately after the lagged returns are measured for the purpose of portfolio formation. In panel B portfolios are formed one month after the lagged returns are measured for the purpose of portfolio formation. The t-statistics are reported in parenthesis.

According to panel A of table 1, the most successful momentum strategy is the portfolio with stocks based on their returns over the formation period 9 months and the holding period 9 months. This strategy yields 0.603 percent per month and it is statistically different from zero at 1 percent level of significance (t=6.82). Except for the J=3 and K=3, J=3 and K=6, J=6 and K=3, J=9 and K=3 strategies, all the other momentum effects are positive and statistically significant.

Because bid-ask bounce and thin trading problem can intensify the continuation effect, panel B reports the average returns if the portfolio holding period is delayed relative to formation by one month. For the shorter ranking and holding intervals, delaying the portfolio formation indeed increases the difference in returns between the winners and losers. These findings are parallel with the findings of Jegadeesh and Titman (1993) and Rouwenhorst (1998). According to the table all the strategies show positive and statistically significant momentum effects. When there is a time lag between the formation period and the holding period, the most successful momentum strategy selects stocks based on their returns over the past 12 months and then holds the portfolio for next 3 months. This strategy yields 0.728 (t=3.77) percent return per month.

In addition to the momentum portfolio returns (P1-P3), table 1 presents the average monthly returns of winner (P1) as well as loser (P3) portfolios to verify whether the momentum effect is due to outperformance of winner portfolios from the loser portfolios. Both panel A and panel B show that the momentum effects are clearly due to the outperformance of winner portfolios from the loser portfolios.

Tab. 1: Momentum Effect from 1995–2008

J=Formation Period, K= Holding Period					
Panel A					
		K=3	**K=6**	**K=9**	**K=12**
	P1	0.927	0.811	0.963	1.023
J=3	P3	0.849	0.686	0.690	0.659
	P1-P3	0.078	0.125	0.273	0.364
	(0.39)	(1.03)	(2.80)***	(4.10)***	
J=6	P1	0.978	0.984	1.111	1.125
	P3	0.767	0.595	0.567	0.619
	P1-P3	0.211	0.389	0.544	0.506
		(1.12)	(3.54)***	(5.68)***	(6.54)***
J=9	P1	1.090	1.129	1.202	1.216
	P3	0.803	0.586	0.598	0.652
	P1-P3	0.287	0.543	0.603	0.563
		(1.50)	(4.91)***	(6.82)***	(8.30)***
J=12	P1	1.305	1.188	1.262	1.282
	P3	0.816	0.601	0.671	0.707
	P1-P3	0.489	0.587	0.591	0.574
		(2.46)**	(5.14)***	(6.70)***	(8.50)***
Panel B					
		K=3	**K=6**	**K=9**	**K=12**
J=3	P1	0.887	0.726	0.816	0.846
	P3	0.266	0.355	0.330	0.355
	P1-P3	0.621	0.370	0.485	0.491
		(3.02)***	(3.25)***	(4.99)***	(6.05)***
J=6	P1	0.939	0.892	0.958	0.939
	P3	0.302	0.268	0.298	0.365
	P1-P3	0.637	0.624	0.660	0.537
		(3.54)***	(5.97)***	(7.32)***	(8.19)***
J=9	P1	1.059	1.014	1.053	0.987
	P3	0.393	0.311	0.338	0.369
	P1-P3	0.665	0.702	0.715	0.617
		(3.58)***	(6.56)***	(8.42)***	(9.56)***
J=12	P1	1.177	1.047	1.049	0.990
	P3	0.448	0.353	0.344	0.350
	P1-P3	0.728	0.694	0.704	0.640
		(3.77)***	(6.26)***	(8.27)***	(9.70)***

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

Source: own calculation

3.2 Market States and Momentum Effect

In order to identify the relation between states of the market and momentum effect, the entire sample was divided into two sub periods, January 1995 to September 2001 and October 2001 to July 2008. The separation into two sub periods coincides with the change in overall primary market trends for Sri Lankan stocks (see fig. 2). The first sub period was mainly bearish and the second sub period was mainly bullish. The trend reversion of the ASPI after October 2001 is mainly due to two reasons. One is the recovery of Asian economies from the deep East Asian crisis. The other reason is the signing of a truce agreement between the Sri Lankan government and the Liberation Tigers of Tamil Ealam (LTTE) who were fighting with the government army asking for a separate home land in the northern part of the Island.

Fig. 2: Momentum Effect in the Down-Market and Up-Market

Source: own computations

Table 2 reports momentum effects for the two sub periods. Panel A of the table shows that momentum effect in the down-market is extremely high. The momentum effects range between 1.403 percent per month for J=12 and K=3 strategy and 0.763 percent per month for J=3 and K=6 strategy. It should be noted that all the average monthly returns of the reported 16 strategies are statistically different from zero at 1percent level of significance. Further, the average monthly returns of winners and losers reveal that momentum effect is a product of positive post formation period average monthly returns of winners and the negative post formation period average monthly returns of losers. Returns on winner portfolios range between 1.093 per month for J=12 and K=3 and 0.281 per month for J=3 and K=6. At the same time return on loser portfolios range between -0.309 per month for J=12 and K=3 and -0.704 per month for J=6 and K=9.

Conversely, Panel B of the table shows that momentum effect in the up-market is relatively low. The momentum effects range between 0.304 percent per month for J=3 and K=3 and 0.039 percent per month for J=3 and K=6. It should be noted that out of all the reported 16 strategies only seven strategies show statistically significant average monthly momentum profits at least at 5 percent level. Further, the examination of average monthly returns of winner and loser portfolios is extremely important to judge whether the momentum prevails in the up market at CSE. The average monthly returns of loser (P3) portfolios in the up-market are larger and positive than that of the down-market losers. Therefore, it reveals that there is no clear momentum effect in the up market at CSE.

Tab. 2: Sub Period Returns of Momentum Portfolios

Panel A: Period from January 1995 to September 2001					
		K=3	K=6	K=9	K=12
J=3	P1	0.521	0.281	0.310	0.349
	P3	-0.405	-0.482	-0.534	-0.455
	P1-P3	0.926	0.763	0.844	0.805
		(2.77)***	(3.94)***	(4.87)***	(5.92)***
J=6	P1	0.711	0.511	0.470	0.426
	P3	-0.408	-0.701	-0.704	-0.509
	P1-P3	1.119	1.213	1.174	0.935
		(3.61)***	(6.54)***	(7.93)***	(10.54)***
J=9	P1	0.901	0.633	0.565	0.540
	P3	-0.450	-0.624	-0.609	-0.417
	P1-P3	1.351	1.258	1.175	0.957
		(4.00)***	(6.68)***	(8.01)***	(10.57)***
J=12	P1	1.093	0.720	0.642	0.633
	P3	-0.309	-0.491	-0.450	-0.355
	P1-P3	1.403	1.211	1.093	0.989
		(4.14)***	(6.56)***	(7.73)***	(9.56)***
Panel B: October 2001 to July 2008					
		K=3	**K=6**	**K=9**	**K=12**
J=3	P1	1.213	1.141	1.244	1.253
	P3	0.908	1.101	1.084	1.079
	P1-P3	0.304	0.039	0.160	0.144
		(1.195)	(0.29)	(1.36)	(1.67)*
J=6	P1	1.136	1.158	1.265	1.327
	P3	0.951	0.991	1.021	1.101
	P1-P3	0.185	0.167	0.244	0.226
		(0.79)	(1.39)	(2.17)***	(2.35)***
J=9	P1	1.047	1.122	1.284	1.290
	P3	0.945	0.857	0.928	0.270
	P1-P3	0.101	0.264	0.302	0.270
		(0.43)	(2.09)**	(2.82)***	(2.87)***
J=12	P1	0.982	1.101	1.237	1.219
	P3	0.732	0.912	0.975	0.987
	P1-P3	0.250	0.189	0.261	0.232
		(1.01)	(1.35)	(2.40)**	(2.37)**

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

Source: own calculation

The overall conclusion of the table 2 is that the momentum effect is stronger in the down market stance than in the up-market stance. In the up-market, virtually all the portfolios are winners since difference between return on the winner portfolios and return on the loser portfolios are negligible. By contrast, in the down-market stance, all the winner portfolios are positive while loser portfolios are negative, and the differences between returns of the winner portfolios and returns of the loser portfolios are statistically significant. Hence momentum effect is visible only in the down-market at CSE.

Conclusion

This study examines the momentum effect at CSE from 1995–2008. The study adds some important findings to existing literature as momentum anomaly is proved to a large extent in developed markets, whereas, there is little evidence in developing markets.

Researchers in finance and practitioners have recognized that average stock returns are related to past performance and cross-section of stock returns is predictable based on past returns. A number of past researchers have reported that past winners outperform past losers in subsequent period not only in the US market but also in some of the other markets. However, still there is no enough evidence in the developing markets. The findings of the study indicate that, average returns of past period winners clearly outperform the average returns of past period losers which add new evidence to the existing momentum literature.

This paper further examines the impact of the states of the market on the profitability of momentum strategies. The results indicate that states of the market in the formation period are not associated with the profitability of the momentum strategies. The momentum profits are significantly positive in the down market. In contrast, momentum profits appear to be positive but not significant in up-market. The reason for the non existence of momentum profits in the up-market is the high positive returns of the formation period losers in the holding period. This finding is contradictory with that of Cooper, Gutierrez and Hameed (2004) but confirms the findings of Antonios and Patricia (2006).

This study has not covered the present deep economic crisis period due to non availability of data. Therefore, it would be interesting and important to further research the momentum effect in the present economic crisis.

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Abstract

MOMENTUM EFFECT AND MARKET STATES: EMERGING MARKET EVIDENCE

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This paper examines the momentum effect in Colombo Stock Exchange (CSE) from January 1995 to December 2008. The sample of the study includes all the voting stocks traded at CSE. Stocks are selected for the strategies implemented in this study based on their returns over the past 3, 6, 9 and 12 months and hold the selected stocks for 3, 6, 9 and 12 months respectively. This gives a total of 16 strategies. In order to identify the relation between market states and momentum effect, the entire sample is divided into two sub periods, January 1995 to September 2001 and October 2001 to July 2008. The first sub period was mainly bearish and the second sub period was mainly bullish. For the overall sample, all the strategies show positive and statistically significant momentum effects. When there is a time lag between the formation period and the holding period, the most successful momentum strategy is the 12 months/3 months strategy where stocks are selected based on their returns over the past 12 months and then holds them for next 3 months. This strategy yields returns of 0.728 percent per month. Further, the momentum effect is stronger in the down market stance than in the up-market stance. In the up-market, virtually all the portfolios are winners since difference between return on the winner portfolios and return on the loser portfolios are negligible. By contrast, in the down-market stance, all the winner portfolios are positive while all the loser portfolios are negative. Hence the winner portfolios significantly outperform the loser portfolios.

Key Words: *Momentum effect, Colombo stock exchange, market states.*

JEL Classification: *G11.*

THE IMPLEMENTATION OF THE CONCEPT OF CORPORATE SOCIAL RESPONSIBILITY IN THE AREA OF INCOME TAX IN THE SLOVAK REPUBLIC

Eva Sopková, Katarína Raškovská

Introduction

The term socially responsible business has been frequently appearing in public and business life in the latest time. It represents an innovative approach to business and focuses on the impact of business activities on society and the environment. In our paper we apply the concept of corporate social responsibility to the area of income taxes in the Slovak Republic.

The issue of social responsibility has been raised by the question how to do business in order to bring profit from the business activities to as many people as possible. The idea of socially responsible business was brought to Slovakia mainly by multinational corporations in the 90s of the 20th century. At present the concept of social responsibility is an important part of corporate strategies. The awareness of corporate social responsibility is raised by a few non-government organizations that focus on particular areas of this concept. Slovak businesses have a tendency to see social responsibility through legislative measures, in other words they mean that businesses implement socially responsible activities within the framework determined by legislation. However, in the area of paying taxes there is still a certain aversion of businesses to behave responsibly to the state and society, which is to pay a full amount of tax in time and not to stint the state or other institutions representing the state of the income from taxes.

In the analysis of socially responsible behaviour of businesses we will focus on income tax, which has an important role in the process of fulfilling of the state budget of the Slovak Republic. In 2005 the share of tax revenues on the total income of the state budget was 37 % and in 2009 it accounted for 47 %.

1. The Concept of Corporate Social Responsibility Applied to the Area of Income Tax

Recent discussions on social responsibility have been initiated by the book by Howard R. Bowen called Social Responsibilities of the Businessman (1953), in which he recommended that business people took into consideration social consequences of their decisions and did activities respecting the goals and values of our society [1]. This definition of corporate social responsibility did not contain any practical possibility to apply the concept in business. In the 80s of the 20th century the focus moved from general theory on social responsibility to empirical research of corporate social responsibility. This resulted in a few theories falling within the central concept of social responsibility. Their common features were general validity of obligations and voluntary acquisition of the concept of corporate social responsibility. The World Business Council for Sustainable Development [12] defines socially responsible business as a continuous commitment of organizations to behave ethically, contribute to sustainable economic development and improvement of the quality of the life of society as a whole. The main idea is transition of businesses from the level „profit only“ (focus solely on profit) to a view enabling to see business in a wider perspective of the system of social and ecological relations. At the same time businesses are moving from short-term

goals to long-term goals and preferring optimum to maximum [1].

One of the solutions that can improve socially responsible behaviour of businesses is the policy of social responsibility. The European Commission issued several documents on social responsibility of businesses in order to help businesses integrate the concept of social responsibility into everyday business life [4]. In the year 2001 the European Commission issued the Green Book, in which it published the first official definition of corporate social responsibility as the "voluntary integration in the social and environmental concerns on the company's behalf for its commercial operations and its relationship with its stakeholders" [2]. This definition points to other aspects of socially responsible business: it focuses on active cooperation with stakeholders, expresses the commitment to contribute to the development of life quality, stresses the development and not only economic growth and classifies socially responsible business in three areas – economic, social and environmental. Socially responsible business in the economic area is tracing and improving processes that the business contributes to the development of the economic environment and the effort to minimize potential negative impact of the business's activities in this area [1]. This area of responsibility to society covers above all code of conduct of the business and its code of ethics, transparency of business activities and principles of good corporate governance, fight against corruption, bribery and violation of laws, relationships with shareholders, consumers, suppliers, advertising, protection of intellectual property and other things.

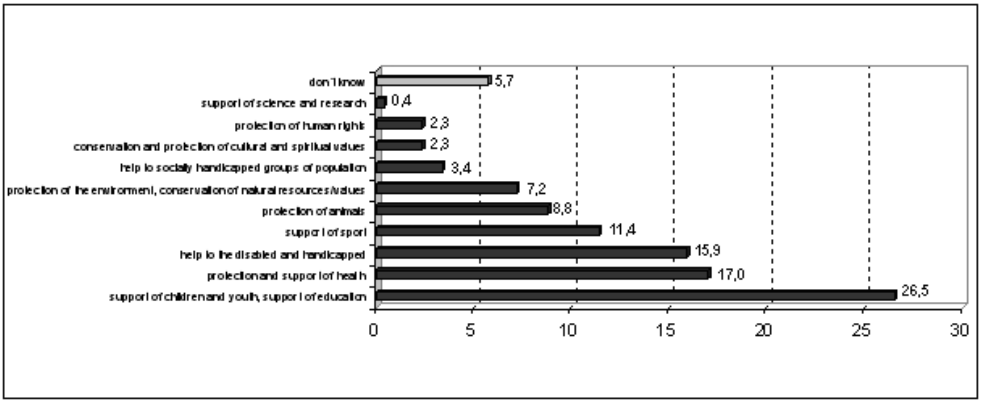
The application of the concept of corporate social responsibility in the area of income tax concerns the relationship of the business with the state and institutions representing the state (tax offices) as well as the relationship with society as such as the tax income is distributed in wider society. The relationship between the business and the government exists on different levels: legal, institutional, social, commercial and individual. The basic norm between the business and the government is law enforcement. In a democratic and market economy environment businesspeople not only respect and accept the legitimacy of government laws and measures, but are also actively involved in their creation. An optimum relationship between the business and the government is when both sides acknowledge their responsibility for the public welfare. The major responsibility of well-governed businesses is to obey the laws. In order to maintain a firm relationship with the government the business must above all „pay all taxes it is liable to pay and it owes, make deductions for insurance of their employees, obey all mandatory central and local government regulations, obtain all necessary government permissions, licences and approvals for business, not try to influence the government decisions by other than legal ways" [1].

Beside other things taxes have a stimulation function, i.e. they serve to encourage business and employee activities and to support or reduce particular activities. Tax evasions are evidence that the tax system of the state does not fully perform the stimulating function. The effectiveness of the tax system and tax legislation of the state greatly depends on how the society /state perceives and influences tax discipline of individual taxpayers. This discipline is reflected by the amount of tax evasions and the ability of society to eliminate their extent to an economically and socially acceptable level [5]. Tax evasions are not only cutting the income of the state budget, but have a decisive role in applying the principle of voluntary payment of taxes by serious taxpayers. Because if a taxpayer who carries out their tax duty properly finds out that the businesses around conceal taxable incomes or overestimate expenditure and thus lower the tax base, he logically states tax inequity. Due to this a conscious taxpayer finds excuses and arguments to avoid their tax duty or to minimize it [8].

Another approach to (ir-)responsible behaviour of businesses in income tax is the possibility to assign 2 % of income tax for specific purposes, which is regulated by § 50 of Act no. 595/2003 Coll. on income tax as amended (paragraph 4 of the Act exactly identifies who can be given the share of the paid tax). This is to support the cooperation of the business and non-profit sectors, where the registered organizations can apply for an allocation of a 2 % share of the paid tax not only from individuals, but also from legal entities. As this is not a classic donation, but allocation of public funds, the assignation of tax by means of 2 % can be considered neither corporate

philanthropy nor a typical manifestation of corporate social responsibility. In providing funds, taxpayers have only the possibility to decide about their allocation. This is an indirect support of non-profit organizations by the state. In case the funds were not allocated, they would go to the state budget. On the other hand, if a business invests its own resources (time, work of their employees, promotion etc.) in the process of effective distribution of the funds among more applicants (in a competition of ideas, evaluation of projects submitted), this input can be considered a manifestation of corporate social responsibility. Most businesses have appreciated the chance to direct their tax payments to organizations they can choose as they believe that the 2 % is a more addressable, effective and transparent way of allocating funds to non-profit organizations than through the state budget. Yet, since 1 January 2011 the mechanism of assigning 2 % of income tax has changed. The most significant change is in gradual lowering of 2 % of the paid tax to 0.5 % by the year 2018. Thus in tax assignation a taxpayer who is a legal entity will reduce the assignation of a share of the paid tax, and with the share of the paid tax they have to make a donation to the organization in the amount of the percentage of the assigned tax. If the taxpayer does not fulfill this condition, the share of the assigned tax will be subsequently lowered by 0.5 % by the tax administrator. The agency TNS SK makes a regular survey about the use the possibility to assign 2 % of income tax for special purposes. The results of the survey from March 2010 are presented in the following graph.

Fig. 1: Purposes for which Businesses Plan to Provide 2 % of Income Tax (in %)



Source: Survey of 2 % of tax carried out by TNS SK in March 2010.
Available on the Internet: <http://www.rozhodni.sk>

The survey found out that only one third (35.7 %) of businesses in Slovakia plan to assign their 2 % for publicly beneficial activities of non-profit organizations, which is approximately the same amount as in 2009. Almost one half (46.7 %) of respondents do not intend to devote their 2 % to NGOs and almost one fifth (17.6 %) had not been decided whether they would assign the 2 % of income tax. The most respondents planned to support children, youth and education (26.5 %). Then the second most important thing was protection and support of health (17.0 %), help to the disabled and handicapped, support of sport, protection of animals or protection of the environment and conservation of natural resources/values [14].

2. The Current State of Tax Evasion on Income Tax in the Slovak Republic

Compliance with standards and rules of behaviour or ethical principles is naturally required from all businesspeople. As Marková states [6], a prerequisite of ethical business is business based on

stable and clear legislation, motivating tax, depreciation and credit policy and on ethical competition. Non-existence of these conditions for business supports illegal activities of economic entities. A business has a social responsibility towards the state, which means among other things sharing the creation of social wealth mainly by means of taxing businesses by individual taxes deducted to the state budget and local budgets to finance the needs of society. However, in practice it is common when businesses behave unethically in deducting a proper amount of tax – instead they artificially lower the tax base, for example by issuing false invoices and registering them in files, concealing part of the income and property. Other forms of tax evasion are accounting manipulation (simple mistakes and evasions based on keeping two sets of accounting), balance offenses (tax evasions resulting for example from underestimating assets, depreciation, creation of reserves, fake accounting costs), paper transactions (fictitious trades to lower tax base), price transfer, tax holding and international business, i.e. possibility of using tax havens [3].

In the period of economic recession, i.e. the time of lower profits and incomes of individuals and businesses, the budgets are reviewed. The attention in individual states and state institutions is paid to the revenues that customs and tax offices are not able to capture, i.e. tax evasions and tax frauds [9]. Tax evasions represent one of more serious problems of taxation effectiveness. Orviská and Hudson [7] define tax evasion as a source of potential serious loss of government revenue that leads to a potential lack of funds for the public sector and an unfair burden on honest taxpayers. Failure to comply with tax laws and illegal activities in one area can motivate people to illegal activities in other areas and thus extend the borders of shadow economy.

The author Lesáková [5] sees the basic motif of tax evasion in a contradiction between the interest of the state to ensure income of the state budget by collecting taxes and natural resistance of taxpayers trying to minimize their tax obligation. Yet, minimizing tax obligation can be also understood as a manifestation of rational and effective activity of the businessperson in case he does so within the applicable legislation as taxes are part of non-productive cost of the business. One of the ways how to increase effectiveness is to cut cost to a minimum level [10]. There is a question when such acting becomes immoral or irresponsible towards society.

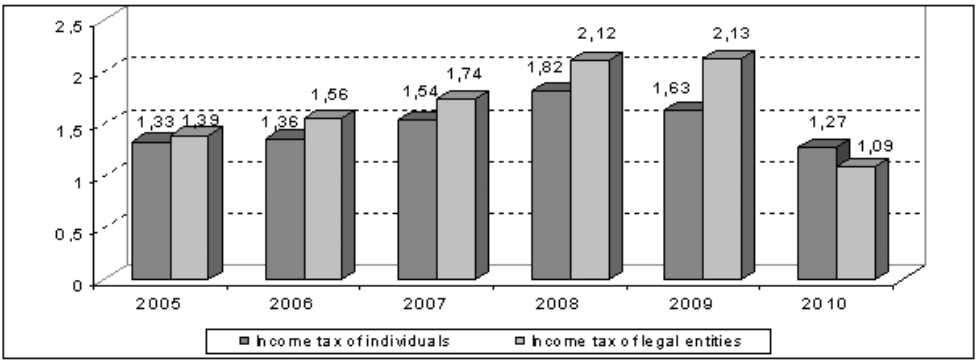
However, the reasons for tax evasion are different. Among the most significant and in literature most frequently mentioned factors influencing tax evasion is social (socio-political) and economic environment together with the state of the legal system of society. Other so-called partial factors of tax evasion can be ever-changing legislation, contradictory laws, absence of binding interpretation of laws and high tax burden. E. Sopková [10] gives also further reasons for tax evasion such as technical factors of collecting taxes, psychological and socio-ethical factors. Lack of civic awareness in tax areas is also given as a cause of tax delinquency, which means that the taxpayer loses the sense of tax liability. Yet, several authors state that ideology, morale and economy are only factors contributing to the establishment of tax offenses in that way they create a favourable environment and act as catalysts of the main reasons, which must be looked for in the tax system itself. According to these authors the causes of tax evasion result above all from the concept and mechanism of the tax system that exposes the taxpayer to temptation and thus it almost automatically leads to fraud.

In our conditions the reason for tax evasion and backlogs is mainly the high tax burden or tax and financial burden of businesses, lack of finance and tax discipline of tax debtors, their general insolvency and the existing legislative environment [6]. We see also the deficiencies of our tax system as a reason for tax evasion in the Slovak Republic; they have a direct impact on the scope of tax evasion. The reasons hampering the reduction of tax evasion are mainly: inconsistent interpretation of the Criminal Code in the cases of reduction and non-payment of taxes and insurance; state monopoly to retail sale of alcohol; absence of a unified state information system linking database records of tax and customs offices, business register, land and trade register.

Within the tax system of the Slovak Republic income tax belongs to the group of direct taxes. Act no. 595/2003 Coll. on income tax as amended governs the taxation of individuals and entities. Immediate consequences

of acting (or non-acting) of taxpayers is the amount of revenues from these taxes paid into the Treasury of the Slovak Republic. At present these revenues account for about 33 % of all tax revenues of the state budget. The following graph presents income tax revenues between 2005 and 2010, separately for income tax revenues of individuals and legal entities.

Fig. 2: Income Tax Revenues in the Slovak Republic (in billion €)



Source: Prepared on the basis of internal materials of Tax Directorate of the Slovak Republic

Revenues from income tax of individuals grew significantly in the period of 2006–2008, together for two years by 34 %, which was a result of a growing rate of employment on the one hand and a high growth of average wage on the other hand. A fall of performance of duty came in 2009, when the total revenue fell against 2008 by 10 %. To a high degree this was due to a drop of the rate of employment and an increase of non-taxable tax base. In 2010 the revenues from this tax – vital for financing self-government – were falling further to the level lower than in 2005. The reason was further drop of employment was accompanied by a little growth of the average wage. Year-to-year growth of corporate income tax did not drop between 2005 and 2008 below 10 % and still in 2008 it reached 21.9 %. In this period the revenues from the tax increased by 52 % in total. The economic recession and falling profits of businesses led to a lower collection of tax in 2010. Corporate income tax in 2010 was below the level of 2005. It is certain that the low cash collection of tax is a negative consequence of repayment of overpaid tax due to high advance payments.

Detection of tax evasion and fraud is a competence of tax control. The tax control is to detect or verify the tax base or other facts having an influence on correct assessment of taxes and chargeability. In 2010 the control was carried out by 1 600 controllers of tax offices and the department of special controls. If we want to quantify the amount and structure of tax evasion in the Slovak Republic, it is necessary to estimate the effectiveness of tax controls on the basis of secondary data from quantified findings in tax controls. According to the Tax Directorate of the Slovak Republic a „finding of a tax control" is an increase of positive tax liability or a decrease of the value of the returned value added tax (so-called excessive deduction). The development of these indicators is given in the following table.

The number of tax controls in Slovakia has been dropping since 2005. This fact has had no influence on the effectiveness of tax control, which has been rather stable in the recent years (approximately 59 %). In 2010 the effectiveness dropped to 53.6 %. It is necessary to say that tax administration considers an effective tax control every control with a finding.

Another indicator of tax evasion and fraud in Slovakia is register of tax crime. Criminal Code Act no. 300/2005 Coll. as amended) states that he who will cut tax, premium on different types of insurance in a small scale, will be imprisoned for one up to five years (§ 276

Tab. 1: Development of Assessment Indicators of Tax Controls in the SR

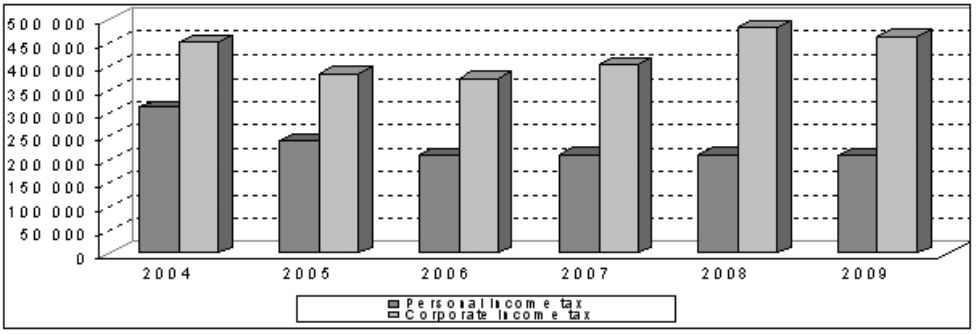
Tax Directorate of SR total	2004	2005	2006	2007	2008	2009	2010
Findings of tax controls (in thousand €)	278,686	261,865	289,523	278,815	380,868	435,549	556,278
Effectiveness of tax controls (in %)	51.7	57.8	62.1	59.5	59.4	59.5	53.6
Number of tax controls	33,747	35,333	31,243	24,711	21,357	19,820	18,400
Number of tax controllers	1,742	1,732	1,749	1,647	1,638	1,643	1,600
Average finding per 1 controller (in thousand €)	160	151	166	169	233	265	348
Average finding per 1 control (in thousand €)	8	7	9	11	18	22	30

Source: Prepared on the basis of internal materials of Tax Directorate of the Slovak Republic

Reducing taxes and insurance premiums). The penalty for reducing tax and insurance premium is increased in case of repeated offense of the law and according to the amount of tax and insurance premium evasion. According to extent the penalty is graded into punishments for minor damage (over € 266), for higher damage (over € 2 660), substantial damage (over € 26 600) and punishments for major damage (over € 133 000). The highest penalty (imprisonment for 7–12 years) is applied when the offender reduces tax and premium in a large scale. The same penalties are given for failure to transfer taxes and insurance premiums (§ 277 of Criminal Code). As of 30 June 2010 the tax administration recorded 11 001 notifications of suspicion of a crime in a total quantified amount of notified and recorded damage more than € 1 bn. for the period of 2004 – 1st half of 2010.

Tax arrears can be classified as quantified or detected form of tax evasion. In most cases this is a declared tax, but for different purposes it has not been paid, and in other cases it is an unpaid sanction. The following graph illustrates income tax arrears during 2004 – 2009 divided into personal income tax arrears and corporate income tax arrears.

Fig. 3: Income Tax Arrears (in thousand €)



Source: Prepared on the basis of internal materials of Tax Directorate of the Slovak Republic

The graph shows that the difference between personal income tax arrears and corporate income tax arrears is growing. Although in 2004 the arrears of corporate income tax were higher than those of personal income tax, in 2007 the difference doubled. From 2004 the amount of income tax arrears was falling, and the lowest amount of arrears (€ 584 147 thousand) was recorded in 2006. On the other hand, the maximum amount of arrears (€ 695 778 thousand) was recorded in 2008. Yet, since 2006 the amount of personal income tax arrears is rather stable while the amount of corporate income tax arrears had a tendency to rise till 2009. This is also confirmed by the Tax Directorate of the Slovak Republic in its annual report, where it states that the biggest growth was recorded with arrears of value added tax and corporate income tax. The biggest share of tax arrears belongs to limited companies, joint stock companies and individuals not recorded in the business register.

3. The Goal, Material and Methods of Research

The main goal of this paper is to assess the level of corporate social responsibility in the payment of income tax and formulate ideas and recommendations to improve the behaviour of businesses in the researched area. The research was done on a sample of businesspeople – income tax payers and on the basis of the current state of tax evasion in the area of income tax in Slovakia. In compliance with the main goal of the paper we have formulated the following partial goals:

1) To describe theoretically the issue of socially responsible behaviour of businesses in relation to fulfillment of income tax obligations of businesses and to identify their activities, areas and processes that can be labeled as socially responsible or irresponsible in the case of paying income tax.
2) To summarize the results of a research carried out by a questionnaire on a sample of businesses in the Slovak Republic and to assess the level of social responsibility of businesses in this area by means of tax evasion.
3) To formulate proposals to improve responsible behaviour of businesspeople in the area of income tax.

Hypotheses are an inseparable part of our paper, and they can have a different character, origin and classification in research. In order to fulfill the goals set in our research we made a choice of hypotheses that will help us understand more deeply the issues of our research from the theoretical as well as practical point of view. The zero hypothesis (H0) was formulated as follows: More than half (more than 50 %) of the responded businesses know the term socially responsible business and can give a particular organization that applies this concept. Businesses understand the obligation to pay tax, but the system of paying taxes is a sort of necessary evil of business, i.e. their attitude to the fulfillment of tax obligations is negative. For this reason most businesses try to rationalize and simplify their tax obligations or to find a way how to circumvent the law. On the basis of the knowledge of the opinions and attitudes of taxpayers we have formulated the following research hypotheses:

H_1: More than 80 % of the responded businesses behave responsibly in the area of income tax and fulfill their tax obligations in time, conscientiously and in compliance with law.

H_2: Businesspeople – individuals behave more responsibly in the area of income tax than businesses.

In order to verify the hypotheses we used the program SPSS, which is used for making statistical analyses. For evaluating the hypotheses we chose a 10 % level of significance, where € = 0.10.

The material we have used to meet the goals of our paper is special literature by domestic and foreign authors dealing with tax issues and socially responsible business. An important source of information are statistical data, current legislative norms of the Slovak Republic and the European community, tax regulations, tax returns and forms valid within the European Union.

The main source of information for us is primary data obtained in our research. The exploratory method we used was the method of questionnaire. Compared to observation and experiment this technique is the most suitable here as it enables to acquire a number of data in a rather short time. We chose the questionnaire as a method of primary research also due to simple organizing the preparation of research, little time needed to carry out the research and easy processing of the results. At the same time questionnaire does not pressure respondents

and reduces the rate of subjectivity of the researcher. On the other hand, the method of questionnaire is connected with the risk of low return and the problem to verify the truth of the acquired data. We solved the problem of reliability of the acquired data by control questions verifying the truth of the provided data and statistic tests (binomial exact test).

The object of our research is responsible behaviour of Slovak businesses in the area of income tax. From the defined object of research we can imply that the basic set of our research covered all businesses in Slovakia. In order to specify the basic set of the questionnaire research more closely we take into account the real number of registered taxpayers. According to the Tax Directorate of the Slovak Republic as of 30 June 2010 there were 2 683 988 businesses registered for corporate income tax and 213 476 individuals registered for personal income tax. As the basic set is extended we made a choice of respondents from the basic set and generated a sample set. When choosing the respondents we made a random selection from the database of businesses. From the total number of 260 distributed questionnaires we received back 135 completed forms. We can state that the return of questionnaire was 52 %.

The questionnaire was created as a simple form, meeting the purpose and questions were full, clear and unambiguous. It consisted of 18 questions on four pages and they were divided into two content groups. In the introduction we provided information about the issue and anonymity of data provided by the respondents. The first group of questions focused on socially responsible business and the issue of personal and corporate income tax. The second group of questions contained identification questions that classified the respondents according to the area of business, legal form and size. The intention of placing this kind of questions right behind the research questions was to obtain the information as we expected that the businesses might not be willing to continue if the questions had been in the introduction. The conclusion contained thanking to the respondents for their time and willingness to participate in the research. The questions were open-ended and closed. With open-ended questions the respondents had a scale of possibilities and an open possibility „other“, where they could express their opinion on the given issue. With each question where they could mark more options they were notified that more answers were possible. The questionnaire was distributed in electronic form as an online questionnaire. The selected businesses were delivered an e-mail asking for cooperation in research. After clicking on the attached electronic message the respondents could complete the questionnaire. The questionnaire was distributed during two weeks in late February and early March 2011. In the processing of the acquired data we used mathematical-statistic methods, especially the method of trend analysis using time series and indices, statistic methods (Mann-Whitney test) and graphic methods of data processing.

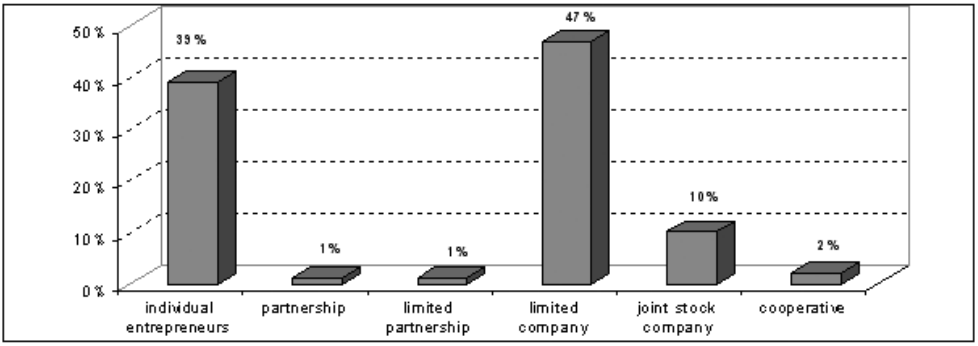
Beside primary we have done also secondary research based on the materials provided by the Tax Directorate of the Slovak Republic. These were data from 2004–2009 (or till 30 June 2010). We started from the year 2004 as in that year the tax system of the Slovak Republic went through several changes due to accession to the European Union. As a member of the EU the Slovak Republic committed to gradually harmonize selected taxes applicable in the Slovak Republic with those applicable in member states of the EU also officially – in legislation. In order to process secondary data and theoretical knowledge we used several theoretical research methods – content-causal analysis and historical-logical method, analysis and synthesis, induction and deduction, comparison and generalization.

4. Results and Discussion

The identification questions at the end of the questionnaire serve to characterize the research set. We analyzed the respondents according to three basic criteria. The first criterion was the area of their business activity. The question had more possible answers in case the respondents do business in more areas. The most respondents marked the area of services (35 %). The second biggest category was trade (32 %). The respondents from businesses in construction accounted for 26 %. The other areas were transport 10 %), industry (8 %) and hotel industry and gastronomy (6 %).

The second criterion to characterize the respondents was legal form of business. The representation of individual forms is given in the following graph.

Fig. 4: Representation of Respondents in the Research Sample by Legal Form of Business



Source: own

From the point of view of legal form of business the biggest group is represented by limited companies. This result reflects the real state in the Slovak Republic as this is the most common form of business. The second biggest group is made by individual entrepreneurs, which was marked by 53 out of 135 respondents. Joint stock company was represented in the sample by 14 businesses. On the whole, it is possible to state that the sample of respondents consisted of 59 % of businesses, 39 % of individual entrepreneurs and 2 % of cooperatives.

As for size (number of employees) the dominant group were small businesses accounting for as much as 79 %. Middle-sized businesses were represented by 18 % of respondents and large companies 4 %. The structure of respondents by size corresponds to the real state in the Slovak Republic.

In the main part of the questionnaire we asked the respondents about corporate social responsibility – how they apply it in responsible behaviour in income tax. In the first question we asked which of the given possibilities they would choose as the most important roles of a business in society. We aimed to find out whether businesses perform also activities that do not bring them a direct economic benefit or they rather contribute to the development of society. The question had more possible answers. From the total number of 135 businesses 85 see their most important role in "creating profit", a role which is a reflection of the economic activity of the business. 81 respondents chose "law enforcement" as one of the most important roles of the business. The high occurrence of these answers is due to the importance of a stable and fair business environment for businesspeople. Another frequent answer was "creating job opportunities", which was marked by 64 respondents. 54 respondents chose as one of the answers also "participate in the development of the region, of the community in which the business runs its activities". We consider the choice of this answer a manifestation of social behaviour of the business, like with the answer "protection of the environment" (37 answers). We can thus conclude that less than half of the respondents consider the social aspect of business important. "Paying taxes" was chosen by 45 respondents, which points to a disturbed relationship between the state and businesses.

Another question was to find out if businesses can define the concept of socially responsible business. There was only one possible answer. We expected the answers "definitely yes" and "rather yes" from the respondents who had already met with this concept and can explain it. On the contrary, the answers "rather not" and "definitely not" should be chosen by businesses that did not know this concept. We can conclude that 88 % of respondents can define the concept of socially responsible business and only 12 % can't. We made a control question to verify the accuracy of responses. We asked if they can give an example of an organization that applies the

concept of socially responsible business in its activities. We assumed that the respondents that can define it answered "yes" and gave an example of a particular organization. The results showed that only 39 % of respondents were able to give such an organization. These two questions aimed to verify the zero hypothesis H0 of the research, where we assumed that more than half of the responded businesses know the concept of socially responsible business and at the same time can give an example of a business that applies this concept in their activities. First we transliterated the question asking about the definition of social responsibility into another variable and we created two groups of businesses. In the first group were businesses that were able to define the concept and chose the answer "definitely yes" or "rather yes" in the questionnaire. In the second group were businesses that were not able to define this concept and thus chose the answer "rather not" and "definitely not". The question asking about the definition of corporate social responsibility was first transliterated into another variable. After transliterating the question we tested it by means of binomial exact test. The testing is illustrated on the following outputs of the statistic software SPSS.

Tab. 2: Binomial Exact Test in Verifying Hypothesis H0

		Category	N	Observed Prop.	Test. Prop.	Asymp. Sig. (2-tailed)	Exact. Sig. (2-tailed)
Defining corporate social responsibility	Group 1	1.00	118	.87	0.50	.000a	.000
	Group 2	.00	17	.13			
	Total		135	1.00			
An example of socially responsible business	Group 1	1	52	.39	.50	.010a	.010
	Group 2	0	83	.61			
	Total		135	1.00			

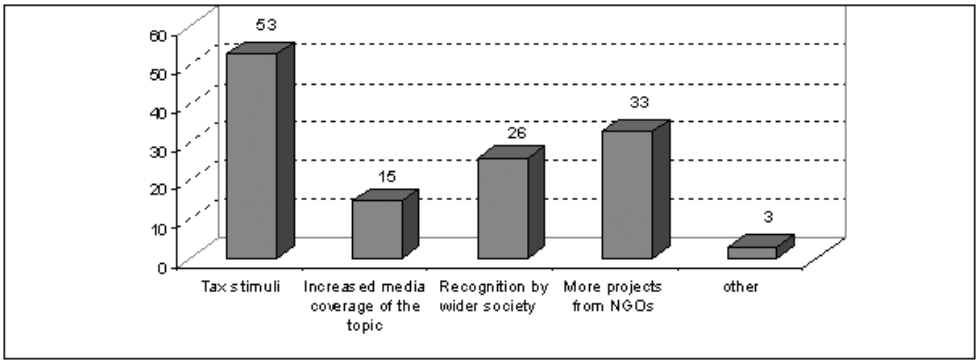
Source: Own processing of results by means of program SPSS

The results from the question about the ability of businesses to define socially responsible business in the program SPSS reached p value 0/2, which is 0 and thus the level of significance was lower than _ = 0.10, which we assumed. Based on this fact we can conclude that the zero hypothesis H0 was proved. With the control question if businesses can give an example of socially responsible business p value was expressed as 1 – 0.010/2, which is 0.995 and thus higher than the assumed € = 0.10. This fact leads to a conclusion that the zero hypothesis H0 was rejected. The testing proved that more than half of the responded businesses know the concept of socially responsible business, but cannot give an example of an organization that applies this concept.

What motivated businesspeople to do socially responsible activities was asked about in another question, where the respondents could choose more answers. The results are shown in the following graph.

53 % of businesses chose tax stimuli as a factor motivating to behave responsibly to society. The research further showed that 33 respondents would be motivated to do socially beneficial activities by higher quality and more attractive projects from NGOs, despite the fact that the analysis of activities and initiatives supporting socially responsible business in Slovakia show that the most important players of social involvement come just from NGOs. These organizations carry out surveys in socially responsible business and cooperate with local businesses in order to help them realize socially beneficial activities. 26 respondents marked recognition from wider society as a motif leading to the support of social involvement of businesses and 15 respondents marked increased media coverage as such a stimulus. This need of businesses points to low awareness of the Slovak public in the area of socially responsible business.

Fig. 5: Motifs of Social Involvement of Businesses



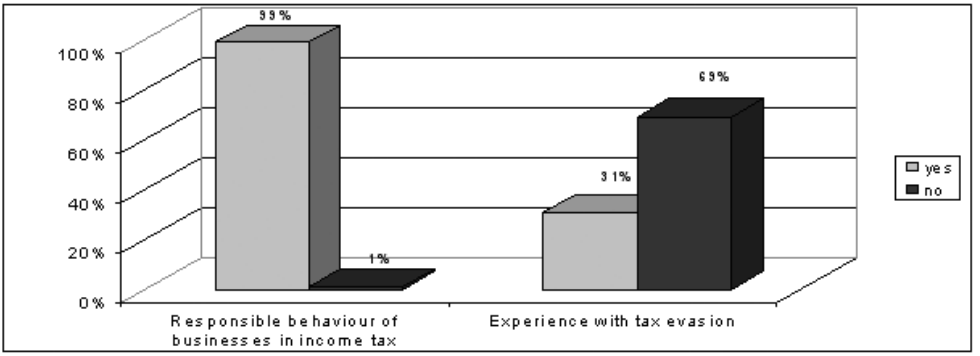
Source: ow

We were also interested which activities businesses consider socially responsible in the area of income tax and then we asked about irresponsible activities in paying income tax. These questions were aimed to find out whether businesses know how to properly fulfill tax obligations, whether they know their obligations imposed by law in the area of income tax. The questions had several possible answers. The research showed that for the most respondents socially responsible behaviour in this area is paying taxes within the statutory time (67 %) and in the right amount (58 %). As much as 46 % of respondents marked 2 % of the paid tax for special purposes a responsible activity in this area. In the question which activities in this area are irresponsible we wanted to find out whether businesses can identify activities breaking the law on income tax and thus which activities can be considered irresponsible behaviour. The research showed that the most respondents consider as socially irresponsible concealing part of income from business activity (62 %) and false accounting and tax cases (61 %). Misrepresentation in the area of income tax was reported as irresponsible activity by 47 % of respondents and artificial inflation of the cost of tax by 41 %. It is possible to state that the given activities are unlawful and in case such breaking of the law is disclosed by tax control, it is sanctioned.

The following question if the respondents behave responsibly in the area of income tax, i.e. if they fulfill their tax obligation in time, conscientiously and in accordance with applicable law, 83 % of respondents answered that they behave responsibly in this area and chose the possibility “definitely yes“. 16 % of respondents chose the possibility “rather yes“ and only 1 % the possibility “rather not“. None of the respondents answered “definitely not”. This question was formulated directly, whereas the question whether the businesses had met with tax evasion was rather indirect. We supposed that if the businesses had ever met with tax evasion, it could concern themselves. A comparison of both questions is illustrated in the following graph.

99 % of respondents answered that they behave responsibly in paying income tax and only 69 % of businesses reported that they had not met with tax evasion. And on the other hand, 1 % of respondents answered that they do not behave responsibly in this area, whereas 31 % of businesses have experience with tax evasion. We can conclude that our assumption was fulfilled because almost all those who are responsible in paying income tax have no experience with tax evasion and vice versa. By means of these two related questions we tested hypothesis H1 , which supposed that more than 80 % of respondents behave responsibly in paying income tax and fulfill their tax obligations in time, conscientiously and in accordance with applicable law. We had to transliterate the main question again into two groups of businesses, one with responsible businesses and the other with irresponsible

Fig. 6: **Comparison of Businesses' Responses to Questions about Their Social Responsibility in Paying Income Tax and about Their Experience with Tax Evasion**



Source: ow

businesses in paying income tax. Subsequently we tested both questions by means of binomial exact test in program SPSS. In the question about responsible behaviour of businesses in paying income tax p value was expressed as 0/2, so it was equal to 0. P value was lower than our chosen level of significance _ = 0.10, which allows us to accept hypothesis H1 and claim that more than 80 % of respondents fulfill their tax obligations in time, conscientiously and in accordance with applicable law. On the basis of the control question, whose p value was set as 0/2, which is lower than our chosen level of significance, we can confirm the hypothesis.

Based on the question asking about responsible behaviour of businesses in paying income tax depending on legal form of business we assessed also hypothesis H2. This hypothesis contained an assumption that entrepreneurs – individuals behave more responsibly than companies. We tested the questions by means of Mann-Whitney test, which is intended for two independent choices. The results are given in the following table.

Tab. 3: **Mann-Whitney Test in Hypothesis H2**

Legal form		N	Mean Rank	Sum of Ranks
SRB in paying income tax	1.00	53	64.29	3407.50
	2.00	79	67.98	5370.50
	Total	132		

			SRB in paying income tax
Mann-Whitney U			1976.500
Wilcoxon W			3407.500
Z			-.825
Asymp. Sig. (2-tailed)			.409
Monte Carlo Sig. (2-tailed)	Sig.		.450[a]
	99 % Confidence interval	Lower Bound	.437
		Upper Bound	.462
Monte Carlo Sig. (1-tailed)	Sig.		.243[a]
	99 % Confidence interval	Lower Bound	.232
		Upper Bound	.254

Source: own

In such testing the difference between the tested groups is significant when p value is lower than the chosen level of significance. Our testing showed that p value is 0.243, which is more than € = 0.10. This leads us to a conclusion that there is no significant difference between individual legal forms in the responsibility of behaviour in paying income tax. Hypothesis H was not proved and we can state that entrepreneurs – individuals behave in this area in a similar way as companies. This statement has been supported also by the chart compiled on the basis of Kruskal-Wallis test, which is used for more than two independent choices. As p value in these cases was higher than €, we can state that both legal forms of business behave equally responsibly in paying income tax and the difference between them is negligible.

We were also interested what factors motivate businesses to tax evasion and vice versa, what motivates businesses to responsible behaviour in this area. The question has again more possible answers. The results showed that the most respondents behave responsibly in this area, which they are led to by their civic responsibility (61 %). We can thus say that most respondents feel naturally responsible towards their country and its needs and realize that tax revenues serve to satisfy the needs of society. Other factors motivating businesses to responsible behaviour in this area are high penalties (53 %). Justice and confidence in public institutions as a motif to behave responsibly was chosen by 20 % of respondents, which points to a low confidence of the citizens in the state and public institutions. Among factors motivating businesspeople to tax evasion were mostly reported answers “low-quality legislation” (53 % of respondents), “high tax rate“ (46 % of respondents) and disagreement of businesses with political decisions and tax policy of the government (39 %). Low tax ethics as a reason for tax evasion was marked by 42 of 135 businesses, which supports the statement that Slovak businesses in general have a low level of tax morale.

5. Synthesis of the Results and Proposals and Recommendations

The research carried out by means of questionnaire was divided into two basic thematic groups. The first part dealt with the issues of socially responsible business whereas the second part was more or less focused on analysis of businesses‘ behaviour in paying income tax. Based on the research we assessed the level of socially responsible business in Slovak businesses in paying income tax; we pointed to the factors motivating businesses to behave responsibly, but also to shortcomings and obstacles for businesses to behave responsibly. With the given shortcomings and obstacles we make recommendations to improve the current state. At first we make recommendations for the area of socially responsible business and then for the area of responsible behaviour of businesses in paying income tax.

The main obstacle to socially responsible business in Slovakia is lack of action of the government in this area. Our recommendation is systematic support to socially responsible business from the part of the state. In our opinion the state should play the main role in implementing a national program of corporate social responsibility. The key players in the implementation of the program should be, above all, the Ministry of the Economy of the Slovak Republic, Ministry of Justice of the Slovak Republic and the Ministry of Labour, Social Affairs and Family of the Slovak Republic. The Ministry of Justice should focus on creating quality legislation in corporate social responsibility, the Ministry of the Economy should create favourable conditions for performing socially beneficial activities and creating programs to motivate businesses to act socially responsibly. The Ministry of Labour, Social Affairs and Family should develop activities to help and support citizens in the social policy, which is part of socially beneficial activities. We suggest that the highest officials take responsibility for acting for the benefit of society on the governmental level and at the same time support the engagement of businesses in social issues. Within the governmental policy they should establish a particular section for the area of socially responsible business that should focus on: creating and updating a national strategy in corporate social responsibility; motivating businesses to engage responsibly in society and participate in the improvement of the environment and social environment; supporting activities of businesses that are engaged in social activities, for example by tax relieves or by favouring environmentally friendly businesses; preferring businesses that

apply the concept of corporate social responsibility to those not engaged in social activities within state tenders and government procurement; preparing and organizing rewards for businesses with developed social activities within socially responsible business.

Slovak media are another barrier in the development of socially responsible business; they do not pay enough attention to these issues. In their activities they should increase the awareness of the Slovak public of the concept of corporate social responsibility. At the same time they should focus their activities on creating an environment stimulating Slovak businesses to social engagement. In our opinion public television and radio stations should devote more time to socially responsible business and their representatives in order to inform about these issues and to introduce this concept in the activities of these institutions and thus to become an example of social engagement for the business sector.

Lack of quality and attractive projects from NGOs is also an obstacle to businesses to behave responsibly in social acting. NGOs should continue their cooperation with businesses and help them introduce the concept of corporate social responsibility. They should create conditions stimulating to engagement in social activities and provide businesses with information related to examples of best practice from Slovakia and thus initiate first of all small and medium-sized businesses as many of them are not engaged in social activities also because they do not know how.

A major obstacle for businesses in the area of corporate social responsibility is lack of funds. It is difficult to suggest a measure that could improve this particular problem. But there are certainly ways of social engagement, for instance friendly business behaviour to the environment and society, responsible treatment of employees, responsible action in the market to suppliers and customers, eliminating corruption; all of these, however, require huge funds.

The major shortcoming in the area of personal and corporate income tax is poor quality legislation with a number of exceptions and loopholes in laws, ever-changing tax policy of the government and disagreement of businesses with the decisions of the government. On the whole it is possible to state that an obstacle to responsible fulfilling tax obligations by businesses is lack of action of the government. The questionnaire research showed that businesses consider the Slovak system of paying taxes corrupted and unnecessarily complicated. The authors Sujová and Sedliačiková [11] qualify just the tax system as a key factor influencing the performance of the economy of the Slovak Republic in future. Thus this means that quality legal norms are the basic prerequisite of decreasing tax evasion. The laws should have clear and unambiguous definitions of rights, obligations and sanctions. Based on the given facts we suggest to improve the cooperation between businesses and government, especially in the creation of new tax laws and formulation of the goals of tax policy.

Conclusion

Tax frauds have serious consequences for state budgets, they lead to breaking the rule of fair taxation and in the end they can distort economic competition and functioning of the market. A long-term goal of tax policy not only of the Slovak Republic, but also other governments of EU member states is shift of tax burden from direct taxes to indirect taxes. However, the space for increasing value added tax has its limits as they consequently influence the consumption of the whole population. As of 1 January 2011 the government of the Slovak Republic increased the rate of value added tax from 19 % to 20 %. Due to lack of revenues of the state budget it is possible to expect that in future the following tax increase will apply to direct taxes.

Tax administrations in developed countries of the world are leaving from restrictive collection of taxes and try to create a so-called tax friendly environment, where taxpayers would consciously and voluntarily fulfill their tax obligations and it would not pay off to cheat the state on taxes. However, this is a long-term process. A condition to create positive tax-legal consciousness of economic entities and to improve their tax discipline is improvement of their tax discipline and rationality of the use of public funds on both sides – businesses and public administration.

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Abstract

THE IMPLEMENTATION OF THE CONCEPT OF CORPORATE SOCIAL RESPONSIBILITY IN THE AREA OF INCOME TAX IN THE SLOVAK REPUBLIC

Eva Sopková, Katarína Raškovská

The concept of corporate social responsibility is an answer to social and economic challenges that national economies are facing in the (post-)crisis period. There is a revaluation of the present principles of business based on achieving profit. Corporate social responsibility is a long-term sustainable solution in the form of engagement of the business sector in solving the problems of society. Responsible businesses make an economic profit and social benefit by their commitment to ethical conduct and social responsibility, whereas irresponsible businesses steal the resources of the state and society. This means that tax evasion can also be considered a manifestation of unethical conduct. In the long term income tax is a significant source of finance for public budgets of the Slovak Republic used for financing the needs of the state and society. This paper presents the results of primary research focused on analysis of tax evasion on income tax in the context of corporate social responsibility in the Slovak Republic. The realistically calculated (i.e. detected) consequences of socially irresponsible behaviour of businesses are analyzed on the basis of data obtained from secondary research in the area of criminal liability for evasion, incorrectly calculated or concealed tax obligations of businesses. The submitted paper contains the development, relationships and consequences of these activities in the Slovak Republic. The output of this paper is the implementation of the concept of corporate social responsibility into the area of income tax and recommendations to improve the identified state in this area in the Slovak Republic.

Key Words: *Corporate social responsibility. Income tax. Tax evasion. Tax arrears. Tax-related crime.*

JEL Classification: *H26, M14.*

TYPOLOGY OF FOREIGN STUDENTS INTERESTED IN STUDYING AT CZECH UNIVERSITIES

Marta Žambochová

Introduction

The main motivation of our research was to analyze alternative ways of funding tertiary education. Primarily, we focused on the tuition fees payable by foreign students. The main research questions were.

- Who (or what) influences the student in deciding whether to travel?
- What is expected from a student studying abroad?
- What the student feels could be an obstacle to studying abroad?
- What is the basic amount for monthly living expenses while studying abroad, which the student is willing to accept?

We have created a classification of foreign candidates for studying at Czech universities, based on specific information. We have described the main characteristics of each category, their financial capacity and motivation, but also their mutual differences. We used some selected tests involving hypotheses, cluster analysis and differing methods for creating decision trees in the course of our examination.

1 Methodology – Rresearch Methods

1.1 Cluster Analysis

In carrying out the classification of students interested in studying abroad, we first used a cluster analysis, which is one of the classification methods of „unsupervised learning“. Cluster analysis [1], [2] deals with the similarities of data objects. It divides sets of objects into several previously unspecified groups (clusters) so that objects within individual clusters were the most similar and objects from different clusters were the least.

Cluster analysis can be performed by way of application of many different methods. The various methods differ both in terms of determining the similarity of objects (similarity measure) as well as the application of a cluster analysis.

The selection of the method of cluster analysis depends first and foremost on whether we have direct source data or aggregated data (eg, frequency table, or matrix of similarities). If we have source data, the choice of method depends on the type of variables (nominal, ordinal, quantitative variables).

In our case we had the source data and we worked with a combination of different types of variables and thereby we limited the selection of method. Otherwise we would have had to modify the data transfer of each of the nominal or ordinal variables on quantitative variables, more precisely, into several binary variables (acquiring only the values of 0 and 1).

The processing of our data is based on a relatively large number of objects. That is the reason why the hierarchical methods are not suitable. *K*-means algorithm is designed for clustering objects described by quantitative variables, which was not applicable in our case. To use this method, we had to preprocess the data by means of binarization, ie the transfer of each categorical variable to the number of binary variables (variable acquiring only the values 0 and 1). The best method for processing data was a two-step method.

The principles of the TwoStep cluster analysis are given in [2]. This method uses an algorithm Birch (Balanced Iterative Reducing and Clustering using Hierarchies), which is

described in more detail in [8], or [9]. The TwoStep method was first included in the 11.5 version of the statistical system SPSS.

1.2 Decision Trees

Decision trees belong to a group of classification methods known as „supervised learning“, where the decision rules for the classification of objects into classes are based on the creation of a learning (training) set. They are a very widespread group of trees, and are used in data models. Decision trees are structures that recursively divide the examined data according to certain decision-making criteria. The root of the tree represents the entire population file. The internal nodes of the tree represent a subset of the population file. The tree leaves can be read as values of a dependent variable. They employ two types of decision trees, classification trees (each sheet is a class assignment) and regression trees (each leaf is assigned constants – to estimate the value of the dependent variable).

A decision tree is generated recursively as dividing the space of predictors values (explanatory variables) on the basis of search questions (splitting rules) that best divides the space into subsets of examined data.

The process of division stops when the criterion to stop emerges (the stopping rule). The next step is to prune the tree. It is necessary to determine the „correct“ size of the tree (trees too small do not capture all the regularities in the data, very large trees include a description and some properties of random data). The generation of the sub-trees arises from the tree algorithm and compares the quality of the generalization of these sub-trees (as well as describes the data).

The procedure may be such that the first decision trees are created on the training data and then their quality is subsequently verified by means of the test data. Another way is a form of cross-validation in order to create the tree and its sub-trees to apply all the data. Once the data is divided into several disjoints of approximately equal parts, it then gradually forms and a part of the data is continually removed from the file. The quality of the tree and its sub-trees is verified using the resulting data sets. The selection of a subtree is such that the lowest estimate of the actual error becomes apparent. If there are multiple subtrees with comparable estimates of actual errors, it selects the smallest one.

Many algorithms were developed to create decision trees. Most of these are used by CART, ID3, C4.5, AID, CHAID, and QUEST, see eg [4], [7] or [10]. For the work we used three types, the algorithms are implemented in the SPSS statistical system, and CART, CHAID, and QUEST.

1.3 Tests of hypotheses

The Kruskal Wallis (or ordinal) test is a non-parametric test and is suitable for different choices of layouts from the normal distribution. The null hypothesis is as follows, „all samples have the same layout“. The test works by ranking the individual elements. See [3]. The Median test is used for testing whether two groups differ in their median value. It is a nonparametric test. Chi-square test for independence assesses whether paired observations on two variables, expressed in a contingency table, are independent of each other.

2 Data processing

2.1 The data structure

The research sample consisted of 1093 students from 6 countries, namely: Slovakia, Greece, Ukraine, Russia, Belarus and China. Most respondents were from China. Chinese students accounted for almost half of the monitored file. The smallest sample data was gathered in the Russian Federation.

The average age of the students involved was 20.87 years. Of these respondents, 62 % were women and 38 % men. Nearly half the respondents were students majoring in a social specialization, as opposed to only one tenth of the respondents being students of humanities or artistic disciplines. Technical and natural sciences were represented by approximately 20 %.

The data also revealed that half of the respondents are students at the bachelor level, as well as students planning to undertake a higher level of education abroad. A quarter of the respondents are secondary school students, as well as students planning to study abroad for bachelor degree studies. However, it is not true that each of the students wishing to undertake degree studies abroad are directly traceable to the current degree.

Students, where neither parent had been an undergraduate, dominated in the sample data. Employing the Chi-square test, we verified that the division into categories according to the level of the parents' education diverges in different countries. In most of the countries surveyed, the structure was consistent with the structure of the total population ie, the largest proportion of students who do not have one of the parents university educated (this category is most pronounced in China – 80.9 % and 70.9 % of the Slovak Republic) and less numerous categories of students whose parents had both been undergraduates (the least frequent in this category were the Slovak Republic – 6.9 % and China – 7.3 %). The Russian Federation and the Ukraine were significantly different in this respect The Russian Federation had the most numerous group (38.2 %) of students where both parents had been undergraduates. The most numerous group (with 42.1 %) of students with one university educated parent was in the Ukraine.

2.2 Classification of students

On the basis of variables related to

- Considering study abroad (yes – perhaps even – no).
- The length of study period (month – semester – year – longer).
- The level of study programme (Bachelor – Master – Doctoral).
- Type of study programme (social – natural – technical – artistic sciences).
- Learning the language (Czech – English/ /Czech – English).
- The length of the preparatory language course (1/2 year – year – or longer).
- Desired outcome of the study programme (level of the degree, the pan-European Bc. – Mgr./ Ing. – Ph.D.; level of the dual degree).

Here a cluster analysis was performed, especially the procedure of SPSS TwoStep Analysis, which created four clusters. We have dealt with this issue already in [6].

Description of the Characteristics of People from Different Clusters

1st cluster (348 respondents)

- Ambivalent about whether to study abroad,
- If they would study abroad, only for 1 semester or 1 year,
- They would rather study at the the Bachelor level,
- Most of the students are in social science disciplines ,
- They would be interested in studying in Czech or in the combination Czech + English,
- They would like to have completed a course in the language within 6 months,
- 1500 Euros for a 6 month course does not seem advantageous to them (maybe they would consider it),
- They would interested in an outcome with a European -wide certificate validity – level Bc. or Mgr.

2nd cluster (382 respondents)

- Ambivalent about whether to study abroad, ňIf they would study abroad, then for 1 year,
- They would rather study at the Master's level,
- Most are students in social sciences , technical and artistic disciplines ,
- They would be interested in studying in English,
- They did not think about the tuition fee of 1500 Euros for a six-month course,
- They would interested in a degree with a European – wide certificate validity – level Mgr. or Bc.

3th cluster (27 respondents)

- Not interested in studying abroad,
- Other questions mostly remained unanswered.

4th cluster (336 respondents)

- They have thought about studying abroad, but not at the present moment ,
- If they would study abroad, it would be for longer than 1 year,
- They would rather study at the Doctoral level,
- Most of the students are from the natural and technical sciences disciplines,
- They would be interested in studying in a combination of Czech + English,
- They would like to have a completed language course duration of 1 year,
- The tuition fee of EUR 3000 per year for the course they find acceptable (maybe would consider it),
- They would interested in a degree with a European – wide certificate validity – all levels.

Slovakia dominated in the 1st cluster in terms of states, Greece in the 2nd cluster and

China in the 4th cluster. Nobody dominated in the 3th cluster.

In addition, we employed the Chi-square test for independence in which we examined which of the following questions regarding the current situation were raised and this correlates with the distribution of the generated clusters.

- Sex (M – F)
- Age
- Degree studies (secondary – Bc. – Mgr./Ing. – Ph.D.)
- Field studies (social sciences – natural sciences – technical – artistic)
- Accomodation during the study period(at home – near the school)
- The financial level of the family (below average – average – above average)
- The payment of tuition fees (no – yes/no problems – yes/minor problems – yes/high load)
- Study results (below average – average – above average)
- Employment opportunities (no problems – problems)
- Tourist stay abroad (no – yes)
- Study abroad (no – yes)
- Another stay abroad (no – yes)
- Considering studying abroad (not – perhaps ever – yes)
- Number of university-educated parents (none – one – two)
- Degree of influence on decision making (1 ... max – 5 ... min)
  - family
  - examples in the surroundings
  - teachers at school
  - promotional materials
- The rating of possible expectations (1 ... max – 5 ... min)
  - knowledge of the country
  - to learn a language
  - studies at a prestigious school
  - gaining practical experience
  - a degree with EU-wide validity
  - better labor market
  - settlement in the country after studying
- Degree of concern (1 ... max – 5 ... min)
  - separation from family
  - separation from friends
  - security situation in the country
  - financial costs associated with studying abroad
  - language barriers
  - different religious sentiments

The null hypotheses of these tests were independent of given variables and the variable meaning belongs to a given cluster. We tested at the 5% significance level.

Only a few variables released the p-value of 0.05. This means that these variables are not affected by membership of individual clusters. The group of these variables includes both concerns about the security situation in the country (p-value = 0.586), concern about the financial costs associated with the stay (p-value = 0.575), fear of different religious beliefs (p-value = 0.206), fear of language barriers (p-value = 0.168) and expectations of obtaining a diploma with a Europe-wide validity (p-value = 0.278), the expectation of settling there after the study programme (p-value = 0.219), expectations for better labor market outcomes (p-value = 0.133).

For other variables, the p-value went up to 0.038, even though for most variables the p-value is almost zero, indicating rejection of the null hypothesis of independence. Because these variables are correlated with the distribution of the clusters, therefore we can say what the prevailing value of the variable for the cluster is.

In the next step of the classification process, we designed decision trees. We used three algorithms implemented in the statistical system SPSS (CART, CHAID, and QUEST).

We chose the newly created variable „belonging to the cluster“ for the dependent variable and we chose the variables belonging to individual survey questions, which in previous Chi-square tests for independence demonstrated dependence, as the dependent variable. The Values risk estimates published in all of the produced trees were similar (in the range 0.282 to 0.325. It is not ideal, but at an adequate level. The worst hit was the QUEST algorithm, primarily CART.

According to various algorithms, members of the clusters in terms of answers to selected questions can be categorised as follows (3rd in the cluster or one type of tree not exempted – will be featured in the list).

QUEST Algorithm

1st cluster

- Students of social science. Disciplines.

2nd cluster

- Secondary school students of humanistic or artistic directions and university students currently paying tuition.

Fig. 1: Classification Tree Generated by CART

Source: own

4th cluster
- Students of natural and technical science disciplines currently paying tuition.

CART Algorithm (see Fig. 1)
1st cluster
- Students of social science disciplines coming from families with below-average incomes.

2nd cluster
- Students coming from families with average to above-average incomes, exhibiting an average to below-average academic performance, who currently pay tuition fees, whereby this doesn't cause additional problems.

4th cluster
- Students of natural, technical and artistic disciplines, who don`t currently pay tuition fees, or if were the case it would cause them great difficulty. These students expect to have practical experience abroad.

CHAID Algorithm
1st cluster
- Students of social science disciplines, expressing a strong fear of separation from the family (answers 1 and 2 on a five-point scale) and coming from families with below-average incomes.

2nd cluster
- Students of Bachelor degree studies with average to below-average academic performance, without much fear of being separated from the family (3 to 5 answers on the five-point scale).

4th cluster
- Students of natural and technical science disciplines exhibiting a strong fear of being separated from the family (answers 1 and 2 on a five-point scale).

This classification furnished us with interesting results. The generated clusters are defined/ /analysed very well (see the above description of the clusters). Furthermore, it appears that in each of the resulting clusters, belonging to one (or several) countries of origin of the student is predominant. It pays to invest in segments with a sufficient number of students from the same country. The f**ourth cluster of predominantly Chinese students appears to be very promising from this point of view**.

The various algorithms for building classification trees also provided us with some good and reasonably interpretable results. **The CHAID algorithm showed how important the fact of student separation from the family is. This implies an important argument for the creation of a marketing strategy proposing a „foster family." The CART algorithm again outlined the fourth segment and is a cluster of low-income students who are interested in practical work experience. If the program is designed and offered as a „paid internship" it will not necessitate the need to spend a lot of money on marketing activities necessary for the attraction of such students**.

A university of regional significance could also be very successful in attracting foreign students belonging to another cluster, ie, students without financial problems, with weaker academic performance, who are likely to accept less prestigious universities and appreciate all the other activities geared to their personal development (using their own personal funds).

In the next phase, we performed an analysis of the jurisdiction of the respondent to the individual clusters and the amount of tuition that the student is willing to pay.

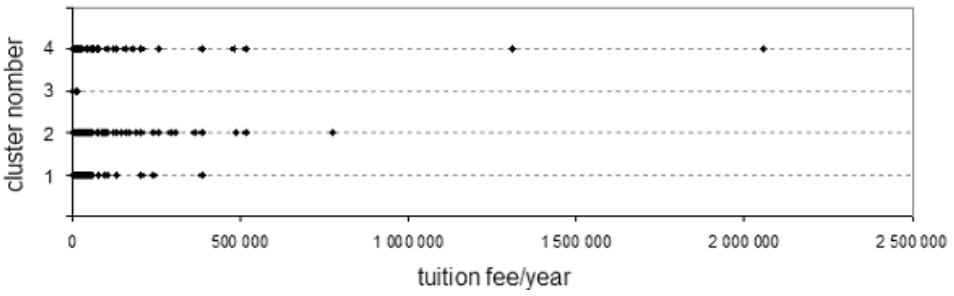
First, we performed the Kruskal-Wallis test to determine whether the value of the tuition fees within the jurisdiction of the various groups was comparable to a cluster or not (i.e., independence or dependence of observed variables).

The null hypothesis was independence and we worked at the 5% significance level. The resulting p-value was almost zero (more precisely 1.45 times 10 -14). This means the 5% level rejecting the null hypothesis. For the students assigned to individual clusters, there are statistically significant differences in the amount of annual tuition fees that students are willing to pay. Figure 2 shows the nonzero values of the annual tuition fees (CZK) within individual clusters.

In a group dominated by the lower value of the annual tuition fees, there are also very significant outliers (more than 2 million CZK). Therefore, the graph in Fig. 2 is not perfectly assessable. We display identical data in a logarithmic scale, which allows a different assessment of this data, in Fig. 3.

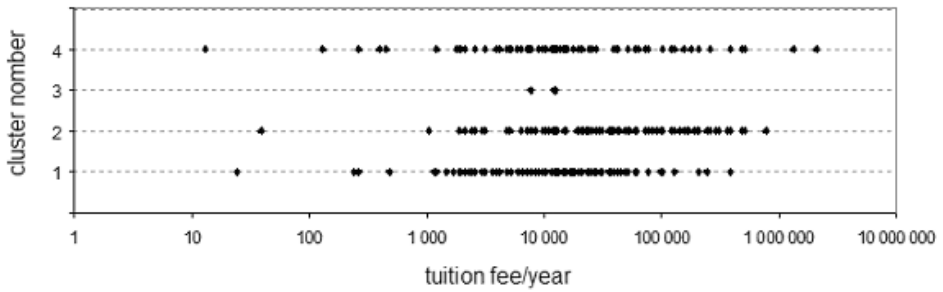
The collected data are summarized in Tab. 1. In each cluster is shown here:
- number of students assigned to the cluster, ňnumber of students in the cluster, who

Fig. 2: The Annual Tuition Fees According to the Clusters (Common Scale)



Source: own

Fig. 3: The Annual Tuition Fees According to the Clusters (Logarithmic Scale)



Source: own

fulfilled the nonzero tuition fees and are willing to pay,

- proportion of students with a completed non-zero tuition fees of all students in a given cluster,
- average tuition fees (CZK), which are paid by the students and the cluster,
- average tuition fees (CZK) calculated from all non-zero values in a given cluster.

Tab. 1: Comparison of Clusters According to the Amount of Annual Tuition

cluster	number of respondents	mean (in CZK)	number of non-zero values	proportion of non-zero values	mean of non-zero values (in CZK)
1	348	16,555.49	282	0.8103	20,488.88
2	382	54,603.64	269	0.7042	77,947.21
3	27	1,203.07	3	0.1111	10,827.67
4	336	51,363.53	262	0.7798	65,870.78

Source: own

Both graphs (Fig. 2 and Fig. 3) and Tab. 1 show that in terms of annual tuition, that the student is willing to pay, the worst cluster number is 3. In this cluster there is only 11.11 % of non-zero values, i.e. 88.89 % of these students are not willing to pay any tuition fees. At the same time, both observed average amounts of annual tuition fees are the lowest of all clusters. This cluster is assigned to students, who are not thinking about studying abroad, and thus they are uninteresting from our point of view, hence the poor results of this cluster are not necessarily negative.

Cluster number 1, which are assigned to students from families with below-average incomes who are planning a short-term bachelor's degree in social sciences and are willing to study in Czech, in Czech or in combination with English, contains the highest proportion of students who are willing to pay any tuition fees (81.03 %). Unfortunately the average amount of tuition, that these students are willing to pay is quite low (20,489 CZK, 16,555 CZK respectively).

Cluster number 2, in which students are from families with above-average income, with average or below-average academic performance who plan on studying abroad in the medium term follow-up of social, artistic or technical sciences, contains a high proportion of students who complete a non-zero amount of any fees (70.42 %). Both of the average level of fees that the student is willing to pay is the highest of all clusters (77,947 CZK, 54,604 CZK respectively).

Cluster number 4, in which students are planning a long-term foreign doctoral study programme in the natural sciences or engineering disciplines who would be willing to pay for a year- long czech language course and continue to study in the combined Czech + English language, and who after completing the study programme abroad, would then like to have some practical experience in the field. This contains a very high proportion of non-zero values of fees (77.98 %). This means that most students in this cluster are willing to pay tuition. Both of the average values are also high in comparison with other clusters (65,871 CZK, 51,364 CZK respectively).

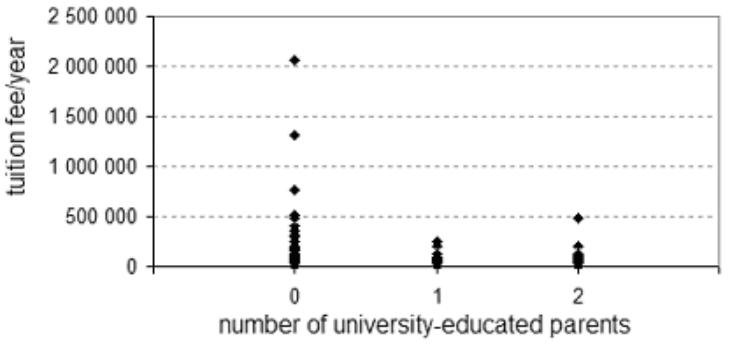
It can be gleaned from the above that the most advantageous group to focus on must be the fourth cluster of students, because they are willing to pay a high amount of long-term tuition fees. The total value that these students will pay is therefore the highest. The problem is the need for accreditation of the doctoral studies.

Very conveniently, it also appears to focus on the master degree students, who, although only in the medium-term plan to stay abroad, nevertheless are willing to pay the highest average annual amount of any annual fees.

2.3 Monitoring the Relationship between Variables and Parents' Education Level of Fees

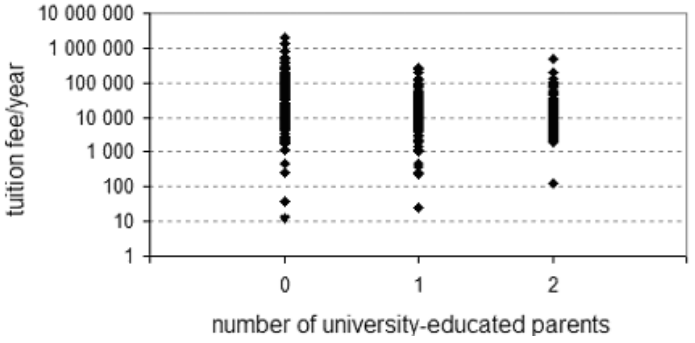
Fig. 4 and 5 are shown the value of any annual fees (CZK) depending on the number of university-educated parents for an ordinary student, respectively, in a logarithmic scale.

Fig. 4: The Annual Tuition Fees According to the Number of University-Educated Parents (Common Scale)



Source: own

Fig. 5: **The Annual Tuition Fees According to the Number of University-Educated Parents (Logarithmic Scale)**



Source: own

The collected data are summarized in Tab. 2. They are presented in the following information:

- Students with a certain number of university-educated parents,
- Number of students assigned to the cluster,
- Number of students in the cluster, who fulfill the nonzero tuition fees that are willing to pay,
- Proportion of students with a completed non-zero tuition fees of all students in a given cluster,
- Average tuition fees (CZK), which are paid by students and the cluster,
- Average tuition fees (CZK) calculated from all non-zero values in a given cluster.

Tab. 2: **Comparison of the Number of University-Educated Parents and the Subsequent Amount of Annual Tuition**

number of university parents	number of respondents	mean (in CZK)	number of non-zero values	proportion of non-zero values	mean of non-zero values (in CZK)
0	698	52,871.14	496	0.7106	69,606.57
1	226	23,212.84	170	0.7522	30,995.97
2	158	24,969.02	135	0.8544	29,223.00

Source: own

We performed a Kruskal-Wallis test to determine whether the values of the level of fees within each class given the number of university-educated parents of the student are or are not comparable (ie, independence or dependence of observed variables).

The null hypothesis was independence and we worked at the 5% significance level. The resulting p-value was very small (more precisely, 0.001347). This means that the 5% level rejects the null hypothesis, i.e. **the amount of annual tuition fees that students are willing to pay depends on the number of university-educated parents of the student**.

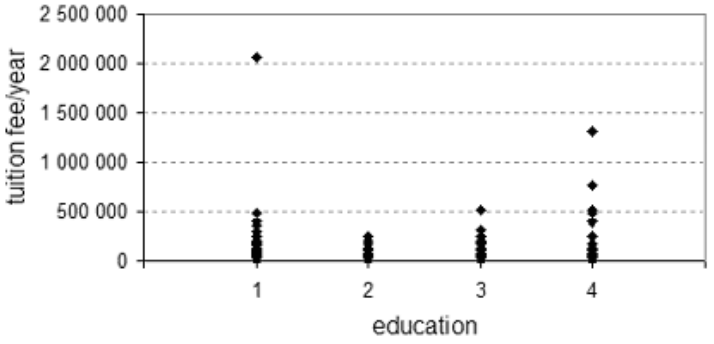
From Tab. 2 , the highest average annual amount for tuition students are willing to pay who do not even have one college-educated parent can be seen (69,607 CZK, 52,871 CZK respectively). The percentage of students who are willing to pay at least some tuition in this category is also quite high (71.06 %).

The highest proportion of students who are willing to pay at least some tuition is highest for students whose parents are both university graduates (85.44 %).

2.4 Monitoring the Relationship between Variables and Higher Education Student Tuition

We performed a Kruskal-Wallis test to determine whether the values of the level of fees within each class given the current level of education of the parents of the student are, or are not comparable (i.e., independence or dependence of observed variables).

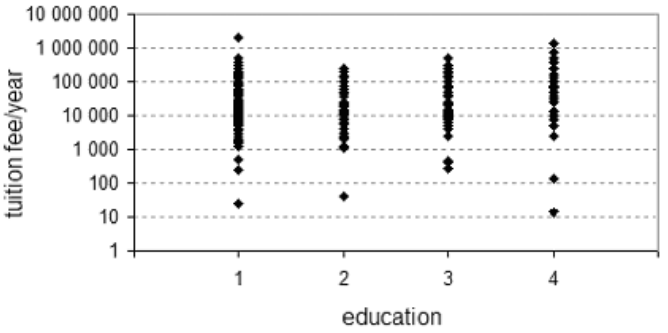
Fig. 6: **The Annual Tuition Fees According to the Level of the Student's Education (Common Scale)**



Source: own

Note: ***1 ... secondary, 2 ... Bc., 3 ... Mgr./Ing., 4 ... Ph.D.***

Fig. 7: **The Annual Tuition According to the Level of Education of the Student (Logarithmic Scale)**



Source: own

Note: ***1 ... secondary, 2 ... Bc., 3 ... Mgr./Ing., 4 ... Ph.D.***

The null hypothesis of independence was two and we worked at the 5% significance level. The resulting p-value was almost zero (more precisely 5.9656 times 10-8). This means that at the 5% level, is the rejection of the null hypothesis of independence, ie the amount of annual tuition fees that students are willing to pay depends on the level of education of the student.

Fig. 6 and 7 show the amount of any annual fees (CZK) according to the ordinary student undergoing education, respectively, in logarithmic scale.

The collected data are summarized in Tab. 3. There are presented as follows here:

- Educational level of the student,
- Number of students assigned to the cluster,
- Number of students in the cluster, who

fulfilled nonzero tuition fees that are willing to pay,
- Proportion of students with a completed non-zero tuition fees of all students in a given cluster,
- Average tuition fees (CZK), which are paid by students and the cluster,
- Average tuition fees (CZK) calculated from all non-zero values in a given cluster.

Tab. 3 shows that the highest average annual amount students are willing to pay for tuition is by those students who have a doctoral education (118,314Kč, 81,209 CZK respectively). The percentage of students who are willing to pay at least some tuition in this category is high (66.38 %).

The highest proportion of students who are willing to pay at least some tuition is highest for students having a bachelor's degree (81.68 %).

Tab. 3: Comparison of Students' Educational Level and the Amount of Annual Tuition

education	number of respondents	mean (in CZK)	number of non-zero values	proportion of non-zero values	mean of non-zero values (in CZK)
secondary	223	25,433.35	134	0.6009	42,325.52
bachelor	535	34,601.45	437	0.8168	42,540.10
follow-up	202	48,421.04	161	0.7970	60,751.81
doctoral116	81,209.42	77	0.6638	118,314.16	

Source: own

Tab. 3 shows that the highest average annual amount for tuition students are willing to pay are those students who have a doctoral education (118,314 CZK, resp. 81,209 CZK). Percentage of students who are willing to pay at least some tuition in this category is high (66.38 %). The highest proportion of students who are willing to pay at least some tuition is highest for students having a bachelor's degree (81.68 %).

In the following part of the research we focused on monitoring the acceptable level of fees depending on other factors (Who or what affects student when deciding whether to travel. What is expected of students studying abroad? What could amount to an obstacle for students who would like to study abroad?) We used the Kruskal-Wallis and MedianTest. The results of all tests are summarized in Tab. 4. We have dealt with this issue already in [5] and [11].

In all observed cases, if the p-value is less than 0.05, we rejected the null hypothesis of independence. From the resulting p-values, it is thus obvious **that an acceptable level of fees depends on the influence that travel, family and the teachers at the school, then on the assumption that study abroad will improve the knowledge of foreign languages, the possibility of gaining practical experience in the foreign country and of acquiring a diploma with European-wide validity. A certain amount of tuition is acceptable but is negatively impacted by the fear of separation from friends and the language barrier.**

We observed those factors which influence the division of students the most. We created a classification tree for the dependent variable „acceptable level of fees" in CZK. We selected all observed factors as explanatory variables. We employ two methods to create a tree (CHAID and CART). The quality of the result was superior when applying the CHAID. The tree structure shows **that the most acceptable level of tuition fees is distinguished from the viewpoint of obtaining practical experience after graduation abroad and then from the viewpoint of improvement in a foreign language**. These are the two most important factors in the conducting of marketing campaigns aimed at attracting foreign students.

Tab. 4: **The Result of Kruskal-Wallis and Median Tests to Monitor the Level of Fees Depending on Various Factors**

question	Kruskal-Wallis test		Median Test	
	CHI	p-value	CHI	p-value
15-family	9.830607606	0.0434	11.00494301	0.0265
15-example	6.883056454	0.1422	10.19532294	0.0373
15-staff	15.6785413	0.0035	19.84890014	0.0005
15-media	13.54819165	0.0089	6.469089732	0.1667
16-culture	9.376714799	0.0523	13.07074678	0.0109
16-langue	15.36958979	0.004	21.65624135	0.0002
16-prestige	5.483692695	0.2412	7.01786513	0.1349
16-practice	17.96345757	0.0013	13.33873788	0.0097
16-degree	9.93869166	0.0415	11.29288298	0.0234
16-job	3.199492824	0.5250	5.712854282	0.2216
16-live	2.409758715	0.6609	3.191380815	0.5263
17-family	2.229029992	0.6937	1.301200215	0.8611
17-friends	10.97936615	0.0268	12.41120044	0.0145
17-country	4.874616897	0.3004	2.782469038	0.5948
17-costs	4.600302626	0.3308	1.96693061	0.7418
17-language	11.711417	0.0196	11.01600837	0.0263

Source: own

Conclusions

This article demonstrated what significance for the student, separation from the family assumes. This necessitates the creation of a marketing strategy involving a „foster family“. Furthermore, a group of students with low incomes who are interested in practical work experience abroad indicated a possible marketing perspective. If the program is designed and offered as a „paid internship“ there will not need to be an extensive and expensive marketing strategy necessary for the attraction of such potential students.

It appears to be very advantageous to focus on master degree students, who, although only planning a medium-term stay abroad, nevertheless are willing to pay the highest average annual amount of any annual fees. Doctoral students are willing to pay a high amount for long-term tuition, thus the total value that these students will pay will be the highest.The problem is the need for accreditation of such doctoral studies.

A university of regional significance could also be very successful in attracting foreign students without financial problems, displaying weaker academic performance, who are likely to accept less prestigious universities and appreciate all the other activities geared to their personal development (using their personal funds).

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Abstract

TYPOLOGY OF FOREIGN STUDENTS INTERESTED IN STUDYING AT CZECH UNIVERSITIES

Marta Žambochová

This paper undertakes and investigates some marketing segmentations of those students wishing to study abroad and the economic potential of such resulting segmentation within the individual groups. Three algorithms were employed as classification trees – CART, CHAID and QUEST for its evaluation from the group of supervised learning methods. From the group of unsupervised learning methods the two–step cluster analysis was chosen. This paper analyzes the results obtained using these methods. It aims to create classes of respondents harbouring similar opinions with respect to tuition fees to be paid by foreign students. We have used various tests for the hypotheses such the as Chi-square Test of Independence and the Kruskal-Wallis Test.

The research sample consisted of more than one thousand students from six countries. A „perfect" type of person as candidate was profiled in terms of willingness and the financial means to pursue their studies in the Republic invested and this survey formed the basis of the profiling. Our research shows that an acceptable level of fees depends on several factors such as: the amount of travel involved, family and teachers at the school, then on the assumption that the study stay abroad would improve knowledge of foreign languages, practical work experience offered in the foreign country and the subsequent acquisition of a diploma with Europe-wide validity. There exists an acceptable level of tuition and this in turn reveals that the most acceptable level of tuition fees may be dependent upon the viewpoint of potential practical work experience abroad and then from the viewpoint of improvement in a foreign language. The amount of annual tuition fees that students are willing to pay depends too on the number of university-educated parents the students possess.

Key Words: *Classification, Cluster Analysis, Decision Trees, Marketing Segmentation, Economic Potential.*

JEL Classification: *C12, C38, H52, I25, M30.*