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The Effect of Straight-line and Accelerated Depreciation Rules on Risky Investment Decisions – an Experimental Study*

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Abstract

The aim of this study is to analyze how depreciation rules influence the decision behavior of investors. For this purpose, we conduct a laboratory experiment in which participants decide on the composition of an asset portfolio in different choice situations. Using an experimental environment with different payment periods, we show that accelerated compared to straight-line depreciation can increase the willingness to invest as hypothesized by theory. Additionally, we are able to replicate the unexpected finding of Ackermann et al. (2013) – that introducing a subsidy leads to a lower willingness to take risk although the net returns are kept constant – with our setting which is different to their experimental environment.

Keywords

Taxation, Straight-line Depreciation, Accelerated Depreciation, Tax Perception, Risk Taking Behavior, Portfolio Choice, Behavioral Taxation

JEL-Classification

C91, D14, H24

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1 Introduction

The influence of taxation on the willingness to take risk and on the willingness to invest of firms and individuals is one main topic in the tax literature.[1] For example, the effects of introducing or increasing an income tax or a capital gains tax, loss offset provision, asymmetric taxation of gains and losses, or asymmetric taxation of different investment opportunities or investor groups are only some central issues of this strand of literature. Additionally, accounting principles – such as depreciation regulations – are important aspects that influence the advantageousness of investment alternatives as they alter the net present value of these opportunities by means of affecting the tax base and therefore the tax amount in each period over the time horizon.

Our aim is to study how depreciation rules – namely straight-line and accelerated depreciation – influence the decision behavior of investors. For this purpose, we conduct a laboratory experiment in which participants decide on the composition of an asset portfolio in different choice situations. To induce an investment environment in the lab that is closer to reality, we decided that subjects receive their money from the experiment not only immediately after the experiment has finished, but also after a certain time lag. This enables us to study the behavior of investors when they are confronted with an investment decision over different time periods. Therefore, we are able to analyze the timing/interest effects of different depreciation rules on the willingness to invest in a controlled environment. So far, there is no study in the tax and accounting literature that applies such an experimental setting to investigate this research question. Additionally, we contribute to the literature by replicating the interesting and unexpected finding of Ackermann et al. (2013) – that introducing a subsidy leads to a lower willingness to take risk although the net returns are kept constant – in a different experimental environment.

The findings of our study are manifold. First, we find that an accelerated compared to a straight-line depreciation rule increases the willingness to invest as hypothesized by theory in our more complex treatment with a subsidy. Second, we are able to replicate the findings observed by Ackermann et al. (2013) when the time lag between the payment periods is not too long. Third, we show that tax misperception biases do not occur when comparing the straight-line and accelerated depreciation rule. Fourth, our study indicates that experimental

[1] See, for example, Hundsdoerfer et al. (2008) and Niemann and Sureth (2008) for overviews over the literature on this topic.

results depend to some extent on the experimental environment and raises, therefore, new questions for future research analyzing why these environment-dependent differences occur.

The remainder of the paper is organized as follows: In section 2, we give a brief review of the theoretical, empirical, and experimental literature. In section 3, we present the design of our experiment and formulate our hypotheses. The results of our study are given in section 4. The results of a variation treatment as a robustness check are presented in section 5. In our last section 6, we summarize and discuss our findings.

2 Literature Review

The research question how depreciation regulations influence the investment behavior of firms and individuals is discussed in the theoretical and empirical tax literature for many decades.[2] Coen (1971), for example, derive two ways in which the accelerated depreciation, compared to the straight-line depreciation, can stimulate investments: an accelerated depreciation increases (1) the after-tax rate of return on the asset ("rate-of-return effect") and (2) the cash flows ("liquidity effect"). Coen estimates the tax savings for 1954-1966 resulting from the accelerated depreciation and the investment tax credit. He finds that the stimulus based on the accelerated depreciation is always higher than the stimulus based on the tax credit. Klein and Taubman (1971) build up an econometric model and estimate the effect of accelerated depreciation and the investment tax credit on investments with the help of several US investment data. They examine the consequences of a temporary suspension of the tax credit and the accelerated depreciation from the fourth quarter 1966 through the third quarter 1968. The results indicate that investors anticipate the suspension and delay investments. Cummins and Hassett (1992) use firm panel data to investigate the impact of changes in the costs of capital and its influence on investment decisions. For this purpose, they consider the tax reform act of 1986 in the US with which the investment tax credit was exposed and depreciation lifetimes were extended. They find a strong linkage between investment decisions and the cost of capital. Increased costs of capital, as a result of, for example, increasing depreciation lifetimes, reduces investments.

Cohen et al. (2002) investigate a change in the US tax law introduced with the 2002 tax bill. Hereafter, firms were allowed to immediately deduct 30 percent of investment purchases in

[2] See, for example, Hundsdoerfer et al. (2008) and Niemann and Sureth (2008). An overview of papers which deals with empirical research on depreciation is given by Jorgenson (1996).

the first year. The remaining 70 percent of the investment purchases have to be depreciated under standard depreciation schedules. Cohen et al. explore the impact of the 30 percent first-year deduction on the marginal cost of equipment investment. They find that this act can increase the incentive to invest in equipment markedly. House and Shapiro (2008) deal with the same change in the US tax rules. They estimate the investment supply elasticity after the 30 percent first-year deduction rule was implemented. They argue that the elasticity of investments for long-lived capital goods is nearly infinite and therefore tax subsidies should be fully reflected in the investment prices. The result of their work indicates that the introduced immediate depreciation lowers the price of the supported assets. Therefore, the investments in qualified capital increased sharply. In addition to this tax law change in 2002, Hulse and Livingstone (2010) further analyze the 2003 Tax Act and its incentive effect of bonus depreciations on investments. In fact, qualified properties bought during the period from September 11, 2001 through December 31, 2004 are subject to an extraordinary bonus depreciation of 30% and 50%, respectively. In contrast to the previous studies, they find only a weak impact of these incentives on capital spending. In line with this result, Desai and Goolsbee (2004) show that the accelerated depreciation method has almost no important effect on the investment behavior.

Feldstein (1982) examines the interaction between depreciation rules and the rate of inflation, and its impact on the investment behavior of firms. His results indicate that the delayed consideration of the historic costs of acquisition with a periodic depreciation leads to reduced investments compared to an immediate depreciation. The longer the period of depreciation and the higher the inflation rate, the lower will be the volume of investments of the firms. Summers (1987) points out that the advantage of different depreciation rules depend on the assumed discount rate. Schneider (1981) states that the effect of using the accelerated instead of straight-line depreciation method is ambiguous and mainly depends on the time structure of alternative payments and on investor’s utility function. Therefore, a clear and unambiguous prediction of how such tax incentives affect investment behavior cannot be provided from a theoretical perspective.

Jackson (2008) and Jackson et al. (2009) study the influence of different depreciation methods on investment decisions empirically. They compare the straight-line depreciation with the accelerated depreciation. The results show that firms which use the accelerated depreciation method are more likely to invest in a replacement asset than firms which use the straight-line depreciation method.

Up to now, only Davis and Swenson (1993) analyze the effects of depreciation rules on investment behavior experimentally. In particular, they investigate the influence of introducing accelerated depreciation rules and tax credits on the demand for depreciable assets in a market setting. They find that the impact of the tax incentives is rather modest as they observed that the demand was unresponsive to the tax incentives. As stated by the authors, "this result is inconsistent with extant neoclassical theory and the expectations of policymakers" (Davis and Swenson, 1993, p. 509).

A small but growing literature analyzing tax perception issues finds that investment decisions can be heavily biased by a misperception of tax effects that possibly could explain the unexpected result of Davis and Swenson (1993).[3] Fochmann et al. (2012a, b), for example, investigate the willingness to take risk when an income tax with a loss offset provision is applied compared to when no taxation is applied. They observe an unexpected high willingness to take risk under an income tax although the gross payoffs are adapted in such a way that both settings (with and without tax) are identical in net terms and thus the same decision pattern was expected. In contrast, Fochmann and Hemmerich (2014) find that introducing an income tax with or without a full loss offset provision leads investors to reduce their willingness to take risk although the gross investments are adjusted accordingly to achieve identical net investments. Ackermann et al. (2013) study how taxes and subsidies influence investment behavior. They find that – although the net income is held constant again – individuals invest less in the risky asset when a tax has to be paid or when a subsidy is paid. They conduct different variations of their baseline experiment to examine how robust these findings are and observe that only a reduction of the environment complexity by reducing the number of states mitigates the identified perception bias. The results of all these studies show that individuals often do not react to taxation as it is expected by a standard

3 Tax perception issues are not only of importance in the context of investment decisions. For example, Gamage et al. (2010), Djanali and Sheehan-Connor (2012), and Fochmann et al. (2013) observe that individuals are more willing to supply labor when a tax is raised on their income from working than when no tax is raised although both cases are identical in net terms. König et al. (1995) and Arrazola et al. (2000) show by using archival data that labor supply decisions are distorted by an incorrect tax perception. Furthermore, Chetty et al. (2009), Finkelstein (2009), and Feldman and Ruffle (2012) find that the consumption of goods can be biased by a tax misperception. Sausgruber and Tyran (2005, 2011) reveal in different laboratory experiments that voting behavior is affected by a distorted tax perception. In the literature, some determinants influencing tax perception are identified. For example, the higher the salience of a tax is, the more correct is the tax perception (see, for example, Rupert and Wright, 1998, Sausgruber and Tyran, 2005, 2011, Chetty et al., 2009, Finkelstein, 2009, Fochmann and Weimann, 2013). Additionally, the higher the tax complexity is, the worse is the quality of individual investment decisions under taxes (see, for example, de Bartolome, 1995, Rupert and Wright, 1998, Rupert et al., 2003, Boylan and Frischmann, 2006, and Blaufus and Ortlieb, 2009). Furthermore, a positive relationship between the accuracy of the tax estimation and education, age, and income, respectively, is shown in the literature (see, for example, Gensemer et al., 1965, Morgan et al., 1977, Lewis, 1978, Fujii and Hawley, 1988, König et al., 1995, Rupert and Fischer, 1995).

theory, which assumes that individuals decide on their net payoffs. Although this strand of literature does not focus on the perception of depreciation rules explicitly, these findings indicate that perception biases are possible important as well when tax effects of different depreciation rules – such as straight-line or accelerated depreciation rules – on investment decisions are economically discussed. Thus, the aim of this study is to link both this literature on tax perception and the "standard" research literature on depreciation rules.

3 Experimental Design, Treatments, and Hypotheses

3.1 Decision Task

In our setting, subjects have to decide on the composition of an asset portfolio in different choice situations.[4] At the beginning of each situation, each subject receives an endowment of 800 Lab-points where 2 Lab-points correspond to 1 Euro cent. The participants' task is to spend their endowment on two investment alternatives: asset A and asset B. The price for one asset of either type is 8 Lab-Points. As an investor is not allowed to save her endowment, she buys 100 assets in each decision situation in total.

The return of asset A is risky and depends on the state of nature. Three states (good, middle, bad) are possible and each state occurs with an equal probability of 1/3. The return of asset B is risk-free and is therefore equal in every state of nature. The returns of both assets are chosen in such a way that asset A does not dominate asset B in each state of nature, but that the expected return of asset A exceeds the risk-free return of asset B. The subjects know the potential returns on both assets in each state of nature before they make their investment decision.

An investment in asset A or B exactly leads to two payoffs with a time lag between both payment dates. Subjects immediately receive the first payoff in cash after the experiment has finished. The second payoff is paid in three weeks. To receive the delayed payment, a participant could choose either to come to the experimenter's office or that the experimenter transfers the money to her bank account. For reasons of simplification, we use "periods" instead of "payment dates" in the following. However, subjects only decide on their investment in the first period. No further decision is made in period 2.

4 The instructions are available in appendix A1.

3.2 Income Taxation, Subsidization, and Treatments

The income from asset A is taxed at a rate of 50%. The tax base is given by the gross return resulting from asset A (i.e., chosen number of asset A times the gross return per asset A) minus the depreciation amount (dependent on the amount initially invested in asset A). The tax is raised in each period separately. As the gross return per asset A and the depreciation amount can be different in both periods, the tax base, the tax amount, and the net payoff can differ as well. The gross returns of asset A are chosen in such a way that the tax base cannot be negative. The risk-free asset B is not subject to taxation.

In our experiment, we use a 2x2 design in which we vary the depreciation rule (within-subject design) and the existence of a subsidy (between-subject design). Thus, we have four different treatments in total. With respect to the depreciation method, we use two different rules: straight-line and accelerated depreciation. In the treatments with the straight-line depreciation rule, the total amount invested in asset A (i.e., chosen number of asset A times the price of 8 Lab-Points for one asset A) is equally distributed across both periods. In the treatments with accelerated depreciation rule, the total amount invested in asset A is completely depreciated in the first period (immediate write-off). In the second period, no further depreciation reduces the tax base.[5]

Regarding the subsidization, we implement treatments with and without a subsidy. In the treatments without subsidy, the decision situation is exactly as described. In the treatments with subsidy, a subsidy of 2 Lab-Points is paid for each asset A. For reasons of simplification, we decided that the subsidy amount does not influence the tax base and is, therefore, not taxed. The risk-free asset B is not subsidized. Table 1 gives an overview over all four treatments. Table 2 shows an example for each treatment and for each period.

Table 1: Treatment overview

		depreciation rule (within-subject design)	
		straight-line	accelerated
subsidy (between-subject design)	without subsidy	straight-line depreciation without subsidy	accelerated depreciation without subsidy
	with subsidy	straight-line depreciation with subsidy	accelerated depreciation with subsidy

[5] Note that the amount invested in asset B is not of importance for tax purposes as asset B is not subject to a tax.

Table 2: Numerical example for each treatment and period

		subsidization	without subsidy				with subsidy			
		depreciation rule	**straight-line**		**accelerated**		**straight-line**		**accelerated**	
		period	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
given values	(1)	depreciation share	50%	50%	100%	0%	50%	50%	100%	0%
	(2)	number of asset A	70	70	70	70	70	70	70	70
	(3)	gross return of one share of asset A	40	20	40	20	40	20	40	20
	(4)	subsidy amount of one share of asset A	---	---	---	---	2	2	2	2
	(5)	return of asset B	2,800	1,400	2,800	1,400	30	15	30	15
asset A	(6)	gross return resulting from asset A = (2) · (3)	2,800	1,400	2,800	1,400	2,800	1,400	2,800	1,400
	(7)	amount invested in asset A = (2) · 8 Lab-Points	560	560	560	560	560	560	560	560
	(8)	depreciation amount = (1) · (7)	280	280	560	0	280	280	560	0
	(9)	tax base = (6) – (8)	2,520	1,120	2,240	1,400	2,520	1,120	2,240	1,400
	(10)	tax amount = 50% · (9)	1,260	560	1,120	700	1,260	560	1,120	700
	(11)	subsidy = (2) · (4)	---	---	---	---	140	140	140	140
	(12)	**net payoff resulting from asset A = (6) – (10) + (11)**	**1,540**	**840**	**1,680**	**700**	**1,680**	**980**	**1,820**	**840**
asset B	(13)	share number of asset B = 100 – (2)	30	30	30	30	30	30	30	30
	(14)	**payoff resulting from asset B = (5) · (13)**	**900**	**450**	**900**	**450**	**900**	**450**	**900**	**450**
	(15)	**total net payoff = (12) + (14)**	**2,440**	**1,290**	**2,580**	**1,150**	**2,580**	**1,430**	**2,720**	**1,290**

3.3 Hypotheses

3.3.1 Straight-line vs. Accelerated Depreciation

As only the risky asset A is taxed in our experiment, the applied depreciation rule only influences the after-tax return of the asset A investment. In particular, an accelerated depreciation leads to a higher present value of the depreciation tax shield compared to a straight-line depreciation because the depreciable amount is higher in the first period under an accelerated depreciation (timing/interest effect). As a consequence, this leads to a higher net present value of the asset A investment under accelerated than under a straight-line depreciation. Thus, in accordance with the theoretical literature, we hypothesize that an accelerated compared to a straight-line depreciation leads to a higher willingness to invest in the risky asset A. This leads us to our first hypothesis.[1]

Hypothesis 1: *The investment in the risky asset A is higher under an accelerated than under a straight-line depreciation.*

As different experimental studies have found perception biases which contradict theoretical predictions (see section 2), we implement net and gross value equivalence decision situations. In the gross value equivalence decision situations, all gross payoffs are identical across the treatments with straight-line and accelerated depreciation. These decision situations are used to test hypothesis 1. To isolate perception biases, we use the net value equivalence decision situations. In these decision situations, the gross payoffs in each treatment are adapted in such a way that the net payoffs are identical across the treatments. Thus, in net terms, the choice situations are completely identical in all our treatments in these decision situations. As a consequence, the same decision pattern is expected in all treatments when no perception bias occurs. This leads us to our hypothesis 2:

Hypothesis 2: *If the net returns are identical, investment in the risky asset A and the risk-free asset B is identical irrespective of whether an accelerated or a straight-line depreciation is applied.*

[1] This hypothesis is analyzed by using the decisions of the gross value equivalent decision situations.

For each of the two depreciation rules, we use 5 net and 5 gross value equivalence decision situations, respectively. Hence, each subject is confronted with 20 decision situations in total.[2] Table 3 depicts this procedure.

Table 3: Specification of the decision situations

	straight-line depreciation	accelerated depreciation
gross value equivalence	5 decision situations	5 decision situations
net value equivalence	5 decision situations	5 decision situations

3.3.2 Subsidy vs. No Subsidy

Ackermann et al. (2013) show that introducing a subsidy while keeping the net returns constant leads to an unexpected perception bias that results in a reduced willingness to take risk.[3] To analyze this perception bias, we use two treatments with and without subsidy but adapt the gross returns in such a way that the net returns are identical in both treatments.[4] Following the observation of Ackermann et al. (2013), we conjecture:

Hypothesis 3: If the net returns are identical, investment in the risky asset A is lower with than without subsidy.

3.4 Experimental Protocol

The experiment was conducted at the computerized experimental laboratory of the Otto-von-Guericke University of Magdeburg (MaXLab). In total, 165 subjects (62 females and 103 males) participated and earned on average 12.91 Euros in approximately 100 minutes (about 7.75 Euros per hour). The experimental software was programmed with z-Tree (Fischbacher, 2007) and subjects (mainly economic students) were recruited with ORSEE (Greiner, 2003).

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[2] To avoid any order effects, the sequence of these 20 decision situations is randomized for each participant. In appendix A2 the (potential) gross and net returns of both assets are displayed for each treatment and each decision situation.

[3] As discussed by Ackermann et al. (2013), one explanation for this result could be that introducing a subsidy results in a more complex decision environment leading investors to decrease their willingness to take risk. A similar observation that points in this direction can be found in Fochmann and Hemmerich (2014).

[4] Note that this perception effect can only be analyzed if the decision situations are identical in net terms. If we would use the same gross payoffs instead, we would not be able to distinguish between a real subsidy effect and the perception effect and, thus, we would not be able to isolate the observed perception bias. A comparison between a setting with and without subsidy when the decision situations are identical in gross terms is unfortunately not possible with our experiment as we did not implement such decision situations.

We implement different methods to make sure subjects understand the decision environment. First, at the beginning of the experiment, the instructions are read out loudly were the procedure of the experiment and the payoff mechanism are explained to the participants. The instructions contain a numerical example for each depreciation rule and for each payment date. In this example the calculation of the net payoff resulting from asset A and B as well as the total net payoff are explained. The participants have time to read the instructions for their own and to ask questions. Second, after reading the instructions, participants face a comprehension test in which they are confronted with a similar example as given in the instructions, but with new numerical values. The test is solved after all questions are answered correctly. Third, participants receive a pocket calculator which could be used during the whole experiment for own calculations. Fourth, a "what-if-calculator" is provided in each decision situation which allows subjects to calculate their tax burden, the (net) payoff resulting from asset A and B, and the total net payoff at different investment levels.

To avoid income effects and strategies to hedge the risk across all decision situations, only one of the 20 decision situations is paid out. For this purpose, each participant is asked to randomly draw a number from 1 to 20 at the end of the experiment to select her payoff relevant decision situation. Hereafter, the participant has to cast a six-sided die to determine the relevant state of nature. The state of nature is good, middle, and bad if f the number is 1 or 2, 3 or 4, and 5 or 6, respectively. Dependent on the chosen quantities of asset A and B in the selected decision situation, the participant's payoffs are calculated for each of the two periods and the payoff of the first period is paid out immediately in cash.

4 Results

4.1 Straight-line vs. Accelerated Depreciation

For our statistical analyses, we use the share of endowment invested in the risky asset A as our dependent variable. The amount invested in the risk-free asset B is the residual share. Table 4 presents descriptive statistics for our dependent variable separated for the treatments and for the gross and net value equivalence decision situations. To analyze our treatment differences statistically, we use the non-parametric Mann-Whitney U test and the parametric t-test both for two independent samples. Table 4 shows the resulting (two-sided) p-values of both tests when we compare the straight-line and accelerated depreciation treatment. Figure 1 (without subsidy) and figure 2 (with subsidy) depict the mean share of endowment invested in the risky asset A.

In the *gross value equivalence* decision situations, we expect a higher willingness to invest in the risky asset under an accelerated than under a straight-line depreciation (hypothesis 1). In the treatment with subsidy, this investment behavior is actually observed and both statistical tests indicate a significant difference between both depreciation treatments (p-values below 5%). Thus, hypothesis 1 can be confirmed. In the treatment without subsidy, however, we do not observe the expected decision pattern and differences are not statistically significant (p-values above 10%). As a result, hypothesis 1 has to be rejected for the case without subsidy.

With respect to the *net value equivalence* decision situations, we hypothesize the same investment behavior as the net returns are identical in both depreciation treatments (hypothesis 2). Independent of whether a subsidy is paid or is not paid, we observe no economically and statistically significant difference between the straight-line and accelerated depreciation treatment. All p-values are above the 10%-level. This result is in accordance with hypothesis 2 which we can therefore confirm.

Table 4: Share of endowment invested in the risky asset A (in percent)

treatment	**statistic**	**gross value equivalence decision situations**		**net value equivalence decision situations**	
		straight-line depreciation	accelerated depreciation	straight-line depreciation	accelerated depreciation
without subsidy (# of subjects: 41)	mean	74.72	72.14	75.96	72.76
	median	90.00	90.00	90.00	83.00
	std. dev.	31.94	34.84	31.97	33.25
	minimum	0	0	0	0
	maximum	100	100	100	100
	# of observations	205	205	205	205
	MWU test	p = 0.3462		p = 0.3463	
	t-test	p = 0.3252		p = 0.1713	
with subsidy (# of subjects: 38)	mean	58.78	65.17	63.66	64.86
	median	65.00	75.00	72.50	75.00
	std. dev.	39.03	37.49	37.38	35.93
	minimum	0	0	0	0
	maximum	100	100	100	100
	# of observations	190	190	190	190
	MWU test	p = 0.0428		p = 0.7028	
	t-test	p = 0.0354		p = 0.6264	

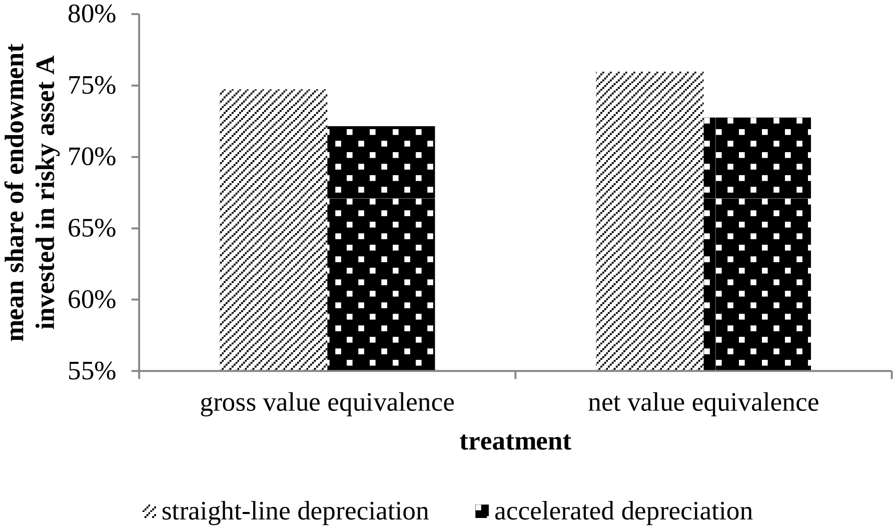

Figure 1: Mean share of endowment invested in the risky asset A (in percent) in the treatment without subsidy

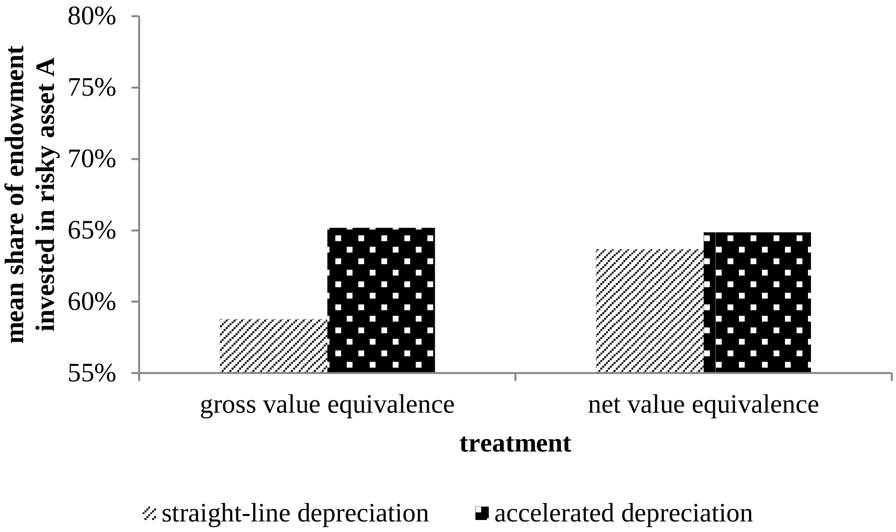

Figure 2: Mean share of endowment invested in the risky asset A (in percent) in the treatment with subsidy

4.2 Subsidy vs. No Subsidy

As observed by Ackermann et al. (2013), we hypothesize that introducing a subsidy leads investors to reduce their willingness to invest in the risky asset A although the net returns are not affected by this subsidy (hypothesis 3). As we are only interested in the decision situations with identical net returns, we just focus on the results of the net value equivalence decision situations in the following. Table 5 presents different descriptive statistics and figure 3 depicts the mean share of endowment invested in the risky asset A. Independent of whether we aggregate the results from both depreciation treatments or not, we observe that the willingness to invest in the risky asset A decreases markedly when a subsidy is paid. All differences are statistically significant (at least) at a 5%-level. Thus, hypothesis 3 is supported and the results of Ackermann et al. (2013) are confirmed by our study.

Table 5: Share of endowment invested in the risky asset A (in percent) in the net value equivalence decision situations

treatment	statistic	without subsidy	with subsidy
straight-line and accelerated depreciation	mean	74.36	64.26
	median	90.00	75.00
	std. dev.	32.62	36.62
	minimum	0	0
	maximum	100	100
	# of subjects	41	38
	# of observations	410	380
	MWU test	$p = 0.0002$	
	t-test	$p < 0.0001$	
straight-line depreciation	mean	75.96	63.66
	median	90.00	72.50
	std. dev.	31.97	37.38
	minimum	0	0
	maximum	100	100
	# of subjects	41	38
	# of observations	205	190
	MWU test	$p = 0.0019$	
	t-test	$p = 0.0005$	
accelerated depreciation	mean	72.76	64.86
	median	83.00	75.00
	std. dev.	33.25	35.93
	minimum	0	0
	maximum	100	100
	# of subjects	41	38
	# of observations	205	190
	MWU test	$p = 0.0343$	
	t-test	$p = 0.0239$	

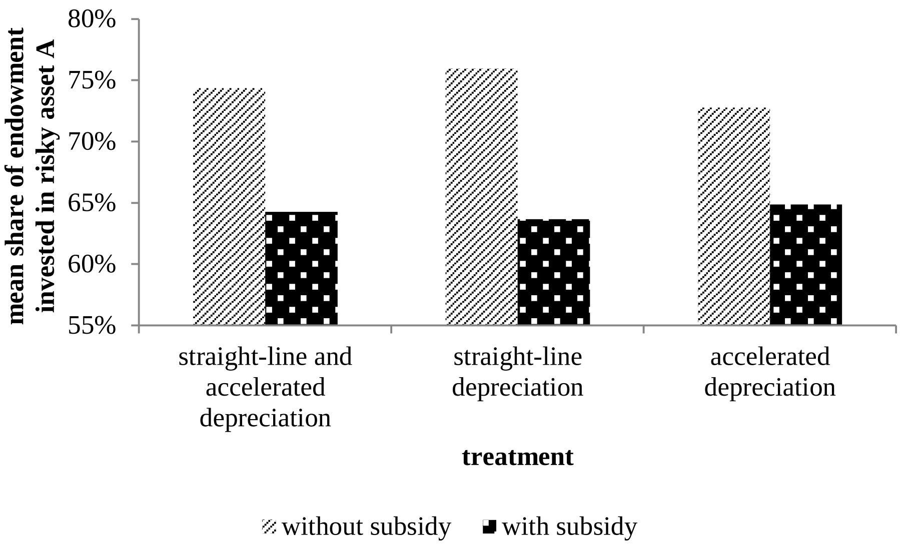

Figure 3: Mean share of endowment invested in the risky asset A (in percent) in the net value equivalent decision situations

5 Robustness Check: Three-Months-Time Lag

In the following, we analyze how robust our results are with respect to the length of the time lag between the first and the second period. The idea is that receiving the second payoff not in three weeks, but in, for example, three months makes the investment decision more important as individuals are perhaps more interested to earn money today and not in the distant future. Thus, we decided to extend the time lag to three month. Anything else remains unchanged. Table 6 and 7 present descriptive statistics for the mean share of endowment invested in the risky asset A for the treatments with the three-months-time lag.

Regarding the differences between the straight-line and accelerated depreciation treatments (see table 6), we observe very similar results as we observed with a time lag of three weeks. In the gross value equivalence decision situations, we only observe an economically and statistically significant difference between both deprecation treatments in the treatment with subsidy. As a consequence, hypothesis 1 has to be confirmed for the case with subsidy, but has to be rejected for the case without subsidy. In the net value equivalence decision situation, we find no differences and therefore hypothesis 2 is supported, again. So far, these results are robust to different time lags. With respect to the introduction of a subsidy (table 7), we still observe a decrease of the willingness to invest in the risky asset A when a subsidy is paid. However, the difference is not significant anymore. As a consequence hypothesis 3 is confirmed in the three-weeks-case, but has to be rejected in the three-months-case.

Table 6: Share of endowment invested in the risky asset A (in percent) – three month time lag

treatment	statistic	gross value equivalence decision situations		net value equivalence decision situations	
		straight-line depreciation	accelerated depreciation	straight-line depreciation	accelerated depreciation
without subsidy (# of subjects: 43)	mean	64.41	63.28	65.60	65.17
	median	70.00	70.00	70.00	80.00
	std. dev.	34.94	36.03	34.86	35.77
	minimum	0	0	0	0
	maximum	100	100	100	100
	# of observations	215	215	215	215
	MWU test	p = 0.9104		p = 0.9825	
	t-test	p = 0.6771		p = 0.8578	
with subsidy (# of subjects: 43)	mean	61.61	68.25	64.44	62.56
	median	70.00	75.00	75.00	70.00
	std. dev.	35.17	32.33	35.33	34.22
	minimum	0	0	0	0
	maximum	100	100	100	100
	# of observations	215	215	215	215
	MWU test	p = 0.1025		p = 0.2871	
	t-test	p = 0.0062		p = 0.4103	

Table 7: Share of endowment invested in the risky asset A (in percent) in the net value equivalence decision situations – three month time lag

treatment	statistic	without subsidy	with subsidy
straight-line and accelerated depreciation	mean	65.39	63.50
	median	75.00	70.00
	std. dev.	35.28	34.75
	minimum	0	0
	maximum	100	100
	# of subjects	43	43
	# of observations	430	430
	MWU test	p = 0.1933	
	t-test	p = 0.4299	
straight-line depreciation	mean	65.60	64.44
	median	70.00	75.00
	std. dev.	34.86	35.33
	minimum	0	0
	maximum	100	100
	# of subjects	43	43
	# of observations	215	215
	MWU test	p = 0.5605	
	t-test	p = 0.7324	
accelerated depreciation	mean	65.17	62.56
	median	80.00	70.00
	std. dev.	35.77	34.22
	minimum	0	0
	maximum	100	100
	# of subjects	43	43
	# of observations	215	215
	MWU test	p = 0.2284	
	t-test	p = 0.4392	

6 Summary and Discussion

The aim of this study is to analyze how depreciation regulations influence the decision behavior of investors. For this purpose, we conduct a laboratory experiment in which participants decide on the composition of an asset portfolio in different choice situations. In line with the theoretical literature, we hypothesize that the capital amount invested in the risky asset is higher under an accelerated than under a straight-line depreciation as the net present value of the investment is higher in the former case (hypothesis 1). As a result, this hypothesis is supported by our data, but only in the treatment with a subsidy. If no subsidy exists, however, the hypothesis has to be rejected.

To control for perception biases which are possibly responsible for this unexpected decision pattern, we use treatments in which the gross returns are adapted in such a way that the net returns are identical under both depreciation methods (net value equivalence decision situations). As a consequence, the same investment behavior is expected in these treatments (hypothesis 2). In line with this hypothesis, we observe no economically and statistically significant difference between the straight-line and accelerated depreciation treatment irrespective of whether a subsidy is paid or is not paid. Thus, we can summarize (1) that perception biases do not occur in this context, but (2) that the theoretical prediction that an accelerated depreciation rule spurs investments is only observed in the more complex treatment with a subsidy. These findings are robust even in a setting in which the time lag between the first and second period is extended to three months instead of three weeks.

To replicate the unexpected observation of Ackermann et al. (2013) that introducing a subsidy leads to a lower willingness to take risk although the net returns are kept constant, we implement treatments with and without a subsidy. Independent of whether we aggregate the results from both depreciation treatments or not, we observe that the willingness to invest in the risky asset A decreases markedly when a subsidy is paid. Thus, we are able to confirm our third hypothesis and, therefore, are able to replicate the findings observed by Ackermann et al. in another kind of experimental environment with different payment periods.

Interestingly, this behavior is not observed in our robustness check treatments in which the time lag between the first and second period is extended to 3 months. One plausible explanation for this asymmetric behavior is that subjects take the investment decision more seriously in the three months than in the three weeks setting. In the former case, subjects are perhaps more willing to think about the choice problem as a “wrong” decision would possibly lead to a lower payoff today and a higher payoff in the distant future. Since this trade-off of receiving less today and more in the future is more important in the three months than in the three weeks setting, a more "rational" behavior and, thus, a lower level of perception bias is to be expected in the first case.

In addition to our contribution to the literature on the effects of different depreciation methods on investment decisions, our study indicates that experimental results depend to some extent on the experimental environment. In particular, we show that the theoretically expected higher willingness to invest under an accelerated depreciation rule is only observed in the more complex treatment with a subsidy and we show that the perception bias found by Ackermann et al. (2013) is only observed in the environment with the three-weeks-time lag between both payment periods. Therefore, future research is required to analyze in more detail why these environment-dependent differences occur.

Appendix

A1 Instructions (originally written in German)

In the following, the instructions of our experiment are presented for the three weeks case. The difference between these instructions and the instructions of the three month case is just the replacement of the word "month" instead of "week". Differences between the treatments with and without a subsidy are highlighted.

General Remarks

By taking part in this experiment, you receive the chance to earn money. The amount of money you may earn depends on the decisions you make during the experiment and upon chance.

Please note that you will not receive your full earnings today. One part of your earnings is paid out to you in cash at the end of the experiment. You will receive the other part in three weeks (meaning on June 12, 2013).

Either you can collect the payment, which you will receive in three weeks, by yourself or it will be transferred to your bank account. We will ask you to choose one of the described alternatives after the experiment.

- In case you decide for collecting the payment by yourself, come to Room 317 (Building 22 A-Part) between 9 am and 5 pm on June 12, 2013 for collecting it.

- In case you decide for transferring the payment to your bank account, we will ask you for your account information after the experiment. We will transfer the remaining payment on June 12, 2013. We explicitly assure you that your data is treated confidentially. Your data will not be disclosed to any third party and is deleted immediately after the transfer.

On the following pages, you find the experiment instructions.

Experiment instructions

For simplification purposes, calculations are done by using Lab-points instead of Euro amounts during the experiment. 2 Lab-points correspond to one Euro Cent, i.e., 200 Lab-points are equal to 1 Euro.

We would like to point out that you are not allowed to talk to other participants or to leave your seat during the experiment. Please read the instructions carefully and thoroughly. In case you have any questions, raise your hand. We will then come to your place for answering your questions. The experiment starts after all participants fully understood the instructions. The experiment consists of *20 decision situations*.

Your task during the experiment

At the beginning of each decision situation, you receive an initial capital of 800 Lab-points which you have to invest in different investment objects. You have to choose to invest in either of the two following investment alternatives: type A or type B. Both investment types are structured in such a way that you can choose to buy one or several objects of either type, i.e., you can decide to buy 1 or, for example, 70 objects of investment type A.

The price for buying one object amounts to 8 Lab-points and is the same for both types. As you receive an initial capital of 800 Lab-points, you can thus buy 100 objects of both types together (type A and type B) in each decision situation.

In each round, you have to choose how many objects of type A and type B you want to buy. You only have to decide how many objects of type A you want to buy. The remaining capital is then automatically invested in objects of type B.

> ***Example:*** *If you decide, for example, to buy 70 objects of type A, you have to spend 560 Lab-points (= 70 · 8 Lab-points per object). The remaining 240 Lab-points (= 800 Lab-points – 560 Lab-points) are then automatically invested in objects of type B. Thus, you receive 30 objects of type B (= 240 Lab-points / 8 Lab-points per object).*

Please note: Both investment types (type A and type B) generate <u>two</u> payoffs. You receive one payoff today and the second one in three weeks.

<u>Payoff of type A</u>

Gross profit of type A

Each acquired object of type A generates a certain *gross profit* at each payment date, i.e., today and in three weeks. The amount of gross profit generated at one payment date is equal for every object of type A. However, the amount of gross profit generated can differ across the two payment dates.

The gross profit of type A depends on the occurrence of a state of nature. Three different states of nature can occur: good, middle, and bad. All states of nature occur with the same probability ($p = 1/3$). The possible gross profits of the three states of nature may be different from decision situation to decision situation and are provided to you prior to each decision.

Example:

state of nature	**payment date: today**	**payment date: in 3 weeks**
good	50	30
middle	40	20
bad	30	10

Please note: The state of nature generated by chance is applied for both payment dates. Considering the example above, if the state of nature “middle” occurs, the gross profit generated at the payment date “today” is 40 Lab-points and at the payment date “in three weeks” is 20 Lab-points. Which state of nature occurs is chosen once by chance and this state is then valid for both payment dates.

Gross payoff of type A

Your “gross payoff of type A” equals the product of the realized gross profit of type A and your acquired amount of objects of type A. For example, if the realized gross profit of type A is 40 Lab-points at a certain payment date and your acquired amount of objects of type A is 70, you receive a “gross payoff of type A” equal to 2,800 Lab-points (= 40 Lab-points · 70) at this payment date.

Net payoff of type A

Type A investment is subject to taxation. The so-called tax base provides the basis for calculating the tax amount. *The tax you have to pay amounts to 50% of the tax base*. The tax base is calculated as follows:

Tax base = gross payoff of type A – deduction

The tax base is thus determined by the amount of your gross payoff of type A and the level of deduction. The level of deduction depends on 1) the amount of capital that you have invested in type A in total and 2) which of the following rules is applied:

1. **50%-50%-rule:** At the first payment date (i.e., today), the level of deduction equals *50%* of the invested capital. At the second payment date (i.e., in three weeks), the level of deduction equals *50%* of the invested capital.
2. **100%-0%-rule:** At the first payment date (i.e., today), the level of deduction equals *100%* of the invested capital. At the second payment date (i.e., in three weeks), the level of deduction equals *0%* of the invested capital.

The applied rule may be different from decision situation to decision situation and is provided to you prior to each decision.

[treatment without subsidy:

*Your "net payoff of type A" equals the "gross payoff of type A" minus tax payment.**]***

[treatment with subsidy:

Besides being subject to taxation, type A investments are also be granted a subsidy. The subsidy amounts to 2 Lab-points for each acquired object of type A. Please note that this subsidy will be granted to you at both payment dates. For example, if you buy 70 objects of type A, you receive a subsidy of 140 Lab-points (= 2 Lab-points · 70) at both payment dates.

Please note that the level of subsidization does not influence the level of taxation.

*Your "net payoff of type A" equals the "gross payoff of type A" minus tax payment plus subsidy.**]***

Payoff of type B

Similar to type A investments, each acquired object of type B generates a profit at each payment date. The amount of profit generated at one payment date is equal for every object of type B. However, the amount of profit generated can differ across the two payment dates. In contrast to type A investments, the amount of profit of type B does not depend on the occurrence of a state of nature, but is equal in all states of nature. Before making your decision, you thus know with certainty the amount of profit generated at each payment date.

Example:

state of nature	**payment date: today**	**payment date: in 3 weeks**
good	30	15
middle	30	15
bad	30	15

The profit of type B may be different from decision situation to decision situation and is provided to you prior to each decision.

[treatment without subsidy:

In contrast to type A investments, type B is not subject to taxation.***]***

[treatment with subsidy:

In contrast to type A investments, type B is neither subject to taxation nor to subsidization.***]***

Your “payoff of type B” equals the product of the profit of type B and your acquired amount of objects of type B. For example, if the realized profit of type B is 30 Lab-points and your acquired amount of objects of type B is 30, you receive a “payoff of type B” equal to 900 Lab-points (= 30 Lab-points · 30).

Total payoff of type A and B

Each payment date generates a total payoff which equals the sum of the “net payoff of type A” and the “payoff of type B”. Please note that a total payment is determined for each payment date.

Calculation example

Taking both rules into account, the following table gives a calculation example of how the total payoff is calculated. The following values are assigned in the calculation: acquired amount of objects of type A 70, realized gross profit of type A at first payment date (i.e., today) 40 Lab-points, realized gross profit of type A at second payment date (i.e., in three weeks) 20 Lab-points, payoff of type B at first payment date 30 Lab-points, and payoff of type B at second payment date 15 Lab-points.

[treatment without subsidy:

		deduction rule	**50%-50%-rule**		**100%-0%-rule**	
		payment date	**today**	**in 3 weeks**	**today**	**in 3 weeks**
given values	(1)	percentage for deduction	50%	50%	100%	0%
	(2)	acquired amount of objects of type A	70	70	70	70
	(3)	realized gross profit of type A	40	20	40	20
	(4)	profit of type B	30	15	30	15
asset A	(5)	gross payoff of type A = (2) · (3)	2,800	1,400	2,800	1,400
	(6)	amount invested in type A = (2) · 8 Lab-points	560	560	560	560
	(7)	deduction = (1) · (6)	280	280	560	0
	(8)	tax base = (5) – (7)	2,520	1,120	2,240	1,400

	(9)	tax amount = 50% · (8)	1,260	560	1,120	700
	(10)	**net payoff of type A = (5) – (9)**	**1,540**	**840**	**1,680**	**700**
asset B	(11)	acquired objects of type B = 100 – (2)	30	30	30	30
	(12)	**payoff of type B = (4) · (11)**	**900**	**450**	**900**	**450**
	(13)	**total net payoff = (10) + (12)**	**2,440**	**1,290**	**2,580**	**1,150**

]

[treatment with subsidy:

		depreciation rule	**50%-50%-rule**		**100%-0%-rule**	
		payment date	**today**	**in 3 weeks**	**today**	**in 3 weeks**
given values	(1)	percentage for deduction	50%	50%	100%	0%
	(2)	acquired amount of objects of type A	70	70	70	70
	(3)	realized gross profit of type A	40	20	40	20
	(4)	subsidy per object of type A	2	2	2	2
	(5)	profit of type B	30	15	30	15
asset A	(6)	gross payoff of type A = (2) · (3)	2,800	1,400	2,800	1,400
	(7)	amount invested in type A = (2) · 8 Lab-points	560	560	560	560
	(8)	deduction = (1) · (7)	280	280	560	0
	(9)	tax base = (6) – (8)	2,520	1,120	2,240	1,400
	(10)	tax amount = 50% · (9)	1,260	560	1,120	700
	(11)	subsidy = (2) · (4)	140	140	140	140
	(12)	**net payoff of type A = (6) – (10) + (11)**	**1,680**	**980**	**1,820**	**840**
asset B	(13)	acquired objects of type B = 100 – (2)	30	30	30	30
	(14)	**payoff of type B = (5) · (13)**	**900**	**450**	**900**	**450**
	(15)	**total net payoff = (12) + (14)**	**2,580**	**1,430**	**2,720**	**1,290**

]

General information

You have the opportunity to conduct test calculations at your computer (lower half of the screen) during the experiment. While doing this, different values (including gross and net values) are presented to you. In addition, you can use the pocket calculator which is at your workplace for own calculations.

After the completion of all 20 decision situations, you will be asked to draw a ball from an urn containing 20 consecutively numbered balls (from 1 to 20). The number assigned to the drawn ball determines the decision situation which is paid out to you. Further, you will be asked to throw a six-sided dice once for determining the state of nature that occurs. If you throw a [1] or [2], the state of nature “good” occurs. If you throw a [3] or [4], the state of nature “middle” occurs. If you throw a [5] or [6], the state of nature “bad” occurs. Your payoff of taking part in the experiment is thus determined by the amount of objects of type A and B you have chosen to buy in this decision situation. The total payoff is then converted in Euro and you receive the payoff generated at the payment date “today” in cash at the end of the experiment. In three weeks, you receive the in Euro converted payoff generated at the payment date “in three weeks”.

After you have read the instructions, we ask you to answer several questions at your computer. Answering these questions allows us to test whether you have fully understood the experimental proceeding. At this point, your answers are not relevant for your payoff at the end of the experiment. Subsequently, the actual experiment starts. Please note that the computer program we use does not separate decimal places with a comma, but with a period.

A2 Gross and net returns

Table A1 and A2 depict the (potential) gross and net returns of both assets in each decision situation for each treatment.

Table A1: Gross and net returns in the treatment without subsidy

depreciation rule	value equivalence	decision number	state of nature	gross return asset A period 1	gross return asset A period 2	gross return asset B period 1	gross return asset B period 2	net return asset A period 1	net return asset A period 2	net return asset B period 1	net return asset B period 2
straight-line depreciation	net value equivalent decision situations	1	good	28.8	16.8	14.2	14.2	16.4	10.4	14.2	14.2
			middle	32.8	18.8			18.4	11.4		
			bad	36.8	20.8			20.4	12.4		
		2	good	16.8	28.8	14.2	14.2	10.4	16.4	14.2	14.2
			middle	18.8	32.8			11.4	18.4		
			bad	20.8	36.8			12.4	20.4		
		3	good	21.6	21.6	14.2	14.2	12.8	12.8	14.2	14.2
			middle	25.6	25.6			14.8	14.8		
			bad	29.6	29.6			16.8	16.8		
		4	good	30.8	18.8	6.8	22.8	17.4	11.4	6.8	22.8
			middle	32.8	20.8			18.4	12.4		
			bad	34.8	22.8			19.4	13.4		
		5	good	18.8	30.8	22.8	6.8	11.4	17.4	22.8	6.8
			middle	20.8	32.8			12.4	18.4		
			bad	22.8	34.8			13.4	19.4		

accelerated depreciation	net value equivalent decision situations	6	good	24.8	20.8			16.4	10.4		
			middle	28.8	22.8	14.2	14.2	18.4	11.4	14.2	14.2
			bad	32.8	24.8			20.4	12.4		
		7	good	12.8	32.8			10.4	16.4		
			middle	14.8	36.8	14.2	14.2	11.4	18.4	14.2	14.2
			bad	16.8	40.8			12.4	20.4		
		8	good	17.6	25.6			12.8	12.8		
			middle	21.6	29.6	14.2	14.2	14.8	14.8	14.2	14.2
			bad	25.6	33.6			16.8	16.8		
		9	good	26.8	22.8			17.4	11.4		
			middle	28.8	24.8	6.8	22.8	18.4	12.4	6.8	22.8
			bad	30.8	26.8			19.4	13.4		
		10	good	14.8	34.8			11.4	17.4		
			middle	16.8	36.8	22.8	6.8	12.4	18.4	22.8	6.8
			bad	18.8	38.8			13.4	19.4		
straight-line depreciation	gross value equivalent decision situations	11	good	16.4	10.4			10.2	7.2		
			middle	18.4	11.4	9.1	9.1	11.2	7.7	9.1	9.1
			bad	20.4	12.4			12.2	8.2		
		12	good	10.4	16.4			7.2	10.2		
			middle	11.4	18.4	9.1	9.1	7.7	11.2	9.1	9.1
			bad	12.4	20.4			8.2	12.2		
		13	good	12.8	12.8			8.4	8.4		
			middle	14.8	14.8	9.1	9.1	9.4	9.4	9.1	9.1
			bad	16.8	16.8			10.4	10.4		
		14	good	17.4	11.4			10.7	7.7		
			middle	18.4	12.4	5.4	13.4	11.2	8.2	5.4	13.4
			bad	19.4	13.4			11.7	8.7		
		15	good	11.4	17.4			7.7	10.7		
			middle	12.4	18.4	13.4	5.4	8.2	11.2	13.4	5.4
			bad	13.4	19.4			8.7	11.7		

accelerated depreciation	gross value equivalent decision situations	16	good	16.4	10.4			12.2	5.2		
			middle	18.4	11.4	9.1	9.1	13.2	5.7	9.1	9.1
			bad	20.4	12.4			14.2	6.2		
		17	good	10.4	16.4			9.2	8.2		
			middle	11.4	18.4	9.1	9.1	9.7	9.2	9.1	9.1
			bad	12.4	20.4			10.2	10.2		
		18	good	12.8	12.8			10.4	6.4		
			middle	14.8	14.8	9.1	9.1	11.4	7.4	9.1	9.1
			bad	16.8	16.8			12.4	8.4		
		19	good	17.4	11.4			12.7	5.7		
			middle	18.4	12.4	5.4	13.4	13.2	6.2	5.4	13.4
			bad	19.4	13.4			13.7	6.7		
		20	good	11.4	17.4			9.7	8.7		
			middle	12.4	18.4	13.4	5.4	10.2	9.2	13.4	5.4
			bad	13.4	19.4			10.7	9.7		

Table A2: Gross and net returns in the treatment with subsidy

depreciation rule	value equivalence	decision number	state of nature	gross return				net return			
				asset A		**asset B**		**asset A**		**asset B**	
				period 1	period 2	period 1	period 2	period 1	period 2	period 1	period 2
straight-line depreciation	net value equivalent decision situations	1	good	24.8	12.8			16.4	10.4		
			middle	28.8	14.8	14.2	14.2	18.4	11.4	14.2	14.2
			bad	32.8	16.8			20.4	12.4		
		2	good	12.8	24.8			10.4	16.4		
			middle	14.8	28.8	14.2	14.2	11.4	18.4	14.2	14.2
			bad	16.8	32.8			12.4	20.4		
		3	good	17.6	17.6			12.8	12.8		
			middle	21.6	21.6	14.2	14.2	14.8	14.8	14.2	14.2
			bad	25.6	25.6			16.8	16.8		
		4	good	26.8	14.8			17.4	11.4		
			middle	28.8	16.8	6.8	22.8	18.4	12.4	6.8	22.8
			bad	30.8	18.8			19.4	13.4		
		5	good	14.8	26.8			11.4	17.4		
			middle	16.8	28.8	22.8	6.8	12.4	18.4	22.8	6.8
			bad	18.8	30.8			13.4	19.4		

accelerated depreciation	net value equivalent decision situations	6	good	20.8	16.8			16.4	10.4		
			middle	24.8	18.8	14.2	14.2	18.4	11.4	14.2	14.2
			bad	28.8	20.8			20.4	12.4		
		7	good	8.8	28.8			10.4	16.4		
			middle	10.8	32.8	14.2	14.2	11.4	18.4	14.2	14.2
			bad	12.8	36.8			12.4	20.4		
		8	good	13.6	21.6			12.8	12.8		
			middle	17.6	25.6	14.2	14.2	14.8	14.8	14.2	14.2
			bad	21.6	29.6			16.8	16.8		
		9	good	22.8	18.8			17.4	11.4		
			middle	24.8	20.8	6.8	22.8	18.4	12.4	6.8	22.8
			bad	26.8	22.8			19.4	13.4		
		10	good	10.8	30.8			11.4	17.4		
			middle	12.8	32.8	22.8	6.8	12.4	18.4	22.8	6.8
			bad	14.8	34.8			13.4	19.4		
straight-line depreciation	gross value equivalent decision situations	11	good	16.4	10.4			12.2	9.2		
			middle	18.4	11.4	11.1	11.1	13.2	9.7	11.1	11.1
			bad	20.4	12.4			14.2	10.2		
		12	good	10.4	16.4			9.2	12.2		
			middle	11.4	18.4	11.1	11.1	9.7	13.2	11.1	11.1
			bad	12.4	20.4			10.2	14.2		
		13	good	12.8	12.8			10.4	10.4		
			middle	14.8	14.8	11.1	11.1	11.4	11.4	11.1	11.1
			bad	16.8	16.8			12.4	12.4		
		14	good	17.4	11.4			12.7	9.7		
			middle	18.4	12.4	7.4	15.4	13.2	10.2	7.4	15.4
			bad	19.4	13.4			13.7	10.7		
		15	good	11.4	17.4			9.7	12.7		
			middle	12.4	18.4	15.4	7.4	10.2	13.2	15.4	7.4
			bad	13.4	19.4			10.7	13.7		

accelerated depreciation	gross value equivalent decision situations	16	good	16.4	10.4	11.1	11.1	14.2	7.2	11.1	11.1
			middle	18.4	11.4			15.2	7.7		
			bad	20.4	12.4			16.2	8.2		
		17	good	10.4	16.4	11.1	11.1	11.2	10.2	11.1	11.1
			middle	11.4	18.4			11.7	11.2		
			bad	12.4	20.4			12.2	12.2		
		18	good	12.8	12.8	11.1	11.1	12.4	8.4	11.1	11.1
			middle	14.8	14.8			13.4	9.4		
			bad	16.8	16.8			14.4	10.4		
		19	good	17.4	11.4	7.4	15.4	14.7	7.7	7.4	15.4
			middle	18.4	12.4			15.2	8.2		
			bad	19.4	13.4			15.7	8.7		
		20	good	11.4	17.4	15.4	7.4	11.7	10.7	15.4	7.4
			middle	12.4	18.4			12.2	11.2		
			bad	13.4	19.4			12.7	11.7		

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