APPENDIX to "A Trust Game in Loss Domain"

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A 1. Instructions

In Baseline and LD treatments:

Welcome to our experiment. The experiment will last approx. 30 minutes. During the experiment you will be able to earn money that will be paid out in cash anonymously once the experiment is over. You will now have plenty of time to read through the instructions for the experiment. If you have any questions on the instructions, please raise your hand and we will come over to you. It is not allowed to talk or communicate with the other participants during the experiment.

Follow the messages that pop up on the screen. There will be some waiting during the experiment. Please do not press any other buttons than those you are asked to press. When you are told on the screen that the experiment is over, it is important that you note down your pc number and the amount earned on the enclosed receipt sheet. When we tell you that you may leave the room, you can take along the receipt sheet to EAL, office no. H-161, to have the amount paid out.

Baseline:

All the participants are split into pairs which consist of a sender and a responder. Half of you are thus given the role as senders and half the role as responders. You do not get to know who your partner is. Your partner is in the room, but you will not get to know who this person is during the experiment or after the experiment.

At the start of the experiment all participants receive NOK 100. Sender (S) then gets the opportunity to send all, some or none of his or her money to the responder (R). The amount that is not sent is kept by the sender. The amount that is sent to R is tripled. If S chooses to send e.g. NOK 20 to R, then R receives NOK 60. If S sends NOK 90, then R receives NOK 270. R then decides how much of this amount he/she wants to keep and how much he/she will send back. The amount that is sent back is not tripled.

In summary: If S sends an amount x to R and R returns y, the profit will be as follows:

- S receives NOK 100-x+y.

- R receives NOK 100+3x-y.

Loss Domain I and II:

All the participants are split into pairs which consist of a player A and a player B. Half of you are thus given the role as player A and half the role as player B. You do not get to know who your partner is. Your partner is in the room, but you will not get to know who this person is during the experiment or after the experiment.

At the start of the experiment all participants receive NOK 200. Player B then gets the opportunity to take money from player A. But before player B makes this decision, player A can insure an amount between 0 and NOK 100. Thus player B is not able to take any money from the amount that is insured.

Loss Domain I:

For each krone that player A insures, player B loses 2 kroner. This means that if player A insures 100 kroner, then player B has nothing left, but can instead take up to 100 kroner from player A. On the other hand, if player A insures nothing, both players keep their corresponding 200 kroner, but player B can then take an amount between 0 and 200 kroner from player A.

Some examples:

If player A insures 80 kroner, then he/she has an uninsured amount of 200-80=120, in addition to the 80 that he/she has insured. Player B will have 200-2*80=40. In addition, player B can decide how much from player A's uninsured amount of 120 that he/she wants to take. Hence, player A ends up with an amount between 80 and 200, while player B ends up with an amount between 40 and 160 kroner.

If player A insures 10 kroner, then he/she has an uninsured amount of 200-10=190, in addition to the 10 that he/she has insured. Player B will have 200-2*10= 180. In addition, player B can decide how much from player A's uninsured amount of 190 that he/she wants to take. Hence, player A ends up with an amount between 10 and 200, while player B ends up with an amount between 180 and 370 kroner.

Summarizing: If player A insures an amount x, and player B takes an amount y from player A, then the payoffs are as follows:

Player A earns kr. 200-y

Player B earns kr. 200-2x+y

Loss Domain II:

For each krone that player A insures, both players A and B lose 1 krone each. This means that if player A insures 100 kroner, both players lose 100 kroner and end up with 100 kroner each. On the other hand, if player A insures nothing, both players keep their corresponding 200 kroner, but player B can then take an amount between 0 and 200 kroner from player A.

Some examples:

If player A insures 80 kroner, then he/she has an uninsured amount of 200-80-80=40 in addition to the 80 that he/she has insured. Player B will have 200-80=120. In addition, player B can decide how much from player A's uninsured amount of 40 that he/she wants to take. Hence, player A ends up with an amount between 80 and 120, while player B ends up with an amount between 120 and 160 kroner.

If player A insures 10 kroner, then he/she has an uninsured amount of 200-10-10=180 in addition to the 10 that he/she has insured. Player B will have 200-10=190. In addition, player B can decide how much from player A's uninsured amount of 180 that he/she wants to take. Hence, player A ends up with an amount between 10 and 190, while player B ends up with an amount between 190 and 370 kroner.

Summarizing: If player A insures an amount x, and player B takes an amount y from player A, then the payoffs are as follows:

Player A earns kr. 200-x-y

Player B earns kr. 200-2x+y

A 2. Tables and Figures

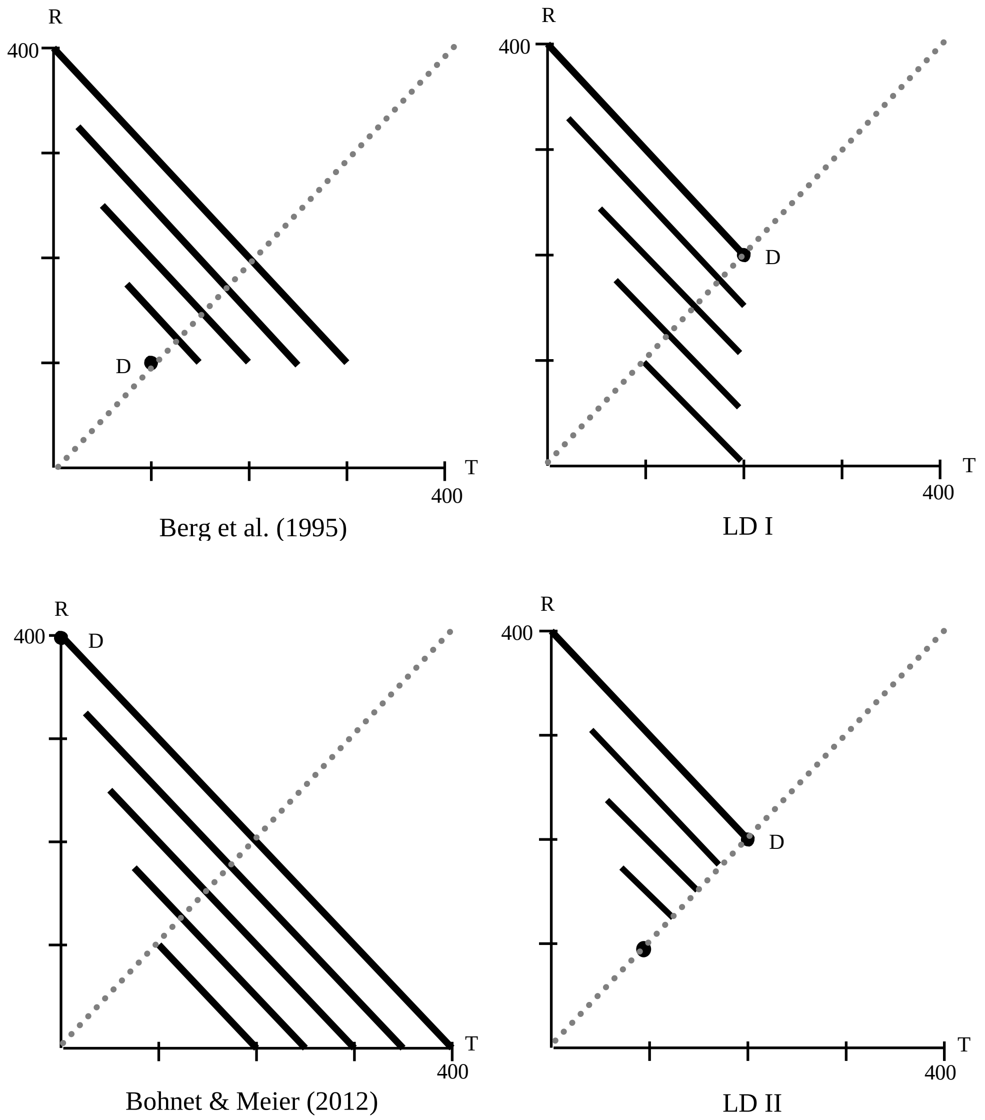

Figure A1. The figure shows payoff sets for different trust levels in Berg et al. (1995), Bohnet & Meier (2012), LD I and LD II. The trustor (T) determines the total surplus, i.e. the isoprofit curve, while the responder (R) determines the allocation at a given isoprofit cuve. The default (D) is the initial allocation before any actions are taken.

Table A1. Determinants of trust (restricting to LD I).

Table A1 presents the Tobit regressions for the money trusted as a function of the treatment (*Loss Domain I*=1), gender (*Female*=1), as well as the Two-Way interaction term *Loss Domain I*Female*. Robust standard errors are reported in parentheses below the estimated coefficients. Individual coefficients are significant at ***p<0.01, **p<0.05, or *p<0.1 significance level. The R^2 is pseudo.

Dependent Variable: Trust			
	Tobit Regressions		
Regressor:	(1)	(2)	(3)
Loss Domain I	-50.00***	-62.46***	-95.09***
	(18.35)	(18.25)	(31.73)
Female		-45.32**	-75.20***
		(18.23)	(24.70)
*Loss Domain I*Female*			54.39
			(36.28)
Intercept	85.64***	117.83***	140.05***
	(11.57)	(18.67)	(24.69)
R^2	0.014	0.027	0.031
F-statistic	0.008	0.001	0.003
N =	89	89	89

Table A2. Determinants of trust (restricting to LD II).

Table A2 shows the Tobit regressions for the money trusted as a function of the treatment (*Loss Domain II*=1), gender (*Female*=1), as well as the Two-Way interaction term *Loss Domain II*Female*. Robust standard errors are reported in parentheses below the estimated coefficients. Individual coefficients are significant at ***p<0.01, **p<0.05, or *p<0.1 significance level. The R^2 is pseudo.

Dependent Variable: Trust			
	Tobit Regressions		
Regressor:	(1)	(2)	(3)
Loss Domain II	-38.18***	-46.30***	-75.57***
	(13.09)	(12.74)	(23.51)
Female		-35.94***	-63.45***
		(12.58)	(19.66)
*Loss Domain II*Female*			46.53*
			(26.26)
Intercept	79.36***	104.64***	125.02***
	(9.18)	(13.14)	(18.97)
R^2	0.014	0.027	0.032
F-statistic	0.004	0.000	0.001
N =	93	93	93

Table A3. Determinants of trustworthiness (restricting to LD I).

Table A3 presents the Tobit regressions for the return ratio as a function of the treatment (*Loss Domain I*=1), money trusted, and gender (*Female*=1) as well as the Two-Way interaction terms *Loss Domain I*Female* and *Loss Domain I*Trust*. Robust standard errors are reported in parentheses below the estimated coefficients. Individual coefficients are significant at ***p<0.01, **p<0.05, or *p<0.1 significance level. The R^2 is pseudo.

Dependent Variable: Trustworthiness					
	Tobit Regressions				
Regressor:	(1)	(2)	(3)	(4)	(5)
Loss Domain I	-0.485*	-0.478*	-0.473*	-0.799	-0.392
	(0.280)	(0.280)	(0.282)	(0.599)	(0.436)
Trust		-0.003	-0.002	-0.004	-0.003
		(0.004)	(0.004)	(0.005)	(0.004)
Female			0.110	0.139	0.169
			(0.249)	(0.257)	(0.285)
*Loss Domain I*Trust*				0.005	
				(0.009)	
*Loss Domain I*Female*					-0.174
					(0.572)
Intercept	1.22***	1.40***	1.32***	1.44***	1.31***
	(0.145)	(0.286)	(0.359)	(0.371)	(0.362)
R^2	0.018	0.020	0.021	0.023	0.022
F-statistic	0.088	0.182	0.290	0.338	0.334
N =	72	72	72	72	72

Table A4. Determinants of trustworthiness (restricting to LD II).

Table A4 shows the Tobit regressions for the return ratio as a function of the treatment (*Loss Domain II*=1), money trusted, and gender (*Female*=1) as well as the Two-Way interaction terms *Loss Domain II*Female* and *Loss Domain II*Trust*. Robust standard errors are reported in parentheses below the estimated coefficients. Individual coefficients are significant at ***p<0.01, **p<0.05, or *p<0.1 significance level. The R^2 is pseudo.

Dependent Variable: Trustworthiness					
	Tobit Regressions				
Regressor:	(1)	(2)	(3)	(4)	(5)
Loss Domain II	-0.473*	-0.465*	-0.423	-1.58***	-0.511
	(0.253)	(0.250)	(0.261)	(0.575)	(0.366)
Trust		0.003	0.003	-0.004	0.003
		(0.004)	(0.004)	(0.005)	(0.004)
Female			0.271	0.308	0.184
			(0.239)	(0.231)	(0.295)
*Loss Domain II*Trust*				0.018**	
				(0.008)	
*Loss Domain II*Female*					0.218
					(0.500)
Intercept	1.22***	1.04***	0.879**	1.35***	0.914**
	(0.145)	(0.292)	(0.343)	(0.367)	(0.364)
R^2	0.018	0.020	0.025	0.052	0.026
F-statistic	0.065	0.157	0.089	0.022	0.155
N =	80	80	80	80	80

A.3 Theory

We first verify the formula for $z(x)$. When the constraint $z \geq \zeta(x)$ is not binding, the first order conditions for the optimization problem imply $0 = -m^{\alpha-1} + \lambda\theta z^{a-1}$ and $m = b(x) - z$. Solving for z then yields the formula.

Consider next the case $\alpha = 0$ (so $\beta = 1$) and $\theta = k \cdot (m(x) - m_0)$. Then, when the returned amount y is positive, we have

$$y = z + x - 100 = \frac{\lambda k(m(x) - m_0)}{\lambda k(m(x) - m_0) + 1} b(x) + x - 100$$

In the baseline (BL) treatment we have $\lambda = 1, m_0 = 100$, while in the loss domain (LD) treatment we have $\lambda \geq 1, m_0 = 200$. Consider x such that $y_{LD} > 0$. Then we must have $m(x) > m_0^{LD} = 200$ and therefore $m(x) > m_0^{BL} = 100$. Moreover, $y_{LD} \geq y_{BL}$ iff $\lambda(m(x) - m_0^{LD}) \geq (m(x) - m_0^{BL})$, which, since $m(x) = 100 + 3x$, is equivalent to $\lambda \geq 3x/(3x - 100)$. This must hold for x such that $100 + 3x - m_0^{LD} > 0$, ie $x > 100/3$.

Since $\frac{100}{3} < x \leq 100$, the condition $\lambda \geq 3x/(3x - 100)$ implies $\lambda \geq \frac{3}{2}$. Hence we must have $y_{LD} < y_{BL}$ if $\lambda < \frac{3}{2}$.

On the other hand, if $\lambda > \frac{3}{2}$, this argument shows that $y_{LD} > y_{BL}$ iff $3x/(3x - 100) < \lambda$, i.e iff $x > \frac{100\lambda}{3(\lambda-1)}$. This verifies the claim in the paragraph preceding Hypothesis 1 in the text.

Now consider $\frac{dy}{dx}$. When $y > 0$, we have $y = z + x - 100$ and thus $\frac{dy}{dx} = \frac{dz}{dx} + 1$, with z given by

$$z = \frac{(\lambda\theta(r(x)))^{\beta}}{(\lambda\theta(r(x)))^{\beta} + 1} b(x) \equiv \frac{\eta(x)}{\eta(x) + 1} b(x)$$

Straightforward computations (shown below) yield

$$\frac{dz}{dx} = z(\eta, x)\left[\frac{1}{\eta(x) + 1}\frac{\eta'(x)}{\eta(x)} + \frac{b'(x)}{b(x)}\right] > 0 \tag{A1}$$

All terms on the RHS are positive, hence z and thus y increases in x. Higher λ yields higher η and thus larger z, for given x. The terms $\frac{\eta'(x)}{\eta(x)}$ and $\frac{b'(x)}{b(x)}$ do not depend on λ. The first term $z(\eta, x)$ on the RHS increases, while the second term (in square brackets) decreases when λ increases. So higher λ yields two opposing effects on $\frac{dz}{dx}$, and thus also on $\frac{dy}{dx}$. The effects of higher m_0 on the derivatives are also not straightforward. We will first show that if $\lambda\theta \leq 1$, then $\frac{dy}{dx}$ is increasing in λ. Note that $\lambda\theta \leq 1$ is a reasonable condition, since $\lambda\theta$ is the relative weight the responder puts on the trustor's payoff

Claim 1. *If* $\lambda\theta(r(x)) \leq 1$, then $\frac{\partial^2 y}{\partial\lambda\partial x} > 0$.

To show this, we differentiate $\frac{dz}{dx}$ with respect to λ, noting that he terms $\frac{\eta'(x)}{\eta(x)}$ and $\frac{b'(x)}{b(x)}$ do not depend on λ. This yields

$$\frac{\partial^2 z}{\partial\lambda\partial x} = (\frac{\partial z}{\partial\eta}\left[\frac{1}{\eta(x) + 1}\frac{\eta'(x)}{\eta(x)} + \frac{b'(x)}{b(x)}\right] + z(\eta, x)\frac{-1}{(\eta(x) + 1)^2}\frac{\eta'(x)}{\eta(x)})\frac{\partial\eta}{\partial\lambda} \tag{A2}$$

Substituting for $z(\eta, x) = \frac{\eta(x)}{\eta(x)+1} b(x)$ and $\frac{\partial z}{\partial \eta} = \frac{1}{(\eta(x)+1)^2} b(x)$ then yields, after some algebra (shown below)

$$\frac{\partial^2 z}{\partial \lambda \partial x} = \frac{b(x)}{(\eta(x)+1)^2} \left(\frac{1-\eta(x)}{\eta(x)+1} \frac{\eta'(x)}{\eta(x)} + \frac{b'(x)}{b(x)} \right) \frac{\partial \eta}{\partial \lambda} \tag{A3}$$

Since $\eta(x) \leq 1$ when $\lambda\theta(r(x)) \leq 1$, and $\frac{\partial \eta}{\partial \lambda} > 0$, we see that $\frac{\partial^2 z}{\partial \lambda \partial x} > 0$. This verifies the claim, since $\frac{\partial^2 y}{\partial \lambda \partial x} = \frac{\partial^2 z}{\partial \lambda \partial x}$.

The next result provides conditions for $\frac{dy}{dx}$ to be increasing in m_0.

Claim 2. *For the case $\alpha = 0$ and $\theta = k \cdot (m(x) - m_0)$, with $k > 0$* and *$m(x) = 100 + 3x$ we have*

$$\frac{\partial^2 y}{\partial m_0 \partial x} > 0 \quad \text{if} \qquad 1/(\lambda k) \leq 400 + 2m_0$$

To verify the claim, first note that for $\eta(x) = \lambda\theta(x) = \lambda k(m_1 x + m_2 - m_0)$ straightforward computations (shown below) yield

$$\frac{\partial^2 z}{\partial m_0 \partial x} = \frac{2\lambda k}{(\eta(x)+1)^2} \left(\frac{\lambda k m_1}{\eta(x)+1} b(x) - \frac{b'(x)}{2} \right) \tag{A4}$$

This implies that $\frac{\partial^2 y}{\partial m_0 \partial x} = \frac{\partial^2 z}{\partial m_0 \partial x}$ is positive iff the last parenthesis is positive, i.e.

$$\frac{\lambda k m_1 b(x)}{\lambda k(m_1 x + m_2 - m_0) + 1} - \frac{b'(x)}{2} = \frac{3(200+2x)}{(3x+100-m_0) + 1/\lambda k} - 1 > 0 \tag{A5}$$

Note that for $y(x) > 0$ we must have $\theta(x) > 0$ and therefore here $3x + 100 - m_0 > 0$. Also note that for $1/\lambda k < 400 + 2m_0$, the expression on the RHS of (XX) exceeds $\frac{3(200+2x)}{(3x+100-m_0)+400+2m_0} - 1$. This last expression is increasing in x, and therefore exceeds its value at $x = (m_0 - 100)/3$, which is 0. This verifies the claim.

Remark. As noted above, it is reasonable to assume $\lambda\theta(x) \leq 1$ for all x, which holds true here if $400 - m_0 \leq 1/\lambda k$. A set of parameters where $400 - m_0 \leq 1/\lambda k \leq 400 + 2m_0$ thus implies that $\lambda\theta(x) \leq 1$ and $\frac{dy}{dx}$ increases with m_0. By Claim 1 we then have $\frac{dy}{dx}$ increasing in both m_0 and in λ.

We finally verify the claim that if the sender is uncertain about the responder's type, then she may optimally choose to send an amount x between the minimum amount (0) and the maximal amount ($x = M = 100$).

Suppose there are two responder types; one altruistic as in the text, and one selfish type, who never returns anything ($y = 0$). For the selfish type, the trustor is left with the monetary payoff $\zeta(x) = M - x$. Supppose the altruistic type returns more than he receives if the latter is sufficiently large, and hence that $z(M) > M$. The sender's expected utility is then

$$pU(z(x)) + (1-p)U(M-x) \equiv v(x),$$

where p is the probability of an altrusistic type.

There will be an interior optimal solution $0 < x < M$ if $v(M) \geq v(0)$ and

$$v'(M) = pU'(z(M))z'(M) - (1-p)U'(0) < 0$$

These conditions will hold if $z(M) > M$, $U'(0)$ is sufficiently large ($U'(0) = \infty$ is certainly sufficient) and p is sufficienly close to 1.

To complete this section, we verify the formulas (A1, A2, A3).

Verification of (A1). Differentiating $z(x) = \frac{\eta(x)}{\eta(x)+1}b(x)$ yields

$$\begin{aligned}
\frac{dz}{dx} &= \frac{1}{(\eta(x)+1)^2}\eta'(x)b(x) + \frac{\eta(x)}{\eta(x)+1}b'(x) \\
&= \frac{\eta(x)}{\eta(x)+1}b(x)(\frac{1}{\eta(x)+1}\frac{\eta'(x)}{\eta(x)} + \frac{b'(x)}{b(x)}) \\
&= z(\eta, x)\left[\frac{1}{\eta(x)+1}\frac{\eta'(x)}{\eta(x)} + \frac{b'(x)}{b(x)}\right]
\end{aligned}$$

Verification of (A3). The following manipulations verify the formula:

$$\begin{aligned}
&(\tfrac{\partial z}{\partial \eta}\left[\tfrac{1}{\eta(x)+1}\tfrac{\eta'(x)}{\eta(x)} + \tfrac{b'(x)}{b(x)}\right] + z(\eta, x)\tfrac{-1}{(\eta(x)+1)^2}\tfrac{\eta'(x)}{\eta(x)}) \\
&= \tfrac{1}{(\eta(x)+1)^2}(b(x)\left[\tfrac{1}{\eta(x)+1}\tfrac{\eta'(x)}{\eta(x)} + \tfrac{b'(x)}{b(x)}\right] - z(\eta, x)\tfrac{\eta'(x)}{\eta(x)}) \\
&= \tfrac{b(x)}{(\eta(x)+1)^2}(\left[\tfrac{1}{\eta(x)+1}\tfrac{\eta'(x)}{\eta(x)} + \tfrac{b'(x)}{b(x)}\right] - \tfrac{\eta(x)}{\eta(x)+1}\tfrac{\eta'(x)}{\eta(x)}) \\
&= \tfrac{b(x)}{(\eta(x)+1)^2}(\tfrac{1-\eta(x)}{\eta(x)+1}\tfrac{\eta'(x)}{\eta(x)} + \tfrac{b'(x)}{b(x)})
\end{aligned}$$

Verification of (A4). When $\eta(x) = \lambda\theta(x) = \lambda k(m_1 x + m_2 - m_0)$, we have $\eta'(x) = \lambda k m_1$ and thus

$$\frac{\partial z}{\partial x} = z(x, \eta)\left[\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)} + \frac{b'(x)}{b(x)}\right]$$

This expression depends on m_0 only via η. Differentiation wrt m_0 then yields

$$\begin{aligned}
\frac{\partial^2 z}{\partial m_0 \partial x} &= \frac{\partial z}{\partial \eta}\frac{\partial \eta}{\partial m_0}\left[\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)} + \frac{b'(x)}{b(x)}\right] + z(\eta, x)\frac{\partial}{\partial \eta}\left[\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)}\right]\frac{\partial \eta}{\partial m_0} \\
&= \frac{b(x)}{(\eta(x)+1)^2}(-\lambda k)\left[\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)} + \frac{b'(x)}{b(x)}\right] + z(\eta, x)\frac{-(2\eta(x)+1)}{(\eta(x)+1)^2}\frac{\lambda k m_1}{\eta(x)^2}(-\lambda k) \\
&= \frac{\lambda k}{(\eta(x)+1)^2}\left(-b(x)\left[\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)} + \frac{b'(x)}{b(x)}\right] + \frac{\eta(x)}{\eta(x)+1}b(x)\frac{2\eta(x)+1}{1}\frac{\lambda k m_1}{\eta(x)^2}\right) \\
&= \frac{\lambda k b(x)}{(\eta(x)+1)^2}\left(\frac{1}{\eta(x)+1}\frac{\lambda k m_1}{\eta(x)}2\eta(x) - \frac{b'(x)}{b(x)}\right) \\
&= \frac{2\lambda k}{(\eta(x)+1)^2}\left(\frac{\lambda k m_1}{\eta(x)+1}b(x) - \frac{b'(x)}{2}\right)
\end{aligned}$$

This verifies (A4).