MGT axioms

MGT001+0.ax Inequalities.
$\forall x, y$: (smaller_or_equal$(x, y) \iff$ (smaller(x, y) or $x = y$)) fof(definition_smaller_or_equal, axiom)
$\forall x, y$: (greater_or_equal$(x, y) \iff$ (greater(x, y) or $x = y$)) fof(definition_greater_or_equal, axiom)
$\forall x, y$: (smaller$(x, y) \iff$ greater(y, x)) fof(definition_smaller, axiom)
$\forall x, y$: $\neg$ greater(x, y) and greater(y, x) fof(meaning_postulate_greater_strict, axiom)
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(meaning_postulate_greater_transitive, axiom)
$\forall x, y$: (smaller(x, y) or $x = y$ or greater(x, y)) fof(meaning_postulate_greater_comparable, axiom)

MGT001-0.ax Inequalities.
smaller_or_equal$(a, b) \Rightarrow$ (smaller(a, b) or $a = b$) cnf(definition_smaller_or_equal$_1$, axiom)
smaller$(a, b) \Rightarrow$ smaller_or_equal(a, b) cnf(definition_smaller_or_equal$_2$, axiom)
$a = b \Rightarrow$ smaller_or_equal(a, b) cnf(definition_smaller_or_equal$_3$, axiom)
greater_or_equal$(a, b) \Rightarrow$ (greater(a, b) or $a = b$) cnf(definition_greater_or_equal$_4$, axiom)
greater$(a, b) \Rightarrow$ greater_or_equal(a, b) cnf(definition_greater_or_equal$_5$, axiom)
$a = b \Rightarrow$ greater_or_equal(a, b) cnf(definition_greater_or_equal$_6$, axiom)
smaller$(a, b) \Rightarrow$ greater(b, a) cnf(definition_smaller$_7$, axiom)
greater$(a, b) \Rightarrow$ smaller(b, a) cnf(definition_smaller$_8$, axiom)
greater$(a, b) \Rightarrow \neg$ greater(b, a) cnf(meaning_postulate_greater_strict$_9$, axiom)
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c) cnf(meaning_postulate_greater_transitive$_{10}$, axiom)
smaller(a, b) or $a = b$ or greater(a, b) cnf(meaning_postulate_greater_comparable$_{11}$, axiom)

MGT problems

MGT001+1.p Selection favors organizations with high inertia
Selection within populations of organizations in modern societies favours organizations whose structure have high inertia.
$\forall x, t$: (organization$(x, t) \Rightarrow \exists r$: reliability$(x, r, t)$) fof(mp$_1$, axiom)
$\forall x, t$: (organization$(x, t) \Rightarrow \exists a$: accountability$(x, a, t)$) fof(mp$_2$, axiom)
$\forall x, t$: (organization$(x, t) \Rightarrow \exists \mathrm{rp}$: reproducibility$(x, \mathrm{rp}, t)$) fof(mp$_3$, axiom)
$\forall x, y, r_1, r_2, a_1, a_2, p_1, p_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reliability(x, r_1, t_1) and reliability(y, r_2, t_2) ar
greater(p_2, p_1)) fof(a1_FOL, hypothesis)
$\forall x, y, t_1, t_2, r_1, r_2, a_1, a_2, \mathrm{rp}_1, \mathrm{rp}_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reliability(x, r_1, t_1) and reliability(y, r_2, t_2)
(greater$(\mathrm{rp}_2, \mathrm{rp}_1) \iff$ (greater(r_2, r_1) and greater(a_2, a_1)))) fof(a2_FOL, hypothesis)
$\forall x, y, t_1, t_2, \mathrm{rp}_1, \mathrm{rp}_2, i_1, i_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization_fr
(greater$(\mathrm{rp}_2, \mathrm{rp}_1) \iff$ greater(i_2, i_1))) fof(a3_FOL, hypothesis)
$\forall x, y, t_1, t_2, i_1, i_2, p_1, p_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization_free
greater(p_2, p_1)) fof(t1_FOL, conjecture)

MGT001-1.p Selection favors organizations with high inertia
Selection within populations of organizations in modern societies favours organizations whose structure have high inertia.
organization$(a, b) \Rightarrow$ reliability$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp1$_1$, axiom)
organization$(a, b) \Rightarrow$ accountability$(a, \mathrm{sk}_2(b, a), b)$ cnf(mp2$_2$, axiom)
organization$(a, b) \Rightarrow$ reproducibility$(a, \mathrm{sk}_3(b, a), b)$ cnf(mp3$_3$, axiom)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i) cnf(a1_FOL$_4$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(f, e) cnf(a2_FOL$_5$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(h, g) cnf(a2_FOL$_6$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i) cnf(a2_FOL$_7$, hypothesis)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and reproducibility$($
greater(h, g) cnf(a3_FOL$_8$, hypothesis)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and reproducibility$($
greater(f, e) cnf(a3_FOL$_9$, hypothesis)
organization$(\mathrm{sk}_4, \mathrm{sk}_6)$ cnf(t1_FOL$_{10}$, negated_conjecture)
organization$(\mathrm{sk}_5, \mathrm{sk}_7)$ cnf(t1_FOL$_{11}$, negated_conjecture)

$\text{reorganization\_free}(\text{sk}_4, \text{sk}_6, \text{sk}_6) \qquad \text{cnf}(\text{t1\_FOL}_{12}, \text{negated\_conjecture})$
$\text{reorganization\_free}(\text{sk}_5, \text{sk}_7, \text{sk}_7) \qquad \text{cnf}(\text{t1\_FOL}_{13}, \text{negated\_conjecture})$
$\text{inertia}(\text{sk}_4, \text{sk}_8, \text{sk}_6) \qquad \text{cnf}(\text{t1\_FOL}_{14}, \text{negated\_conjecture})$
$\text{inertia}(\text{sk}_5, \text{sk}_9, \text{sk}_7) \qquad \text{cnf}(\text{t1\_FOL}_{15}, \text{negated\_conjecture})$
$\text{survival\_chance}(\text{sk}_4, \text{sk}_{10}, \text{sk}_6) \qquad \text{cnf}(\text{t1\_FOL}_{16}, \text{negated\_conjecture})$
$\text{survival\_chance}(\text{sk}_5, \text{sk}_{11}, \text{sk}_7) \qquad \text{cnf}(\text{t1\_FOL}_{17}, \text{negated\_conjecture})$
$\text{greater}(\text{sk}_9, \text{sk}_8) \qquad \text{cnf}(\text{t1\_FOL}_{18}, \text{negated\_conjecture})$
$\neg\, \text{greater}(\text{sk}_{11}, \text{sk}_{10}) \qquad \text{cnf}(\text{t1\_FOL}_{19}, \text{negated\_conjecture})$

MGT002+1.p Structural inertia increases monotonically with age.
$\forall x, t\text{: } (\text{organization}(x, t) \ \Rightarrow\ \exists \text{rp: reproducibility}(x, \text{rp}, t)) \qquad \text{fof}(\text{mp}_3, \text{axiom})$
$\forall x, t_1, t_2\text{: } (\text{reorganization\_free}(x, t_1, t_2) \ \Rightarrow\ (\text{reorganization\_free}(x, t_1, t_1) \text{ and } \text{reorganization\_free}(x, t_2, t_2))) \qquad \text{fof}(\text{mp}_4, \text{axiom}$
$\forall x, y, t_1, t_2, \text{rp}_1, \text{rp}_2, i_1, i_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(y, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_1) \text{ and } \text{reorganization\_fr}$
$(\text{greater}(\text{rp}_2, \text{rp}_1) \iff \text{greater}(i_2, i_1))) \qquad \text{fof}(\text{a3\_FOL}, \text{hypothesis})$
$\forall x, \text{rp}_1, \text{rp}_2, t_1, t_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(x, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_2) \text{ and } \text{reproducibility}(x, \text{rp}_1, t_1)$
$\text{greater}(\text{rp}_2, \text{rp}_1)) \qquad \text{fof}(\text{a4\_FOL}, \text{hypothesis})$
$\forall x, i_1, i_2, t_1, t_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(x, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_2) \text{ and } \text{inertia}(x, i_1, t_1) \text{ and } \text{inertia}($
$\text{greater}(i_2, i_1)) \qquad \text{fof}(\text{t2\_FOL}, \text{conjecture})$

MGT002-1.p Structural inertia increases monotonically with age.
$\text{organization}(a, b) \ \Rightarrow\ \text{reproducibility}(a, \text{sk}_1(b, a), b) \qquad \text{cnf}(\text{mp3}_1, \text{axiom})$
$\text{reorganization\_free}(a, b, c) \ \Rightarrow\ \text{reorganization\_free}(a, b, b) \qquad \text{cnf}(\text{mp4}_2, \text{axiom})$
$\text{reorganization\_free}(a, b, c) \ \Rightarrow\ \text{reorganization\_free}(a, c, c) \qquad \text{cnf}(\text{mp4}_3, \text{axiom})$
$(\text{organization}(a, b) \text{ and } \text{organization}(c, d) \text{ and } \text{reorganization\_free}(a, b, b) \text{ and } \text{reorganization\_free}(c, d, d) \text{ and } \text{reproducibility}($
$\text{greater}(h, g) \qquad \text{cnf}(\text{a3\_FOL}_4, \text{hypothesis})$
$(\text{organization}(a, b) \text{ and } \text{organization}(c, d) \text{ and } \text{reorganization\_free}(a, b, b) \text{ and } \text{reorganization\_free}(c, d, d) \text{ and } \text{reproducibility}($
$\text{greater}(f, e) \qquad \text{cnf}(\text{a3\_FOL}_5, \text{hypothesis})$
$(\text{organization}(a, b) \text{ and } \text{organization}(a, c) \text{ and } \text{reorganization\_free}(a, b, c) \text{ and } \text{reproducibility}(a, d, b) \text{ and } \text{reproducibility}(a, e,$
$\text{greater}(e, d) \qquad \text{cnf}(\text{a4\_FOL}_6, \text{hypothesis})$
$\text{organization}(\text{sk}_2, \text{sk}_5) \qquad \text{cnf}(\text{t2\_FOL}_7, \text{negated\_conjecture})$
$\text{organization}(\text{sk}_2, \text{sk}_6) \qquad \text{cnf}(\text{t2\_FOL}_8, \text{negated\_conjecture})$
$\text{reorganization\_free}(\text{sk}_2, \text{sk}_5, \text{sk}_6) \qquad \text{cnf}(\text{t2\_FOL}_9, \text{negated\_conjecture})$
$\text{inertia}(\text{sk}_2, \text{sk}_3, \text{sk}_5) \qquad \text{cnf}(\text{t2\_FOL}_{10}, \text{negated\_conjecture})$
$\text{inertia}(\text{sk}_2, \text{sk}_4, \text{sk}_6) \qquad \text{cnf}(\text{t2\_FOL}_{11}, \text{negated\_conjecture})$
$\text{greater}(\text{sk}_6, \text{sk}_5) \qquad \text{cnf}(\text{t2\_FOL}_{12}, \text{negated\_conjecture})$
$\neg\, \text{greater}(\text{sk}_4, \text{sk}_3) \qquad \text{cnf}(\text{t2\_FOL}_{13}, \text{negated\_conjecture})$

MGT003+1.p Organizational death rates decrease with age.
$\forall x, t_1, t_2\text{: } (\text{reorganization\_free}(x, t_1, t_2) \ \Rightarrow\ (\text{reorganization\_free}(x, t_1, t_1) \text{ and } \text{reorganization\_free}(x, t_2, t_2))) \qquad \text{fof}(\text{mp}_4, \text{axiom}$
$\forall x, t\text{: } (\text{organization}(x, t) \ \Rightarrow\ \exists i\text{: inertia}(x, i, t)) \qquad \text{fof}(\text{mp}_5, \text{axiom})$
$\forall x, y, t_1, t_2, i_1, i_2, p_1, p_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(y, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_1) \text{ and } \text{reorganization\_free}$
$\text{greater}(p_2, p_1)) \qquad \text{fof}(\text{t1\_FOL}, \text{hypothesis})$
$\forall x, i_1, i_2, t_1, t_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(x, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_2) \text{ and } \text{inertia}(x, i_1, t_1) \text{ and } \text{inertia}($
$\text{greater}(i_2, i_1)) \qquad \text{fof}(\text{t2\_FOL}, \text{hypothesis})$
$\forall x, p_1, p_2, t_1, t_2\text{: } ((\text{organization}(x, t_1) \text{ and } \text{organization}(x, t_2) \text{ and } \text{reorganization\_free}(x, t_1, t_2) \text{ and } \text{survival\_chance}(x, p_1, t_1) \text{ a}$
$\text{greater}(p_2, p_1)) \qquad \text{fof}(\text{t3\_FOL}, \text{conjecture})$

MGT003-1.p Organizational death rates decrease with age.
$\text{reorganization\_free}(a, b, c) \ \Rightarrow\ \text{reorganization\_free}(a, b, b) \qquad \text{cnf}(\text{mp4}_1, \text{axiom})$
$\text{reorganization\_free}(a, b, c) \ \Rightarrow\ \text{reorganization\_free}(a, c, c) \qquad \text{cnf}(\text{mp4}_2, \text{axiom})$
$\text{organization}(a, b) \ \Rightarrow\ \text{inertia}(a, \text{sk}_1(b, a), b) \qquad \text{cnf}(\text{mp5}_3, \text{axiom})$
$(\text{organization}(a, b) \text{ and } \text{organization}(c, d) \text{ and } \text{reorganization\_free}(a, b, b) \text{ and } \text{reorganization\_free}(c, d, d) \text{ and } \text{inertia}(a, e, b) \text{ a}$
$\text{greater}(h, g) \qquad \text{cnf}(\text{t1\_FOL}_4, \text{hypothesis})$
$(\text{organization}(a, b) \text{ and } \text{organization}(a, c) \text{ and } \text{reorganization\_free}(a, b, c) \text{ and } \text{inertia}(a, d, b) \text{ and } \text{inertia}(a, e, c) \text{ and } \text{greater}(c,$
$\text{greater}(e, d) \qquad \text{cnf}(\text{t2\_FOL}_5, \text{hypothesis})$
$\text{organization}(\text{sk}_2, \text{sk}_5) \qquad \text{cnf}(\text{t3\_FOL}_6, \text{negated\_conjecture})$
$\text{organization}(\text{sk}_2, \text{sk}_6) \qquad \text{cnf}(\text{t3\_FOL}_7, \text{negated\_conjecture})$
$\text{reorganization\_free}(\text{sk}_2, \text{sk}_5, \text{sk}_6) \qquad \text{cnf}(\text{t3\_FOL}_8, \text{negated\_conjecture})$
$\text{survival\_chance}(\text{sk}_2, \text{sk}_3, \text{sk}_5) \qquad \text{cnf}(\text{t3\_FOL}_9, \text{negated\_conjecture})$
$\text{survival\_chance}(\text{sk}_2, \text{sk}_4, \text{sk}_6) \qquad \text{cnf}(\text{t3\_FOL}_{10}, \text{negated\_conjecture})$
$\text{greater}(\text{sk}_6, \text{sk}_5) \qquad \text{cnf}(\text{t3\_FOL}_{11}, \text{negated\_conjecture})$

$\neg$ greater(sk_4, sk_3)   cnf(t3_FOL$_{12}$, negated_conjecture)

MGT004+1.p Attempts at reorganization increase death rates.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists r$: reliability(x, r, t))   fof(mp$_1$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists a$: accountability(x, a, t))   fof(mp$_2$, axiom)
$\forall x, y, r_1, r_2, a_1, a_2, p_1, p_2, t_1, t_2$: ((organization($x, t_1$) and organization($y, t_2$) and reliability($x, r_1, t_1$) and reliability($y, r_2, t_2$) ar
greater(p_2, p_1))   fof(a1_FOL, hypothesis)
$\forall x, r_1, r_2, a_1, a_2, t_1, t_2$, ta, tb: ((organization(x, t_1) and organization(x, t_2) and reorganization(x, ta, tb) and reliability(x, r_1, t_1)
(greater(r_1, r_2) and greater(a_1, a_2)))   fof(a6_FOL, hypothesis)
$\forall x, p_1, p_2, t_1, t_2$, ta, tb: ((organization(x, t_1) and organization(x, t_2) and reorganization(x, ta, tb) and survival_chance(x, p_1, t_1)
greater(p_1, p_2))   fof(t4_FOL, conjecture)

MGT004-1.p Attempts at reorganization increase death rates.
organization(a, b) $\Rightarrow$ reliability(a, $sk_1(b, a)$, b)   cnf(mp1$_1$, axiom)
organization(a, b) $\Rightarrow$ accountability(a, $sk_2(b, a)$, b)   cnf(mp2$_2$, axiom)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i)   cnf(a1_FOL$_3$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization(a, d, e) and reliability(a, f, b) and reliability(a, g, c) and account
(greater(d, b) or greater(c, e) or greater(f, g))   cnf(a6_FOL$_4$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization(a, d, e) and reliability(a, f, b) and reliability(a, g, c) and account
(greater(d, b) or greater(c, e) or greater(h, i))   cnf(a6_FOL$_5$, hypothesis)
organization(sk_3, sk_6)   cnf(t4_FOL$_6$, negated_conjecture)
organization(sk_3, sk_7)   cnf(t4_FOL$_7$, negated_conjecture)
reorganization(sk_3, sk_8, sk_9)   cnf(t4_FOL$_8$, negated_conjecture)
survival_chance(sk_3, sk_4, sk_6)   cnf(t4_FOL$_9$, negated_conjecture)
survival_chance(sk_3, sk_5, sk_7)   cnf(t4_FOL$_{10}$, negated_conjecture)
$\neg$ greater(sk_8, sk_6)   cnf(t4_FOL$_{11}$, negated_conjecture)
greater(sk_7, sk_6)   cnf(t4_FOL$_{12}$, negated_conjecture)
$\neg$ greater(sk_7, sk_9)   cnf(t4_FOL$_{13}$, negated_conjecture)
$\neg$ greater(sk_4, sk_5)   cnf(t4_FOL$_{14}$, negated_conjecture)

MGT005-1.p Complexity increases the risk of death due to reorganization.
greater(a, b) $\Rightarrow$ $a \neq b$ cnf(mp6_1$_{26}$, axiom)
greater(a, b) $\Rightarrow$ $\neg$ greater(b, a)   cnf(mp6_2$_{27}$, axiom)
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c)   cnf(mp11$_{28}$, axiom)
organization(a, b) $\Rightarrow$ survival_chance(a, $sk_1(b, a)$, b)   cnf(mp12$_{29}$, axiom)
(organization(a, b) and organization(a, c) and greater(d, b) and greater(c, d)) $\Rightarrow$ organization(a, d)   cnf(mp13$_{30}$, axiom)
reorganization(a, b, c) $\Rightarrow$ greater(c, b)   cnf(mp7$_{31}$, axiom)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and survival_chance(a, d, b) and survival_chance(a, e
greater(e, d)   cnf(t3_FOL$_{32}$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization(a, d, e) and survival_chance(a, f, b) and survival_chance(a, g, c) a
(greater(d, b) or greater(c, e) or greater(f, g))   cnf(t4_FOL$_{33}$, hypothesis)
(organization(a, b) and organization(c, b) and organization(c, d) and class(a, e, b) and class(c, e, b) and reorganization(a, b, f)
greater(d, f)   cnf(a10_FOL$_{34}$, hypothesis)
(organization(a, b) and organization(c, b) and organization(a, d) and organization(c, d) and class(a, e, b) and class(c, e, b) and
(greater(i, j) or $i = j$)   cnf(a11_FOL$_{35}$, hypothesis)
organization(sk_2, sk_{11})   cnf(t5_FOL$_{36}$, negated_conjecture)
organization(sk_3, sk_{11})   cnf(t5_FOL$_{37}$, negated_conjecture)
organization(sk_2, sk_{13})   cnf(t5_FOL$_{38}$, negated_conjecture)
organization(sk_3, sk_{13})   cnf(t5_FOL$_{39}$, negated_conjecture)
class(sk_2, sk_5, sk_{11})   cnf(t5_FOL$_{40}$, negated_conjecture)
class(sk_3, sk_5, sk_{11})   cnf(t5_FOL$_{41}$, negated_conjecture)
survival_chance(sk_2, sk_6, sk_{11})   cnf(t5_FOL$_{42}$, negated_conjecture)
survival_chance(sk_3, sk_6, sk_{11})   cnf(t5_FOL$_{43}$, negated_conjecture)
reorganization(sk_2, sk_{11}, sk_{12})   cnf(t5_FOL$_{44}$, negated_conjecture)
reorganization(sk_3, sk_{11}, sk_{13})   cnf(t5_FOL$_{45}$, negated_conjecture)
reorganization_type(sk_2, sk_4, sk_{11})   cnf(t5_FOL$_{46}$, negated_conjecture)
reorganization_type(sk_3, sk_4, sk_{11})   cnf(t5_FOL$_{47}$, negated_conjecture)
reorganization_free(sk_2, sk_{12}, sk_{13})   cnf(t5_FOL$_{48}$, negated_conjecture)
survival_chance(sk_2, sk_7, sk_{13})   cnf(t5_FOL$_{49}$, negated_conjecture)
survival_chance(sk_3, sk_8, sk_{13})   cnf(t5_FOL$_{50}$, negated_conjecture)

complexity$(\mathrm{sk}_2, \mathrm{sk}_9, \mathrm{sk}_{11})$ cnf(t5_FOL$_{51}$, negated_conjecture)
complexity$(\mathrm{sk}_3, \mathrm{sk}_{10}, \mathrm{sk}_{11})$ cnf(t5_FOL$_{52}$, negated_conjecture)
greater$(\mathrm{sk}_{10}, \mathrm{sk}_9)$ cnf(t5_FOL$_{53}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_7, \mathrm{sk}_8)$ cnf(t5_FOL$_{54}$, negated_conjecture)

MGT006+1.p Reliability and accountability increase with time.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists$rp: reproducibility(x, rp, t)) fof(mp$_3$, axiom)
$\forall x, y, t_1, t_2, r_1, r_2, a_1, a_2, \mathrm{rp}_1, \mathrm{rp}_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reliability(x, r_1, t_1) and reliability(y, r_2, t_2)
(greater$(\mathrm{rp}_2, \mathrm{rp}_1)$ $\iff$ (greater(r_2, r_1) and greater(a_2, a_1)))) fof(a2_FOL, hypothesis)
$\forall x, \mathrm{rp}_1, \mathrm{rp}_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and reproducibility(x, rp_1, t_1)
greater$(\mathrm{rp}_2, \mathrm{rp}_1)$) fof(a4_FOL, hypothesis)
$\forall x, r_1, r_2, a_1, a_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and reliability(x, r_1, t_1) a
(greater(r_2, r_1) and greater(a_2, a_1))) fof(t6_FOL, conjecture)

MGT006-1.p Reliability and accountability increase with time.
organization(a, b) $\Rightarrow$ reproducibility$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp3$_1$, axiom)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(f, e) cnf(a2_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(h, g) cnf(a2_FOL$_3$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i) cnf(a2_FOL$_4$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and reproducibility(a, d, b) and reproducibility$(a, e,$
greater(e, d) cnf(a4_FOL$_5$, hypothesis)
organization$(\mathrm{sk}_2, \mathrm{sk}_7)$ cnf(t6_FOL$_6$, negated_conjecture)
organization$(\mathrm{sk}_2, \mathrm{sk}_8)$ cnf(t6_FOL$_7$, negated_conjecture)
reorganization_free$(\mathrm{sk}_2, \mathrm{sk}_7, \mathrm{sk}_8)$ cnf(t6_FOL$_8$, negated_conjecture)
reliability$(\mathrm{sk}_2, \mathrm{sk}_3, \mathrm{sk}_7)$ cnf(t6_FOL$_9$, negated_conjecture)
reliability$(\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t6_FOL$_{10}$, negated_conjecture)
accountability$(\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_7)$ cnf(t6_FOL$_{11}$, negated_conjecture)
accountability$(\mathrm{sk}_2, \mathrm{sk}_6, \mathrm{sk}_8)$ cnf(t6_FOL$_{12}$, negated_conjecture)
greater$(\mathrm{sk}_8, \mathrm{sk}_7)$ cnf(t6_FOL$_{13}$, negated_conjecture)
greater$(\mathrm{sk}_4, \mathrm{sk}_3)$ $\Rightarrow$ $\neg$ greater$(\mathrm{sk}_6, \mathrm{sk}_5)$ cnf(t6_FOL$_{14}$, negated_conjecture)

MGT007+1.p Reproducibility decreases during reorganization.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists r$: reliability(x, r, t)) fof(mp$_1$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists a$: accountability(x, a, t)) fof(mp$_2$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists a$: reproducibility(x, a, t)) fof(mp_not_in_TR, axiom)
$\forall x, y, t_1, t_2, r_1, r_2, a_1, a_2, \mathrm{rp}_1, \mathrm{rp}_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reliability(x, r_1, t_1) and reliability(y, r_2, t_2)
(greater$(\mathrm{rp}_2, \mathrm{rp}_1)$ $\iff$ (greater(r_2, r_1) and greater(a_2, a_1)))) fof(a2_FOL, hypothesis)
$\forall x, r_1, r_2, a_1, a_2, t_1, t_2, \mathrm{ta}, \mathrm{tb}$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization$(x, \mathrm{ta}, \mathrm{tb})$ and reliability(x, r_1, t_1)
(greater(r_1, r_2) and greater(a_1, a_2))) fof(a6_FOL, hypothesis)
$\forall x, \mathrm{rp}_1, \mathrm{rp}_2, t_1, t_2, \mathrm{ta}, \mathrm{tb}$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization$(x, \mathrm{ta}, \mathrm{tb})$ and reproducibility$(x, \mathrm{rp}_1,$
greater$(\mathrm{rp}_1, \mathrm{rp}_2)$) fof(t7_FOL, conjecture)

MGT007-1.p Reproducibility decreases during reorganization.
organization(a, b) $\Rightarrow$ reliability$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp1$_1$, axiom)
organization(a, b) $\Rightarrow$ accountability$(a, \mathrm{sk}_2(b, a), b)$ cnf(mp2$_2$, axiom)
organization(a, b) $\Rightarrow$ reproducibility$(a, \mathrm{sk}_3(b, a), b)$ cnf(mp_not_in_TR$_3$, axiom)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(f, e) cnf(a2_FOL$_4$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(h, g) cnf(a2_FOL$_5$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i) cnf(a2_FOL$_6$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization(a, d, e) and reliability(a, f, b) and reliability(a, g, c) and account
(greater(d, b) or greater(c, e) or greater(f, g))) cnf(a6_FOL$_7$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization(a, d, e) and reliability(a, f, b) and reliability(a, g, c) and account
(greater(d, b) or greater(c, e) or greater(h, i))) cnf(a6_FOL$_8$, hypothesis)
organization$(\mathrm{sk}_4, \mathrm{sk}_7)$ cnf(t7_FOL$_9$, negated_conjecture)
organization$(\mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t7_FOL$_{10}$, negated_conjecture)

reorganization$(\mathrm{sk}_4, \mathrm{sk}_9, \mathrm{sk}_{10})$ cnf(t7_FOL$_{11}$, negated_conjecture)
reproducibility$(\mathrm{sk}_4, \mathrm{sk}_5, \mathrm{sk}_7)$ cnf(t7_FOL$_{12}$, negated_conjecture)
reproducibility$(\mathrm{sk}_4, \mathrm{sk}_6, \mathrm{sk}_8)$ cnf(t7_FOL$_{13}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_9, \mathrm{sk}_7)$ cnf(t7_FOL$_{14}$, negated_conjecture)
greater$(\mathrm{sk}_8, \mathrm{sk}_7)$ cnf(t7_FOL$_{15}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_8, \mathrm{sk}_{10})$ cnf(t7_FOL$_{16}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_5, \mathrm{sk}_6)$ cnf(t7_FOL$_{17}$, negated_conjecture)

MGT008+1.p Organizational death rates decrease with size.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, c, s_1, s_2, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and class(x, c, t_1) and class(y, c, t_2) and size(x, s_1, t_1) a
greater(i_2, i_1)) fof(a5_FOL, hypothesis)
$\forall x, y, t_1, t_2, i_1, i_2, p_1, p_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization_free
greater(p_2, p_1)) fof(t1_FOL, hypothesis)
$\forall x, y, c, p_1, p_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization_fr
greater(p_2, p_1)) fof(t8_FOL, conjecture)

MGT008-1.p Organizational death rates decrease with size.
organization(a, b) $\Rightarrow$ inertia$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and size(a, f, b) and size(c, g, d) and inertia$(a, h, b$
greater(i, h) cnf(a5_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and inertia(a, e, b) ar
greater(h, g) cnf(t1_FOL$_3$, hypothesis)
organization$(\mathrm{sk}_2, \mathrm{sk}_9)$ cnf(t8_FOL$_4$, negated_conjecture)
organization$(\mathrm{sk}_3, \mathrm{sk}_{10})$ cnf(t8_FOL$_5$, negated_conjecture)
reorganization_free$(\mathrm{sk}_2, \mathrm{sk}_9, \mathrm{sk}_9)$ cnf(t8_FOL$_6$, negated_conjecture)
reorganization_free$(\mathrm{sk}_3, \mathrm{sk}_{10}, \mathrm{sk}_{10})$ cnf(t8_FOL$_7$, negated_conjecture)
class$(\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_9)$ cnf(t8_FOL$_8$, negated_conjecture)
class$(\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_{10})$ cnf(t8_FOL$_9$, negated_conjecture)
survival_chance$(\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_9)$ cnf(t8_FOL$_{10}$, negated_conjecture)
survival_chance$(\mathrm{sk}_3, \mathrm{sk}_6, \mathrm{sk}_{10})$ cnf(t8_FOL$_{11}$, negated_conjecture)
size$(\mathrm{sk}_2, \mathrm{sk}_7, \mathrm{sk}_9)$ cnf(t8_FOL$_{12}$, negated_conjecture)
size$(\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10})$ cnf(t8_FOL$_{13}$, negated_conjecture)
greater$(\mathrm{sk}_8, \mathrm{sk}_7)$ cnf(t8_FOL$_{14}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_6, \mathrm{sk}_5)$ cnf(t8_FOL$_{15}$, negated_conjecture)

MGT009+1.p Large organization have higher reproducibility
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, t_1, t_2, \mathrm{rp}_1, \mathrm{rp}_2, i_1, i_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization_fr
(greater$(\mathrm{rp}_2, \mathrm{rp}_1)$ $\iff$ greater(i_2, i_1))) fof(a3_FOL, hypothesis)
$\forall x, y, c, s_1, s_2, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and class(x, c, t_1) and class(y, c, t_2) and size(x, s_1, t_1) a
greater(i_2, i_1)) fof(a5_FOL, hypothesis)
$\forall x, y, c, \mathrm{rp}_1, \mathrm{rp}_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization
greater$(\mathrm{rp}_2, \mathrm{rp}_1)$) fof(t9_FOL, conjecture)

MGT009-1.p Large organization have higher reproducibility
organization(a, b) $\Rightarrow$ inertia$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and reproducibility$(a$
greater(h, g) cnf(a3_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and reproducibility$(a$
greater(f, e) cnf(a3_FOL$_3$, hypothesis)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and size(a, f, b) and size(c, g, d) and inertia$(a, h, b$
greater(i, h) cnf(a5_FOL$_4$, hypothesis)
organization$(\mathrm{sk}_2, \mathrm{sk}_9)$ cnf(t9_FOL$_5$, negated_conjecture)
organization$(\mathrm{sk}_3, \mathrm{sk}_{10})$ cnf(t9_FOL$_6$, negated_conjecture)
reorganization_free$(\mathrm{sk}_2, \mathrm{sk}_9, \mathrm{sk}_9)$ cnf(t9_FOL$_7$, negated_conjecture)
reorganization_free$(\mathrm{sk}_3, \mathrm{sk}_{10}, \mathrm{sk}_{10})$ cnf(t9_FOL$_8$, negated_conjecture)
class$(\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_9)$ cnf(t9_FOL$_9$, negated_conjecture)
class$(\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_{10})$ cnf(t9_FOL$_{10}$, negated_conjecture)
reproducibility$(\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_9)$ cnf(t9_FOL$_{11}$, negated_conjecture)
reproducibility$(\mathrm{sk}_3, \mathrm{sk}_6, \mathrm{sk}_{10})$ cnf(t9_FOL$_{12}$, negated_conjecture)

size($\mathrm{sk}_2, \mathrm{sk}_7, \mathrm{sk}_9$) cnf(t9_FOL$_{13}$, negated_conjecture)
size($\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10}$) cnf(t9_FOL$_{14}$, negated_conjecture)
greater($\mathrm{sk}_8, \mathrm{sk}_7$) cnf(t9_FOL$_{15}$, negated_conjecture)
$\neg$ greater($\mathrm{sk}_6, \mathrm{sk}_5$) cnf(t9_FOL$_{16}$, negated_conjecture)

MGT010+1.p Large organization have higher reliability and accountability
Large organization have higher reliability and accountability than small organizations (of the same class).
$\forall x, t$: (organization$(x, t) \Rightarrow \exists \mathrm{rp}$: reproducibility$(x, \mathrm{rp}, t)$) fof(mp$_3$, axiom)
$\forall x, y, t_1, t_2, r_1, r_2, a_1, a_2, \mathrm{rp}_1, \mathrm{rp}_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reliability(x, r_1, t_1) and reliability(y, r_2, t_2)
(greater$(\mathrm{rp}_2, \mathrm{rp}_1) \iff$ (greater(r_2, r_1) and greater(a_2, a_1)))) fof(a2_FOL, hypothesis)
$\forall x, y, c, \mathrm{rp}_1, \mathrm{rp}_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganization
greater$(\mathrm{rp}_2, \mathrm{rp}_1)$)) fof(t9_FOL, hypothesis)
$\forall x, y, c, r_1, r_2, a_1, a_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and reorganization_free(x, t_1, t_1) and reorganiza
(greater(r_2, r_1) and greater(a_2, a_1)))) fof(t10_FOL, conjecture)

MGT010-1.p Large organization have higher reliability and accountability
Large organization have higher reliability and accountability than small organizations (of the same class).
organization$(a, b) \Rightarrow$ reproducibility$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp3$_1$, axiom)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(f, e) cnf(a2_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(h, g) cnf(a2_FOL$_3$, hypothesis)
(organization(a, b) and organization(c, d) and reliability(a, e, b) and reliability(c, f, d) and accountability(a, g, b) and accounta
greater(j, i) cnf(a2_FOL$_4$, hypothesis)
(organization(a, b) and organization(c, d) and reorganization_free(a, b, b) and reorganization_free(c, d, d) and class(a, e, b) and
greater(g, f) cnf(t9_FOL$_5$, hypothesis)
organization($\mathrm{sk}_2, \mathrm{sk}_{11}$) cnf(t10_FOL$_6$, negated_conjecture)
organization($\mathrm{sk}_3, \mathrm{sk}_{12}$) cnf(t10_FOL$_7$, negated_conjecture)
reorganization_free($\mathrm{sk}_2, \mathrm{sk}_{11}, \mathrm{sk}_{11}$) cnf(t10_FOL$_8$, negated_conjecture)
reorganization_free($\mathrm{sk}_3, \mathrm{sk}_{12}, \mathrm{sk}_{12}$) cnf(t10_FOL$_9$, negated_conjecture)
class($\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_{11}$) cnf(t10_FOL$_{10}$, negated_conjecture)
class($\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_{12}$) cnf(t10_FOL$_{11}$, negated_conjecture)
reliability($\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_{11}$) cnf(t10_FOL$_{12}$, negated_conjecture)
reliability($\mathrm{sk}_3, \mathrm{sk}_6, \mathrm{sk}_{12}$) cnf(t10_FOL$_{13}$, negated_conjecture)
accountability($\mathrm{sk}_2, \mathrm{sk}_7, \mathrm{sk}_{11}$) cnf(t10_FOL$_{14}$, negated_conjecture)
accountability($\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{12}$) cnf(t10_FOL$_{15}$, negated_conjecture)
size($\mathrm{sk}_2, \mathrm{sk}_9, \mathrm{sk}_{11}$) cnf(t10_FOL$_{16}$, negated_conjecture)
size($\mathrm{sk}_3, \mathrm{sk}_{10}, \mathrm{sk}_{12}$) cnf(t10_FOL$_{17}$, negated_conjecture)
greater($\mathrm{sk}_{10}, \mathrm{sk}_9$) cnf(t10_FOL$_{18}$, negated_conjecture)
greater($\mathrm{sk}_6, \mathrm{sk}_5$) $\Rightarrow \neg$ greater($\mathrm{sk}_8, \mathrm{sk}_7$) cnf(t10_FOL$_{19}$, negated_conjecture)

MGT011+1.p Organizational size cannot decrease without reorganization
$\forall x, t$: (organization$(x, t) \Rightarrow \exists i$: inertia$(x, i, t)$) fof(mp$_5$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and $x = y$ fof(mp6$_1$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and greater(y, x) fof(mp6$_2$, axiom)
$\forall x, t$: (organization$(x, t) \Rightarrow \exists c$: class$(x, c, t)$) fof(mp$_9$, axiom)
$\forall x, t_1, t_2, c_1, c_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and class(x, c_1, t_1) and class$(x, c$
$c_1 = c_2$) fof(mp$_{10}$, axiom)
$\forall x, y, c, s_1, s_2, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and class(x, c, t_1) and class(y, c, t_2) and size(x, s_1, t_1) a
greater(i_2, i_1))) fof(a5_FOL, hypothesis)
$\forall x, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and inertia(x, i_1, t_1) and inertia(
greater(i_2, i_1))) fof(t2_FOL, hypothesis)
$\forall x, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and size(x, s_1, t_1) and size$(x, s_2$
$\neg$ greater(s_1, s_2))) fof(t11_FOL, conjecture)

MGT011-1.p Organizational size cannot decrease without reorganization
organization$(a, b) \Rightarrow$ inertia$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp5$_{20}$, axiom)
greater$(a, b) \Rightarrow a \neq b$ cnf(mp6_1$_{21}$, axiom)
greater$(a, b) \Rightarrow \neg$ greater(b, a) cnf(mp6_2$_{22}$, axiom)
organization$(a, b) \Rightarrow$ class$(a, \mathrm{sk}_2(b, a), b)$ cnf(mp9$_{23}$, axiom)

(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and class(a, d, b) and class(a, e, c)) $\Rightarrow$ $d =$
e cnf(mp10$_{24}$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and size(a, f, b) and size(c, g, d) and inertia($a, h,$
greater(i, h) cnf(a5_FOL$_{25}$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and inertia(a, d, b) and inertia(a, e, c) and greater($c,$
greater(e, d) cnf(t2_FOL$_{26}$, hypothesis)
organization(sk$_3$, sk$_6$) cnf(t11_FOL$_{27}$, negated_conjecture)
organization(sk$_3$, sk$_7$) cnf(t11_FOL$_{28}$, negated_conjecture)
reorganization_free(sk$_3$, sk$_6$, sk$_7$) cnf(t11_FOL$_{29}$, negated_conjecture)
size(sk$_3$, sk$_4$, sk$_6$) cnf(t11_FOL$_{30}$, negated_conjecture)
size(sk$_3$, sk$_5$, sk$_7$) cnf(t11_FOL$_{31}$, negated_conjecture)
greater(sk$_7$, sk$_6$) cnf(t11_FOL$_{32}$, negated_conjecture)
greater(sk$_4$, sk$_5$) cnf(t11_FOL$_{33}$, negated_conjecture)

MGT012+1.p Complexity of an organization cannot get smaller by age
Complexity of an organization cannot get smaller by age in lack of reorganization.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and $x = y$ fof(mp6$_1$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and greater(y, x) fof(mp6$_2$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists c$: class(x, c, t)) fof(mp$_9$, axiom)
$\forall x, t_1, t_2, c_1, c_2$: ((organization($x, t_1$) and organization($x, t_2$) and reorganization_free(x, t_1, t_2) and class(x, c_1, t_1) and class($x,$
$c_1 = c_2$) fof(mp$_{10}$, axiom)
$\forall x, y, c, c_1, c_2, i_1, i_2, t_1, t_2$: ((organization($x, t_1$) and organization($y, t_2$) and class($x, c, t_1$) and class($y, c, t_2$) and complexity($x,$
greater(i_2, i_1)) fof(a12_FOL, hypothesis)
$\forall x, i_1, i_2, t_1, t_2$: ((organization($x, t_1$) and organization($x, t_2$) and reorganization_free(x, t_1, t_2) and inertia(x, i_1, t_1) and inertia(
greater(i_2, i_1)) fof(t2_FOL, hypothesis)
$\forall x, c_1, c_2, t_1, t_2$: ((organization($x, t_1$) and organization($x, t_2$) and reorganization_free(x, t_1, t_2) and complexity(x, c_1, t_1) and co
$\neg$ greater(c_1, c_2)) fof(t12_FOL, conjecture)

MGT012-1.p Complexity of an organization cannot get smaller by age
Complexity of an organization cannot get smaller by age in lack of reorganization.
organization(a, b) $\Rightarrow$ inertia(a, sk$_1$(b, a), b) cnf(mp5$_{20}$, axiom)
greater(a, b) $\Rightarrow$ $a \neq b$ cnf(mp6_1$_{21}$, axiom)
greater(a, b) $\Rightarrow$ $\neg$ greater(b, a) cnf(mp6_2$_{22}$, axiom)
organization(a, b) $\Rightarrow$ class(a, sk$_2$(b, a), b) cnf(mp9$_{23}$, axiom)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and class(a, d, b) and class(a, e, c)) $\Rightarrow$ $d =$
e cnf(mp10$_{24}$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and complexity(a, f, b) and complexity(c, g, d) an
greater(i, h) cnf(a12_FOL$_{25}$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and inertia(a, d, b) and inertia(a, e, c) and greater($c,$
greater(e, d) cnf(t2_FOL$_{26}$, hypothesis)
organization(sk$_3$, sk$_6$) cnf(t12_FOL$_{27}$, negated_conjecture)
organization(sk$_3$, sk$_7$) cnf(t12_FOL$_{28}$, negated_conjecture)
reorganization_free(sk$_3$, sk$_6$, sk$_7$) cnf(t12_FOL$_{29}$, negated_conjecture)
complexity(sk$_3$, sk$_4$, sk$_6$) cnf(t12_FOL$_{30}$, negated_conjecture)
complexity(sk$_3$, sk$_5$, sk$_7$) cnf(t12_FOL$_{31}$, negated_conjecture)
greater(sk$_7$, sk$_6$) cnf(t12_FOL$_{32}$, negated_conjecture)
greater(sk$_4$, sk$_5$) cnf(t12_FOL$_{33}$, negated_conjecture)

MGT013+1.p If organization complexity increases, its size cannot decrease
If the complexity of an organization gets bigger, its size cannot get smaller (in lack of reorganization).
$\forall x, y$: $\neg$ greater(x, y) and $x = y$ fof(mp6$_1$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and greater(y, x) fof(mp6$_2$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ time(t)) fof(mp$_{15}$, axiom)
$\forall t_1, t_2$: ((time(t_1) and time(t_2)) $\Rightarrow$ (greater(t_1, t_2) or $t_1 = t_2$ or greater(t_2, t_1))) fof(mp$_{16}$, axiom)
$\forall x, t_1, t_2$: (reorganization_free(x, t_1, t_2) $\Rightarrow$ reorganization_free(x, t_2, t_1)) fof(mp$_{17}$, axiom)
$\forall x, c_1, c_2, t_1, t_2$: ((organization($x, t_1$) and organization($x, t_2$) and complexity($x, c_1, t_1$) and complexity($x, c_2, t_2$) and $t_1 =$
t_2) $\Rightarrow$ $c_1 = c_2$) fof(mp$_{18}$, axiom)
$\forall x, s_1, s_2, t_1, t_2$: ((organization($x, t_1$) and organization($x, t_2$) and reorganization_free(x, t_1, t_2) and size(x, s_1, t_1) and size(x, s_2
$\neg$ greater(s_1, s_2)) fof(t11_FOL, hypothesis)

$\forall x, c_1, c_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and complexity(x, c_1, t_1) and co
$\neg$ greater(c_1, c_2)) fof(t12_FOL, hypothesis)
$\forall x, c_1, c_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and complexity(x, c_1, t_1)
$\neg$ greater(s_1, s_2)) fof(t13_FOL, conjecture)

MGT013-1.p If organization complexity increases, its size cannot decrease
If the complexity of an organization gets bigger, its size cannot get smaller (in lack of reorganization).
greater(a, b) $\Rightarrow$ $a \neq b$ cnf(mp6_1$_{18}$, axiom)
greater(a, b) $\Rightarrow$ $\neg$ greater(b, a) cnf(mp6_2$_{19}$, axiom)
organization(a, b) $\Rightarrow$ time(b) cnf(mp15$_{20}$, axiom)
(time(a) and time(b)) $\Rightarrow$ (greater(a, b) or $a = b$ or greater(b, a)) cnf(mp16$_{21}$, axiom)
reorganization_free(a, b, c) $\Rightarrow$ reorganization_free(a, c, b) cnf(mp17$_{22}$, axiom)
(organization(a, b) and organization(a, c) and complexity(a, d, b) and complexity(a, e, c) and $b = c$) $\Rightarrow$ $d = e$ cnf(mp18$_{23}$
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and size(a, d, b) and size(a, e, c) and greater(c, b)) $\Rightarrow$
$\neg$ greater(d, e) cnf(t11_FOL$_{24}$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and complexity(a, d, b) and complexity(a, e, c) and g
$\neg$ greater(d, e) cnf(t12_FOL$_{25}$, hypothesis)
organization$(\mathrm{sk}_1, \mathrm{sk}_6)$ cnf(t13_FOL$_{26}$, negated_conjecture)
organization$(\mathrm{sk}_1, \mathrm{sk}_7)$ cnf(t13_FOL$_{27}$, negated_conjecture)
reorganization_free$(\mathrm{sk}_1, \mathrm{sk}_6, \mathrm{sk}_7)$ cnf(t13_FOL$_{28}$, negated_conjecture)
complexity$(\mathrm{sk}_1, \mathrm{sk}_2, \mathrm{sk}_6)$ cnf(t13_FOL$_{29}$, negated_conjecture)
complexity$(\mathrm{sk}_1, \mathrm{sk}_3, \mathrm{sk}_7)$ cnf(t13_FOL$_{30}$, negated_conjecture)
size$(\mathrm{sk}_1, \mathrm{sk}_4, \mathrm{sk}_6)$ cnf(t13_FOL$_{31}$, negated_conjecture)
size$(\mathrm{sk}_1, \mathrm{sk}_5, \mathrm{sk}_7)$ cnf(t13_FOL$_{32}$, negated_conjecture)
greater$(\mathrm{sk}_3, \mathrm{sk}_2)$ cnf(t13_FOL$_{33}$, negated_conjecture)
greater$(\mathrm{sk}_4, \mathrm{sk}_5)$ cnf(t13_FOL$_{34}$, negated_conjecture)

MGT014+1.p If orgainzation size increases, its complexity cannot decrease
If the size of an organization gets bigger, its complexity cannot get smaller (in lack of reorganization).
$\forall x, y$: $\neg$ greater(x, y) and $x = y$ fof(mp6$_1$, axiom)
$\forall x, y$: $\neg$ greater(x, y) and greater(y, x) fof(mp6$_2$, axiom)
$\forall x, t$: (organization(x, t) $\Rightarrow$ time(t)) fof(mp$_{15}$, axiom)
$\forall t_1, t_2$: ((time(t_1) and time(t_2)) $\Rightarrow$ (greater(t_1, t_2) or $t_1 = t_2$ or greater(t_2, t_1))) fof(mp$_{16}$, axiom)
$\forall x, t_1, t_2$: (reorganization_free(x, t_1, t_2) $\Rightarrow$ reorganization_free(x, t_2, t_1)) fof(mp$_{17}$, axiom)
$\forall x, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and size(x, s_1, t_1) and size(x, s_2, t_2) and $t_1 = t_2$) $\Rightarrow$ $s_1 = s_2$) fof(mp$_{19}$, axiom)
$\forall x, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and size(x, s_1, t_1) and size$(x, s_2$
$\neg$ greater(s_1, s_2)) fof(t11_FOL, hypothesis)
$\forall x, c_1, c_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and complexity(x, c_1, t_1) and co
$\neg$ greater(c_1, c_2)) fof(t12_FOL, hypothesis)
$\forall x, c_1, c_2, s_1, s_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(x, t_2) and reorganization_free(x, t_1, t_2) and complexity(x, c_1, t_1)
$\neg$ greater(c_1, c_2)) fof(t14_FOL, conjecture)

MGT014-1.p If orgainzation size increases, its complexity cannot decrease
If the size of an organization gets bigger, its complexity cannot get smaller (in lack of reorganization).
greater(a, b) $\Rightarrow$ $a \neq b$ cnf(mp6_1$_{18}$, axiom)
greater(a, b) $\Rightarrow$ $\neg$ greater(b, a) cnf(mp6_2$_{19}$, axiom)
organization(a, b) $\Rightarrow$ time(b) cnf(mp15$_{20}$, axiom)
(time(a) and time(b)) $\Rightarrow$ (greater(a, b) or $a = b$ or greater(b, a)) cnf(mp16$_{21}$, axiom)
reorganization_free(a, b, c) $\Rightarrow$ reorganization_free(a, c, b) cnf(mp17$_{22}$, axiom)
(organization(a, b) and organization(a, c) and size(a, d, b) and size(a, e, c) and $b = c$) $\Rightarrow$ $d = e$ cnf(mp19$_{23}$, axiom)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and size(a, d, b) and size(a, e, c) and greater(c, b)) $\Rightarrow$
$\neg$ greater(d, e) cnf(t11_FOL$_{24}$, hypothesis)
(organization(a, b) and organization(a, c) and reorganization_free(a, b, c) and complexity(a, d, b) and complexity(a, e, c) and g
$\neg$ greater(d, e) cnf(t12_FOL$_{25}$, hypothesis)
organization$(\mathrm{sk}_1, \mathrm{sk}_6)$ cnf(t14_FOL$_{26}$, negated_conjecture)
organization$(\mathrm{sk}_1, \mathrm{sk}_7)$ cnf(t14_FOL$_{27}$, negated_conjecture)
reorganization_free$(\mathrm{sk}_1, \mathrm{sk}_6, \mathrm{sk}_7)$ cnf(t14_FOL$_{28}$, negated_conjecture)
complexity$(\mathrm{sk}_1, \mathrm{sk}_2, \mathrm{sk}_6)$ cnf(t14_FOL$_{29}$, negated_conjecture)
complexity$(\mathrm{sk}_1, \mathrm{sk}_3, \mathrm{sk}_7)$ cnf(t14_FOL$_{30}$, negated_conjecture)
size$(\mathrm{sk}_1, \mathrm{sk}_4, \mathrm{sk}_6)$ cnf(t14_FOL$_{31}$, negated_conjecture)

$\mathrm{size}(\mathrm{sk}_1, \mathrm{sk}_5, \mathrm{sk}_7)$ cnf(t14_FOL$_{32}$, negated_conjecture)
$\mathrm{greater}(\mathrm{sk}_5, \mathrm{sk}_4)$ cnf(t14_FOL$_{33}$, negated_conjecture)
$\mathrm{greater}(\mathrm{sk}_2, \mathrm{sk}_3)$ cnf(t14_FOL$_{34}$, negated_conjecture)

MGT015+1.p Complexity increases the expected duration of reorganisation.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, c, c_1, c_2, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and class(x, c, t_1) and class(y, c, t_2) and complexity$(x,$
greater(i_2, i_1)) fof(a12_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, i_1, i_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization$(x, \mathrm{ta})$ and organization(y, ta) and organization(y, tc) and class(x, c, ta) and class$(y,$
greater(tc, tb)) fof(a13_FOL, hypothesis)
$\forall x, y, \mathrm{re}, c, c_1, c_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization$(x, \mathrm{ta})$ and organization(y, ta) and organization(y, tc) and class(x, c, ta) and class$(y,$
greater(tc, tb)) fof(t15_FOL, conjecture)

MGT015-1.p Complexity increases the expected duration of reorganisation.
organization(a, b) $\Rightarrow$ inertia$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and complexity(a, f, b) and complexity(c, g, d) an
greater(i, h) cnf(a12_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, b) and organization(c, d) and class(a, e, b) and class(c, e, b) and reorganization(a, b, f)
greater(d, f) cnf(a13_FOL$_3$, hypothesis)
organization$(\mathrm{sk}_2, \mathrm{sk}_8)$ cnf(t15_FOL$_4$, negated_conjecture)
organization$(\mathrm{sk}_3, \mathrm{sk}_8)$ cnf(t15_FOL$_5$, negated_conjecture)
organization$(\mathrm{sk}_3, \mathrm{sk}_{10})$ cnf(t15_FOL$_6$, negated_conjecture)
class$(\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_8)$ cnf(t15_FOL$_7$, negated_conjecture)
class$(\mathrm{sk}_3, \mathrm{sk}_5, \mathrm{sk}_8)$ cnf(t15_FOL$_8$, negated_conjecture)
reorganization$(\mathrm{sk}_2, \mathrm{sk}_8, \mathrm{sk}_9)$ cnf(t15_FOL$_9$, negated_conjecture)
reorganization$(\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10})$ cnf(t15_FOL$_{10}$, negated_conjecture)
reorganization_type$(\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t15_FOL$_{11}$, negated_conjecture)
reorganization_type$(\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t15_FOL$_{12}$, negated_conjecture)
complexity$(\mathrm{sk}_2, \mathrm{sk}_6, \mathrm{sk}_8)$ cnf(t15_FOL$_{13}$, negated_conjecture)
complexity$(\mathrm{sk}_3, \mathrm{sk}_7, \mathrm{sk}_8)$ cnf(t15_FOL$_{14}$, negated_conjecture)
greater$(\mathrm{sk}_7, \mathrm{sk}_6)$ cnf(t15_FOL$_{15}$, negated_conjecture)
$\neg$ greater$(\mathrm{sk}_{10}, \mathrm{sk}_9)$ cnf(t15_FOL$_{16}$, negated_conjecture)

MGT016+1.p More complex organizations have shorter reorganization
The more complex an organization is at the beginning of reorganization, the sooner disbanding due to reorganization (possibly) happens - i.e., the shorter is the reorganization.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, c, c_1, c_2, i_1, i_2, t_1, t_2$: ((organization$(x, t_1)$ and organization(y, t_2) and class(x, c, t_1) and class(y, c, t_2) and complexity$(x,$
greater(i_2, i_1)) fof(a12_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, i_1, i_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization$(x, \mathrm{ta})$ and organization(y, ta) and $\neg$ organization(y, tc) and class(x, c, ta) and class(
greater(tb, tc)) fof(a14_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, c_1, c_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization$(x, \mathrm{ta})$ and organization(y, ta) and $\neg$ organization(y, tc) and class(x, c, ta) and class(
greater(tb, tc)) fof(t16_FOL, conjecture)

MGT016-1.p More complex organizations have shorter reorganization
The more complex an organization is at the beginning of reorganization, the sooner disbanding due to reorganization (possibly) happens - i.e., the shorter is the reorganization.
organization(a, b) $\Rightarrow$ inertia$(a, \mathrm{sk}_1(b, a), b)$ cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and complexity(a, f, b) and complexity(c, g, d) an
greater(i, h) cnf(a12_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, b) and class(a, e, b) and class(c, e, b) and reorganization(a, b, f) and reorganization$(c, b$
(organization(c, d) or greater(f, d))) cnf(a14_FOL$_3$, hypothesis)
organization$(\mathrm{sk}_2, \mathrm{sk}_8)$ cnf(t16_FOL$_4$, negated_conjecture)
organization$(\mathrm{sk}_3, \mathrm{sk}_8)$ cnf(t16_FOL$_5$, negated_conjecture)
$\neg$ organization$(\mathrm{sk}_3, \mathrm{sk}_{10})$ cnf(t16_FOL$_6$, negated_conjecture)
class$(\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_8)$ cnf(t16_FOL$_7$, negated_conjecture)
class$(\mathrm{sk}_3, \mathrm{sk}_5, \mathrm{sk}_8)$ cnf(t16_FOL$_8$, negated_conjecture)
reorganization$(\mathrm{sk}_2, \mathrm{sk}_8, \mathrm{sk}_9)$ cnf(t16_FOL$_9$, negated_conjecture)
reorganization$(\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10})$ cnf(t16_FOL$_{10}$, negated_conjecture)
reorganization_type$(\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t16_FOL$_{11}$, negated_conjecture)
reorganization_type$(\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_8)$ cnf(t16_FOL$_{12}$, negated_conjecture)

complexity($\mathrm{sk}_2, \mathrm{sk}_6, \mathrm{sk}_8$) cnf(t16_FOL$_{13}$, negated_conjecture)
complexity($\mathrm{sk}_3, \mathrm{sk}_7, \mathrm{sk}_8$) cnf(t16_FOL$_{14}$, negated_conjecture)
greater($\mathrm{sk}_7, \mathrm{sk}_6$) cnf(t16_FOL$_{15}$, negated_conjecture)
$\neg$ greater($\mathrm{sk}_9, \mathrm{sk}_{10}$) cnf(t16_FOL$_{16}$, negated_conjecture)

MGT017+1.p Length of reoganisation proportional to organization size
The length of reorganizational period grows by the size the organization begins reorganization (if the bigger organization survives it).
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, c, s_1, s_2, i_1, i_2, t_1, t_2$: ((organization($x, t_1$) and organization($y, t_2$) and class($x, c, t_1$) and class($y, c, t_2$) and size($x, s_1, t_1$) a
greater(i_2, i_1)) fof(a5_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, i_1, i_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization($x$, ta) and organization($y$, ta) and organization($y$, tc) and class($x, c$, ta) and class($y$,
greater(tc, tb)) fof(a13_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, s_1, s_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization($x$, ta) and organization($y$, ta) and organization($y$, tc) and class($x, c$, ta) and class($y$,
greater(tc, tb)) fof(t17_FOL, conjecture)

MGT017-1.p Length of reoganisation proportional to organization size
The length of reorganizational period grows by the size the organization begins reorganization (if the bigger organization survives it).
organization(a, b) $\Rightarrow$ inertia($a, \mathrm{sk}_1(b, a), b$) cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and size(a, f, b) and size(c, g, d) and inertia(a, h,
greater(i, h) cnf(a5_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, b) and organization(c, d) and class(a, e, b) and class(c, e, b) and reorganization(a, b, f)
greater(d, f) cnf(a13_FOL$_3$, hypothesis)
organization($\mathrm{sk}_2, \mathrm{sk}_8$) cnf(t17_FOL$_4$, negated_conjecture)
organization($\mathrm{sk}_3, \mathrm{sk}_8$) cnf(t17_FOL$_5$, negated_conjecture)
organization($\mathrm{sk}_3, \mathrm{sk}_{10}$) cnf(t17_FOL$_6$, negated_conjecture)
class($\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_8$) cnf(t17_FOL$_7$, negated_conjecture)
class($\mathrm{sk}_3, \mathrm{sk}_5, \mathrm{sk}_8$) cnf(t17_FOL$_8$, negated_conjecture)
reorganization($\mathrm{sk}_2, \mathrm{sk}_8, \mathrm{sk}_9$) cnf(t17_FOL$_9$, negated_conjecture)
reorganization($\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10}$) cnf(t17_FOL$_{10}$, negated_conjecture)
reorganization_type($\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_8$) cnf(t17_FOL$_{11}$, negated_conjecture)
reorganization_type($\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_8$) cnf(t17_FOL$_{12}$, negated_conjecture)
size($\mathrm{sk}_2, \mathrm{sk}_6, \mathrm{sk}_8$) cnf(t17_FOL$_{13}$, negated_conjecture)
size($\mathrm{sk}_3, \mathrm{sk}_7, \mathrm{sk}_8$) cnf(t17_FOL$_{14}$, negated_conjecture)
greater($\mathrm{sk}_7, \mathrm{sk}_6$) cnf(t17_FOL$_{15}$, negated_conjecture)
$\neg$ greater($\mathrm{sk}_{10}, \mathrm{sk}_9$) cnf(t17_FOL$_{16}$, negated_conjecture)

MGT018+1.p Larger organizations have shorter reorganization
The bigger an organization is at the beginning of reorganization, the sooner disbanding due to reorganization (possibly) happens - i.e., the shorter is the reorganization.
$\forall x, t$: (organization(x, t) $\Rightarrow$ $\exists i$: inertia(x, i, t)) fof(mp$_5$, axiom)
$\forall x, y, c, s_1, s_2, i_1, i_2, t_1, t_2$: ((organization($x, t_1$) and organization($y, t_2$) and class($x, c, t_1$) and class($y, c, t_2$) and size($x, s_1, t_1$) a
greater(i_2, i_1)) fof(a5_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, i_1, i_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization($x$, ta) and organization($y$, ta) and $\neg$ organization(y, tc) and class(x, c, ta) and class(
greater(tb, tc)) fof(a14_FOL, hypothesis)
$\forall x, y, \mathrm{rt}, c, s_1, s_2, \mathrm{ta}, \mathrm{tb}, \mathrm{tc}$: ((organization($x$, ta) and organization($y$, ta) and $\neg$ organization(y, tc) and class(x, c, ta) and class(
greater(tb, tc)) fof(t18_FOL, conjecture)

MGT018-1.p Larger organizations have shorter reorganization
The bigger an organization is at the beginning of reorganization, the sooner disbanding due to reorganization (possibly) happens - i.e., the shorter is the reorganization.
organization(a, b) $\Rightarrow$ inertia($a, \mathrm{sk}_1(b, a), b$) cnf(mp5$_1$, axiom)
(organization(a, b) and organization(c, d) and class(a, e, b) and class(c, e, d) and size(a, f, b) and size(c, g, d) and inertia(a, h,
greater(i, h) cnf(a5_FOL$_2$, hypothesis)
(organization(a, b) and organization(c, b) and class(a, e, b) and class(c, e, b) and reorganization(a, b, f) and reorganization(c,
(organization(c, d) or greater(f, d)) cnf(a14_FOL$_3$, hypothesis)
organization($\mathrm{sk}_2, \mathrm{sk}_8$) cnf(t18_FOL$_4$, negated_conjecture)
organization($\mathrm{sk}_3, \mathrm{sk}_8$) cnf(t18_FOL$_5$, negated_conjecture)
$\neg$ organization($\mathrm{sk}_3, \mathrm{sk}_{10}$) cnf(t18_FOL$_6$, negated_conjecture)
class($\mathrm{sk}_2, \mathrm{sk}_5, \mathrm{sk}_8$) cnf(t18_FOL$_7$, negated_conjecture)

class($\mathrm{sk}_3, \mathrm{sk}_5, \mathrm{sk}_8$)   cnf($\mathrm{t18\_FOL}_8$, negated_conjecture)
reorganization($\mathrm{sk}_2, \mathrm{sk}_8, \mathrm{sk}_9$)   cnf($\mathrm{t18\_FOL}_9$, negated_conjecture)
reorganization($\mathrm{sk}_3, \mathrm{sk}_8, \mathrm{sk}_{10}$)   cnf($\mathrm{t18\_FOL}_{10}$, negated_conjecture)
reorganization_type($\mathrm{sk}_2, \mathrm{sk}_4, \mathrm{sk}_8$)   cnf($\mathrm{t18\_FOL}_{11}$, negated_conjecture)
reorganization_type($\mathrm{sk}_3, \mathrm{sk}_4, \mathrm{sk}_8$)   cnf($\mathrm{t18\_FOL}_{12}$, negated_conjecture)
size($\mathrm{sk}_2, \mathrm{sk}_6, \mathrm{sk}_8$)   cnf($\mathrm{t18\_FOL}_{13}$, negated_conjecture)
size($\mathrm{sk}_3, \mathrm{sk}_7, \mathrm{sk}_8$)   cnf($\mathrm{t18\_FOL}_{14}$, negated_conjecture)
greater($\mathrm{sk}_7, \mathrm{sk}_6$)   cnf($\mathrm{t18\_FOL}_{15}$, negated_conjecture)
$\neg$ greater($\mathrm{sk}_9, \mathrm{sk}_{10}$)   cnf($\mathrm{t18\_FOL}_{16}$, negated_conjecture)

MGT019+2.p Growth rate of EPs exceeds that of FMs in stable environments
The growth rate of efficent producers exceeds the growth rate of first movers past a certain time in stable environments.
$\neg \forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ greater(disbanding_rate(first_movers,
$\forall t$: ((greater(disbanding_rate(first_movers, t), disbanding_rate(efficient_producers, t)) and greater_or_equal(founding_rate(effici
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))   fof(mp_EP_lower_disbanding_rate, axiom)
$\forall x, y$: (greater_or_equal(x, y) $\Rightarrow$ (greater(x, y) or $x = y$))   fof(mp_greater_or_equal, axiom)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater_or_equal(founding_rate(efficient_producers, t), founding_rate(first_movers, t)))))   fof(a_8, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))))   fof($\mathrm{prove\_l}_1$, conjecture)

MGT019-2.p Growth rate of EPs exceeds that of FMs in stable environments
The growth rate of efficent producers exceeds the growth rate of first movers past a certain time in stable environments.
environment(sk_1)   cnf($\mathrm{l2}_{22}$, axiom)
subpopulations(first_movers, efficient_producers, $\mathrm{sk}_1, \mathrm{sk}_2$)   cnf($\mathrm{l2}_{23}$, axiom)
$\neg$ greater(disbanding_rate(first_movers, sk_2), disbanding_rate(efficient_producers, sk_2))   cnf($\mathrm{l2}_{24}$, axiom)
(greater(disbanding_rate(first_movers, a), disbanding_rate(efficient_producers, a)) and greater_or_equal(founding_rate(efficient
greater(growth_rate(efficient_producers, a), growth_rate(first_movers, a))   cnf($\mathrm{mp\_EP\_lower\_disbanding\_rate}_{25}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$)   cnf($\mathrm{mp\_greater\_or\_equal}_{26}$, axiom)
(environment(a) and stable(a)) $\Rightarrow$ in_environment($a, \mathrm{sk}_3(a)$)   cnf($\mathrm{a8}_{27}$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal($b, \mathrm{sk}_3(a)$)) $\Rightarrow$
greater_or_equal(founding_rate(efficient_producers, b), founding_rate(first_movers, b))   cnf($\mathrm{a8}_{28}$, hypothesis)
environment(sk_4)   cnf($\mathrm{prove\_l1}_{29}$, negated_conjecture)
stable(sk_4)   cnf($\mathrm{prove\_l1}_{30}$, negated_conjecture)
in_environment(sk_4, a) $\Rightarrow$ subpopulations(first_movers, efficient_producers, $\mathrm{sk}_4, \mathrm{sk}_5(a)$)   cnf($\mathrm{prove\_l1}_{31}$, negated_conjecture
in_environment(sk_4, a) $\Rightarrow$ greater_or_equal($\mathrm{sk}_5(a), a$)   cnf($\mathrm{prove\_l1}_{32}$, negated_conjecture)
in_environment(sk_4, a) $\Rightarrow$ $\neg$ greater(growth_rate(efficient_producers, $\mathrm{sk}_5(a)$), growth_rate(first_movers, $\mathrm{sk}_5(a)$))   cnf(prove_

MGT020-1.p First movers exceeds efficient producers disbanding rate
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ $\neg$ decreases(disbanding_rate(first_movers, b)\
disbanding_rate(efficient_producers, b))   cnf($\mathrm{l3}_{22}$, axiom)
(environment(a) and in_environment(a, initial_FM_EP(a))) $\Rightarrow$ subpopulations(first_movers, efficient_producers, a, initial_FM
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ greater_or_equal(b, initial_FM_EP(a))   cnf(
(environment(a) and greater_or_equal(b, c) and greater_or_equal(d, b) and subpopulations(first_movers, efficient_producers, a,
(decreases(disbanding_rate(first_movers, b)\disbanding_rate(efficient_producers, b)) or greater(disbanding_rate(first_movers, d)
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ in_environment(a, b)   cnf(mp_time_point_o
environment(a) $\Rightarrow$ greater_or_equal(initial_FM_EP(a), start_time(a))   cnf($\mathrm{mp\_initial\_time}_{27}$, axiom)
(environment(a) and greater_or_equal(b, start_time(a)) and greater(c, b) and in_environment(a, c)) $\Rightarrow$ in_environment(a, b)
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c)   cnf($\mathrm{mp\_greater\_transitivity}_{29}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$)   cnf($\mathrm{mp\_greater\_or\_equal}_{30}$, axiom)
environment(a) $\Rightarrow$ greater(disbanding_rate(first_movers, initial_FM_EP(a)), disbanding_rate(efficient_producers, initial_FM_E
(environment(a) and subpopulations(first_movers, efficient_producers, a, b) and subpopulations(first_movers, efficient_produce
subpopulations(first_movers, efficient_producers, a, d)   cnf($\mathrm{a10}_{32}$, hypothesis)
environment(sk_1)   cnf($\mathrm{prove\_l2}_{33}$, negated_conjecture)
subpopulations(first_movers, efficient_producers, $\mathrm{sk}_1, \mathrm{sk}_2$)   cnf($\mathrm{prove\_l2}_{34}$, negated_conjecture)
$\neg$ greater(disbanding_rate(first_movers, sk_2), disbanding_rate(efficient_producers, sk_2))   cnf($\mathrm{prove\_l2}_{35}$, negated_conjecture)

MGT021+1.p Difference between disbanding rates does not decrease
The difference between the disbanding rates of first movers and efficient producers does not decrease with time.

$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ in_environment(e, t)) fof(mp_time_p
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ greater(number_of_organizations(e, t), 0
$\forall x$: (increases(x) $\Rightarrow$ $\neg$ decreases(x)) fof(mp_increase_not_decrease, axiom)
$\forall x, y$: (greater_or_equal(x, y) $\Rightarrow$ (greater(x, y) or $x = y$)) fof(mp_greater_or_equal, axiom)
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater(number_of_organizations(e, t), 0)) $\Rightarrow$ ((greater(equilibrium(e), t
decreases(resources(e, t))) and ($\neg$ greater(equilibrium(e), t $\Rightarrow$ constant(resources(e, t))))) fof(a_3, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ ((decreases(resources(e, t)) $\Rightarrow$
increases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))) and (constant(resources(e, t)) $\Rightarrow$
$\neg$ decreases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))))) fof(l_4, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ $\neg$ decreases(disbanding_rate(first_mover
disbanding_rate(efficient_producers, t))) fof(prove_l_3, conjecture)

MGT021-1.p Difference between disbanding rates does not decrease
The difference between the disbanding rates of first movers and efficient producers does not decrease with time.
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ in_environment(a, b) cnf(mp_time_point_i
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ greater(number_of_organizations(a, b), 0)
increases(a) $\Rightarrow$ $\neg$ decreases(a) cnf(mp_increase_not_decrease$_{29}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$) cnf(mp_greater_or_equal$_{30}$, axiom)
(environment(a) and in_environment(a, b) and greater(number_of_organizations(a, b), 0) and greater(equilibrium(a), b)) $\Rightarrow$
decreases(resources(a, b)) cnf(a3$_{31}$, hypothesis)
(environment(a) and in_environment(a, b) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ (greater(equilibrium(a), b) or co
(environment(a) and subpopulations(first_movers, efficient_producers, a, b) and decreases(resources(a, b))) $\Rightarrow$ increases(disba
disbanding_rate(efficient_producers, b)) cnf(l4$_{33}$, hypothesis)
(environment(a) and subpopulations(first_movers, efficient_producers, a, b) and constant(resources(a, b))) $\Rightarrow$ $\neg$ decreases(disb
disbanding_rate(efficient_producers, b)) cnf(l4$_{34}$, hypothesis)
environment(sk$_1$) cnf(prove_l3$_{35}$, negated_conjecture)
subpopulations(first_movers, efficient_producers, sk$_1$, sk$_2$) cnf(prove_l3$_{36}$, negated_conjecture)
decreases(disbanding_rate(first_movers, sk$_2$)$\setminus$disbanding_rate(efficient_producers, sk$_2$)) cnf(prove_l3$_{37}$, negated_conjecture)

MGT022+1.p Decreasing resource availability affects FMS more than EPs
Decreasing resource availability affects the disbanding rate of first movers more than the disbanding rate of efficient producers.
$\forall x$: (constant(x) $\Rightarrow$ $\neg$ decreases(x)) fof(mp_constant_not_decrease, axiom)
$\forall e, s_1, s_2, t$: ((environment(e) and subpopulations(s_1, s_2, e, t) and greater(resilience(s_2), resilience(s_1))) $\Rightarrow$ ((decreases(resour
increases(disbanding_rate(s_1, t)$\setminus$disbanding_rate(s_2, t))) and (constant(resources(e, t)) $\Rightarrow$ constant(disbanding_rate(s_1, t)$\setminus$
disbanding_rate(s_2, t))))) fof(a_5, hypothesis)
greater(resilience(efficient_producers), resilience(first_movers)) fof(a_2, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ ((decreases(resources(e, t)) $\Rightarrow$
increases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))) and (constant(resources(e, t)) $\Rightarrow$
$\neg$ decreases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))))) fof(prove_l_4, conjecture)

MGT022+2.p Decreasing resource availability affects FMS more than EPs
Decreasing resource availability affects the disbanding rate of first movers more than the disbanding rate of efficient producers.
$\forall x$: (constant(x) $\Rightarrow$ $\neg$ decreases(x)) fof(mp_constant_not_decrease, axiom)
$\forall e, s_1, s_2, t$: ((environment(e) and subpopulations(s_1, s_2, e, t) and greater(resilience(s_2), resilience(s_1))) $\Rightarrow$ ((decreases(resour
increases(disbanding_rate(s_1, t)$\setminus$disbanding_rate(s_2, t))) and (constant(resources(e, t)) $\Rightarrow$ constant(disbanding_rate(s_1, t)$\setminus$
disbanding_rate(s_2, t))))) fof(a_6, hypothesis)
greater(resilience(efficient_producers), resilience(first_movers)) fof(a_2, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ ((decreases(resources(e, t)) $\Rightarrow$
increases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))) and (constant(resources(e, t)) $\Rightarrow$
$\neg$ decreases(disbanding_rate(first_movers, t) $\setminus$ disbanding_rate(efficient_producers, t))))) fof(prove_l_4, conjecture)

MGT022-1.p Decreasing resource availability affects FMS more than EPs
Decreasing resource availability affects the disbanding rate of first movers more than the disbanding rate of efficient producers.
constant(a) $\Rightarrow$ $\neg$ decreases(a) cnf(mp_constant_not_decrease$_1$, axiom)
(environment(a) and subpopulations(b, c, a, d) and greater(resilience(c), resilience(b)) and decreases(resources(a, d))) $\Rightarrow$
increases(disbanding_rate(b, d) $\setminus$ disbanding_rate(c, d)) cnf(a5$_2$, hypothesis)
(environment(a) and subpopulations(b, c, a, d) and greater(resilience(c), resilience(b)) and constant(resources(a, d))) $\Rightarrow$
constant(disbanding_rate(b, d) $\setminus$ disbanding_rate(c, d)) cnf(a5$_3$, hypothesis)

greater(resilience(efficient_producers), resilience(first_movers))   cnf(a2_4, hypothesis)
environment(sk_1)   cnf(prove_l4_5, negated_conjecture)
subpopulations(first_movers, efficient_producers, sk_1, sk_2)   cnf(prove_l4_6, negated_conjecture)
decreases(resources(sk_1, sk_2)) or constant(resources(sk_1, sk_2))   cnf(prove_l4_7, negated_conjecture)
decreases(resources(sk_1, sk_2)) or decreases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2))   cn
increases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2)) $\Rightarrow$ constant(resources(sk_1, sk_2))   cn
increases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2)) $\Rightarrow$ decreases(disbanding_rate(first_mov
disbanding_rate(efficient_producers, sk_2))   cnf(prove_l4_{10}, negated_conjecture)

MGT022-2.p Decreasing resource availability affects FMS more than EPs
Decreasing resource availability affects the disbanding rate of first movers more than the disbanding rate of efficient producers.
constant(a) $\Rightarrow$ $\neg$ decreases(a)   cnf(mp_constant_not_decrease$_1$, axiom)
(environment(a) and subpopulations(b, c, a, d) and greater(resilience(c), resilience(b)) and decreases(resources(a, d))) $\Rightarrow$
increases(disbanding_rate(b, d) \ disbanding_rate(c, d))   cnf(a6_2, hypothesis)
(environment(a) and subpopulations(b, c, a, d) and greater(resilience(c), resilience(b)) and constant(resources(a, d))) $\Rightarrow$
constant(disbanding_rate(b, d) \ disbanding_rate(c, d))   cnf(a6_3, hypothesis)
greater(resilience(efficient_producers), resilience(first_movers))   cnf(a2_4, hypothesis)
environment(sk_1)   cnf(prove_l4_5, negated_conjecture)
subpopulations(first_movers, efficient_producers, sk_1, sk_2)   cnf(prove_l4_6, negated_conjecture)
decreases(resources(sk_1, sk_2)) or constant(resources(sk_1, sk_2))   cnf(prove_l4_7, negated_conjecture)
decreases(resources(sk_1, sk_2)) or decreases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2))   cn
increases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2)) $\Rightarrow$ constant(resources(sk_1, sk_2))   cn
increases(disbanding_rate(first_movers, sk_2)\disbanding_rate(efficient_producers, sk_2)) $\Rightarrow$ decreases(disbanding_rate(first_mov
disbanding_rate(efficient_producers, sk_2))   cnf(prove_l4_{10}, negated_conjecture)

MGT023+1.p Stable environments have a critical point.
$\forall e$, to: ((environment(e) and $\neg$ greater(growth_rate(efficient_producers, to), growth_rate(first_movers, to)) and in_environment
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))) $\Rightarrow$ to = critical_point(e))   fof(d_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\neg$ greater(growth_rate(efficient_producers, to), growth
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))))   fof(l_{12}, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ in_environment(e, critical_point(e)))   fof(prove_l$_5$, conjecture)

MGT023+2.p Stable environments have a critical point.
$\forall e$: ((environment(e) and $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers, e, t) and grea
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\neg$ greater(grow
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))))   fof(mp_earliest_time_growth_rate_exceeds, axion
$\forall e$, to: ((environment(e) and $\neg$ greater(growth_rate(efficient_producers, to), growth_rate(first_movers, to)) and in_environment
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))) $\Rightarrow$ to = critical_point(e))   fof(d_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t)))))   fof(l_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ in_environment(e, critical_point(e)))   fof(prove_l$_5$, conjecture)

MGT023-1.p Stable environments have a critical point.
(environment(a) and in_environment(a, b)) $\Rightarrow$ (greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b)) or su
critical_point(a))   cnf(d1_{17}, hypothesis)
(environment(a) and in_environment(a, b)) $\Rightarrow$ (greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b)) or gr
critical_point(a))   cnf(d1_{18}, hypothesis)
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, $sk_1(b, a)$), growth_rate(first_movers, sk
(greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b)) or b = critical_point(a))   cnf(d1_{19}, hypothesis)
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, $sk_2(a)$)   cnf(l12_{20}, hypothesis)
(environment(a) and stable(a)) $\Rightarrow$ $\neg$ greater(growth_rate(efficient_producers, $sk_2(a)$), growth_rate(first_movers, $sk_2(a)$))   c
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater(b, $sk_2(a)$)) $\Rightarrow$
greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b))   cnf(l12_{22}, hypothesis)
environment(sk_3)   cnf(prove_l5_{23}, negated_conjecture)
stable(sk_3)   cnf(prove_l5_{24}, negated_conjecture)
$\neg$ in_environment(sk_3, critical_point(sk_3))   cnf(prove_l5_{25}, negated_conjecture)

MGT024+1.p Subpopulation growth rates are in equilibria
If a subpopulation has positive growth rate, then the other subpopulation must have negative growth rate in equilibrium.
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ in_environment(e, t))   fof(mp_time_p

$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t)) $\Rightarrow$ greater(number_of_organizations(e, t), 0
$\forall e, t$: ((environment(e) and greater_or_equal(t, equilibrium(e))) $\Rightarrow$ $\neg$ greater(equilibrium(e), t)) fof(mp_equilibrium, axiom
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater(number_of_organizations(e, t), 0)) $\Rightarrow$ ((greater(equilibrium(e), t
decreases(resources(e, t))) and ($\neg$ greater(equilibrium(e), t) $\Rightarrow$ constant(resources(e, t))))) fof(a_3, hypothesis)
$\forall e, t$: ((environment(e) and in_environment(e, t)) $\Rightarrow$ ((decreases(resources(e, t)) $\Rightarrow$ $\neg$ decreases(number_of_organizations(e, t
constant(number_of_organizations(e, t))))) fof(a_6, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t) and constant(number_of_organizations(e, t))
((growth_rate(first_movers, t) $= 0$ and growth_rate(efficient_producers, t) $= 0$) or (greater(growth_rate(first_movers, t), 0) and
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t) and greater_or_equal(t, equilibrium(e))) $\Rightarrow$
((growth_rate(first_movers, t) $= 0$ and growth_rate(efficient_producers, t) $= 0$) or (greater(growth_rate(first_movers, t), 0) and

MGT026-1.p Selection favors efficient producers past the critical point
(environment(a) and subpopulations(b, c, a, d) and greater(growth_rate(c, d), growth_rate(b, d))) $\Rightarrow$ selection_favors(c, b, d)
(environment(a) and subpopulation(b, a, c) and subpopulation(d, a, c) and greater(cardinality_at_time(b, c), 0) and cardinality
0) $\Rightarrow$ selection_favors(b, d, c) cnf(mp2_favour_members$_{29}$, axiom)
(environment(a) and in_environment(a, b) and greater(cardinality_at_time(first_movers, b), 0) and greater(cardinality_at_time
subpopulations(first_movers, efficient_producers, a, b) cnf(mp_non_empty_fm_and_ep$_{30}$, axiom)
(environment(a) and in_environment(a, b)) $\Rightarrow$ greater_or_equal(cardinality_at_time(first_movers, b), 0) cnf(mp_first_mover
(environment(a) and in_environment(a, b)) $\Rightarrow$ subpopulation(first_movers, a, b) cnf(mp_subpopulations$_{32}$, axiom)
(environment(a) and in_environment(a, b)) $\Rightarrow$ subpopulation(efficient_producers, a, b) cnf(mp_subpopulations$_{33}$, axiom)
environment(a) $\Rightarrow$ greater_or_equal(critical_point(a), appear(efficient_producers, a)) cnf(mp_critical_point_after_EP$_{34}$, axi
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c) cnf(mp_greater_transitivity$_{35}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$) cnf(mp_greater_or_equal$_{36}$, axiom)
greater(a, b) $\Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{37}$, axiom)
$a = b$ $\Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{38}$, axiom)
(environment(a) and $b =$ critical_point(a)) $\Rightarrow$ $\neg$ greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b))
(environment(a) and $b =$ critical_point(a) and subpopulations(first_movers, efficient_producers, a, c) and greater(c, b)) $\Rightarrow$
greater(growth_rate(efficient_producers, c), growth_rate(first_movers, c)) cnf(d1$_{40}$, hypothesis)
(environment(a) and in_environment(a, b) and greater_or_equal(b, appear(efficient_producers, a))) $\Rightarrow$ greater(cardinality_at_t
environment(sk$_1$) cnf(prove_l8$_{42}$, negated_conjecture)
in_environment(sk$_1$, sk$_2$) cnf(prove_l8$_{43}$, negated_conjecture)
greater(sk$_2$, critical_point(sk$_1$)) cnf(prove_l8$_{44}$, negated_conjecture)
$\neg$ selection_favors(efficient_producers, first_movers, sk$_2$) cnf(prove_l8$_{45}$, negated_conjecture)

MGT027+1.p The FM set contracts in stable environments
The first mover set begins to contract past a certain time in stable environments.
$\forall e$, to: ((environment(e) and stable(e) and in_environment(e, to) and $\forall t$: ((greater(cardinality_at_time(first_movers, t), 0) and
greater(0, growth_rate(first_movers, t)))) $\Rightarrow$ contracts_from(to, first_movers)) fof(mp_contracts_from, axiom)
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater(cardinality_at_time(first_movers, t), 0) and greater(cardinality_at
subpopulations(first_movers, efficient_producers, e, t)) fof(mp_non_empty_fm_and_ep, axiom)
$\forall e, t_1, t_2$: ((environment(e) and stable(e) and in_environment(e, t_1) and greater(t_2, t_1)) $\Rightarrow$ in_environment(e, t_2)) fof(mp_
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ in_environment(e, appear(efficient_producers, e))) fof(mp_EP_in_stable_environme
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(mp_greater_transitivity, axiom)
$\forall x, y$: (greater_or_equal(x, y) $\iff$ (greater(x, y) or $x = y$)) fof(mp_greater_or_equal, axiom)
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater_or_equal(t, appear(efficient_producers, e))) $\Rightarrow$ greater(cardinalit
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (greater(to, appear(efficient_producers, e)) and $\forall t$: ((subpopulations(first_movers
greater(0, growth_rate(first_movers, t)))))) fof(l_{10}, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (greater(to, appear(efficient_producers, e)) and contracts_from(to, first_movers)))

MGT027-1.p The FM set contracts in stable environments
The first mover set begins to contract past a certain time in stable environments.
(environment(a) and stable(a) and in_environment(a, b)) $\Rightarrow$ (greater(cardinality_at_time(first_movers, sk$_1$(b, a)), 0) or contra
(environment(a) and stable(a) and in_environment(a, b)) $\Rightarrow$ (greater_or_equal(sk$_1$(b, a), b) or contracts_from(b, first_movers))
(environment(a) and stable(a) and in_environment(a, b) and greater(0, growth_rate(first_movers, sk$_1$(b, a)))) $\Rightarrow$ contracts_fro
(environment(a) and in_environment(a, b) and greater(cardinality_at_time(first_movers, b), 0) and greater(cardinality_at_time
subpopulations(first_movers, efficient_producers, a, b) cnf(mp_non_empty_fm_and_ep$_{27}$, axiom)
(environment(a) and stable(a) and in_environment(a, b) and greater(c, b)) $\Rightarrow$ in_environment(a, c) cnf(mp_long_stable_en
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, appear(efficient_producers, a)) cnf(mp_EP_in_stable_environments$_2$
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c) cnf(mp_greater_transitivity$_{30}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$) cnf(mp_greater_or_equal$_{31}$, axiom)
greater(a, b) $\Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{32}$, axiom)

$a = b \Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{33}$, axiom)
(environment(a) and in_environment(a, b) and greater_or_equal$(b$, appear(efficient_producers, a))) $\Rightarrow$ greater(cardinality_at_t
(environment(a) and stable(a)) $\Rightarrow$ greater(sk$_2(a)$, appear(efficient_producers, a)) cnf(l10$_{35}$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal$(b$, sk$_2(a)$)) $\Rightarrow$
greater(0, growth_rate(first_movers, b)) cnf(l10$_{36}$, hypothesis)
environment(sk$_3$) cnf(prove_l9$_{37}$, negated_conjecture)
stable(sk$_3$) cnf(prove_l9$_{38}$, negated_conjecture)
greater(a, appear(efficient_producers, sk$_3$)) $\Rightarrow \neg$ contracts_from(a, first_movers) cnf(prove_l9$_{39}$, negated_conjecture)

MGT028+1.p FMs have a negative growth rate in stable environments
First movers have negative growth rate past a certain point of time (also after the appearence of efficient producers) in stable environments.
$\forall e$: ((environment(e) and stable(e) and $\exists t_1$: (in_environment(e, t_1) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(0, growth_rate(first_movers, t))))) $\Rightarrow \exists t_2$: (greater(t_2, appear(efficient_producers, e)) and $\forall t$: ((subpopulations(first_m
greater(0, growth_rate(first_movers, t))))) fof(mp_first_movers_negative_growth, axiom)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow \exists$to: (in_environment$(e$, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
(greater(growth_rate(efficient_producers, t), 0) and greater(0, growth_rate(first_movers, t)))))) fof(l_{11}, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow \exists$to: (greater(to, appear(efficient_producers, e)) and $\forall t$: ((subpopulations(first_movers
greater(0, growth_rate(first_movers, t))))) fof(prove_l$_{10}$, conjecture)

MGT028-1.p FMs have a negative growth rate in stable environments
First movers have negative growth rate past a certain point of time (also after the appearence of efficient producers) in stable environments.
(environment(a) and stable(a) and in_environment(a, b)) $\Rightarrow$ (subpopulations(first_movers, efficient_producers, a, sk$_1(b, a)$) or
(environment(a) and stable(a) and in_environment(a, b)) $\Rightarrow$ (greater_or_equal(sk$_1(b, a), b$) or greater(sk$_2(a)$, appear(efficient
(environment(a) and stable(a) and in_environment(a, b) and subpopulations(first_movers, efficient_producers, a, c) and greate
(subpopulations(first_movers, efficient_producers, a, sk$_1(b, a)$) or greater(0, growth_rate(first_movers, c))) cnf(mp_first_mov
(environment(a) and stable(a) and in_environment(a, b) and subpopulations(first_movers, efficient_producers, a, c) and greate
(greater_or_equal(sk$_1(b, a), b$) or greater(0, growth_rate(first_movers, c))) cnf(mp_first_movers_negative_growth$_4$, axiom)
(environment(a) and stable(a) and in_environment(a, b) and greater(0, growth_rate(first_movers, sk$_1(b, a)$))) $\Rightarrow$ greater(sk$_2$(
(environment(a) and stable(a) and in_environment(a, b) and greater(0, growth_rate(first_movers, sk$_1(b, a)$)) and subpopulatio
greater(0, growth_rate(first_movers, c)) cnf(mp_first_movers_negative_growth$_6$, axiom)
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, sk$_3(a)$) cnf(l11$_7$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal$(b$, sk$_3(a)$)) $\Rightarrow$
greater(growth_rate(efficient_producers, b), 0) cnf(l11$_8$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal$(b$, sk$_3(a)$)) $\Rightarrow$
greater(0, growth_rate(first_movers, b)) cnf(l11$_9$, hypothesis)
environment(sk$_4$) cnf(prove_l10$_{10}$, negated_conjecture)
stable(sk$_4$) cnf(prove_l10$_{11}$, negated_conjecture)
greater(a, appear(efficient_producers, sk$_4$)) $\Rightarrow$ subpopulations(first_movers, efficient_producers, sk$_4$, sk$_5(a)$) cnf(prove_l10$_1$
greater(a, appear(efficient_producers, sk$_4$)) $\Rightarrow$ greater_or_equal(sk$_5(a), a$) cnf(prove_l10$_{13}$, negated_conjecture)
greater(a, appear(efficient_producers, sk$_4$)) $\Rightarrow \neg$ greater(0, growth_rate(first_movers, sk$_5(a)$)) cnf(prove_l10$_{14}$, negated_con

MGT029+1.p EPs have positive and FMs have negative growth rates
Efficient producers have positive, while first movers have negative growth rate past a certain point of time in stable environments.
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(mp_greater_transitivity, axiom)
$\forall e, t_1, t_2$: ((in_environment(e, t_1) and in_environment(e, t_2)) $\Rightarrow$ (greater(t_2, t_1) or $t_2 = t_1$ or greater(t_1, t_2))) fof(mp_times
$\forall x, y$: (greater_or_equal$(x, y) \iff$ (greater(x, y) or $x = y$)) fof(mp_greater_or_equal, axiom)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t) and greater_or_equal$(t$, equilibrium(e))) $\Rightarrow$
((growth_rate(first_movers, t) $= 0$ and growth_rate(efficient_producers, t) $= 0$) or (greater(growth_rate(first_movers, t), 0) and
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow \exists$to: (in_environment$(e$, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) fof(l_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow \exists t$: (in_environment(e, t) and greater_or_equal$(t$, equilibrium(e)))) fof(a_4, hypothe
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow \exists$to: (in_environment$(e$, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
(greater(growth_rate(efficient_producers, t), 0) and greater(0, growth_rate(first_movers, t)))))) fof(prove_l$_{11}$, conjecture)

MGT030+1.p Earliest time point when FM growth rate exceeds EP growth rate
There is an earliest time point, past which FM's growth rate exceeds EP's growth rate.

$\forall e$: ((environment(e) and $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers, e, t) and grea
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\neg$ greater(grow
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) fof(mp_earliest_time_growth_rate_exceeds, axio
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) fof(l_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\neg$ greater(growth_rate(efficient_producers, to), growth
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) fof(prove_l_{12}, conjecture)

MGT030-1.p Earliest time point when FM growth rate exceeds EP growth rate
There is an earliest time point, past which FM's growth rate exceeds EP's growth rate.
(environment(a) and in_environment(a, b)) $\Rightarrow$ (subpopulations(first_movers, efficient_producers, a, sk$_1(b, a)$) or in_environme
(environment(a) and in_environment(a, b)) $\Rightarrow$ (greater_or_equal(sk$_1(b, a), b$) or in_environment(a, sk$_2(a)$)) cnf(mp_earlies
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, sk$_2(a)$), growth_rate(first_movers, sk$_2$(
subpopulations(first_movers, efficient_producers, a, sk$_1(b, a)$) cnf(mp_earliest_time_growth_rate_exceeds$_3$, axiom)
(environment(a) and in_environment(a, b) and subpopulations(first_movers, efficient_producers, a, c) and greater(c, sk$_2(a)$)) =
(subpopulations(first_movers, efficient_producers, a, sk$_1(b, a)$) or greater(growth_rate(efficient_producers, c), growth_rate(first_
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, sk$_2(a)$), growth_rate(first_movers, sk$_2$(
greater_or_equal(sk$_1(b, a), b$) cnf(mp_earliest_time_growth_rate_exceeds$_5$, axiom)
(environment(a) and in_environment(a, b) and subpopulations(first_movers, efficient_producers, a, c) and greater(c, sk$_2(a)$)) =
(greater_or_equal(sk$_1(b, a), b$) or greater(growth_rate(efficient_producers, c), growth_rate(first_movers, c))) cnf(mp_earliest_
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, sk$_1(b, a)$), growth_rate(first_movers, sk
in_environment(a, sk$_2(a)$) cnf(mp_earliest_time_growth_rate_exceeds$_7$, axiom)
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, sk$_1(b, a)$), growth_rate(first_movers, sk
$\neg$ greater(growth_rate(efficient_producers, sk$_2(a)$), growth_rate(first_movers, sk$_2(a)$)) cnf(mp_earliest_time_growth_rate_exc
(environment(a) and in_environment(a, b) and greater(growth_rate(efficient_producers, sk$_1(b, a)$), growth_rate(first_movers, sk
greater(growth_rate(efficient_producers, c), growth_rate(first_movers, c)) cnf(mp_earliest_time_growth_rate_exceeds$_9$, axiom
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, sk$_3(a)$) cnf(l1$_{10}$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal(b, sk$_3(a)$)) $\Rightarrow$
greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b)) cnf(l1$_{11}$, hypothesis)
environment(sk$_4$) cnf(prove_l12$_{12}$, negated_conjecture)
stable(sk$_4$) cnf(prove_l12$_{13}$, negated_conjecture)
in_environment(sk$_4, a$) $\Rightarrow$ (greater(growth_rate(efficient_producers, a), growth_rate(first_movers, a)) or subpopulations(first_
in_environment(sk$_4, a$) $\Rightarrow$ (greater(growth_rate(efficient_producers, a), growth_rate(first_movers, a)) or greater(sk$_5(a), a$))
(in_environment(sk$_4, a$) and greater(growth_rate(efficient_producers, sk$_5(a)$), growth_rate(first_movers, sk$_5(a)$))) $\Rightarrow$ greater(g

MGT031+1.p First movers appear first in an environment
$\forall e$: (environment(e) $\Rightarrow$ greater(number_of_organizations(e, appear(an_organisation, e)), 0)) fof(mp_positive_number_whe
$\forall e, t$: ((environment(e) and greater(number_of_organizations(e, t), 0)) $\Rightarrow$ $\exists s$: (subpopulation(s, e, t) and greater(cardinality_a
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater(appear(efficient_producers, e), t)) $\Rightarrow$ $\neg$ greater(cardinality_at_ti
$\forall e, t$: ((environment(e) and in_environment(e, t) and greater(appear(first_movers, e), t)) $\Rightarrow$ $\neg$ greater(cardinality_at_time(firs
$\forall e$: (environment(e) $\Rightarrow$ greater_or_equal(appear(first_movers, e), appear(an_organisation, e))) fof(mp_FM_not_precede_firs
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(mp_greater_transitivity, axiom)
$\forall x, y$: (greater_or_equal(x, y) $\iff$ (greater(x, y) or $x = y$)) fof(mp_greater_or_equal, axiom)
$\forall e, x, t$: ((environment(e) and subpopulation(x, e, t) and greater(cardinality_at_time(x, t), 0)) $\Rightarrow$ (x = efficient_producers or x
first_movers)) fof(a_9, hypothesis)
$\forall e$: (environment(e) $\Rightarrow$ greater(appear(efficient_producers, e), appear(first_movers, e))) fof(a_{13}, hypothesis)
$\forall e$: ((environment(e) and in_environment(e, appear(an_organisation, e))) $\Rightarrow$ appear(an_organisation, e) = appear(first_mover

MGT031-1.p First movers appear first in an environment
environment(a) $\Rightarrow$ greater(number_of_organizations(e, appear(an_organisation, a)), 0) cnf(mp_positive_number_when_app
(environment(a) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ subpopulation(sk$_1(b, a), a, b$) cnf(mp_number_mean_no
(environment(a) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ greater(cardinality_at_time(sk$_1(b, a), b$), 0) cnf(mp_nu
(environment(a) and in_environment(a, b) and greater(appear(efficient_producers, a), b)) $\Rightarrow$ $\neg$ greater(cardinality_at_time(eff
(environment(a) and in_environment(a, b) and greater(appear(first_movers, a), b)) $\Rightarrow$ $\neg$ greater(cardinality_at_time(first_move
environment(a) $\Rightarrow$ greater_or_equal(appear(first_movers, a), appear(an_organisation, a)) cnf(mp_FM_not_precede_first$_{25}$, a
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c) cnf(mp_greater_transitivity$_{26}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$) cnf(mp_greater_or_equal$_{27}$, axiom)
greater(a, b) $\Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{28}$, axiom)
$a = b$ $\Rightarrow$ greater_or_equal(a, b) cnf(mp_greater_or_equal$_{29}$, axiom)
(environment(a) and subpopulation(b, a, c) and greater(cardinality_at_time(b, c), 0)) $\Rightarrow$ (b = efficient_producers or b =
first_movers) cnf(a9$_{30}$, hypothesis)

environment(a) $\Rightarrow$ greater(appear(efficient_producers, e), appear(first_movers, a)) cnf(a13$_{31}$, hypothesis)
environment(sk$_2$) cnf(prove_l13$_{32}$, negated_conjecture)
in_environment(sk$_2$, appear(an_organisation, sk$_2$)) cnf(prove_l13$_{33}$, negated_conjecture)
appear(an_organisation, sk$_2$) $\neq$ appear(first_movers, sk$_2$) cnf(prove_l13$_{34}$, negated_conjecture)

MGT032+2.p Selection favours EPs above FMs
In stable environments, selection favors efficient producers above first movers past a certain point in time.
$\forall e, s_1, s_2, t$: ((environment(e) and subpopulations(s_1, s_2, e, t) and greater(growth_rate(s_2, t), growth_rate(s_1, t))) $\Rightarrow$ selection_favors(s_2, s_1, t)) fof(mp1_high_growth_rates, axiom)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
greater(growth_rate(efficient_producers, t), growth_rate(first_movers, t))))) fof(l_1, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and $\forall t$: ((subpopulations(first_movers, efficient_producers,
selection_favors(efficient_producers, first_movers, t)))) fof(prove_t$_1$, conjecture)

MGT032-2.p Selection favours EPs above FMs
In stable environments, selection favors efficient producers above first movers past a certain point in time.
(environment(a) and subpopulations(b, c, a, d) and greater(growth_rate(c, d), growth_rate(b, d))) $\Rightarrow$ selection_favors(c, b, d)
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, sk$_1$(a)) cnf(l1$_2$, hypothesis)
(environment(a) and stable(a) and subpopulations(first_movers, efficient_producers, a, b) and greater_or_equal(b, sk$_1$(a))) $\Rightarrow$
greater(growth_rate(efficient_producers, b), growth_rate(first_movers, b)) cnf(l1$_3$, hypothesis)
environment(sk$_2$) cnf(prove_t1$_4$, negated_conjecture)
stable(sk$_2$) cnf(prove_t1$_5$, negated_conjecture)
in_environment(sk$_2$, a) $\Rightarrow$ subpopulations(first_movers, efficient_producers, sk$_2$, sk$_3$(a)) cnf(prove_t1$_6$, negated_conjecture)
in_environment(sk$_2$, a) $\Rightarrow$ greater_or_equal(sk$_3$(a), a) cnf(prove_t1$_7$, negated_conjecture)
in_environment(sk$_2$, a) $\Rightarrow$ $\neg$ selection_favors(efficient_producers, first_movers, sk$_3$(a)) cnf(prove_t1$_8$, negated_conjecture)

MGT033-1.p Selection favors FMs above EPs until EPs appear
Selection favors first movers above efficient producers until the appearance of efficient producers.
(environment(a) and subpopulation(b, a, c) and subpopulation(d, a, c) and greater(cardinality_at_time(b, c), 0) and cardinality
0) $\Rightarrow$ selection_favors(b, d, c) cnf(mp2_favour_members$_{24}$, axiom)
(environment(a) and in_environment(a, b) and greater(appear(c, a), b)) $\Rightarrow$ cardinality_at_time(c, b) = 0 cnf(mp_not_prese
(environment(a) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ subpopulation(sk$_1$(b, a), a, b) cnf(mp_positive_sum_me
(environment(a) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ greater(cardinality_at_time(sk$_1$(b, a), b), 0) cnf(mp_pos
cardinality_at_time(a, t) = 0 $\Rightarrow$ $\neg$ greater(cardinality_at_time(a, b), 0) cnf(mp_zero_is_not_positive$_{28}$, axiom)
(environment(a) and greater(number_of_organizations(a, b), 0)) $\Rightarrow$ in_environment(a, b) cnf(mp_positive_and_sustains$_{29}$, a
(environment(a) and in_environment(a, b) and in_environment(a, c) and greater_or_equal(c, d) and greater_or_equal(d, b)) $\Rightarrow$
in_environment(a, d) cnf(mp_durations_are_time_intervals$_{30}$, axiom)
environment(a) $\Rightarrow$ in_environment(a, start_time(a)) cnf(mp_opening_time_in_duration$_{31}$, axiom)
environment(a) $\Rightarrow$ greater_or_equal(appear(first_movers, a), start_time(a)) cnf(mp_no_FM_before_opening$_{32}$, axiom)
(environment(a) and in_environment(a, b)) $\Rightarrow$ subpopulation(first_movers, a, b) cnf(mp_subpopulations$_{33}$, axiom)
(environment(a) and in_environment(a, b)) $\Rightarrow$ subpopulation(efficient_producers, a, b) cnf(mp_subpopulations$_{34}$, axiom)
(environment(a) and in_environment(a, appear(first_movers, a))) $\Rightarrow$ in_environment(a, appear(an_organisation, a)) cnf(m
(environment(a) and in_environment(a, b) and greater_or_equal(b, appear(an_organisation, a))) $\Rightarrow$ greater(number_of_organiz
(environment(a) and subpopulation(b, a, c) and greater(cardinality_at_time(b, c), 0)) $\Rightarrow$ (b = efficient_producers or b =
first_movers) cnf(a9$_{37}$, hypothesis)
(environment(a) and in_environment(a, appear(an_organisation, a))) $\Rightarrow$ appear(an_organisation, a) = appear(first_movers, a)
environment(sk$_2$) cnf(prove_t2$_{39}$, negated_conjecture)
in_environment(sk$_2$, sk$_3$) cnf(prove_t2$_{40}$, negated_conjecture)
greater_or_equal(sk$_3$, appear(first_movers, sk$_2$)) cnf(prove_t2$_{41}$, negated_conjecture)
greater(appear(efficient_producers, sk$_2$), sk$_3$) cnf(prove_t2$_{42}$, negated_conjecture)
$\neg$ selection_favors(first_movers, efficient_producers, sk$_3$) cnf(prove_t2$_{43}$, negated_conjecture)

MGT035+1.p EPs outcompete FMs in stable environments
Efficient producers outcompete first movers past a certain time in stable environments.
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(mp_greater_transitivity, axiom)
$\forall e, t_1, t_2$: ((in_environment(e, t_1) and in_environment(e, t_2)) $\Rightarrow$ (greater(t_2, t_1) or $t_2 = t_1$ or greater(t_1, t_2))) fof(mp_times
$\forall x, y$: (greater_or_equal(x, y) $\iff$ (greater(x, y) or $x = y$)) fof(mp_greater_or_equal, axiom)
$\forall e, s_1, s_2, t$: ((environment(e) and subpopulations(s_1, s_2, e, t)) $\Rightarrow$ ((greater_or_equal(growth_rate(s_2, t), 0) and greater(0, grow
outcompetes(s_2, s_1, t))) fof(d_2, hypothesis)
$\forall e, t$: ((environment(e) and subpopulations(first_movers, efficient_producers, e, t) and greater_or_equal(t, equilibrium(e))) $\Rightarrow$
((growth_rate(first_movers, t) = 0 and growth_rate(efficient_producers, t) = 0) or (greater(growth_rate(first_movers, t), 0) and

$\forall e$: $((\mathrm{environment}(e) \text{ and } \mathrm{stable}(e)) \Rightarrow \exists \mathrm{to}$: $(\mathrm{in\_environment}(e, \mathrm{to}) \text{ and } \forall t$: $((\mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}$
$\mathrm{greater}(\mathrm{growth\_rate}(\mathrm{efficient\_producers}, t), \mathrm{growth\_rate}(\mathrm{first\_movers}, t)))))$ $\quad$ $\mathrm{fof}(l_1, \mathrm{hypothesis})$
$\forall e$: $((\mathrm{environment}(e) \text{ and } \mathrm{stable}(e)) \Rightarrow \exists t$: $(\mathrm{in\_environment}(e, t) \text{ and } \mathrm{greater\_or\_equal}(t, \mathrm{equilibrium}(e))))$ $\quad$ $\mathrm{fof}(a_4, \mathrm{hypothe}$
$\forall e$: $((\mathrm{environment}(e) \text{ and } \mathrm{stable}(e)) \Rightarrow \exists \mathrm{to}$: $(\mathrm{in\_environment}(e, \mathrm{to}) \text{ and } \forall t$: $((\mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}$
$\mathrm{outcompetes}(\mathrm{efficient\_producers}, \mathrm{first\_movers}, t))))$ $\quad$ $\mathrm{fof}(\mathrm{prove\_t}_4, \mathrm{conjecture})$

MGT036+1.p First movers never outcompete efficient producers.
$\forall e, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t)) \Rightarrow \mathrm{subpopulations}(\mathrm{efficient\_producers}, \mathrm{first}$
$\forall e, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t)) \Rightarrow \mathrm{in\_environment}(e, t))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_time\_p}$
$\forall e, s_1, s_2, t$: $(((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(s_1, t), 0)) \iff$
$\neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_1, t)))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_growth\_rate\_relationships}, \mathrm{axiom})$
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow ((\mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(s_2, t), 0) \text{ and } \mathrm{greater}(0, \mathrm{grow}$
$\mathrm{outcompetes}(s_2, s_1, t)))$ $\quad$ $\mathrm{fof}(d_2, \mathrm{hypothesis})$
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{in\_environment}(e, t) \text{ and } \neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_1, t)) \text{ and } \mathrm{greater}(\mathrm{resilience}(s_2), \mathrm{resilienc}$
$\neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_2, t)))$ $\quad$ $\mathrm{fof}(a_{12}, \mathrm{hypothesis})$
$\mathrm{greater}(\mathrm{resilience}(\mathrm{efficient\_producers}), \mathrm{resilience}(\mathrm{first\_movers}))$ $\quad$ $\mathrm{fof}(a_2, \mathrm{hypothesis})$
$\forall e, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t)) \Rightarrow \neg\, \mathrm{outcompetes}(\mathrm{first\_movers}, \mathrm{efficient\_pro}$

MGT036+2.p First movers never outcompete efficient producers.
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow \mathrm{subpopulations}(s_2, s_1, e, t))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_symmetry\_of\_subpop}$
$\forall e, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t)) \Rightarrow \mathrm{in\_environment}(e, t))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_time\_p}$
$\forall e, s_1, s_2, t$: $(((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(s_1, t), 0)) \iff$
$\neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_1, t)))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_growth\_rate\_relationships}, \mathrm{axiom})$
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow ((\mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(s_2, t), 0) \text{ and } \mathrm{greater}(0, \mathrm{grow}$
$\mathrm{outcompetes}(s_2, s_1, t)))$ $\quad$ $\mathrm{fof}(d_2, \mathrm{hypothesis})$
$\mathrm{greater}(\mathrm{resilience}(\mathrm{efficient\_producers}), \mathrm{resilience}(\mathrm{first\_movers}))$ $\quad$ $\mathrm{fof}(a_2, \mathrm{hypothesis})$
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{in\_environment}(e, t) \text{ and } \neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_1, t)) \text{ and } \mathrm{greater}(\mathrm{resilience}(s_2), \mathrm{resilienc}$
$\neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(s_2, t)))$ $\quad$ $\mathrm{fof}(a_{13}, \mathrm{hypothesis})$
$\forall e, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t)) \Rightarrow \neg\, \mathrm{outcompetes}(\mathrm{first\_movers}, \mathrm{efficient\_pro}$

MGT036+3.p First movers never outcompete efficient producers.
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow \mathrm{subpopulations}(s_2, s_1, e, t))$ $\quad$ $\mathrm{fof}(\mathrm{mp\_symmetry\_of\_subpop}$
$\forall e, s_1, s_2, t$: $((\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(s_1, s_2, e, t)) \Rightarrow ((\mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(s_2, t), 0) \text{ and } \mathrm{greater}(0, \mathrm{grow}$
$\mathrm{outcompetes}(s_2, s_1, t)))$ $\quad$ $\mathrm{fof}(d_2, \mathrm{hypothesis})$
$\exists e, t$: $(\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t) \text{ and } \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(\mathrm{first\_mover}$
$\exists e, t$: $(\mathrm{environment}(e) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, e, t) \text{ and } \mathrm{outcompetes}(\mathrm{first\_movers}, \mathrm{efficient\_produ}$

MGT036-1.p First movers never outcompete efficient producers.
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, a, b)) \Rightarrow \mathrm{subpopulations}(\mathrm{efficient\_producers}, \mathrm{first\_move}$
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, a, b)) \Rightarrow \mathrm{in\_environment}(a, b)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_time\_point\_o}$
$\mathrm{greater}(0, \mathrm{growth\_rate}(b, c)) \Rightarrow \mathrm{environment}(a)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_3, \mathrm{axiom})$
$\mathrm{greater}(0, \mathrm{growth\_rate}(a, d)) \Rightarrow \mathrm{subpopulations}(a, b, c, d)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_4, \mathrm{axiom})$
$\mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(a, b), 0) \Rightarrow \neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(a, b))$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_5, \mathrm{axiom})$
$(\mathrm{environment}(c) \text{ and } \mathrm{subpopulations}(a, d, c, b)) \Rightarrow (\mathrm{greater}(0, \mathrm{growth\_rate}(a, b)) \text{ or } \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(a, b), 0))$
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(b, c, a, d) \text{ and } \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(c, d), 0) \text{ and } \mathrm{greater}(0, \mathrm{growth\_rate}(b, d))) \Rightarrow$
$\mathrm{outcompetes}(c, b, d)$ $\quad$ $\mathrm{cnf}(\mathrm{d2}_7, \mathrm{hypothesis})$
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(b, c, a, d) \text{ and } \mathrm{outcompetes}(c, b, d)) \Rightarrow \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(c, d), 0)$ $\quad$ $\mathrm{cnf}(\mathrm{d2}_8$
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(b, c, a, d) \text{ and } \mathrm{outcompetes}(c, b, d)) \Rightarrow \mathrm{greater}(0, \mathrm{growth\_rate}(b, d))$ $\quad$ $\mathrm{cnf}(\mathrm{d2}_9, \mathrm{hypothe}$
$(\mathrm{environment}(a) \text{ and } \mathrm{in\_environment}(a, b) \text{ and } \mathrm{greater}(\mathrm{resilience}(d), \mathrm{resilience}(c)) \text{ and } \mathrm{greater}(0, \mathrm{growth\_rate}(d, b))) \Rightarrow$
$\mathrm{greater}(0, \mathrm{growth\_rate}(c, b))$ $\quad$ $\mathrm{cnf}(\mathrm{a12}_{10}, \mathrm{hypothesis})$
$\mathrm{greater}(\mathrm{resilience}(\mathrm{efficient\_producers}), \mathrm{resilience}(\mathrm{first\_movers}))$ $\quad$ $\mathrm{cnf}(\mathrm{a2}_{11}, \mathrm{hypothesis})$
$\mathrm{environment}(\mathrm{sk}_1)$ $\quad$ $\mathrm{cnf}(\mathrm{prove\_t5}_{12}, \mathrm{negated\_conjecture})$
$\mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, \mathrm{sk}_1, \mathrm{sk}_2)$ $\quad$ $\mathrm{cnf}(\mathrm{prove\_t5}_{13}, \mathrm{negated\_conjecture})$
$\mathrm{outcompetes}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, \mathrm{sk}_2)$ $\quad$ $\mathrm{cnf}(\mathrm{prove\_t5}_{14}, \mathrm{negated\_conjecture})$

MGT036-2.p First movers never outcompete efficient producers.
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(b, c, a, d)) \Rightarrow \mathrm{subpopulations}(c, b, a, d)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_symmetry\_of\_subpopulations}_1, \mathrm{axiom}$
$(\mathrm{environment}(a) \text{ and } \mathrm{subpopulations}(\mathrm{first\_movers}, \mathrm{efficient\_producers}, a, b)) \Rightarrow \mathrm{in\_environment}(a, b)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_time\_point\_o}$
$\mathrm{greater}(0, \mathrm{growth\_rate}(b, c)) \Rightarrow \mathrm{environment}(a)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_3, \mathrm{axiom})$
$\mathrm{greater}(0, \mathrm{growth\_rate}(a, d)) \Rightarrow \mathrm{subpopulations}(a, b, c, d)$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_4, \mathrm{axiom})$
$\mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(a, b), 0) \Rightarrow \neg\, \mathrm{greater}(0, \mathrm{growth\_rate}(a, b))$ $\quad$ $\mathrm{cnf}(\mathrm{mp\_growth\_rate\_relationships}_5, \mathrm{axiom})$
$(\mathrm{environment}(c) \text{ and } \mathrm{subpopulations}(a, d, c, b)) \Rightarrow (\mathrm{greater}(0, \mathrm{growth\_rate}(a, b)) \text{ or } \mathrm{greater\_or\_equal}(\mathrm{growth\_rate}(a, b), 0))$

(environment(a) and subpopulations(b, c, a, d) and greater_or_equal(growth_rate(c, d), 0) and greater(0, growth_rate(b, d))) $\Rightarrow$
outcompetes(c, b, d) cnf(d2$_7$, hypothesis)
(environment(a) and subpopulations(b, c, a, d) and outcompetes(c, b, d)) $\Rightarrow$ greater_or_equal(growth_rate(c, d), 0) cnf(d2$_8$
(environment(a) and subpopulations(b, c, a, d) and outcompetes(c, b, d)) $\Rightarrow$ greater(0, growth_rate(b, d)) cnf(d2$_9$, hypothe
greater(resilience(efficient_producers), resilience(first_movers)) cnf(a2$_{10}$, hypothesis)
(environment(a) and in_environment(a, b) and greater(resilience(d), resilience(c)) and greater(0, growth_rate(d, b))) $\Rightarrow$
greater(0, growth_rate(c, b)) cnf(a13$_{11}$, hypothesis)
environment(sk$_1$) cnf(prove_t5$_{12}$, negated_conjecture)
subpopulations(first_movers, efficient_producers, sk$_1$, sk$_2$) cnf(prove_t5$_{13}$, negated_conjecture)
outcompetes(first_movers, efficient_producers, sk$_2$) cnf(prove_t5$_{14}$, negated_conjecture)

MGT036-3.p First movers never outcompete efficient producers.
(environment(a) and subpopulations(b, c, a, d)) $\Rightarrow$ subpopulations(c, b, a, d) cnf(mp_symmetry_of_subpopulations$_1$, axiom
(environment(a) and subpopulations(b, c, a, d) and greater_or_equal(growth_rate(c, d), 0) and greater(0, growth_rate(b, d))) $\Rightarrow$
outcompetes(c, b, d) cnf(d2$_2$, hypothesis)
(environment(a) and subpopulations(b, c, a, d) and outcompetes(c, b, d)) $\Rightarrow$ greater_or_equal(growth_rate(c, d), 0) cnf(d2$_3$
(environment(a) and subpopulations(b, c, a, d) and outcompetes(c, b, d)) $\Rightarrow$ greater(0, growth_rate(b, d)) cnf(d2$_4$, hypothe
environment(sk$_1$) cnf(a13_star$_5$, hypothesis)
subpopulations(first_movers, efficient_producers, sk$_1$, sk$_2$) cnf(a13_star$_6$, hypothesis)
greater_or_equal(growth_rate(first_movers, sk$_2$), 0) cnf(a13_star$_7$, hypothesis)
greater(0, growth_rate(efficient_producers, sk$_2$)) cnf(a13_star$_8$, hypothesis)
(environment(a) and subpopulations(first_movers, efficient_producers, a, b)) $\Rightarrow$ $\neg$ outcompetes(first_movers, efficient_produce

MGT038+1.p FMs become extinct in stable environments
First movers become extinct past a certain point in time in stable environments.
finite_set(first_movers) fof(mp7_first_movers_exist, axiom)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ in_environment(e, appear(first_movers, e))) fof(mp_stable_first_movers, axiom)
$\forall s$, to: ((finite_set(s) and contracts_from(to, s)) $\Rightarrow$ $\exists t_2$: (greater(t_2, to) and cardinality_at_time(s, t_2) = 0)) fof(mp_contra
$\forall e, t_1, t_2$: ((environment(e) and stable(e) and in_environment(e, t_1) and greater(t_2, t_1)) $\Rightarrow$ in_environment(e, t_2)) fof(mp_
$\forall x, y, z$: ((greater(x, y) and greater(y, z)) $\Rightarrow$ greater(x, z)) fof(mp_greater_transitivity, axiom)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (greater(to, appear(efficient_producers, e)) and contracts_from(to, first_movers)))
$\forall e$: (environment(e) $\Rightarrow$ greater(appear(efficient_producers, e), appear(first_movers, e))) fof(a_{13}, hypothesis)
$\forall e$: ((environment(e) and stable(e)) $\Rightarrow$ $\exists$to: (in_environment(e, to) and greater(to, appear(first_movers, e)) and cardinality_a
0)) fof(prove_t$_7$, conjecture)

MGT038-1.p FMs become extinct in stable environments
First movers become extinct past a certain point in time in stable environments.
finite_set(first_movers) cnf(mp7_first_movers_exist$_{17}$, axiom)
(environment(a) and stable(a)) $\Rightarrow$ in_environment(a, appear(first_movers, a)) cnf(mp_stable_first_movers$_{18}$, axiom)
(finite_set(a) and contracts_from(b, a)) $\Rightarrow$ greater(sk$_1$(b, a), b) cnf(mp_contracting_time$_{19}$, axiom)
(finite_set(a) and contracts_from(b, a)) $\Rightarrow$ cardinality_at_time(s, t_2) = 0 cnf(mp_contracting_time$_{20}$, axiom)
(environment(a) and stable(a) and in_environment(a, b) and greater(c, b)) $\Rightarrow$ in_environment(a, c) cnf(mp_long_stable_e
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c) cnf(mp_greater_transitivity$_{22}$, axiom)
(environment(a) and stable(a)) $\Rightarrow$ greater(sk$_2$(a), appear(efficient_producers, a)) cnf(l9$_{23}$, hypothesis)
(environment(a) and stable(a)) $\Rightarrow$ contracts_from(sk$_2$(a), first_movers) cnf(l9$_{24}$, hypothesis)
environment(a) $\Rightarrow$ greater(appear(efficient_producers, e), appear(first_movers, a)) cnf(a13$_{25}$, hypothesis)
environment(sk$_3$) cnf(prove_t7$_{26}$, negated_conjecture)
stable(sk$_3$) cnf(prove_t7$_{27}$, negated_conjecture)
(in_environment(sk$_3$, a) and greater(a, appear(first_movers, sk$_3$))) $\Rightarrow$ cardinality_at_time(first_movers, to) $\neq$ 0 cnf(prove_t

MGT039-1.p Selection favours EPs above Fms if change is slow
Selection favors efficient producers above first movers if environmental change is slow.
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers)) $\Rightarrow$
(environment(sk$_1$(a)) or selection_favors(efficient_producers, first_movers, a)) cnf(mp3_favoured_trategy$_{20}$, axiom)
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers)) $\Rightarrow$
(in_environment(a, sk$_1$(a)) or selection_favors(efficient_producers, first_movers, a)) cnf(mp3_favoured_trategy$_{21}$, axiom)
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers) and selection_
selection_favors(efficient_producers, first_movers, a) cnf(mp3_favoured_trategy$_{22}$, axiom)
(observational_period(a) and slow_change(a) and environment(b) and in_environment(a, b)) $\Rightarrow$ in_environment(b, sk$_2$(b, a))
(observational_period(a) and slow_change(a) and environment(b) and in_environment(a, b)) $\Rightarrow$ greater(sk$_2$(b, a), critical_poi
propagation_strategy(first_movers) cnf(mp_organizational_sets1$_{25}$, axiom)

propagation_strategy(efficient_producers)   cnf(mp_organizational_sets2$_{26}$, axiom)
(environment(a) and greater_or_equal(b, start_time(a)) and greater_or_equal(end_time(a), b)) $\Rightarrow$ in_environment(a, b)   cnf
(environment(a) and in_environment(a, b)) $\Rightarrow$ greater_or_equal(end_time(a), b)   cnf(mp_environment_end_point$_{28}$, axiom)
environment(a) $\Rightarrow$ greater_or_equal(critical_point(a), start_time(a))   cnf(mp_time_of_critical_point$_{29}$, axiom)
(greater(a, b) and greater(b, c)) $\Rightarrow$ greater(a, c)   cnf(mp_greater_transitivity$_{30}$, axiom)
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$)   cnf(mp_greater_or_equal$_{31}$, axiom)
greater(a, b) $\Rightarrow$ greater_or_equal(a, b)   cnf(mp_greater_or_equal$_{32}$, axiom)
$a = b$ $\Rightarrow$ greater_or_equal(a, b)   cnf(mp_greater_or_equal$_{33}$, axiom)
(environment(a) and greater(b, start_time(a))) $\Rightarrow$ (greater(b, end_time(a)) or greater_or_equal(end_time(a), b))   cnf(mp_b
(environment(a) and in_environment(a, b) and greater(b, critical_point(a))) $\Rightarrow$ selection_favors(efficient_producers, first_move
observational_period(sk$_3$)   cnf(prove_t8$_{36}$, negated_conjecture)
slow_change(sk$_3$)   cnf(prove_t8$_{37}$, negated_conjecture)
$\neg$ selection_favors(efficient_producers, first_movers, sk$_3$)   cnf(prove_t8$_{38}$, negated_conjecture)

MGT040-2.p Selection favours FMs above EPs if change is not extreme
Selection favors first movers above efficient producers if environmental change is rapid but not extreme during the observational period.
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers)) $\Rightarrow$
(environment(sk$_1$(a)) or selection_favors(efficient_producers, first_movers, a))   cnf(mp3_favoured_trategy$_{23}$, axiom)
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers)) $\Rightarrow$
(in_environment(a, sk$_1$(a)) or selection_favors(efficient_producers, first_movers, a))   cnf(mp3_favoured_trategy$_{24}$, axiom)
(observational_period(a) and propagation_strategy(first_movers) and propagation_strategy(efficient_producers) and selection_
selection_favors(efficient_producers, first_movers, a)   cnf(mp3_favoured_trategy$_{25}$, axiom)
(observational_period(a) and rapid_change(a) and environment(b) and in_environment(a, b)) $\Rightarrow$ $\neg$ in_environment(b, critical_
(observational_period(a) and environment(b) and in_environment(a, b) and empty(b)) $\Rightarrow$ extreme(a)   cnf(mp6_not_extrem
propagation_strategy(first_movers)   cnf(mp_organizational_sets1$_{28}$, axiom)
propagation_strategy(efficient_producers)   cnf(mp_organizational_sets2$_{29}$, axiom)
environment(a) $\Rightarrow$ in_environment(a, end_time(a))   cnf(mp_endpoint_in_environment$_{30}$, axiom)
environment(a) $\Rightarrow$ (in_environment(a, critical_point(a)) or greater(critical_point(a), end_time(a)))   cnf(mp_critical_point_
environment(a) $\Rightarrow$ (empty(a) or greater_or_equal(end_time(a), appear(an_organisation, a)))   cnf(mp_non_empty_means_or
(environment(a) and greater_or_equal(b, appear(efficient_producers, a)) and greater(critical_point(a), b)) $\Rightarrow$ (in_environment(
(environment(a) and greater_or_equal(b, appear(efficient_producers, a)) and greater(critical_point(a), b) and selection_favors(f
(in_environment(a, critical_point(a)) or selection_favors(first_movers, efficient_producers, end_time(a)))   cnf(mp_selection_fa
greater_or_equal(a, b) $\Rightarrow$ (greater(a, b) or $a = b$)   cnf(mp_greater_or_equal$_{35}$, axiom)
in_environment(a, b) $\Rightarrow$ (greater(appear(efficient_producers, a), b) or greater_or_equal(b, appear(efficient_producers, a)))   c
(environment(a) and in_environment(a, b) and greater_or_equal(b, appear(first_movers, a)) and greater(appear(efficient_produ
selection_favors(first_movers, efficient_producers, b)   cnf(t2$_{37}$, hypothesis)
(environment(a) and in_environment(a, critical_point(a)) and greater_or_equal(b, appear(efficient_producers, a)) and greater(c
selection_favors(first_movers, efficient_producers, b)   cnf(t3$_{38}$, hypothesis)
observational_period(sk$_2$)   cnf(prove_t9$_{39}$, negated_conjecture)
rapid_change(sk$_2$)   cnf(prove_t9$_{40}$, negated_conjecture)
$\neg$ extreme(sk$_2$)   cnf(prove_t9$_{41}$, negated_conjecture)
$\neg$ selection_favors(first_movers, efficient_producers, sk$_2$)   cnf(prove_t9$_{42}$, negated_conjecture)

MGT041+2.p There are non-FM and non-EP organisations
There are non-first mover and non-efficient producers organisations.
$\forall x, t$: $\neg$ number_of_routines(x, t, low) and number_of_routines(x, t, high)   fof(mp_not_high_and_low, axiom)
$\forall x, t$: ((organisation_at_time(x, t) and efficient_producer(x) and founding_time(x, t)) $\Rightarrow$ has_elaborated_routines(x, t))   fof
$\forall x, t$: ((organisation_at_time(x, t) and first_mover(x) and founding_time(x, t)) $\Rightarrow$ number_of_routines(x, t, low))   fof(a_{15}, h
$\exists x, t$: (organisation_at_time(x, t) and founding_time(x, t) and number_of_routines(x, t, high) and $\neg$ has_elaborated_routines(x,
$\exists x, t$: (organisation_at_time(x, t) and $\neg$ first_mover(x) and $\neg$ efficient_producer(x))   fof(prove_t$_{10}$, conjecture)

MGT041-2.p There are non-FM and non-EP organisations
There are non-first mover and non-efficient producers organisations.
number_of_routines(a, b, low) $\Rightarrow$ $\neg$ number_of_routines(a, b, high)   cnf(mp_not_high_and_low$_1$, axiom)
(organisation_at_time(a, b) and efficient_producer(a) and founding_time(a, b)) $\Rightarrow$ has_elaborated_routines(a, b)   cnf(a14$_2$, h
(organisation_at_time(a, b) and first_mover(a) and founding_time(a, b)) $\Rightarrow$ number_of_routines(a, b, low)   cnf(a15$_3$, hypoth
organisation_at_time(sk$_1$, sk$_2$)   cnf(a16$_4$, hypothesis)
founding_time(sk$_1$, sk$_2$)   cnf(a16$_5$, hypothesis)
number_of_routines(sk$_1$, sk$_2$, high)   cnf(a16$_6$, hypothesis)
$\neg$ has_elaborated_routines(sk$_1$, sk$_2$)   cnf(a16$_7$, hypothesis)

organisation_at_time(a, b) $\Rightarrow$ (first_mover(a) or efficient_producer(a)) cnf(prove_t10$_8$, negated_conjecture)

MGT043+1.p Conditions for a higher hazard of mortality
When an organization lacks immunity, the growth of internal friction elevates its hazard of mortality when its knowledge and the quality of its ties are constant.
include('Axioms/MGT001+0.ax')
$\forall x, t_0, t$: ((organization(x) and $\neg$ has_immunity(x, t_0) and $\neg$ has_immunity(x, t)) $\Rightarrow$ (((greater(capability(x, t), capability$(x, t_0$
smaller(hazard_of_mortality(x, t), hazard_of_mortality(x, t_0))) and ((greater_or_equal(capability(x, t), capability(x, t_0)) and gr
smaller(hazard_of_mortality(x, t), hazard_of_mortality(x, t_0))) and ((capability(x, t) = capability(x, t_0) and position(x, t) =
position(x, t_0)) $\Rightarrow$ hazard_of_mortality(x, t) = hazard_of_mortality(x, t_0))))) fof(assumption$_4$, axiom)
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ (((greater(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and smaller_or_equal(internal_fric
greater(capability(x, t), capability(x, t_0)))) and ((smaller_or_equal(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and gre
smaller(capability(x, t), capability(x, t_0)))) and ((stock_of_knowledge(x, t) = stock_of_knowledge(x, t_0) and internal_friction$(x,$
internal_friction(x, t_0)) $\Rightarrow$ capability(x, t) = capability(x, t_0))))) fof(assumption$_5$, axiom)
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ ((greater(external_ties(x, t), external_ties(x, t_0)) $\Rightarrow$ greater(position(x, t), position(x, t_0)))) and (
external_ties(x, t_0) $\Rightarrow$ position(x, t) = position(x, t_0))))) fof(assumption$_6$, axiom)
$\forall x, t_0, t$: ((organization(x) and $\neg$ has_immunity(x, t_0) and $\neg$ has_immunity(x, t) and stock_of_knowledge(x, t) = stock_of_know
external_ties(x, t)) $\Rightarrow$ greater(hazard_of_mortality(x, t), hazard_of_mortality(x, t_0)))) fof(lemma$_2$, conjecture)

MGT043-1.p Conditions for a higher hazard of mortality
When an organization lacks immunity, the growth of internal friction elevates its hazard of mortality when its knowledge and the quality of its ties are constant.
include('Axioms/MGT001-0.ax')
(organization(a) and greater(capability(a, c), capability(a, b)) and greater_or_equal(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and greater_or_equal(capability(a, c), capability(a, b)) and greater(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and capability(a, c) = capability(a, b) and position(a, c) = position(a, b)) $\Rightarrow$ (has_immunity(a, b) or has_imm
hazard_of_mortality(a, b)) cnf(assumption_4$_{40}$, axiom)
(organization(a) and greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and smaller_or_equal(internal_friction(a, b), in
greater(capability(a, b), capability(a, c))) cnf(assumption_5$_{41}$, axiom)
(organization(a) and smaller_or_equal(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and greater(internal_friction(a, b), in
smaller(capability(a, b), capability(a, c))) cnf(assumption_5$_{42}$, axiom)
(organization(a) and stock_of_knowledge(a, b) = stock_of_knowledge(a, c) and internal_friction(a, b) = internal_friction(a, c))
capability(a, b) = capability(a, c) cnf(assumption_5$_{43}$, axiom)
(organization(a) and greater(external_ties(a, b), external_ties(a, c))) $\Rightarrow$ greater(position(a, b), position(a, c)) cnf(assumpti
(organization(a) and external_ties(a, b) = external_ties(a, c)) $\Rightarrow$ position(a, b) = position(a, c) cnf(assumption_6$_{45}$, axiom
organization(sk$_1$) cnf(lemma_2$_{46}$, negated_conjecture)
$\neg$ has_immunity(sk$_1$, sk$_2$) cnf(lemma_2$_{47}$, negated_conjecture)
$\neg$ has_immunity(sk$_1$, sk$_3$) cnf(lemma_2$_{48}$, negated_conjecture)
stock_of_knowledge(sk$_1$, sk$_3$) = stock_of_knowledge(sk$_1$, sk$_2$) cnf(lemma_2$_{49}$, negated_conjecture)
greater(internal_friction(sk$_1$, sk$_3$), internal_friction(sk$_1$, sk$_2$)) cnf(lemma_2$_{50}$, negated_conjecture)
external_ties(sk$_1$, sk$_2$) = external_ties(sk$_1$, sk$_3$) cnf(lemma_2$_{51}$, negated_conjecture)
$\neg$ greater(hazard_of_mortality(sk$_1$, sk$_3$), hazard_of_mortality(sk$_1$, sk$_2$)) cnf(lemma_2$_{52}$, negated_conjecture)

MGT044+1.p Capability increases monotonically with age
An organization's capability increases monotonically with its age.
include('Axioms/MGT001+0.ax')
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ (((greater(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and smaller_or_equal(internal_fric
greater(capability(x, t), capability(x, t_0)))) and ((smaller_or_equal(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and gre
smaller(capability(x, t), capability(x, t_0)))) and ((stock_of_knowledge(x, t) = stock_of_knowledge(x, t_0) and internal_friction$(x,$
internal_friction(x, t_0)) $\Rightarrow$ capability(x, t) = capability(x, t_0))))) fof(assumption$_5$, axiom)
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ greater(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0))))
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ internal_friction(x, t) = internal_friction(x, t_0)) fof(assumption$_9$, axiom)
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ greater(capability(x, t), capability(x, t_0)))) fof(lemma$_3$, co

MGT044-1.p Capability increases monotonically with age
An organization's capability increases monotonically with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and smaller_or_equal(internal_friction(a, b), in
greater(capability(a, b), capability(a, c))) cnf(assumption_5$_{32}$, axiom)

(organization(a) and smaller_or_equal(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and greater(internal_friction(a, b), i
smaller(capability(a, b), capability(a, c)) cnf(assumption_5_{33}, axiom)
(organization(a) and stock_of_knowledge(a, b) = stock_of_knowledge(a, c) and internal_friction(a, b) = internal_friction(a, c))
capability(a, b) = capability(a, c) cnf(assumption_5_{34}, axiom)
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) cnf(assu
organization(a) $\Rightarrow$ internal_friction(a, b) = internal_friction(a, c) cnf(assumption_9_{36}, axiom)
organization(sk_1) cnf(lemma_3_{37}, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_$3_{38}$, negated_conjecture)
$\neg$ greater(capability($\mathrm{sk}_1, \mathrm{sk}_3$), capability($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_$3_{39}$, negated_conjecture)

MGT045+1.p Structural position increases monotonically with age
An organization's structural position increases monotonically with its age.
include('Axioms/MGT001+0.ax')
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ ((greater(external_ties(x, t), external_ties(x, t_0)) $\Rightarrow$ greater(position(x, t), position(x, t_0))) and (
external_ties(x, t_0) $\Rightarrow$ position(x, t) = position(x, t_0)))) fof(assumption$_6$, axiom)
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ greater(external_ties(x, t), external_ties(x, t_0))) fof(assum
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ greater(position(x, t), position(x, t_0))) fof(lemma$_4$, conjec

MGT045-1.p Structural position increases monotonically with age
An organization's structural position increases monotonically with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and greater(external_ties(a, b), external_ties(a, c))) $\Rightarrow$ greater(position(a, b), position(a, c)) cnf(assumpti
(organization(a) and external_ties(a, b) = external_ties(a, c)) $\Rightarrow$ position(a, b) = position(a, c) cnf(assumption_6_{31}, axiom
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(external_ties(a, b), external_ties(a, c)) cnf(assumption_8_{32}, ax
organization(sk_1) cnf(lemma_4_{33}, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_$4_{34}$, negated_conjecture)
$\neg$ greater(position($\mathrm{sk}_1, \mathrm{sk}_3$), position($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_$4_{35}$, negated_conjecture)

MGT046-1.p Unendowed organization's hazard of mortality declines with age
An unendowed organization's hazard of mortality declines monotonically with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and has_immunity(a, b)) $\Rightarrow$ has_endowment(a) cnf(assumption_1_{41}, axiom)
(organization(a) and greater(capability(a, c), capability(a, b)) and greater_or_equal(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and greater_or_equal(capability(a, c), capability(a, b)) and greater(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and capability(a, c) = capability(a, b) and position(a, c) = position(a, b)) $\Rightarrow$ (has_immunity(a, b) or has_im
hazard_of_mortality(a, b)) cnf(assumption_4_{44}, axiom)
(organization(a) and greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and smaller_or_equal(internal_friction(a, b), i
greater(capability(a, b), capability(a, c)) cnf(assumption_5_{45}, axiom)
(organization(a) and smaller_or_equal(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and greater(internal_friction(a, b), i
smaller(capability(a, b), capability(a, c)) cnf(assumption_5_{46}, axiom)
(organization(a) and stock_of_knowledge(a, b) = stock_of_knowledge(a, c) and internal_friction(a, b) = internal_friction(a, c))
capability(a, b) = capability(a, c) cnf(assumption_5_{47}, axiom)
(organization(a) and greater(external_ties(a, b), external_ties(a, c))) $\Rightarrow$ greater(position(a, b), position(a, c)) cnf(assumpti
(organization(a) and external_ties(a, b) = external_ties(a, c)) $\Rightarrow$ position(a, b) = position(a, c) cnf(assumption_6_{49}, axiom
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) cnf(assu
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(external_ties(a, b), external_ties(a, c)) cnf(assumption_8_{51}, ax
organization(a) $\Rightarrow$ internal_friction(a, b) = internal_friction(a, c) cnf(assumption_9_{52}, axiom)
organization(sk_1) cnf(theorem_1_{53}, negated_conjecture)
$\neg$ has_endowment(sk_1) cnf(theorem_1_{54}, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(theorem_$1_{55}$, negated_conjecture)
$\neg$ smaller(hazard_of_mortality($\mathrm{sk}_1, \mathrm{sk}_3$), hazard_of_mortality($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(theorem_$1_{56}$, negated_conjecture)

MGT048+1.p Capability decreases monotonically with its age
An organization's capability decreases monotonically with its age.
include('Axioms/MGT001+0.ax')
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ (((greater(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and smaller_or_equal(internal_fri
greater(capability(x, t), capability(x, t_0))) and ((smaller_or_equal(stock_of_knowledge(x, t), stock_of_knowledge(x, t_0)) and gre
smaller(capability(x, t), capability(x, t_0))) and ((stock_of_knowledge(x, t) = stock_of_knowledge(x, t_0) and internal_friction(x,
internal_friction(x, t_0)) $\Rightarrow$ capability(x, t) = capability(x, t_0)))) fof(assumption$_5$, axiom)

$\forall x, t_0, t$: (organization(x) $\Rightarrow$ stock_of_knowledge(x, t) = stock_of_knowledge(x, t_0)) fof(assumption$_{10}$, axiom)
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ greater(internal_friction(x, t), internal_friction(x, t_0))) fof
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ smaller(capability(x, t), capability(x, t_0))) fof(lemma$_5$, co

MGT048-1.p Capability decreases monotonically with its age
An organization's capability decreases monotonically with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and smaller_or_equal(internal_friction(a, b), i
greater(capability(a, b), capability(a, c)) cnf(assumption_5$_{32}$, axiom)
(organization(a) and smaller_or_equal(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and greater(internal_friction(a, b), i
smaller(capability(a, b), capability(a, c)) cnf(assumption_5$_{33}$, axiom)
(organization(a) and stock_of_knowledge(a, b) = stock_of_knowledge(a, c) and internal_friction(a, b) = internal_friction(a, c))
capability(a, b) = capability(a, c) cnf(assumption_5$_{34}$, axiom)
organization(a) $\Rightarrow$ stock_of_knowledge(a, b) = stock_of_knowledge(a, c) cnf(assumption_10$_{35}$, axiom)
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(internal_friction(a, b), internal_friction(a, c)) cnf(assumption
organization(sk_1) cnf(lemma_5$_{37}$, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_5$_{38}$, negated_conjecture)
$\neg$ smaller(capability($\mathrm{sk}_1, \mathrm{sk}_3$), capability($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_5$_{39}$, negated_conjecture)

MGT049+1.p Structural position does not vary with its age
An organization's structural position does not vary with its age.
include('Axioms/MGT001+0.ax')
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ ((greater(external_ties(x, t), external_ties(x, t_0)) $\Rightarrow$ greater(position(x, t), position(x, t_0))) and
external_ties(x, t_0) $\Rightarrow$ position(x, t) = position(x, t_0)))) fof(assumption$_6$, axiom)
$\forall x, t_0, t$: (organization(x) $\Rightarrow$ external_ties(x, t) = external_ties(x, t_0)) fof(assumption$_{11}$, axiom)
$\forall x, t_0, t$: ((organization(x) and greater(age(x, t), age(x, t_0))) $\Rightarrow$ position(x, t) = position(x, t_0)) fof(lemma$_6$, conjecture)

MGT049-1.p Structural position does not vary with its age
An organization's structural position does not vary with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and greater(external_ties(a, b), external_ties(a, c))) $\Rightarrow$ greater(position(a, b), position(a, c)) cnf(assumpt
(organization(a) and external_ties(a, b) = external_ties(a, c)) $\Rightarrow$ position(a, b) = position(a, c) cnf(assumption_6$_{31}$, axiom
organization(a) $\Rightarrow$ external_ties(a, b) = external_ties(a, c) cnf(assumption_11$_{32}$, axiom)
organization(sk_1) cnf(lemma_6$_{33}$, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(lemma_6$_{34}$, negated_conjecture)
position($\mathrm{sk}_1, \mathrm{sk}_3$) $\neq$ position($\mathrm{sk}_1, \mathrm{sk}_2$) cnf(lemma_6$_{35}$, negated_conjecture)

MGT050-1.p Unendowed organization's hazard of mortality increases with age
An unendowed organization's hazard of mortality increases with its age.
include('Axioms/MGT001-0.ax')
(organization(a) and has_immunity(a, b)) $\Rightarrow$ has_endowment(a) cnf(assumption_1$_{41}$, axiom)
(organization(a) and greater(capability(a, c), capability(a, b)) and greater_or_equal(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and greater_or_equal(capability(a, c), capability(a, b)) and greater(position(a, c), position(a, b))) $\Rightarrow$
(has_immunity(a, b) or has_immunity(a, c) or smaller(hazard_of_mortality(a, c), hazard_of_mortality(a, b))) cnf(assumptio
(organization(a) and capability(a, c) = capability(a, b) and position(a, c) = position(a, b)) $\Rightarrow$ (has_immunity(a, b) or has_im
hazard_of_mortality(a, b)) cnf(assumption_4$_{44}$, axiom)
(organization(a) and greater(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and smaller_or_equal(internal_friction(a, b), i
greater(capability(a, b), capability(a, c)) cnf(assumption_5$_{45}$, axiom)
(organization(a) and smaller_or_equal(stock_of_knowledge(a, b), stock_of_knowledge(a, c)) and greater(internal_friction(a, b), i
smaller(capability(a, b), capability(a, c)) cnf(assumption_5$_{46}$, axiom)
(organization(a) and stock_of_knowledge(a, b) = stock_of_knowledge(a, c) and internal_friction(a, b) = internal_friction(a, c))
capability(a, b) = capability(a, c) cnf(assumption_5$_{47}$, axiom)
(organization(a) and greater(external_ties(a, b), external_ties(a, c))) $\Rightarrow$ greater(position(a, b), position(a, c)) cnf(assumpt
(organization(a) and external_ties(a, b) = external_ties(a, c)) $\Rightarrow$ position(a, b) = position(a, c) cnf(assumption_6$_{49}$, axiom
organization(a) $\Rightarrow$ stock_of_knowledge(a, b) = stock_of_knowledge(a, c) cnf(assumption_10$_{50}$, axiom)
organization(a) $\Rightarrow$ external_ties(a, b) = external_ties(a, c) cnf(assumption_11$_{51}$, axiom)
(organization(a) and greater(age(a, b), age(a, c))) $\Rightarrow$ greater(internal_friction(a, b), internal_friction(a, c)) cnf(assumption
organization(sk_1) cnf(theorem_3$_{53}$, negated_conjecture)
$\neg$ has_endowment(sk_1) cnf(theorem_3$_{54}$, negated_conjecture)
greater(age($\mathrm{sk}_1, \mathrm{sk}_3$), age($\mathrm{sk}_1, \mathrm{sk}_2$)) cnf(theorem_3$_{55}$, negated_conjecture)

$\neg\,\mathrm{greater}(\mathrm{hazard\_of\_mortality}(\mathrm{sk}_1,\mathrm{sk}_3),\mathrm{hazard\_of\_mortality}(\mathrm{sk}_1,\mathrm{sk}_2))$ $\quad$ cnf(theorem_3$_{56}$, negated_conjecture)

MGT052+1.p The environment at any time is similar with itself
include('Axioms/MGT001+0.ax')
$\forall x,t_0,t\colon (\mathrm{dissimilar}(x,t_0,t) \iff (\mathrm{organization}(x) \text{ and } \neg\,\mathrm{is\_aligned}(x,t_0) \iff \mathrm{is\_aligned}(x,t)))$ $\quad$ fof(definition$_2$, axiom)
$\forall x,t\colon \neg\,\mathrm{dissimilar}(x,t,t)$ $\quad$ fof(background_assumption$_1$, conjecture)

MGT052-1.p The environment at any time is similar with itself
include('Axioms/MGT001-0.ax')
$\mathrm{dissimilar}(a,b,c) \Rightarrow \mathrm{organization}(a)$ $\quad$ cnf(definition_2$_{29}$, axiom)
$\mathrm{dissimilar}(a,b,c) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{is\_aligned}(a,c))$ $\quad$ cnf(definition_2$_{30}$, axiom)
$(\mathrm{dissimilar}(a,b,c) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow \neg\,\mathrm{is\_aligned}(a,c)$ $\quad$ cnf(definition_2$_{31}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{32}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{33}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{34}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{35}$, axiom)
$\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_2,\mathrm{sk}_2)$ $\quad$ cnf(background_assumption_1$_{36}$, negated_conjecture)

MGT053+1.p The dissimilarity relation is symmetric
include('Axioms/MGT001+0.ax')
$\forall x,t_0,t\colon (\mathrm{dissimilar}(x,t_0,t) \iff (\mathrm{organization}(x) \text{ and } \neg\,\mathrm{is\_aligned}(x,t_0) \iff \mathrm{is\_aligned}(x,t)))$ $\quad$ fof(definition$_2$, axiom)
$\forall x,t_1,t_2\colon (\mathrm{dissimilar}(x,t_1,t_2) \iff \mathrm{dissimilar}(x,t_2,t_1))$ $\quad$ fof(lemma$_7$, conjecture)

MGT053-1.p The dissimilarity relation is symmetric
include('Axioms/MGT001-0.ax')
$\mathrm{dissimilar}(a,b,c) \Rightarrow \mathrm{organization}(a)$ $\quad$ cnf(definition_2$_{29}$, axiom)
$\mathrm{dissimilar}(a,b,c) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{is\_aligned}(a,c))$ $\quad$ cnf(definition_2$_{30}$, axiom)
$(\mathrm{dissimilar}(a,b,c) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow \neg\,\mathrm{is\_aligned}(a,c)$ $\quad$ cnf(definition_2$_{31}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{32}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{33}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{34}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{35}$, axiom)
$\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_2,\mathrm{sk}_3) \text{ or } \mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_3,\mathrm{sk}_2)$ $\quad$ cnf(lemma_7$_{36}$, negated_conjecture)
$\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_2,\mathrm{sk}_3) \Rightarrow \mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_2,\mathrm{sk}_3)$ $\quad$ cnf(lemma_7$_{37}$, negated_conjecture)
$\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_3,\mathrm{sk}_2) \Rightarrow \mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_3,\mathrm{sk}_2)$ $\quad$ cnf(lemma_7$_{38}$, negated_conjecture)
$\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_3,\mathrm{sk}_2) \Rightarrow \neg\,\mathrm{dissimilar}(\mathrm{sk}_1,\mathrm{sk}_2,\mathrm{sk}_3)$ $\quad$ cnf(lemma_7$_{39}$, negated_conjecture)

MGT054+1.p Hazard of mortality increases in a drifting environment
An unendowed organization's hazard of mortality increases with age in a drifting environment.
include('Axioms/MGT001+0.ax')
$\forall x,t\colon ((\mathrm{organization}(x) \text{ and } \neg\,\mathrm{has\_endowment}(x)) \Rightarrow \neg\,\mathrm{has\_immunity}(x,t))$ $\quad$ fof(assumption$_1$, axiom)
$\forall x,t_0,t\colon ((\mathrm{organization}(x) \text{ and } \mathrm{has\_immunity}(x,t_0) \text{ and } \neg\,\mathrm{has\_immunity}(x,t)) \Rightarrow \mathrm{greater}(\mathrm{hazard\_of\_mortality}(x,t),\mathrm{hazard\_o}$
$\forall x,t_0,t\colon (\mathrm{dissimilar}(x,t_0,t) \iff (\mathrm{organization}(x) \text{ and } \neg\,\mathrm{is\_aligned}(x,t_0) \iff \mathrm{is\_aligned}(x,t)))$ $\quad$ fof(definition$_2$, axiom)
$\forall x,t\colon ((\mathrm{organization}(x) \text{ and } \mathrm{age}(x,t)=0) \Rightarrow \mathrm{is\_aligned}(x,t))$ $\quad$ fof(assumption$_{13}$, axiom)
$\forall x,t_0,t\colon ((\mathrm{organization}(x) \text{ and } \mathrm{is\_aligned}(x,t_0) \text{ and } \neg\,\mathrm{is\_aligned}(x,t)) \Rightarrow \mathrm{greater}(\mathrm{capability}(x,t_0),\mathrm{capability}(x,t)))$ $\quad$ fof(as
$\forall x,t_0,t\colon ((\mathrm{organization}(x) \text{ and } \mathrm{age}(x,t_0)=0) \Rightarrow (\mathrm{greater}(\mathrm{age}(x,t),\mathrm{sigma}) \iff \mathrm{dissimilar}(x,t_0,t)))$ $\quad$ fof(assumption$_{15}$, a
$\forall x,t_0,t\colon ((\mathrm{organization}(x) \text{ and } \neg\,\mathrm{has\_immunity}(x,t_0) \text{ and } \neg\,\mathrm{has\_immunity}(x,t) \text{ and } \mathrm{greater}(\mathrm{capability}(x,t),\mathrm{capability}(x,t_0)))$
$\mathrm{greater}(\mathrm{hazard\_of\_mortality}(x,t_0),\mathrm{hazard\_of\_mortality}(x,t)))$ $\quad$ fof(assumption$_{16}$, axiom)
$\forall x,t_0,t_1,t_2\colon ((\mathrm{organization}(x) \text{ and } \neg\,\mathrm{has\_endowment}(x) \text{ and } \mathrm{age}(x,t_0)=0 \text{ and } \mathrm{smaller\_or\_equal}(\mathrm{age}(x,t_1),\mathrm{sigma}) \text{ and greate}$
$\mathrm{greater}(\mathrm{hazard\_of\_mortality}(x,t_2),\mathrm{hazard\_of\_mortality}(x,t_1)))$ $\quad$ fof(theorem$_5$, conjecture)

MGT054-1.p Hazard of mortality increases in a drifting environment
An unendowed organization's hazard of mortality increases with age in a drifting environment.
include('Axioms/MGT001-0.ax')
$(\mathrm{organization}(a) \text{ and } \mathrm{has\_immunity}(a,b)) \Rightarrow \mathrm{has\_endowment}(a)$ $\quad$ cnf(assumption_1$_{38}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{has\_immunity}(a,b)) \Rightarrow (\mathrm{has\_immunity}(a,c) \text{ or } \mathrm{greater}(\mathrm{hazard\_of\_mortality}(a,c),\mathrm{hazard\_of\_mortality}(a,$
$\mathrm{dissimilar}(a,b,c) \Rightarrow \mathrm{organization}(a)$ $\quad$ cnf(definition_2$_{40}$, axiom)
$\mathrm{dissimilar}(a,b,c) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{is\_aligned}(a,c))$ $\quad$ cnf(definition_2$_{41}$, axiom)
$(\mathrm{dissimilar}(a,b,c) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow \neg\,\mathrm{is\_aligned}(a,c)$ $\quad$ cnf(definition_2$_{42}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{43}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,b,c))$ $\quad$ cnf(definition_2$_{44}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,c) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{45}$, axiom)
$(\mathrm{organization}(a) \text{ and } \mathrm{is\_aligned}(a,b)) \Rightarrow (\mathrm{is\_aligned}(a,b) \text{ or } \mathrm{dissimilar}(a,c,b))$ $\quad$ cnf(definition_2$_{46}$, axiom)

(organization(a) and age(a, b) = 0) $\Rightarrow$ is_aligned(a, b) cnf(assumption_13$_{47}$, axiom)
(organization(a) and is_aligned(a, b)) $\Rightarrow$ (is_aligned(a, c) or greater(capability(a, b), capability(a, c))) cnf(assumption_14$_{4}$
(organization(a) and age(a, b) = 0 and greater(age(a, c), sigma)) $\Rightarrow$ dissimilar(a, b, c) cnf(assumption_15$_{49}$, axiom)
(organization(a) and age(a, b) = 0 and dissimilar(a, b, c)) $\Rightarrow$ greater(age(a, c), sigma) cnf(assumption_15$_{50}$, axiom)
(organization(a) and greater(capability(a, c), capability(a, b))) $\Rightarrow$ (has_immunity(a, b) or has_immunity(a, c) or greater(haza
organization(sk$_1$) cnf(theorem_5$_{52}$, negated_conjecture)
$\neg$ has_endowment(sk$_1$) cnf(theorem_5$_{53}$, negated_conjecture)
age(sk$_1$, sk$_2$) = 0 cnf(theorem_5$_{54}$, negated_conjecture)
smaller_or_equal(age(sk$_1$, sk$_3$), sigma) cnf(theorem_5$_{55}$, negated_conjecture)
greater(age(sk$_1$, sk$_4$), sigma) cnf(theorem_5$_{56}$, negated_conjecture)
greater(sigma, 0) cnf(theorem_5$_{57}$, negated_conjecture)
$\neg$ greater(hazard_of_mortality(sk$_1$, sk$_4$), hazard_of_mortality(sk$_1$, sk$_3$)) cnf(theorem_5$_{58}$, negated_conjecture)

MGT056+1.p Conditions for a constant then jumping hazard of mortality 2
When (‘eta’ >= ‘sigma’) in a drifting environment, an endowed organization’s hazard of mortality remains constant until age ‘eta’ and then jumps to a higher level in a drifting environment.
include(’Axioms/MGT001+0.ax’)
$\forall x$: (has_endowment(x) $\iff$ $\forall t$: (organization(x) and (smaller_or_equal(age(x, t), eta) $\Rightarrow$ has_immunity(x, t)) and (greater(
$\neg$ has_immunity(x, t)))) fof(definition$_1$, axiom)
$\forall x, t_0, t$: ((organization(x) and has_immunity(x, t_0) and has_immunity(x, t)) $\Rightarrow$ hazard_of_mortality(x, t_0) = hazard_of_morta
$\forall x, t_0, t$: ((organization(x) and has_immunity(x, t_0) and $\neg$ has_immunity(x, t)) $\Rightarrow$ greater(hazard_of_mortality(x, t), hazard_o
$\forall x, t_0, t_1, t_2$: ((organization(x) and has_endowment(x) and age(x, t_0) = 0 and smaller_or_equal(age(x, t_1), eta) and greater(age
(greater(hazard_of_mortality(x, t_2), hazard_of_mortality(x, t_1)) and hazard_of_mortality(x, t_1) = hazard_of_mortality(x, t_0)))

MGT056-1.p Conditions for a constant then jumping hazard of mortality 2
When (‘eta’ >= ‘sigma’) in a drifting environment, an endowed organization’s hazard of mortality remains constant until age ‘eta’ and then jumps to a higher level in a drifting environment.
include(’Axioms/MGT001-0.ax’)
has_endowment(a) $\Rightarrow$ organization(a) cnf(definition_1$_{31}$, axiom)
(has_endowment(a) and smaller_or_equal(age(a, b), eta)) $\Rightarrow$ has_immunity(a, b) cnf(definition_1$_{32}$, axiom)
(has_endowment(a) and greater(age(a, b), eta)) $\Rightarrow$ $\neg$ has_immunity(a, b) cnf(definition_1$_{33}$, axiom)
organization(a) $\Rightarrow$ (smaller_or_equal(age(a, sk$_1$(a)), eta) or greater(age(a, sk$_1$(a)), eta) or has_endowment(a)) cnf(definiti
organization(a) $\Rightarrow$ (smaller_or_equal(age(a, sk$_1$(a)), eta) or has_immunity(a, sk$_1$(a)) or has_endowment(a)) cnf(definition
(organization(a) and has_immunity(a, sk$_1$(a))) $\Rightarrow$ (greater(age(a, sk$_1$(a)), eta) or has_endowment(a)) cnf(definition_1$_{36}$, a
(organization(a) and has_immunity(a, sk$_1$(a))) $\Rightarrow$ (has_immunity(a, sk$_1$(a)) or has_endowment(a)) cnf(definition_1$_{37}$, axi
(organization(a) and has_immunity(a, b) and has_immunity(a, c)) $\Rightarrow$ hazard_of_mortality(a, b) = hazard_of_mortality(a, c)
(organization(a) and has_immunity(a, b)) $\Rightarrow$ (has_immunity(a, c) or greater(hazard_of_mortality(a, c), hazard_of_mortality(a
organization(sk$_2$) cnf(lemma_9$_{40}$, negated_conjecture)
has_endowment(sk$_2$) cnf(lemma_9$_{41}$, negated_conjecture)
age(sk$_2$, sk$_3$) = 0 cnf(lemma_9$_{42}$, negated_conjecture)
smaller_or_equal(age(sk$_2$, sk$_4$), eta) cnf(lemma_9$_{43}$, negated_conjecture)
greater(age(sk$_2$, sk$_5$), eta) cnf(lemma_9$_{44}$, negated_conjecture)
greater_or_equal(eta, sigma) cnf(lemma_9$_{45}$, negated_conjecture)
greater(sigma, 0) cnf(lemma_9$_{46}$, negated_conjecture)
greater(hazard_of_mortality(sk$_2$, sk$_5$), hazard_of_mortality(sk$_2$, sk$_4$)) $\Rightarrow$ hazard_of_mortality(sk$_2$, sk$_4$) $\neq$ hazard_of_mortality(s

MGT057+1.p Conditions for a constant then increasing hazard of mortality
In a drifting environment, an endowed organization’s hazard of mortality is constant during the period of immunity; beyond the period of immunity, the hazard rises with age.
include(’Axioms/MGT001+0.ax’)
$\forall x$: (has_endowment(x) $\iff$ $\forall t$: (organization(x) and (smaller_or_equal(age(x, t), eta) $\Rightarrow$ has_immunity(x, t)) and (greater(
$\neg$ has_immunity(x, t)))) fof(definition$_1$, axiom)
$\forall x, t_0, t$: ((organization(x) and has_immunity(x, t_0) and has_immunity(x, t)) $\Rightarrow$ hazard_of_mortality(x, t_0) = hazard_of_morta
$\forall x, t_0, t$: ((organization(x) and has_immunity(x, t_0) and $\neg$ has_immunity(x, t)) $\Rightarrow$ greater(hazard_of_mortality(x, t), hazard_o
$\forall x, t_0, t_1, t_2$: ((organization(x) and has_endowment(x) and age(x, t_0) = 0 and smaller_or_equal(age(x, t_1), eta) and greater(age
(greater(hazard_of_mortality(x, t_2), hazard_of_mortality(x, t_1)) and hazard_of_mortality(x, t_1) = hazard_of_mortality(x, t_0)))

MGT057-1.p Conditions for a constant then increasing hazard of mortality
In a drifting environment, an endowed organization’s hazard of mortality is constant during the period of immunity; beyond the period of immunity, the hazard rises with age.
include(’Axioms/MGT001-0.ax’)

has_endowment(a) $\Rightarrow$ organization(a) cnf(definition_1$_{31}$, axiom)
(has_endowment(a) and smaller_or_equal(age(a, b), eta)) $\Rightarrow$ has_immunity(a, b) cnf(definition_1$_{32}$, axiom)
(has_endowment(a) and greater(age(a, b), eta)) $\Rightarrow$ $\neg$ has_immunity(a, b) cnf(definition_1$_{33}$, axiom)
organization(a) $\Rightarrow$ (smaller_or_equal(age(a, sk$_1$(a)), eta) or greater(age(a, sk$_1$(a)), eta) or has_endowment(a)) cnf(definiti
organization(a) $\Rightarrow$ (smaller_or_equal(age(a, sk$_1$(a)), eta) or has_immunity(a, sk$_1$(a)) or has_endowment(a)) cnf(definition
(organization(a) and has_immunity(a, sk$_1$(a))) $\Rightarrow$ (greater(age(a, sk$_1$(a)), eta) or has_endowment(a)) cnf(definition_1$_{36}$, a
(organization(a) and has_immunity(a, sk$_1$(a))) $\Rightarrow$ (has_immunity(a, sk$_1$(a)) or has_endowment(a)) cnf(definition_1$_{37}$, axi
(organization(a) and has_immunity(a, b) and has_immunity(a, c)) $\Rightarrow$ hazard_of_mortality(a, b) = hazard_of_mortality(a, c)
(organization(a) and has_immunity(a, b)) $\Rightarrow$ (has_immunity(a, c) or greater(hazard_of_mortality(a, c), hazard_of_mortality(a
organization(sk$_2$) cnf(theorem_6$_{40}$, negated_conjecture)
has_endowment(sk$_2$) cnf(theorem_6$_{41}$, negated_conjecture)
age(sk$_2$, sk$_3$) = 0 cnf(theorem_6$_{42}$, negated_conjecture)
smaller_or_equal(age(sk$_2$, sk$_4$), eta) cnf(theorem_6$_{43}$, negated_conjecture)
greater(age(sk$_2$, sk$_5$), eta) cnf(theorem_6$_{44}$, negated_conjecture)
greater(eta, 0) cnf(theorem_6$_{45}$, negated_conjecture)
greater(hazard_of_mortality(sk$_2$, sk$_5$), hazard_of_mortality(sk$_2$, sk$_4$)) $\Rightarrow$ hazard_of_mortality(sk$_2$, sk$_4$) $\neq$ hazard_of_mortality(s

MGT058+1.p An organization's position cannot be both fragile and robust
include('Axioms/MGT001+0.ax')
$\forall x$: (fragile_position(x) $\iff$ $\forall t$: ((smaller_or_equal(age(x, t), sigma) $\Rightarrow$ positional_advantage(x, t)) and (greater(age(x, t), sig
$\neg$ positional_advantage(x, t)))) fof(definition$_3$, axiom)
$\forall x$: (robust_position(x) $\iff$ $\forall t$: ((smaller_or_equal(age(x, t), tau) $\Rightarrow$ $\neg$ positional_advantage(x, t)) and (greater(age(x, t), tau
positional_advantage(x, t)))) fof(definition$_4$, axiom)
$\forall x$: ((organization(x) and $\exists t_0$: age(x, t_0) = 0 and greater_or_equal(sigma, 0) and greater_or_equal(tau, 0)) $\Rightarrow$ $\neg$ fragile_positio

MGT058-1.p An organization's position cannot be both fragile and robust
include('Axioms/MGT001-0.ax')
(fragile_position(a) and smaller_or_equal(age(a, b), sigma)) $\Rightarrow$ positional_advantage(a, b) cnf(definition_3$_{30}$, axiom)
(fragile_position(a) and greater(age(a, b), sigma)) $\Rightarrow$ $\neg$ positional_advantage(a, b) cnf(definition_3$_{31}$, axiom)
smaller_or_equal(age(a, sk$_1$(a)), sigma) or greater(age(a, sk$_1$(a)), sigma) or fragile_position(a) cnf(definition_3$_{32}$, axiom)
smaller_or_equal(age(a, sk$_1$(a)), sigma) or positional_advantage(a, sk$_1$(a)) or fragile_position(a) cnf(definition_3$_{33}$, axiom)
positional_advantage(a, sk$_1$(a)) $\Rightarrow$ (greater(age(a, sk$_1$(a)), sigma) or fragile_position(a)) cnf(definition_3$_{34}$, axiom)
positional_advantage(a, sk$_1$(a)) $\Rightarrow$ (positional_advantage(a, sk$_1$(a)) or fragile_position(a)) cnf(definition_3$_{35}$, axiom)
(robust_position(a) and smaller_or_equal(age(a, b), tau)) $\Rightarrow$ $\neg$ positional_advantage(a, b) cnf(definition_4$_{36}$, axiom)
(robust_position(a) and greater(age(a, b), tau)) $\Rightarrow$ positional_advantage(a, b) cnf(definition_4$_{37}$, axiom)
smaller_or_equal(age(a, sk$_2$(a)), tau) or greater(age(a, sk$_2$(a)), tau) or robust_position(a) cnf(definition_4$_{38}$, axiom)
positional_advantage(a, sk$_2$(a)) $\Rightarrow$ (smaller_or_equal(age(a, sk$_2$(a)), tau) or robust_position(a)) cnf(definition_4$_{39}$, axiom)
positional_advantage(a, sk$_2$(a)) or greater(age(a, sk$_2$(a)), tau) or robust_position(a) cnf(definition_4$_{40}$, axiom)
positional_advantage(a, sk$_2$(a)) $\Rightarrow$ (positional_advantage(a, sk$_2$(a)) or robust_position(a)) cnf(definition_4$_{41}$, axiom)
organization(sk$_3$) cnf(lemma_10$_{42}$, negated_conjecture)
age(sk$_3$, sk$_4$) = 0 cnf(lemma_10$_{43}$, negated_conjecture)
greater_or_equal(sigma, 0) cnf(lemma_10$_{44}$, negated_conjecture)
greater_or_equal(tau, 0) cnf(lemma_10$_{45}$, negated_conjecture)
fragile_position(sk$_3$) cnf(lemma_10$_{46}$, negated_conjecture)
robust_position(sk$_3$) cnf(lemma_10$_{47}$, negated_conjecture)

MGT059+1.p Hazard of mortality is constant during periods of immunity
An organization's hazard of mortality is constant during periods in which it has immunity.
include('Axioms/MGT001+0.ax')
$\forall x, t$: (organization(x) $\Rightarrow$ ((has_immunity(x, t) $\Rightarrow$ hazard_of_mortality(x, t) = very_low) and ($\neg$ has_immunity(x, t) $\Rightarrow$
(((is_aligned(x, t) and positional_advantage(x, t)) $\Rightarrow$ hazard_of_mortality(x, t) = low) and (($\neg$ is_aligned(x, t) and positional_
hazard_of_mortality(x, t) = mod$_1$) and ((is_aligned(x, t) and $\neg$ positional_advantage(x, t)) $\Rightarrow$ hazard_of_mortality(x, t) =
mod$_2$) and (($\neg$ is_aligned(x, t) and $\neg$ positional_advantage(x, t)) $\Rightarrow$ hazard_of_mortality(x, t) = high))))) fof(assumption$_1$
$\forall x, t_0, t$: ((organization(x) and has_immunity(x, t_0) and has_immunity(x, t)) $\Rightarrow$ hazard_of_mortality(x, t_0) = hazard_of_morta

MGT059-1.p Hazard of mortality is constant during periods of immunity
An organization's hazard of mortality is constant during periods in which it has immunity.
include('Axioms/MGT001-0.ax')
(organization(a) and has_immunity(a, b)) $\Rightarrow$ hazard_of_mortality(a, b) = very_low cnf(assumption_17$_{32}$, axiom)
(organization(a) and is_aligned(a, b) and positional_advantage(a, b)) $\Rightarrow$ (has_immunity(a, b) or hazard_of_mortality(a, b) =
low) cnf(assumption_17$_{33}$, axiom)

$(\text{organization}(a) \text{ and } \text{positional\_advantage}(a,b)) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{is\_aligned}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{mod}_1)$ cnf(assumption_17$_{34}$, axiom)
$(\text{organization}(a) \text{ and } \text{is\_aligned}(a,b)) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{positional\_advantage}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{mod}_2)$ cnf(assumption_17$_{35}$, axiom)
$\text{organization}(a) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{is\_aligned}(a,b) \text{ or } \text{positional\_advantage}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{high})$ cnf(assumption_17$_{36}$, axiom)
$\text{organization}(\text{sk}_1)$ cnf(assumption_2$_{37}$, negated_conjecture)
$\text{has\_immunity}(\text{sk}_1, \text{sk}_2)$ cnf(assumption_2$_{38}$, negated_conjecture)
$\text{has\_immunity}(\text{sk}_1, \text{sk}_3)$ cnf(assumption_2$_{39}$, negated_conjecture)
$\text{hazard\_of\_mortality}(\text{sk}_1, \text{sk}_2) \neq \text{hazard\_of\_mortality}(\text{sk}_1, \text{sk}_3)$ cnf(assumption_2$_{40}$, negated_conjecture)

MGT060+1.p Hazard of mortality is lower during periods of immunity
An organization's hazard of mortality is lower during periods in which it has immunity than in periods in which it does not.
include('Axioms/MGT001+0.ax')
$\forall x, t$: $(\text{organization}(x) \Rightarrow ((\text{has\_immunity}(x,t) \Rightarrow \text{hazard\_of\_mortality}(x,t) = \text{very\_low}) \text{ and } (\neg \text{has\_immunity}(x,t) \Rightarrow (((\text{is\_aligned}(x,t) \text{ and } \text{positional\_advantage}(x,t)) \Rightarrow \text{hazard\_of\_mortality}(x,t) = \text{low}) \text{ and } ((\neg \text{is\_aligned}(x,t) \text{ and } \text{positional\_}$
$\text{hazard\_of\_mortality}(x,t) = \text{mod}_1) \text{ and } ((\text{is\_aligned}(x,t) \text{ and } \neg \text{positional\_advantage}(x,t)) \Rightarrow \text{hazard\_of\_mortality}(x,t) = \text{mod}_2) \text{ and } ((\neg \text{is\_aligned}(x,t) \text{ and } \neg \text{positional\_advantage}(x,t)) \Rightarrow \text{hazard\_of\_mortality}(x,t) = \text{high})))))$ fof(assumption$_1$
$\text{greater}(\text{high}, \text{mod}_1)$ fof(assumption_18a, axiom)
$\text{greater}(\text{mod}_1, \text{low})$ fof(assumption_18b, axiom)
$\text{greater}(\text{low}, \text{very\_low})$ fof(assumption_18c, axiom)
$\text{greater}(\text{high}, \text{mod}_2)$ fof(assumption_18d, axiom)
$\text{greater}(\text{mod}_2, \text{low})$ fof(assumption_18e, axiom)
$\forall x, t_0, t$: $((\text{organization}(x) \text{ and } \text{has\_immunity}(x,t_0) \text{ and } \neg \text{has\_immunity}(x,t)) \Rightarrow \text{greater}(\text{hazard\_of\_mortality}(x,t), \text{hazard\_o}$

MGT060-1.p Hazard of mortality is lower during periods of immunity
An organization's hazard of mortality is lower during periods in which it has immunity than in periods in which it does not.
include('Axioms/MGT001-0.ax')
$(\text{organization}(a) \text{ and } \text{has\_immunity}(a,b)) \Rightarrow \text{hazard\_of\_mortality}(a,b) = \text{very\_low}$ cnf(assumption_17$_{32}$, axiom)
$(\text{organization}(a) \text{ and } \text{is\_aligned}(a,b) \text{ and } \text{positional\_advantage}(a,b)) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{low})$ cnf(assumption_17$_{33}$, axiom)
$(\text{organization}(a) \text{ and } \text{positional\_advantage}(a,b)) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{is\_aligned}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{mod}_1)$ cnf(assumption_17$_{34}$, axiom)
$(\text{organization}(a) \text{ and } \text{is\_aligned}(a,b)) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{positional\_advantage}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{mod}_2)$ cnf(assumption_17$_{35}$, axiom)
$\text{organization}(a) \Rightarrow (\text{has\_immunity}(a,b) \text{ or } \text{is\_aligned}(a,b) \text{ or } \text{positional\_advantage}(a,b) \text{ or } \text{hazard\_of\_mortality}(a,b) = \text{high})$ cnf(assumption_17$_{36}$, axiom)
$\text{greater}(\text{high}, \text{mod}_1)$ cnf(assumption_18a$_{37}$, axiom)
$\text{greater}(\text{mod}_1, \text{low})$ cnf(assumption_18b$_{38}$, axiom)
$\text{greater}(\text{low}, \text{very\_low})$ cnf(assumption_18c$_{39}$, axiom)
$\text{greater}(\text{high}, \text{mod}_2)$ cnf(assumption_18d$_{40}$, axiom)
$\text{greater}(\text{mod}_2, \text{low})$ cnf(assumption_18e$_{41}$, axiom)
$\text{organization}(\text{sk}_1)$ cnf(assumption_3$_{42}$, negated_conjecture)
$\text{has\_immunity}(\text{sk}_1, \text{sk}_2)$ cnf(assumption_3$_{43}$, negated_conjecture)
$\neg \text{has\_immunity}(\text{sk}_1, \text{sk}_3)$ cnf(assumption_3$_{44}$, negated_conjecture)
$\neg \text{greater}(\text{hazard\_of\_mortality}(\text{sk}_1, \text{sk}_3), \text{hazard\_of\_mortality}(\text{sk}_1, \text{sk}_2))$ cnf(assumption_3$_{45}$, negated_conjecture)

MGT066+1.p Inequalities.
include('Axioms/MGT001+0.ax')

MGT066-1.p Inequalities.
include('Axioms/MGT001-0.ax')