matrix notation as $\langle \mathbf{A}_{\mathbf{e}}^{\bar{\jmath}}, \mathbf{X} \rangle \leq 0$ for $\bar{\jmath} = 1, \ldots, 5$.

A.4 Proof of claim 4

To illustrate why claim 4 holds, consider again the concrete case of the ERC (36). As just noted, the conditions $\langle \mathbf{A}_{\mathbf{e}}^{\bar{\jmath}}, \mathbf{X} \rangle \leq 0$ for $\bar{\jmath} = 1, \ldots, 5$ enforced by the relaxation (24) boil down to the inequalities (38). The condition $\langle \mathbf{A}_{\mathbf{e}}, \mathbf{X} \rangle \geq 0$ enforced by the relaxation (23) boils down to the inequality (39). In order to prove claim 4 in this specific case, I thus need to show that, if $\mathbf{X} \in \mathcal{P}_{\text{rel}}^n$ satisfies inequalities (38), then it also satisfies inequalities (39). Indeed, the last inequality in (38) says that $x_{5,5}$ is null, and can thus be dropped from the other four inequalities (38). Multiplying the first inequality in (38) by 4, the second by 4, the third by 8 and the fourth by 16, I get (40). Summing the inequalities (40) together, I get the inequality (41). As $x_{i,j} \geq 0$, I can weaken the inequality (41) by dividing the left hand side by 2 and by adding $2x_{1,1}$ and $2x_{2,1}$ to the right hand side, thus obtaining the desired inequality (39).

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