Crowdsourcing City Government: 
Using Tournaments to Improve Inspection Accuracy

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Online Appendix – Proof of Proposition 1

The value of $(1 - \varphi)^{1,\Sigma} - 1$ is monotonically increasing in $\varphi$ and goes from 0 to $\infty$ as $\varphi$ goes from 0 to 1. Hence, there must exist a value of $\varphi$ at which $(1 - \varphi)^{1,\Sigma} - 1$ equals $\frac{V(\overline{q}) - V(\overline{q})}{V(q_{max}) - V(q)}$, a constant. The value of $\frac{V(\overline{q}) - V(\overline{q})}{V(q_{max}) - V(q)}$ is rising with $V(\overline{q})$ and falling with $V(q)$ and $V(q_{max})$; hence, $\varphi^*$ is rising with $V(\overline{q})$ and falling with $V(q)$ and $V(q_{max})$. For a given $\varphi$, the value of $(1 - \varphi)^{1,\Sigma} - 1$ is rising with $\frac{\Sigma}{w}$; hence, $\varphi^*$ must be falling with $\frac{\Sigma}{w}$.