The model presented in the text generates a moral hazard problem for a household in its choice of civic effort, under a host of simplifying specifications. In particular, we have assumed that (i) feasible tenure contracts have to be linear in the observable outcome – the future price of a home, and that (ii) this price is a deterministic function of unobservable effort. In what follows, we briefly present a more general model of contracting between a household and a real estate company, and demonstrate that our qualitative results are robust to such generalizations. So consider the following principal-agent model:

A long-lived risk-neutral principal (real estate company) owns a durable good $H$ (housing unit). An agent (household) lives for two periods and benefits from consuming the flow services of $H$ only in the first period. In that period, the agent can put in effort to add value to $H$, which benefits her and increases the future price of $H$ (this price going to the principal). Both players consume a divisible numeraire commodity in all periods, and discount the future by $\delta \in (0, 1)$.

The agent’s effort ($a$) can be high ($e$) or low ($n$). It is not observable by the principal and so cannot be contracted upon. The agent’s current benefit from effort net of cost is $[q(a) - a]$. The future price of $H$ is a random variable $P$ distributed on $[0, \infty)$ with a distribution function $G(p|a)$, where $G(p|e)$ first-order stochastically dominates $G(p|n)$. A feasible contract is a pair $\{\beta, \alpha(p)\}$, where $\beta \in \mathbb{R}$ is the ‘up-front payment’ that the agent makes to the principal, and $\alpha(p)$ is the ‘rebate’ that the principal gives back to the agent in the second period if the realized future price of $H$ is $p$. The rebate function $\alpha(p)$ can be any real-valued function, but it is required to satisfy the limited liability clause: $\alpha(p) \geq 0$ for all $p$. A contract $\{\beta, \alpha(p)\}$ is thus a specific ‘complete contract with limited liability’ under moral hazard.

Under the contract $\{\beta, \alpha(\cdot)\}$, if the agent (with current income $y$ and future income $w$) chooses
Consider the model where the agent makes a take-it-or-leave-it contract offer. Here the optimal contract solves the following problem: maximize $u(a, b; \beta, \alpha(\cdot) | y)$ with respect to $a$, $b$, $\beta$, and $\alpha(\cdot)$, subject to: (i) $a = a^*(\beta, \alpha(\cdot)| y)$ and $b = b^*(\beta, \alpha(\cdot)| y)$ [incentive compatibility]; (ii) $\pi(a^*(\cdot); \beta, \alpha(\cdot)) \geq \pi^0$ [individual rationality]; and (iii) $\alpha(p) \geq 0$ for all $p$ [limited liability].

The solution to the above problem will have the following features. There will exist a threshold income level $y^*(\rho)$ such that, if the agent’s current income $y$ is less than the threshold, the optimal contract will be the default contract and $a^* = n$; and if $y > y^*$, the optimal contract will generate $a^* = e$.

Thus there will be a wealth effect on incentives. The moral hazard problem will not be ‘solved’ for all agents (i.e., for all $y$) due to (i) the incentive problem, (ii) the agents’ desire to smooth consumption, (iii) the limited liability clause, and (iv) credit market imperfections. A similar result will arise in the alternative model where the principal makes a take-it-or-leave-it contract offer.

The above discussion clarifies the general nature of the moral hazard problem that is embedded in our model. The analysis seems to suggest the necessity of a limited liability clause to generate a wealth effect on incentives. However, consider the following ‘extended’ model:

The agent lives for three periods, but still consumes $H$ only in the first period (and consumes the numeraire in all three periods). A feasible contract $\{\beta, \alpha(\cdot)\}$ no longer has to satisfy a limited liability clause (i.e., $\alpha(p)$ can be negative for some $p$). The agent can borrow $b_t$ in period $t = 1, 2$, under the same terms as before. Here, the agent will be forced to borrow in period 2 if $\alpha(p)$ is a large negative number to ensure non-negative consumption in period 2. Again, when the optimal contract is solved for, we will find a similar wealth effect on incentives. The basic reason for this result is that incentive
payments are \textit{effectively} bounded below because the agent will never accept a contract under which his income in any period will fall below zero.