<table>
<tr><th>Component of total energy rebound</th><th colspan="2">Origin/Mechanism</th></tr>
<tr><td></td><td>Jenkins (2011) / Greening (2000) / Thomas & Azevedo (2013)</td><td>MPC & Large rebound paper (& comparison to Jenkins/Greening)</td></tr>
<tr><td rowspan="2">Microeconomic rebound: these rebound mechanisms occur at the single device level, within the static economy, based on responses to the reduction in implicit price of an energy service.</td><td>Direct rebound: describes the direct response to the single energy efficiency improvement. Jenkins et al. 2011 (p.13, 10) split into two sub-classes:
Income/output effects: This is the increasing demand for that energy service by producers to expand their output ('an output effect') or consumers (an 'income effect').
Substitution effects: this captures the substitution of that energy service for the other goods or services (consumers) or inputs to production (producers).</td><td>1. Substitution effect: as per Jenkins
3. Income effect. As per jenkins
5. Emplacement effect = device upgrade.</td></tr>
<tr><td>Indirect rebound: describes the indirect response to the single energy efficiency improvement. Jenkins et al. 2011 (p.13, 10) split into two sub-classes:
Re-spending and re-investment effects: If consumers and firms see net cost savings from energy efficiency improvements, this may increase consumer expenditures or investments in production - increasing demand for goods, services, and factors of production, which in turn require energy to produce and support. (this maps to our indirect substitution and income effects)
Embodied energy effects: The energy ‘embodied’ in the efficiency improvements themselves will offset some portion of the energy savings achieved. (This maps to part of our emplacement effect)</td><td>2. Substitution effect: Part of Jenkins respending/reinvestment effects
4. Income effect: Other part of Jenkins respending/reinvestment effects
6. Emplacement effect = lifecycle effect (embodied, operations and maintenance, and disposal). Jenkins includes embodied effect only.</td></tr>
<tr><td>Macroeconomic rebound:
These mechanisms originate from the dynamic response of the economy to reach a stable equilibrium (between supply and demand for goods and energy services). They combine various short and long run effects.</td><td>Greening et al.(2000) split these into two sub-classes:
Economy-wide effects: shorter-term induced changes in prices and quantities of goods/services throughout the economy, to reach a new, stable equilibrium.
Transformational effects: these stem from longer term change to consumers' preferences, social institutions, and rearrangement of the organization of production.
Thomas and Azevedo (2013) split into 5 components:
a lower market price for energy,
changes in economic structure,
economic-competiveness
investment and disinvestment,
labor market changes</td><td>7. Macroeconomic rebound effect: a multiplier effect, k. made up of components including:
Growth effect
Composition effect
Scale effect
Labour supply effect
Energy market effect
Disinvestment effect
Close alignment to Thomas and Azevedo (2013). Greening (2000) splits into short vs longer term, which don’t map that well to these 6 effects, as they include short/long term effects.</td></tr>
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