Modelling the actions and interactions of different parties in the transport and housing sectors

**Demographics**

A realistic life-cycle is simulated for each household.

- Age
- Income percentile
- Initial wealth
- Buy-to-let tendency

Households without a house decide whether to buy or rent and where (residential choice), renters continue to pay rent until the end of their contracts, owner-occupiers decide whether to sell any of their owned properties and where (investment choice) and whether to sell any of their contracts, owner-occupiers decide whether to sell their properties and where (residential choice), renters continue to pay rent until the end of their contracts.

**Construction**

A profit maximising construction sector decides how many new houses to build in each region.

- Quality band
- Proportional to expected profits (average regional prices)

Households’ income depends on age (though percentile remains fixed), they pay taxes, and spend on essential and non-essential consumption before making their housing decisions.

**Income and expenditure**

Households without a house decide whether to buy or rent and where, depending on household’s budget and access to household’s job via transport infrastructure. This contributes to the geographical distribution of demand for housing.

**Policy choices**

**Macroeconomic policy**

The Central Bank and/or the Financial Regulator have a number of macroeconomic policy choices, such as: choosing the base interest rate, imposing maximum loan-to-value ratios for mortgages, or other affordability requirements.

**Infrastructure policy**

From local to central governments and departments, transport infrastructure investment can reduce the cost and/or the time needed to commute between any two regions.

**Local policy**

Both local and central governments and departments have a number of choices for regulating the construction sector, such as imposing social housing ratios and charges as Community Infrastructure Levy.

**Household behaviour**

Households without a house decide whether to buy or rent and where (investment choice), renters continue to pay rent until the end of their contracts, owner-occupiers decide whether to sell any of their owned properties and where (residential choice), renters continue to pay rent until the end of their contracts.

**Market mechanism**

Iterated double auction

- Buyers try to obtain the highest possible quality that they can afford and at the minimum available price
- Sellers receiving a single bid directly accept it
- Sellers receiving multiple bids get to increase the price and randomly choose among the buyers still interested

**Outputs**

Spatial distributions of housing prices for different infrastructure policies

A wealth of socio-economic variables at different levels of aggregation

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