Housing Transfer Taxes and Household Mobility:
Distortion on the Housing or Labour Market?

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Look at long-term effect of **UK stamp duty** – a tax on real estate transfers payable by buyer – on actual household mobility

- Does tax induced increase in relocation costs reduce mobility? By how much?
- Does stamp duty affect housing- and job-related mobility differentially?

**How?**

- Use UK micro-data
- Exploit **discontinuous jump** in the tax rate from 1 to 3% at the cut-off house value of £250k
- Use this discontinuity to identify effect of stamp duty on mobility
1. Motivation
2. UK stamp duty system & theoretical predictions
3. Empirical strategy (RD)
4. Data
5. Evidence and Robustness (including analysis of bunching)
6. Conclusions
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2. UK stamp duty system & theoretical predictions
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Why should we care?

1. Taxes on real estate transactions are economically important
   - UK: 0 – 7% of HVs (generating £8 billion in 08/09)
   - Not just UK – Most European countries have very substantive tax rates (e.g. Spain: 7%)
   - US: 0 – 2.2% + local taxes

2. If stamp duty indeed reduces mobility, this can cause wasteful mismatch in housing and labor markets...
“By discouraging mutually beneficial transactions, stamp duty ensures that properties are not held by the people who value them most. **It creates a disincentive for people to move house**, thereby leading to potential **inflexibilities in the labour market** and encouraging people to **live [...] in properties of a size and in a location** that they may well not otherwise have chosen.”
Two open questions

- How big is adverse effect of UK stamp duty on actual household mobility?

- Are distortions mainly confined to labour or housing markets?
What do we know so far? Little previous empirical work...

- **Van Ommeren and van Leuvensteijn (2005)**
  - Provide *indirect evidence on mobility effects* for the NLs using theoretical model to infer effect of transaction costs
  - *1 percentage point* increase in transaction costs *reduces* mobility by at least 8%

- **Dachis, Duranton and Turner (2012)**
  - Look at *short-term effect* of a transfer tax in Toronto
  - Estimate effect on *housing transaction volume and prices* using Diff-in-Diff
  - *1.1% tax* on HVs led to a *15% decrease* in transactions in first eight months after introduction

- Our study: on **UK**, on *long-term (equilibrium) effects*, on actual HH mobility, distinguishing b/w labour and housing related moves and using RD-type design
Basic idea: Exploit discontinuity in UK stamp duty tax rate...

<table>
<thead>
<tr>
<th>Purchase price</th>
<th>UK Stamp duty rate (during our sample period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to £125,000</td>
<td>0%</td>
</tr>
<tr>
<td>£125,001 to £250,000</td>
<td>1%</td>
</tr>
<tr>
<td>£250,001 to £500,000</td>
<td>3%</td>
</tr>
<tr>
<td>Over £500,000 to £1 million</td>
<td>4%</td>
</tr>
<tr>
<td>Over £1 million</td>
<td>5%</td>
</tr>
</tbody>
</table>

Our focus is on **£250k cut-off** for three reasons:

1. Tax jump is big: from £2500 to £7500!
2. Data reasonably dense around it
3. Hasn’t been affected by regional exemptions
Expected effects of stamp duty increase?

- **Stamp duty drives wedge b/w price obtained by seller and price paid by buyer**
  - Transaction costs reduce **housing transactions**
  - But transaction ≠ move!
  - Could in theory move without selling, but...
    - Most sellers need down-payment for new home
    - Few people want to be landlord and rent out old home
  - Drop in **mobility** likely similar to drop in transaction volume

- **Propensity of move affected by**
  - Expected costs (stamp duty)
  - Expected benefits of move (employment shocks vs. incremental housing related motives)
Job related moves

Expected benefits associated with employment related / longer-distance moves likely have large variance.
Expected benefits associated with incremental housing related / shorter distance moves likely have smaller variance.
1. Stamp duty increase reduces housing transaction volume

2. Stamp duty increase reduces household mobility (by a similar fraction)

3. Adverse effect on (incremental, shorter-distance) housing related moves is greater than corresponding adverse effect on (longer-distance, shock-driven) job related moves
What exactly happens at cut-off?

- Consider setting
  - Dwellings produce housing services $H$
  - Buyer’s willingness to pay for one unit of $H$ is $P$
  - For simplicity $P=1$
  - Stamp duty $t$ is capitalized into house price $V$: $V=PH/(1+t)=H/(1+t)$

- Owner’s incentive to sell and move depends on $V/H = 1/(1+t)$
  - An increase in stamp duty $t$ decreases $V/H$
Implications for empirical work

1) Price per unit of $H$ obtained by seller decreases sharply at the £250k cut-off from 0.99 to 0.97 $\rightarrow$ Above cut-off sellers will tolerate larger disequilibrium before moving (so will be less likely to move)

2) Price distribution should have pile-up at £250k
... But note: we do not use transaction prices (in core analysis) but rather self-assessed HVs...
Our treatment variable

- Treatment = 1 if **self-assessed** house value > £250k
  - Pr(affected by the 3% rate) increases sharply at £250k
  - But we can’t identify those who really took treatment
  - Compliers on either side of cut-off $\Rightarrow$ downward bias

$\Rightarrow$ **We estimate the reduced form of a fuzzy Regression Discontinuity IV regression**

- **Fuzzy** because can’t be sure all HH above cut-off are indeed affected

- **Reduced form** because we don’t observe actual treatment so have to use likelihood of obtaining treatment directly, not as instrument
People tend to report rounded values but no abnormal pile-up at £250k (unlike in transaction price distribution)

⇒ Supports validity of RD design (no precise manipulation of assignment variable)
We estimate using 20 to 40% bands around house value of £250k by OLS:

\[ \text{Move}_{it} = \beta_t + \beta_1 \text{Treat}_{it-1} + f(\text{House value}_{it-1}) + \epsilon_{it} \]

- Treat = 1 if self-reported house value > £250k
- \( f(\text{House value}_{it-1}) \) is 1\textsuperscript{st}-4\textsuperscript{th} order polynomial

**Identifying assumption**: all other factors that determine mobility evolve smoothly w.r.t. house values
Two concerns & proposed remedies

1. HHs who intend to stay may not follow market as closely and may be more likely to give “rounded” estimates of their HV (including £250k)
   - Include dummy for round values (in multiples of £50k)

2. Recent movers are problematic
   - They have just “precisely manipulated” the assignment variable
     - Sorting on unobservables possible
   - Exclude those who moved in t-1 ⇒ slightly stronger results
Data

- **British Household Panel Survey (BHPS)**
  - Roughly 10,000 HHs annually
  - Sample period: 2003 to 2008 (2003 = First year with new stamp duty system with stricter control on tax evasion)

- **Key variables**
  - Mover indicator (1/0): 1 if household moved between interviews in t-1 and t
  - **Self-assessed** house values
    - Arguably, this is relevant HV measure for mobility decisions

- **Controls**
  - Age, kids, HH income, region dummies, GCE A-levels or higher, bachelor degree or higher, year dummies, dummy for round HVs
### Main Results I

**Dependent variable: household moved (0/1)**

<table>
<thead>
<tr>
<th>Band around £250k cut-off</th>
<th>Order of polynomial of house value</th>
<th>NO</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 %</td>
<td></td>
<td>-0.001</td>
<td>-0.02</td>
<td>-0.037**</td>
<td>-0.055**</td>
<td>-0.044</td>
<td>6665</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.007]</td>
<td>[0.018]</td>
<td>[0.018]</td>
<td>[0.027]</td>
<td>[0.028]</td>
<td></td>
</tr>
<tr>
<td>30 %</td>
<td></td>
<td>0.006</td>
<td>-0.025***</td>
<td>-0.027***</td>
<td>-0.022**</td>
<td>-0.029**</td>
<td>14151</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.004]</td>
<td>[0.008]</td>
<td>[0.010]</td>
<td>[0.010]</td>
<td>[0.014]</td>
<td></td>
</tr>
<tr>
<td>40 %</td>
<td></td>
<td>0.003</td>
<td>-0.011</td>
<td>-0.015*</td>
<td>-0.029***</td>
<td>-0.024**</td>
<td>17997</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.004]</td>
<td>[0.007]</td>
<td>[0.008]</td>
<td>[0.009]</td>
<td>[0.011]</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Additional control variables: year dummies, dummy for round house value. Standard errors clustered at household level brackets. * p<0.1, ** p<0.05, *** p<0.01. Preferred specification in row according to AIC score indicated by *italics*.

**Preferred specification:** band wide enough for reasonably precise estimation; higher than 3\(^{rd}\) order polynomial increases AIC score.
Main results II: Differential effects by distance of move and reason of move

<table>
<thead>
<tr>
<th>Band around £250k cut-off</th>
<th>Distance of move</th>
<th>Reason for move</th>
<th>Reason for move</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;10km</td>
<td>10-30km</td>
<td>&gt;30km</td>
</tr>
<tr>
<td>20 %</td>
<td>-0.057***</td>
<td>0.013</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>[0.018]</td>
<td>[0.011]</td>
<td>[0.014]</td>
</tr>
<tr>
<td>30 %</td>
<td>-0.025***</td>
<td>0.002</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>[0.006]</td>
<td>[0.005]</td>
<td>[0.005]</td>
</tr>
<tr>
<td>40 %</td>
<td>-0.026***</td>
<td>-0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>[0.005]</td>
<td>[0.004]</td>
<td>[0.005]</td>
</tr>
</tbody>
</table>

Dependent variable: household moved (0/1)

3rd order polynomial of house value

Reason for move

Housing | Employm. | Other

-0.027 | 0.01 | -0.032*
[0.019] | [0.007] | [0.019]

-0.019*** | 0.005 | -0.004
[0.007] | [0.003] | [0.007]

-0.020*** | 0.002 | -0.001
[0.006] | [0.003] | [0.006]

Notes: Additional control variables: year dummies, dummy for round house value. Standard errors clustered at household level brackets. * p<0.1, ** p<0.05, *** p<0.01.

⇒ Adverse effects largely confined to housing related short-distance moves
‘Countless’ validity & robustness checks...

1. Balance of covariance tests
2. Add demographic and location specific controls
3. Allow slope of polynomials to differ on the two sides of cut-off
4. Placebo tests w artificial cut-offs: Check results are not driven by ‘round value’ phenomenon
5. Drop HHs who self-report value of 250k
6. Limit sample only to HHs who say they are likely to move
7. Two-way cluster at HV group level and HH level
8. Show ‘aggregate effect’ on transaction volume of similar magnitude (using transaction price data)
‘Aggregate effect’ on transaction volume

- **Idea:** Use **universe of housing transaction price data (from Land Registry)** to provide estimate of aggregate effect of stamp duty on **volume of transactions**

- **Does not allow us to identify impact on (job- vs. housing related) mobility** **BUT...**
  - Use of alternative dataset & approach provides a **cross-validation check** of magnitude of adverse effect
  - Gives more **precise estimate of overall effect on transaction volume** since observe treatment and results based on much larger sample size
  - One might be worried about manipulation of timing of move, but this spec **controls for such timing behaviour**...
Empirical model
(following literature on ‘bunching’)

- **Basic idea:** Control for bunching behaviour
- **How?** Limit sample to transaction prices b/w £150k and £350k, create £5k wide bins & include controls for bunching

\[
\ln(N_{jt}) = \beta_t + \beta_1 \text{Treat}_{jt} + f_t(Price_{jt}) + \lambda_1 \text{Bin}_{240} + \ldots + \lambda_6 \text{Bin}_{265} + \delta_1 \text{Round50}_j + \delta_2 \text{AfterRound50}_j + u_{jt}
\]

- \(N_{jt}\) ... Number of transactions in bin \(j\) in year \(t\)
- \(Treat = 1\) if value of bin > £250k
- \(f(Price_{jt})\) is polynomial of upper bound of bin (shape of polynomial allowed to vary by year)
- Control for (i) bins close to cut-off where bunching occurs, (ii) bins with round values, and (iii) bins immediately after round values
### Results: Effects on transaction volume

**Dependent variable:** \( \ln(\text{number of transactions in bin}) \)

<table>
<thead>
<tr>
<th>Order of polynomial of house value</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price&gt;£250k</td>
<td>-0.142***</td>
<td>-0.142***</td>
<td>-0.287***</td>
<td>-0.287***</td>
<td>-0.315***</td>
</tr>
<tr>
<td></td>
<td>[0.044]</td>
<td>[0.045]</td>
<td>[0.070]</td>
<td>[0.071]</td>
<td>[0.109]</td>
</tr>
<tr>
<td>6 bin dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Price&gt;£250k</td>
<td>-0.097</td>
<td>-0.097*</td>
<td>-0.282***</td>
<td>-0.282***</td>
<td>-0.331**</td>
</tr>
<tr>
<td></td>
<td>[0.063]</td>
<td>[0.055]</td>
<td>[0.094]</td>
<td>[0.092]</td>
<td>[0.164]</td>
</tr>
<tr>
<td>8 bin dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes:** \( N=240 \) (6 years \( \times \) 40 bins). * \( p<0.1 \), ** \( p<0.05 \), *** \( p<0.01 \). Preferred specification in row according to AIC score indicated by *italics*.

**Preferred specifications:** 5\(^{th}\) to 7\(^{th}\) order polynomials
Conclusions

- The UK stamp duty has **strong negative effect** on actual household mobility
  - 2%-point increase in stamp duty reduces annual rate of mobility by **2-3 percentage points** (~ 40% reduction in propensity to move)
  - Also find similar adverse effect on transaction volume (~ 30% reduction)
  - Naïve estimates fail to identify this effect

- **Effect confined to short-distance and non-job related moves**

- Implies potentially important welfare losses due to misallocation of housing (rather than labour market mismatch)
Thank you!

_Paper downloadable from:
http://www.cemmap.ac.uk/forms/Housing%20Conference/hilber_housingtransfertaxes.pdf_