Land wealth, Inequality and taxation

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Ouline

1. The specific nature of land wealth

2. Recovering land values, and the spatial and interpersonal distribution of land wealth

3. The role of gift and inheritance in shaping land wealth inequality and corrective taxation

1.The specific nature of urban land as an asset

Urban land represents 80%, 90% of total land wealth

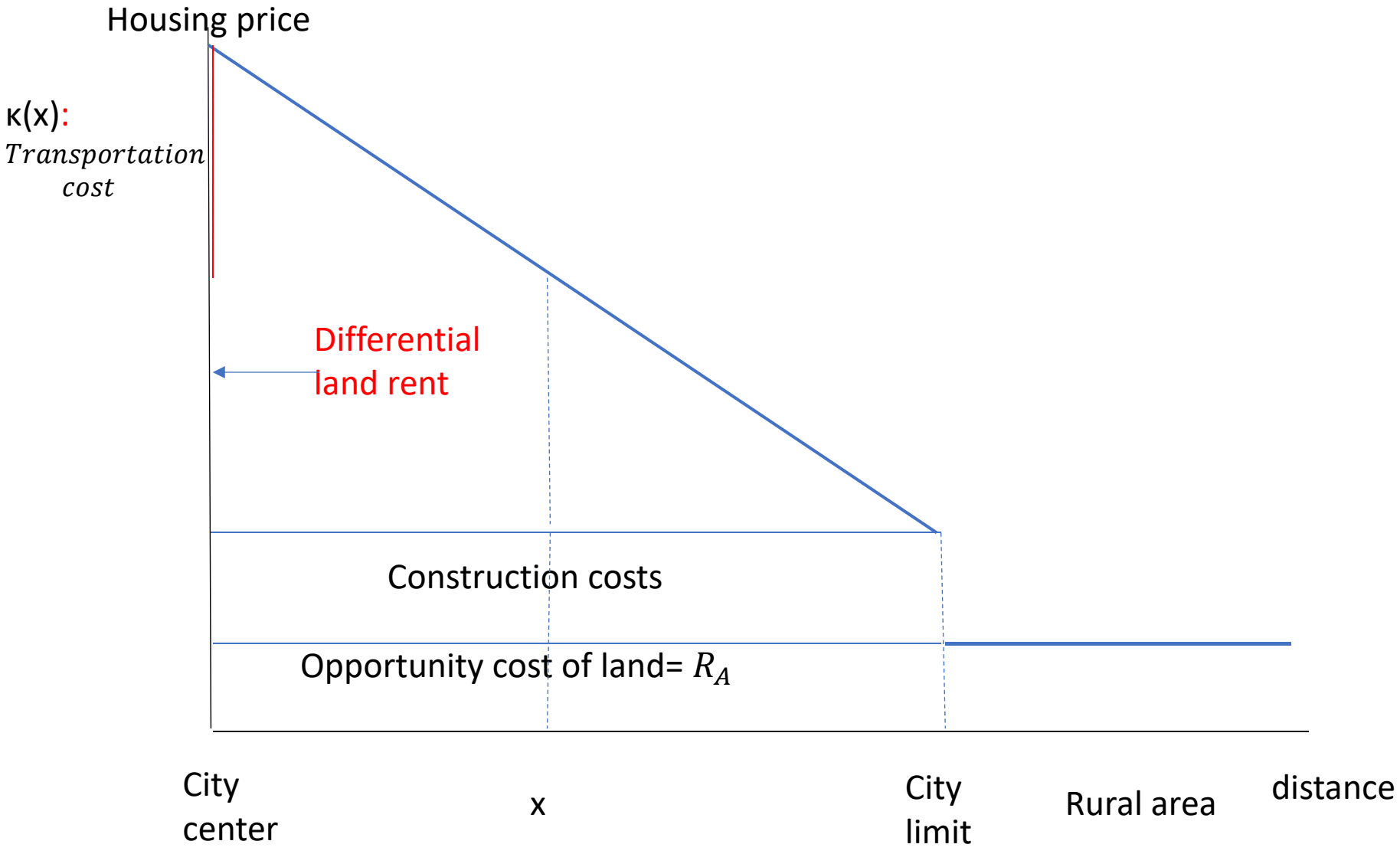
Specific

- Not produced asset; it is taken from other land uses (agricultural, recreational, carbon sink).
- Urban land does not need to be worked on
- Urban land does not depreciate
- Urban land cannot be moved
- In a closed city, in fixed quantity
- Only in an open city, land supply is not fixed

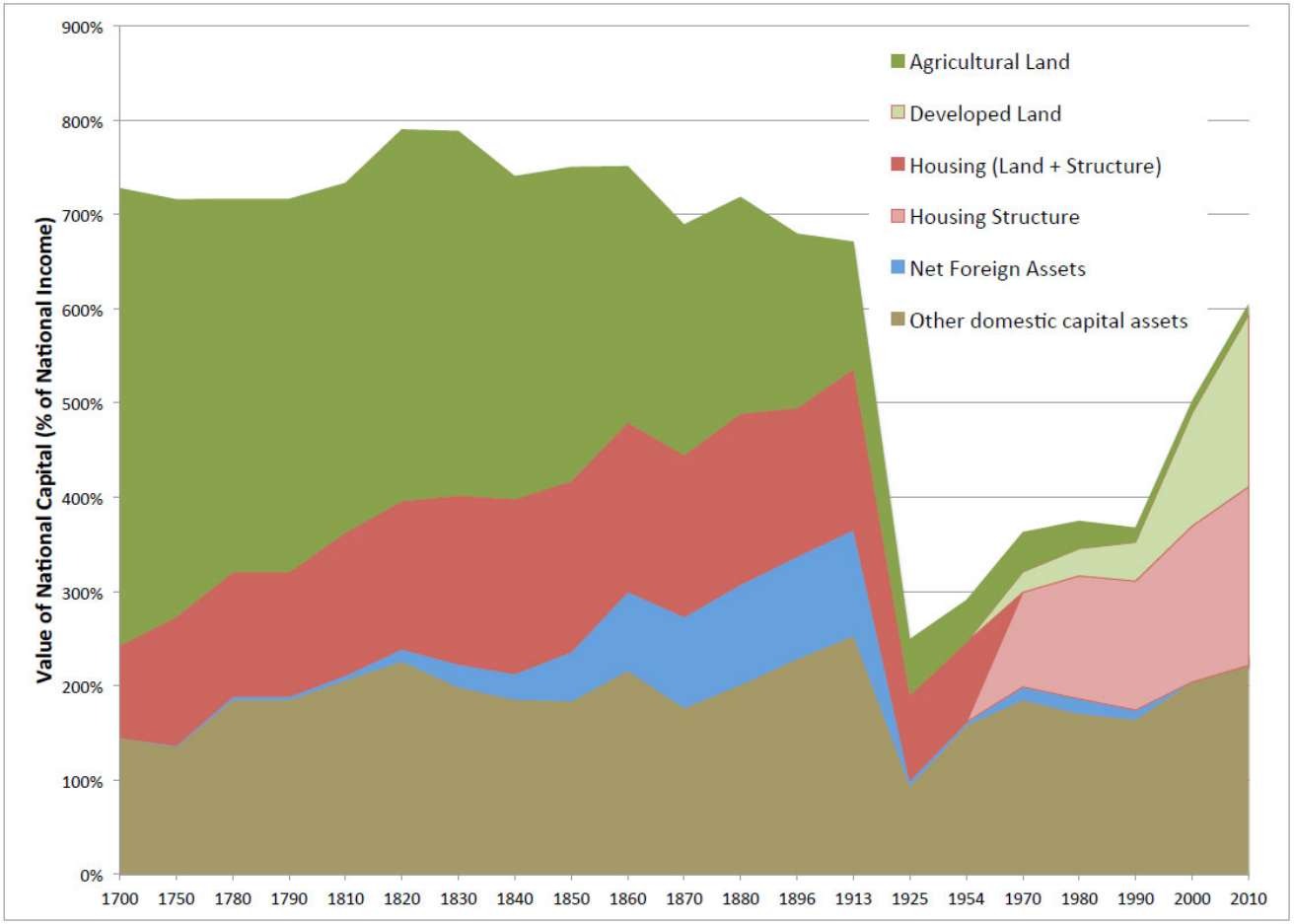
Urban land valued for its location

- For a given access to various amenities
- The city is an example of a non-convex technology.
- Increasing returns from being together to produce, to entertain, to consume goods and services, to meet, linked to density.
- Increasing returns create rents for producers but also for landowners.
- Rents are money generated by some scarcity.
- Scarcity here comes from the fact that not everyone can be close to the place where increasing returns are generated.

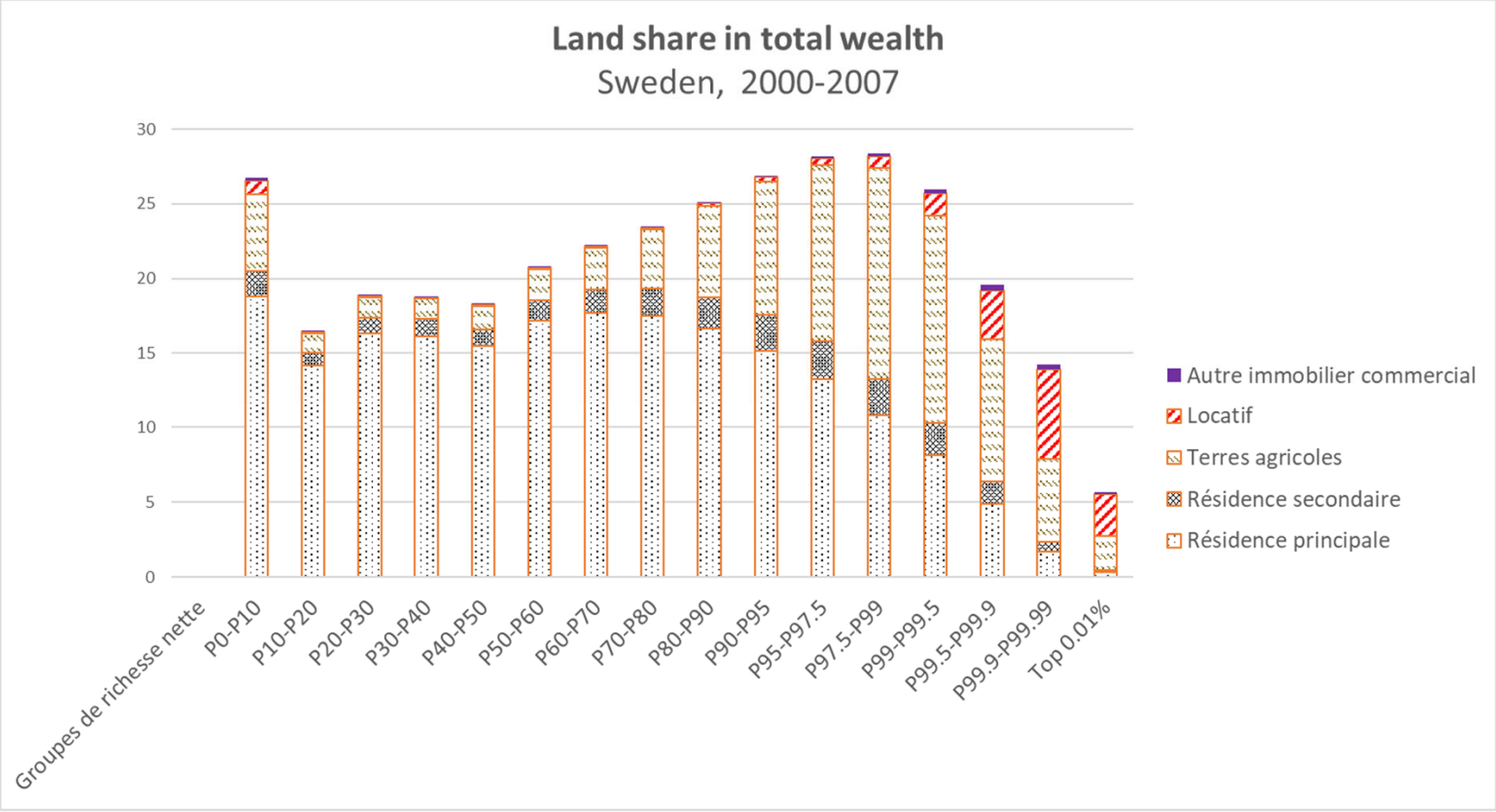
Figure 1: Urban land valued for its proximity to city center



Far from be negligible 1/3 of total wealth (France)



Inequality far from negligible: Sweden (Bach-Calvet-Sodini 2020) As much evenly distributed as total wealth



A good case for taxing differential land rents

- Three type of arguments

1. Financing local public goods.

- Henry George Theorem Arnott and Stiglitz (1979) and many others.

- At the optimal city size which maximises the utility of a homogeneous population, the quantity of local public good should be equal to half cumulated transportation costs = cumulated differential land rents

2. Arguments from the housing markets

- The housing price increase in Europe is mainly due to the increase of urban land rent (3/4)
- Increase land scarcity because of tourist demand (Airbnb), land regulation, and greenness in cities
- Affordability issue and housing bottleneck for the young
- The Lockean argument may work for structures, not for land
- Taxing land wealth can tame housing prices and housing price bubble

3. Portofolio choices at the macro level

- Private investments are needed for funding the transition to a sustainable economy, AI, and reindustrialization
- Investing in Construction be encouraged or at least non-taxed
- Taxing investors in public debt?
- Taxing differential land rents is restoring the public nature of urban land rent

Two issues remain

1. Operationalizing (Part 2)
    1. Housing market values are available
    2. Housing land value?
    3. Can we get a consistent land value for each built plot?

2. Land Value Tax (LVT) each year or taxing intergenerational transfers of land? (Part 3)

2. Recovering land values, and the spatial and interpersonal distribution of land wealth

G. Chapelle, A. Lemoine, J. Paul-Venturine, A. Trannoy and E. Wasmer (2025) : What is France worth? Residential land value estimates. DP Sciences Po.

Estimation bases on a spanning procedure: From land development value to the land value beneath each housing

Match of two Data set

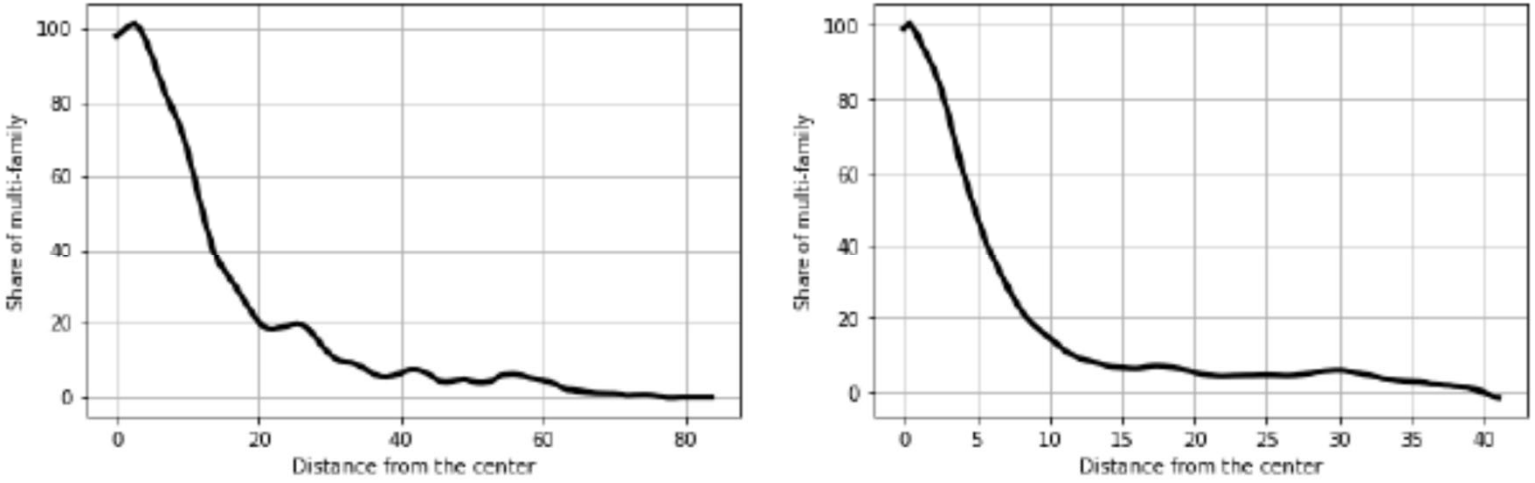
- DV3F: Data set on real estate transactions from 2010 tà 2019
- Land registry Coming from Digitalized Cadaster (2023)
- Linking each land transaction to a parcel in the land registry.
- Identification of parcels purchases for land development and redevelopment

Descriptive statistics

Table 1: Descriptive statistics of land transaction datasets

	(1) DV3F unfiltered	(2) DV3F all	(3) EPTB single	(4) DV3F single	(5) DV3F multi
Observations	914,847	698,801	590,790	663,267	35,693
Total price - mean	151,742	119,696	73,885	77,201	909,190
Total price - median	67,351	63,360	60,000	60,600	350,000
Surface - mean	1569	1026	985	949	2453
Surface - median	756	724	750	716	1089
Price per sqm - mean	202	155	110	125	709
Price per sqm - median	93	93	84	89	352
Units built - mean	2	2	1	1	25
Units built - sum	1,705,436	1,482,374	590,707	660,650	822,349

Domination of multifamily close to city centers

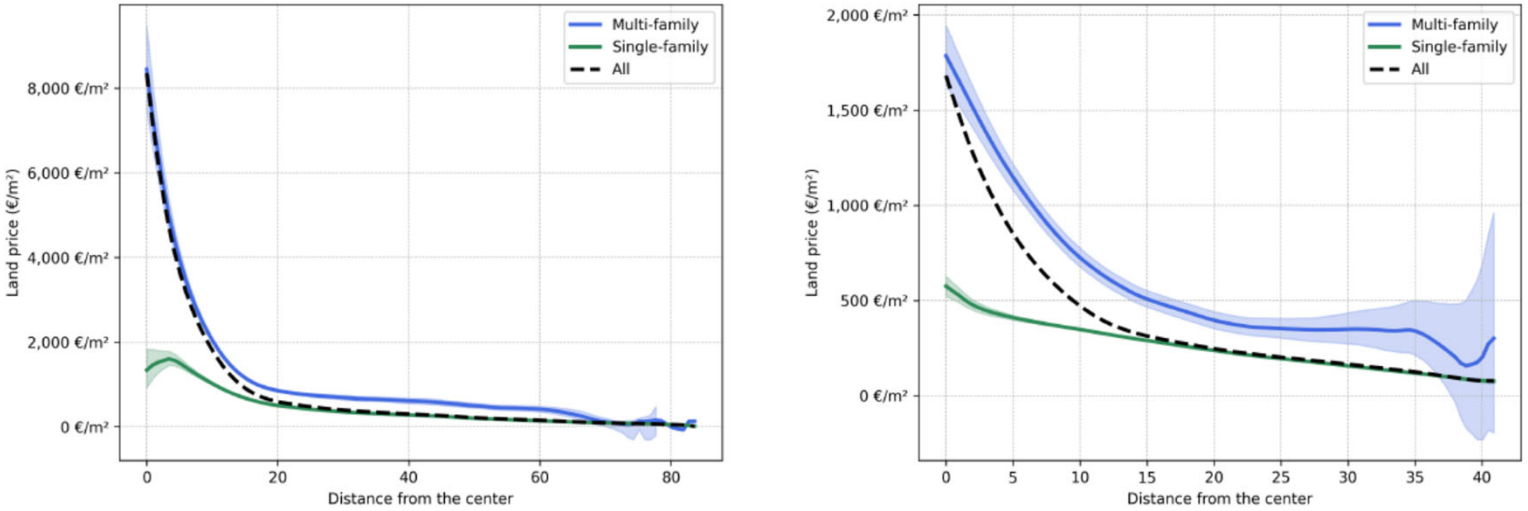


(a) Paris (b) Lyon

Figure 1: Share of land transactions for multi-family dwellings

Notes: Author's computation from the dataset described in column 2 of Table 1. Distance to the center expressed in km^2. Local regression based on an Epaniechnikov kernel density function with a bandwidth of 10 km. We regress distance on a dummy indicating whether the land parcel was transformed as a collective development. The center is defined weighting municipalities coordinate by their respective number of jobs. Urban areas as defined by INSEE in 2020.

Land price gradient Paris, Lyon



(a) Paris (b) Lyon

Figure 2: Land price gradient in major French metropolitan areas

Notes: Author's computation from the dataset described in column (2) of Table 1. Standard errors computed using 5,000 bootstrap replications. Panels display the estimated land price gradient with 95% confidence intervals Local regression based on an Epanechnikov kernel with a bandwidth of 10 km. We regress distance on price per square meter. The center is defined by weighting municipalities' coordinates by their number of jobs. Urban areas as defined by INSEE in 2020.

France Map Land values hedonic estimation (Value of the municality FE)

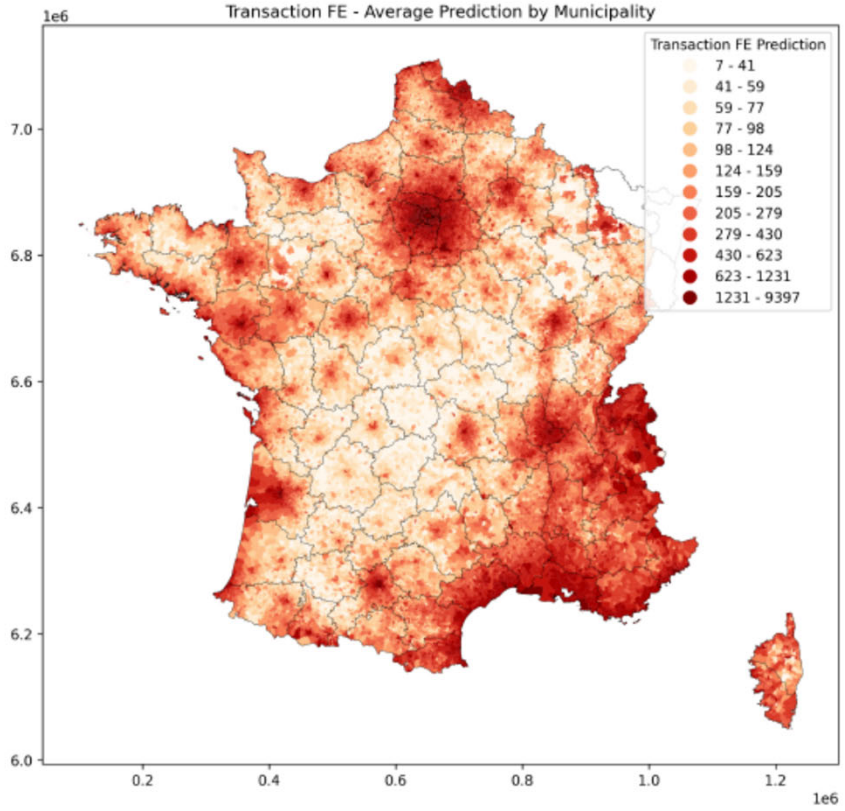


Figure 4: Predictions at the municipality level in 2019
Hedonic FE model, transaction specification

Notes: Average prediction value of land price per square meter in 2019 using hedonic model with fixed effects specification 4 ("transaction model"). See table 2 for a list of all control variables. Results averaged by municipality. Legend breaks at deciles of prediction value, and additional last breaks at the 95th and the 99th percentile.

France Map land value XG-Boost estimation

(better than other machine learning Mayer and al.2019 (Switzerland) and Jafary et al. 2024) for Melbourne)

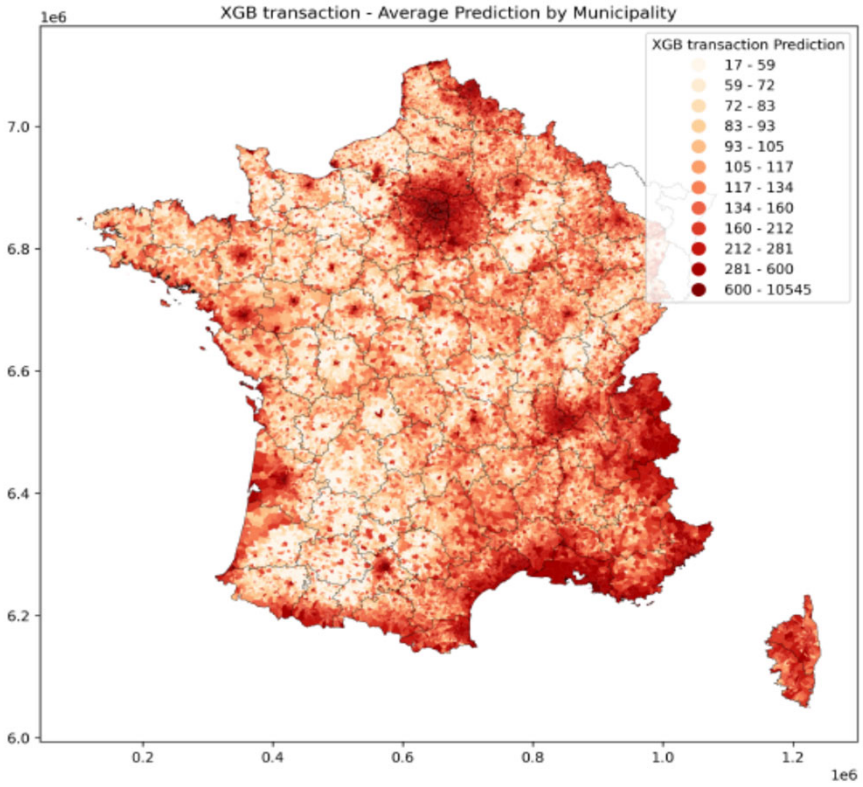


Figure 5: Predictions at the municipality level in 2019
XGB model, transaction specification

Notes: Average prediction value of land price per square meter in 2019 using XGBoost specification 4 ("transaction model"). See table 2 for a list of all control variables. Results averaged by municipality. Legend breaks at deciles of prediction value, and additional last breaks at the 95th and the 99th percentile. Negative values are set to 0.

Quality of prediction

Table 2: Model description and performance measures

	(1) Baseline		(2) + Context		(3) + Intended Use		(4) + Transaction	
	FE	XGB	FE	XGB	FE	XGB	FE	XGB
Train sample								
RMSE								
All	0.349	0.132	0.348	0.073	0.348	0.069	0.343	0.063
Single-family	0.296	0.129	0.296	0.071	0.295	0.068	0.292	0.062
Multi-family	0.857	0.173	0.856	0.104	0.856	0.095	0.831	0.066
R^2	0.888	0.984	0.889	0.995	0.889	0.996	0.892	0.996
N	576,479	576,479	576,479	576,479	576,479	576,479	576,479	576,479
Test sample								
RMSE								
All	0.372	0.395	0.374	0.377	0.374	0.380	0.369	0.370
Single-family	0.318	0.342	0.320	0.327	0.319	0.331	0.318	0.327
Multi-family	0.907	0.925	0.906	0.883	0.906	0.881	0.878	0.820
R^2	0.872	0.857	0.871	0.869	0.871	0.867	0.875	0.874
N	144,119	144,119	144,119	144,119	144,119	144,119	144,119	144,119

Last step: evaluating the land wealth of each French household

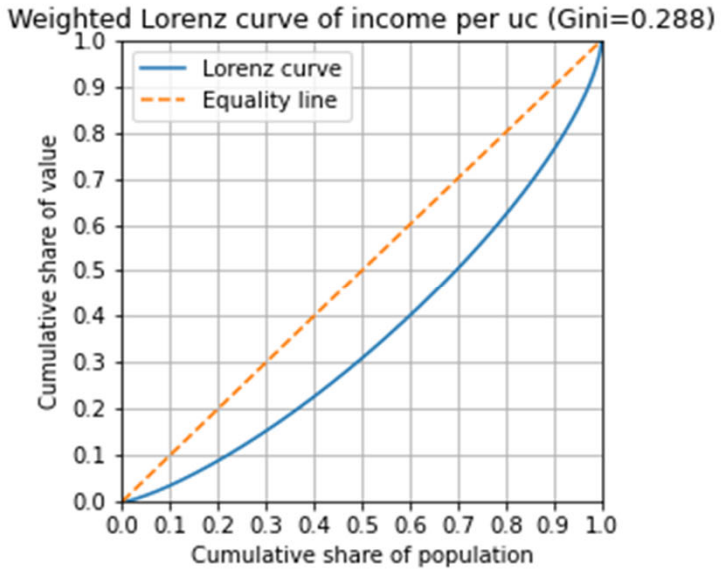
- Fichier démographique sur les logements et les individus (Fidéli): Properties owned by each resident and French citizen plus income

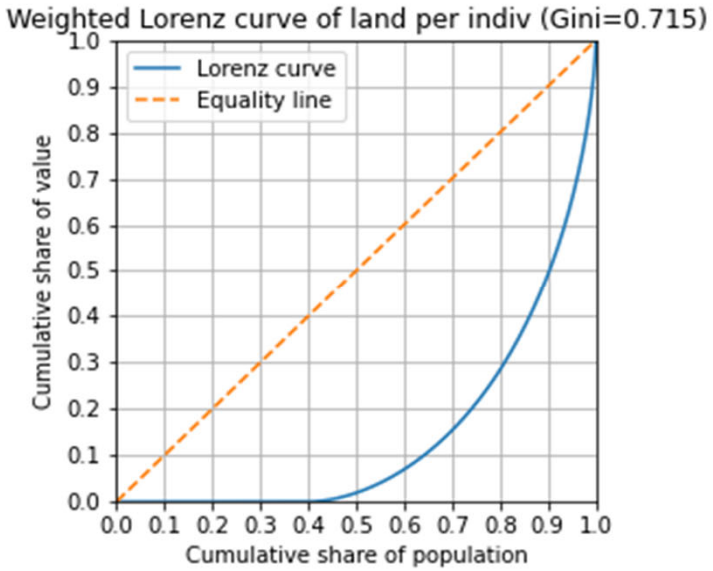
- The value of each parcel is estimated with the hedonic or XG Boost estimation.

- Here Hedonic results because calibrated on the French National Accounts

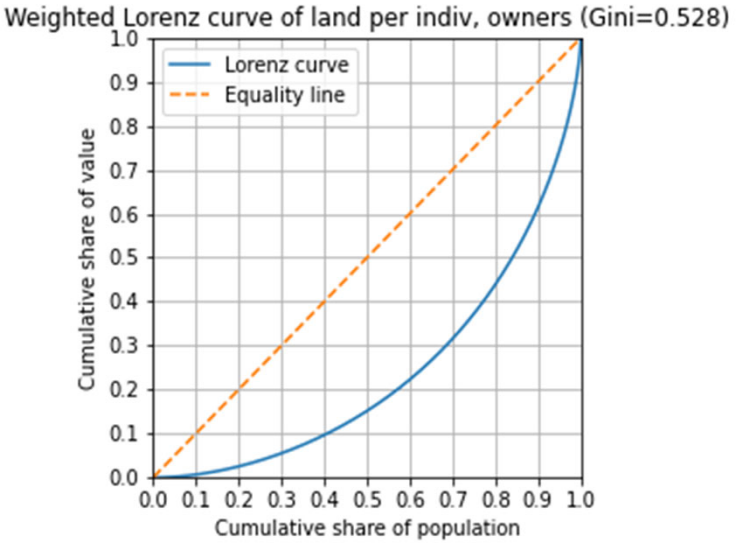
- For multifamily, the parcel value is allocated among the landowners owning flats in the building according to the flat aera.

Lorenz curves of disposable income and land wealth per capita (all population)





Lorenz curves disposable income per uc and land wealth per capita (landowners)



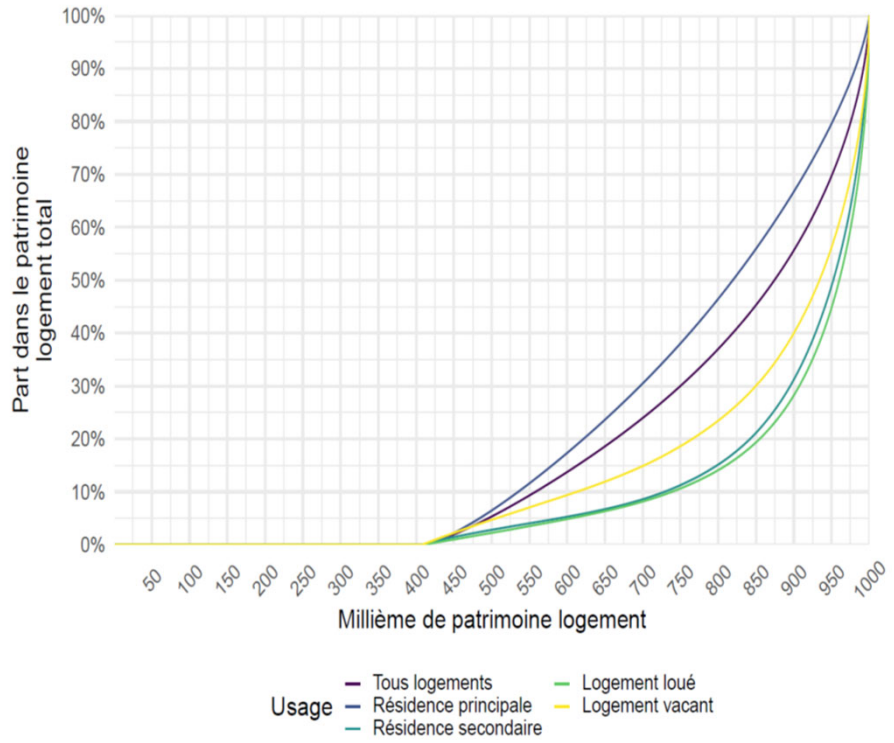
Lorenz Curves for the housing value distribution

(André Meslins INSEE 2025) Gini estimation from the graphs, Trapezoide method

Uncertainty *±0,02–0,03)*

Main residence: 0,65
All housing: 0,70
Vacant housing: 0,75
Rental housing: 0,78
Secondary residence: 0,82

FIGURE 14 – Part cumulée dans le patrimoine immobilier brut par millième de patrimoine immobilier brut



The main message about land wealth inequality

- Bottom inequality

- More pronounced than total wealth inequality 0.67 LIS data, INSEE 0,652.

- More pronounced than housing inequality Insee 0,654

André and Meslins 2025: 0,7

- Grasp the intuition in looking at Figure 1
  - Compare the inequality of the distribution of (Constructions + differential rent) vs the distribution of differential ren in a city. The latter should be higher because it is obtained by subtracting a constant.

3. The role of gift and inheritance in shaping land wealth inequality

3.1 OLG models and urban models

Brunetti, R., Gaigné C., and Moizeau F (2025). Land, Wealth and Taxation DP INRAE.

3.2 Ramsey dynastic models with perpetual youth and three classes

Li, J. Trannoy A and Wasmer E. (2025) Land and Property Taxation in a Dynastic Growth Economy -- Tax the Chatelains! CEPR DP19954.

3.1 Mixing space and time

- Plugging urban models in a dynamic macro framework
- Models with monocentric cities and housing, land and financial accumulation in OLG model
- Homogeneous wage earners with heterogeneous wealth
- Altruistic behavior through gifts, financial bequests and parent's home
- Only homeowship (Italy, Spain 74%) with imperfect mortgage market

Framework

- Discrete time t =1,2,….,+∞
- A constant mass N of agents: each parent gives birth to one offspring.
- Overlapping generation living two periods
- No growth: constant marginal labor productivity = constant wage
- The only one dimension of heterogeneity: wealth

The link between generations

- The young choose to live at a given distance x from the center of a monocentric city and this choice cannot be changed when getting old.

- The housing price: $p_t(\mathrm{x})$

- Young receive a gift g_t (transfer into vivos) from their parent at time t

- And inheritance h_{t+1} from their parents at time t+1

Assumptions (Housing)

- Monocentric city on a line
- Homes: discrete and unique size set to 1
- Neglecting construction.
- Home: a land plot at distance (location) x from the CBD (where all jobs are concentrated)
- Only one home at distance $x \in (0, 1)$
- In a city, the housing choice reduces to location choice
- Housing value = land value
- Young needs to purchase their home and to pay for it in the first period

Imperfect credit markets

- Borrowing is limited by the loan-to-value constraint
- Young cannot borrow more than a fraction $\lambda \in (0,1)$ of the housing price
- The down payment cannot be less that $(1 - \lambda)\, p_t(\mathrm{x})$
- It is location specific.
- A specific link between the down payment and the gift because the gift is the only asset at birth and need to purchase a home at birth
- $g_t \geq (1 - \lambda)\, p_t(\mathrm{x})$
- A credit-constrained agent cannot afford a location costing more than $\frac{g_t}{(1-\lambda)}$

Land auction

- It opens at the beginning of each period
- An auction selling the dead parent's home living at x
- The starting price is the auction price at the previous period.
- Nex generations bid for vacant homes and the land auction selects the highest bid for each location

Budget constraints of the agent

- Non-durable consumption good c produced with a CRS production function with only labor as input

- Commuting costs κ(x) with κ'(x) > 0

- When young
- $w + g_t = c_t + p_t(x) + r\lambda\, p_t(x) + s_t + \kappa(x)$

- When old
- $(1 + r)\, s_t + h_{t+1} = c_{t+1} + g_{t+1} + b_{t+1} + \kappa(x)$

Preferences

- At a given location, new generation maximise a utility function whose arguments are
  - The non durable consumption when young c_t
  - The non durable consumption when old c_{t+1}
  - The gift they provide to their offspring g_t
  - The bequest they leave to their offspring h_{t+2}
- Under the budget constraints
- The loan-to-value constraint
- The wealth identity composition

Wealth accumulation within a generation

- At birth, $W_t = g_t$
- When beginning old, $W_{t+1} = p_{t+1}(x) + h_{t+1} + (1 + r)\, s_t$
- At death, $W_{t+2} = (1 + r) b_{t+1} + p_{t+2}(x) = h_{t+2}$

A residential equilibrium

(1) No household has an incentive to change their city choice

(2) All agents sharing the same wealth have the same maximum utility level

(3) Markets clear

We assume perfect forsight

The bid price function (1)

- What's the reservation price for locating at x for a given utility level u?
- A Hicksian concept at constant utility.
- Since the demand is calibrated at 1, the Hicksian price.
- The case of no mortgage interest: the period before covid with QE from ECB
- When credit constraint is not biding
- When credit constraint is biding.

The bid price function (2)

- When credit constraint is not biding
- Differentiate the indirect utility function wrt x $in\ the\ absence\ of moving\ costs\ u'(x) = 0$
- $B_t(x,u) = K_t - \kappa(x)(1+\pi) + \pi^2\ p_{t+2}(x)$ (1)
- Standard trade-off between land prices and commuting costs
- Assuming $\kappa'(x) > 0$ and $p'_{t+2}(x) < 0, B'_t\ (x,u) < 0$
- But (1) means ready to bid more because of the expectation of land price sale

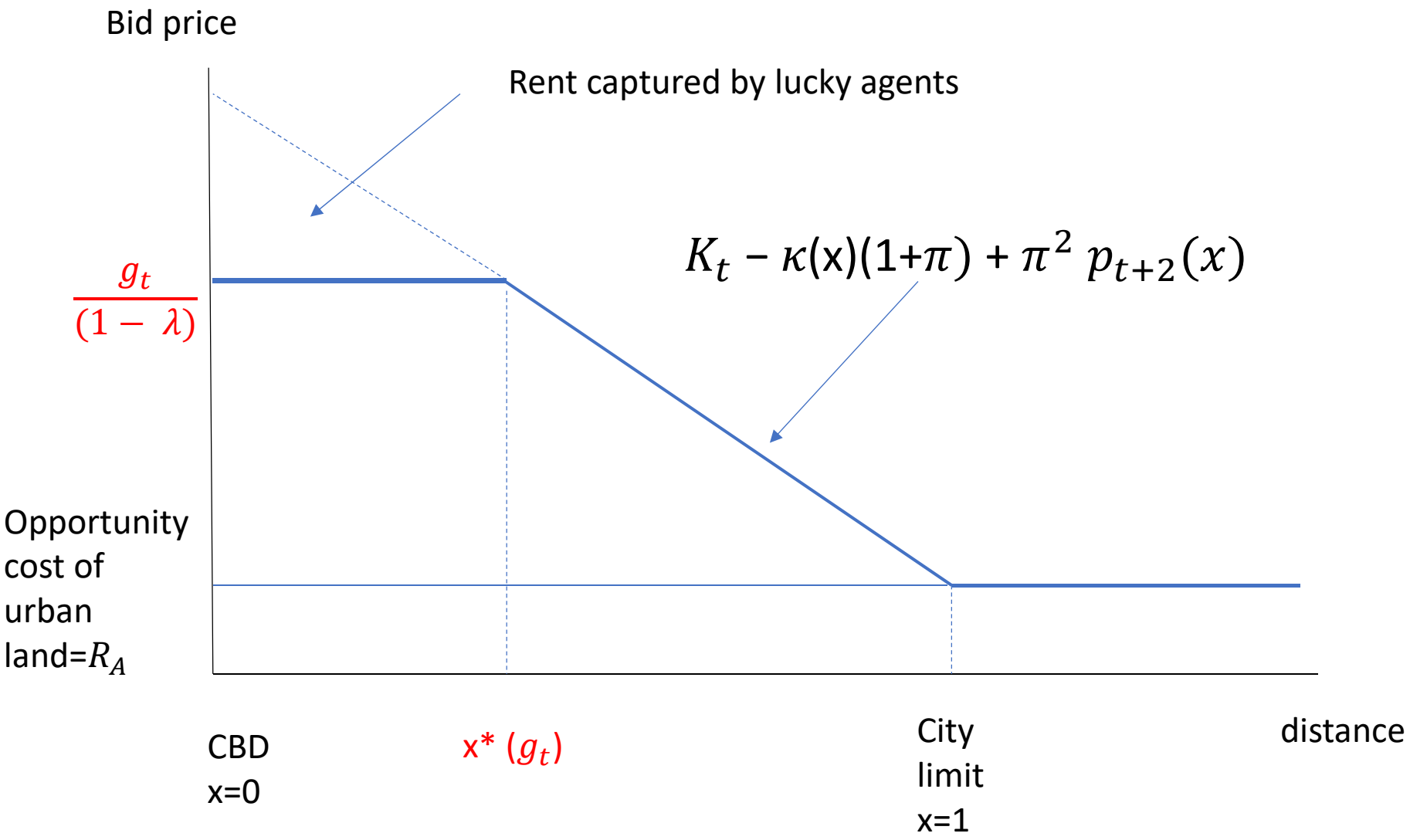
Bid price function (3)

- When credit constraint biding for a range of location (0, x*(g_t)),

- $B_t\ (x, g_t) =$ $\left\{ \begin{array}{c} \frac{g_t}{(1-\lambda)}\ for\ x \in (0, x*\ (g_t)); \\ \\ K_t - \kappa(x)(1+\pi) + \pi^2\ p_{t+2}(x) for\ x \in (\ x*\ (g_t),1) \end{array} \right\}$

- The constant of integration K_t is determined by $B_t\ (1, u)$= R_A

Figure 2: Bid price with linear commuting costs for an agent with initial wealth g



Three types of city spatial equilibrium

1. **Exogenous inequality : Wealth differentials and no credit constraints**

   - Utility differentials arise only from initial wealth differentials

2. **Endogenous inequality: Wealth homogeneity and Credit constraints**

   - A situation close to the post-WWII equilibrium
   - In period t, lucky young can save on housing, which translates into more savings and larger transfers inter vivos and bequests in t+1.
   - Wealth Inequality emerges from the interplay of credit constraints and altruistic agents
   - Symmetry breaking and rent captured by lucky agents (see Figure 3)

Third type of equilibrium

3. **Exogenous and endogenous inequality: Credit constraints and wealth heterogeneity**

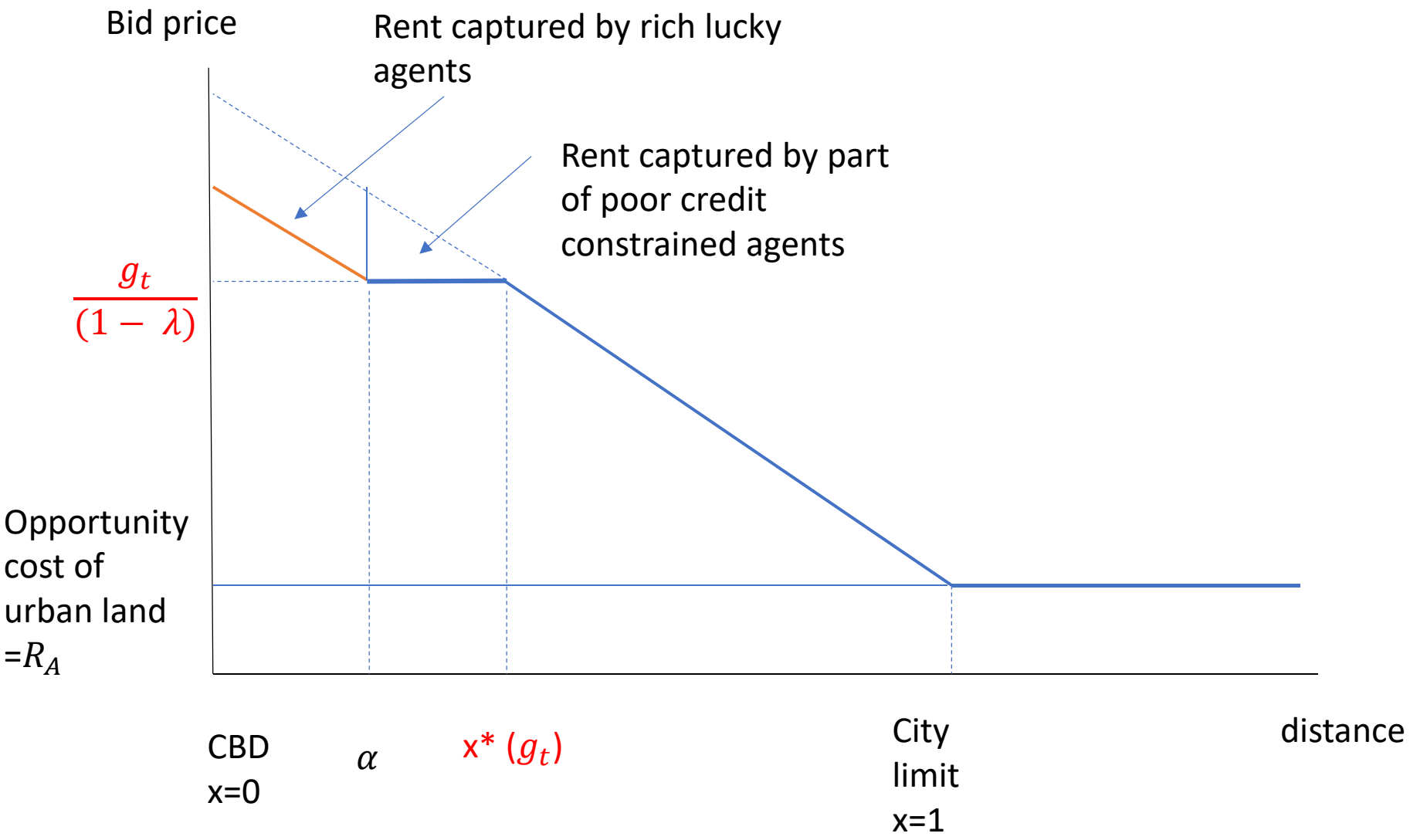
- Two wealth classes : rich who are not credit constrained in proportion $\alpha < x*(g_t)$ (South America, South Africa)

- Two classes of lucky agents

a) Poor credit constrained whose bid prices are not outbid by rich agents

b) Rich who benefit from the absence of bidders for the upper segment of land market due to the credit constraints that thwart poor agents

Figure 3: Equilibrium 3 with 2 wealth classes



Is equilibrium land allocation efficient?

- No because credit constraint.

- But even in the absence of credit constraints, a second source of inefficiency because the agent does not pay the shadow price of land

- What's the shadow price of land?

- Urban Land is scarce. What's the social value of one more unit of land at x? What are the resources saved? One person living at 1 can now live at x and save transportation costs ($\kappa(1)$ - $\kappa(x))(1+\pi)$

Restoring efficiency

- An inheritance tax on the home land bequest minus the opportunity cost of urban land

- $\tau(x) = p_{t+2}(\mathrm{x}) - R_A$

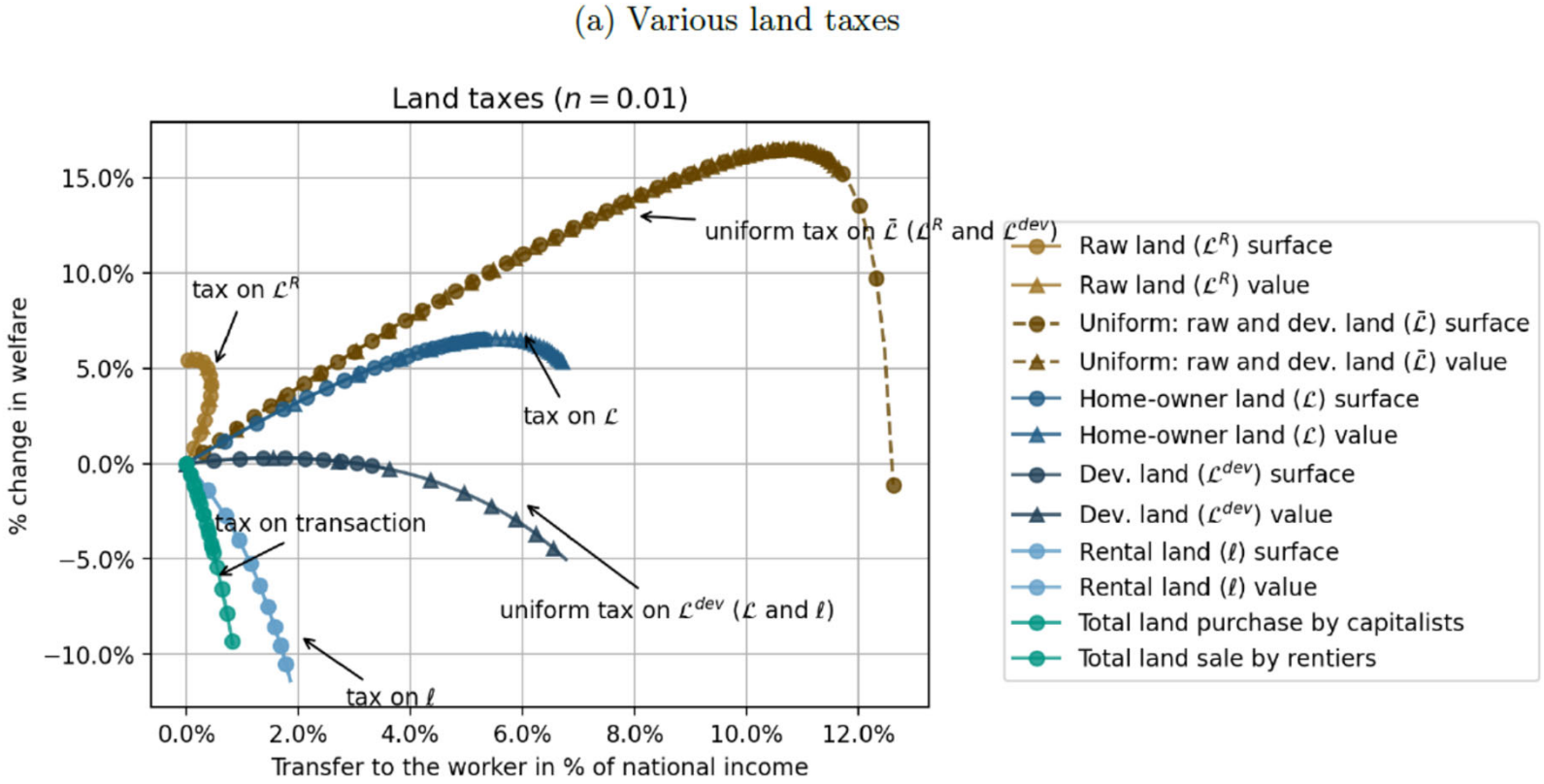
- Then, $B_t\ (x, u) = R_A$ +(κ(1) - κ(x))(1+π)

- Better than a uniform LVT at each period on $p_t(\mathrm{x})$ and $p_{t+1}(\mathrm{x})$

2.2 The lessons from Ramsey

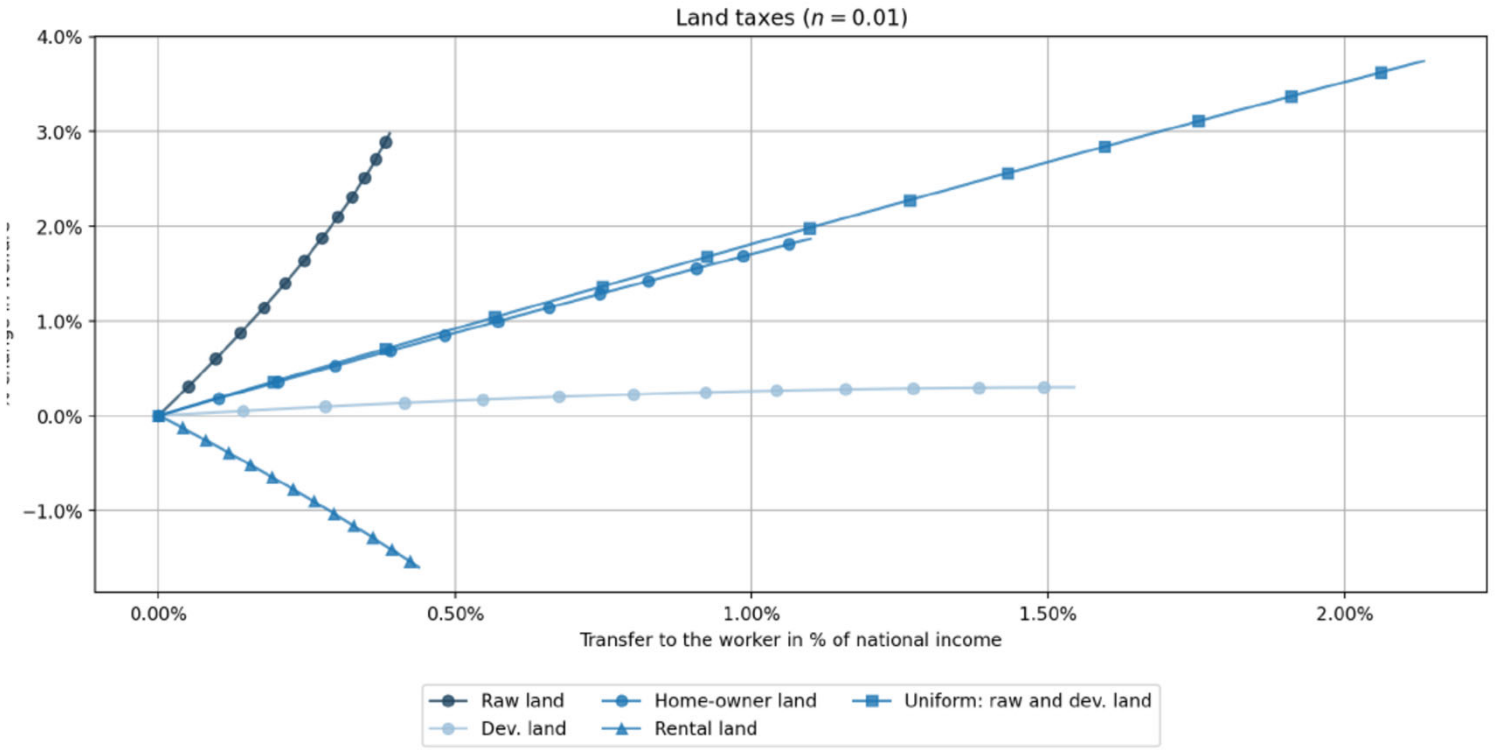
- Annual land tax and inheritance tax are equivalent good
- But the inheritance tax rate should be much higher to generate the same discounted revenues
- In peace time, death rate is low
- High tax rates are more prone to tax optimization or tax evasion, without speaking of political acceptability

Welfare gain with annual taxes



Welfare gain with inheritance tax

Figure 2: Taxes on inherited land, inherited housing and inherited capital



Political equilibrium?

- Vicious loop
- High land rent and value in main cities for young reinforce the affordability criss and low fertility (arbitrage space/commuting cost)
- In the long run less political weight for the young

Thank you for your attention