Rent Forecasting II

Rental Growth and Uncertainty

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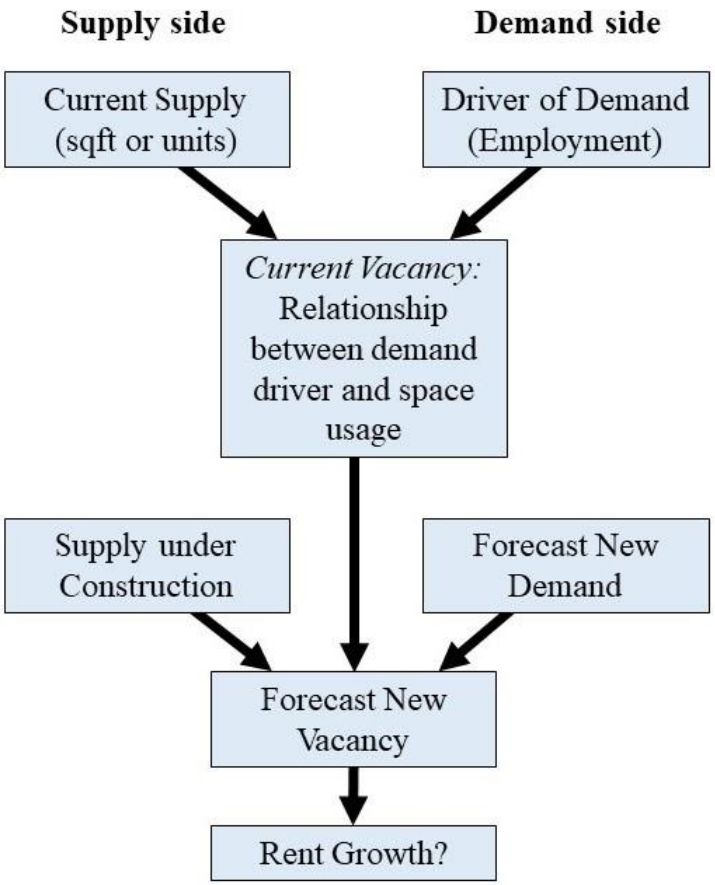
UCONN

1 Introduction

What are we going to do during this class:

- In the previous class we showed how to do forecasts using time series data of ret.
- Today, we are going to talk more about a structural approach. We are going to forecast rent (the g) parameter, based on *other* variables that directly impact rent. This is also called the structural approach based on market analysis.
- We will directly model demand and supply for real estate in a short-run model.

2 Simple Structural Approach



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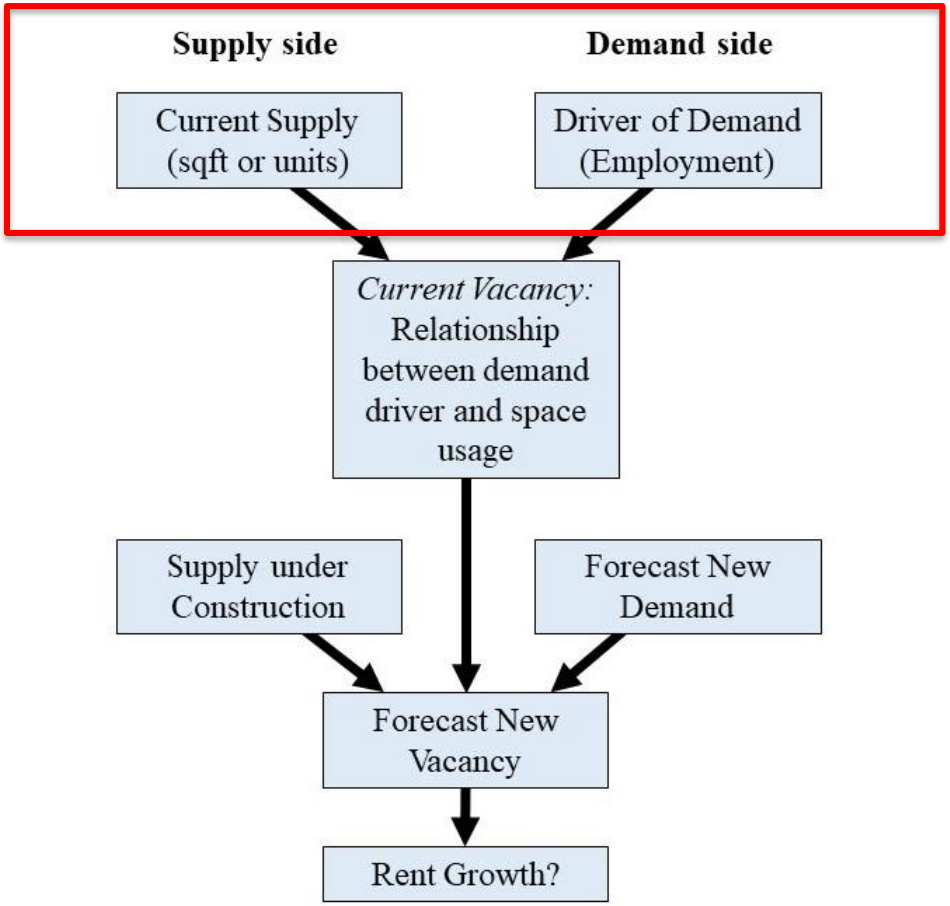
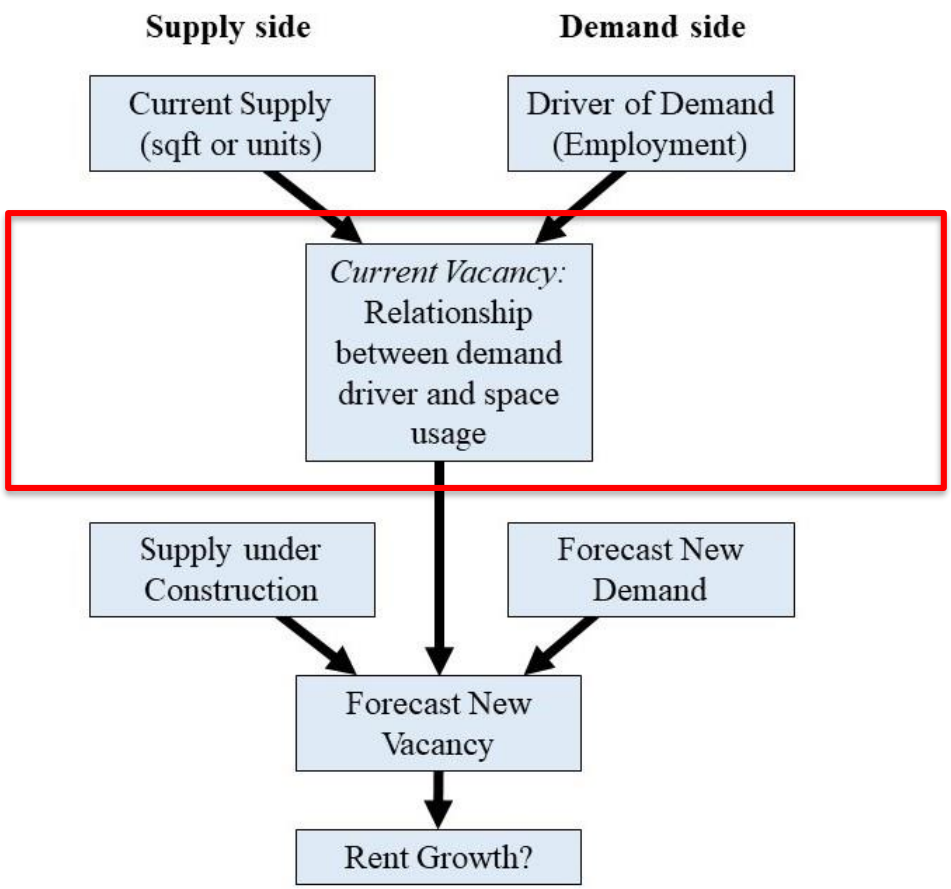


2 Simple Structural Approach

Property type	Demand driver
Single-Family (Owner-occupied)	- **Population** - Interest rates - Employment
Multi-Family (Rental)	- **Population** - Young population - Employment *(Blue color)*
Retail	- **Retail sales** - Disposable income - Retail employment
Office	- **FIRE employment**
Warehouse	- **Inventory** - Warehouse employment - Transportation employment

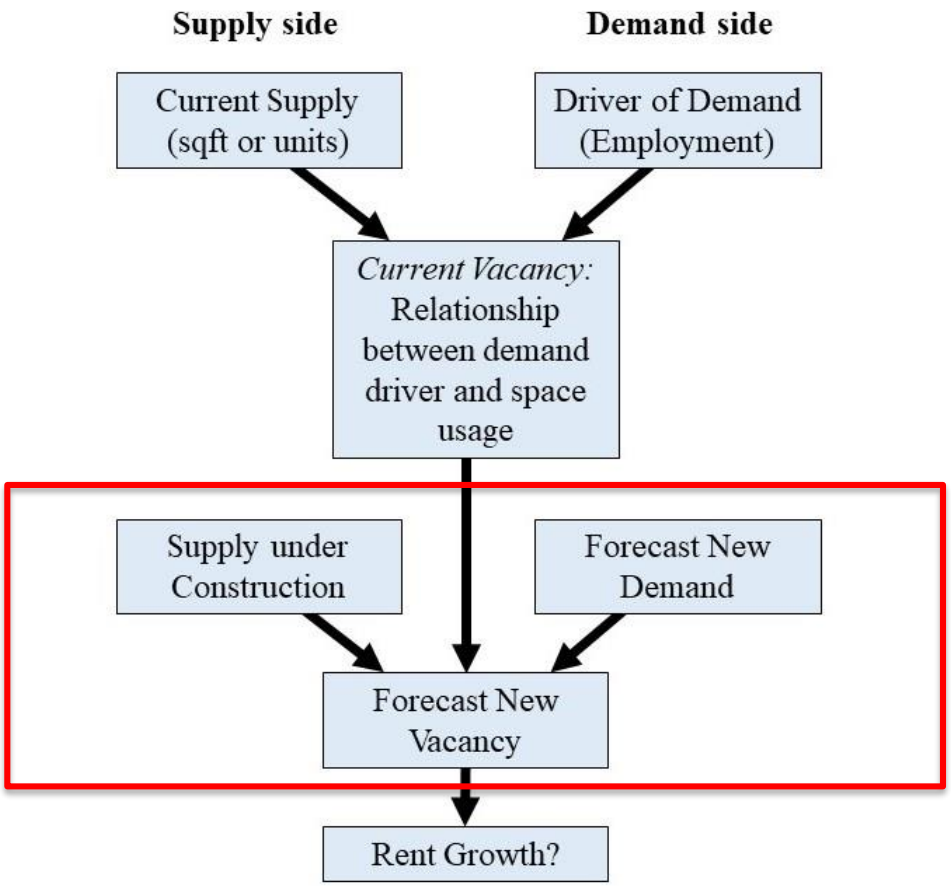
2 Simple Structural Approach



2 Simple Structural Analysis

- Next, we relate the underlying demand sources to the amount of real estate space usage demand.
- This can be easy;
  - The number of households, should roughly equal the amount of housing units.
- Or hard;
  - How much square feet does an employee for a given occupation need?
  - What *type of retail* would fit for *what income levels*? And how much retail per person would you need?

2 Simple Structural Approach



2 Simple Structural Analysis

- Next, we forecast future demand and supply of space in our market.
  - Demand side. Make projections by extrapolating previous trends on the relevant demand drivers. This will tell you how much more (or less of course) square feet / units will be needed at any given point in time in the future.
  - Supply side. Construction permits are typically publicly available. However, note that not all projects are finished, and that redevelopment can also be important. This will give us the amount of square feet / units that will be added in the future.

- Note that it is now relatively straightforward to subtract the two, to find the future shortage (or not) of supply.

2 Simple Structural Analysis

- Example (Boston Office, 5-year projection)
  - BLS expects office jobs to grow at 70 basis points (0.7%) annually in the coming 10 years.
  - This equates to approximately 6,000 office jobs per year.
  - In 2024, there were 844 thousand office jobs in the Boston metro area.
  - 6.8 million (net) square feet is under development.
  - Assume 240 square feet per employee.

	Formula	Now	In 5 years	Difference
Net Current Inventory	S + C	223,954,598	230,766,696	6,812,099
Employees	5 years x 6,000	844,000	874,000	30,000
Net Absorption	30,000 empl x 240 sqft		7,200,000	
Vacant Space	VS + NA - C	26,574,343	26,186,442	(387,902)
Vacancy rate	VS/S	11.87%	11.35%	-0.52%

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Vacancy roughly stays the same

2 Simple Structural Analysis

- The **pro** of this approach is that it is… well, simple.
  - When looking over a short horizon (3 years or less), the approach can give valuable insights.

- A few **issues** with this approach.
  - We still cannot ascertain an exact rental growth forecast (g)
  - It assumes that all the development in the pipeline will be developed.
  - It ignores the dynamics over a longer period of time.

4 Regression based VAR

- The Vector Autoregressive (VAR) Model is a popular model for forecasting.

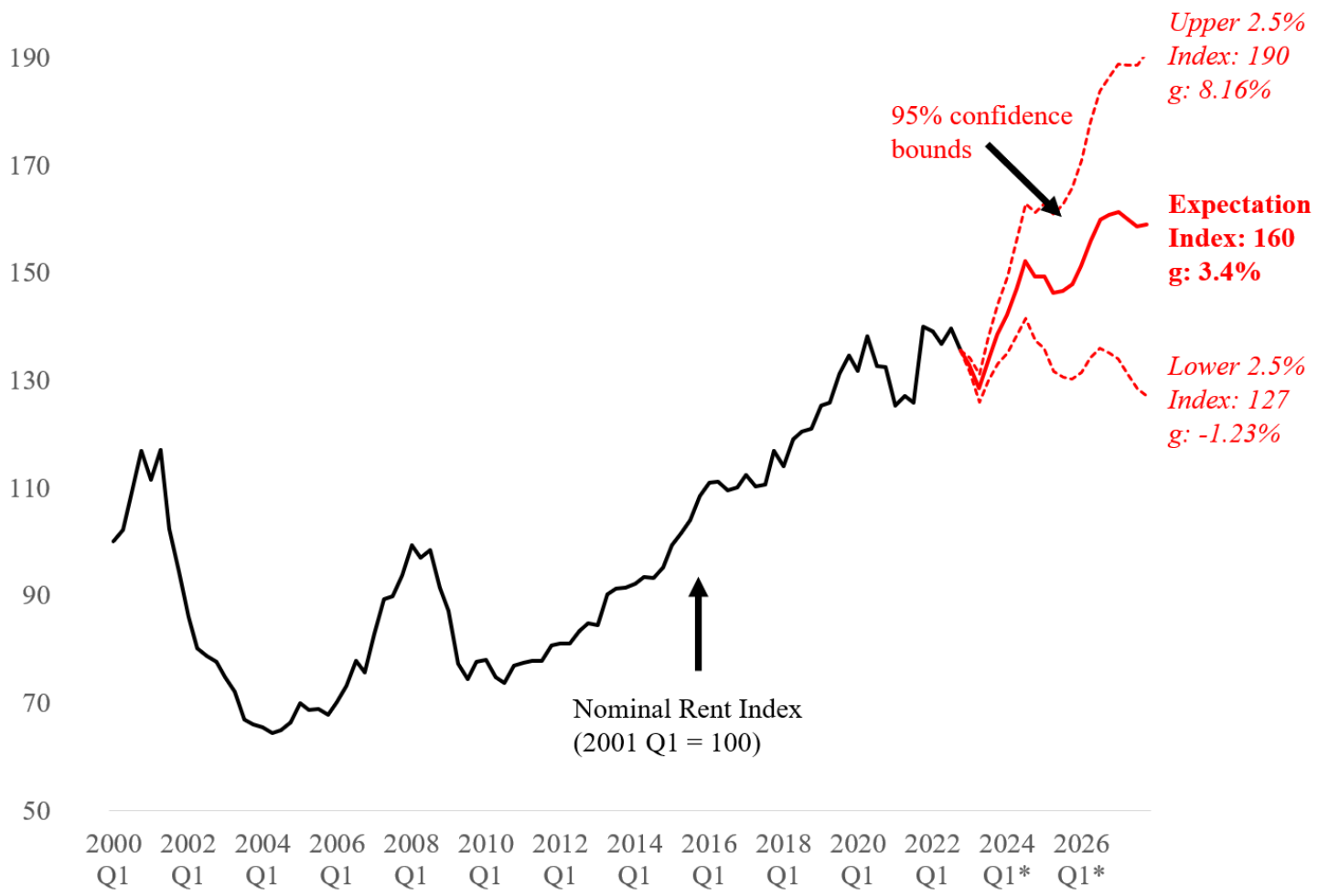
$$\Delta R_t = \lambda_1 + \lambda_{11}\Delta R_{t-1} + \lambda_{12}\Delta C_{t-1} + \lambda_{13}\Delta V_{t-1} + \lambda_{14}\Delta D_t + \varepsilon_{r,t}$$

$$\Delta C_t = \lambda_2 + \lambda_{21}\Delta R_{t-1} + \lambda_{22}\Delta C_{t-1} + \lambda_{23}\Delta V_{t-1} + \lambda_{24}\Delta D_t + \varepsilon_{c,t}$$

$$\Delta V_t = \lambda_3 + \lambda_{31}\Delta R_{t-1} + \lambda_{32}\Delta C_{t-1} + \lambda_{33}\Delta V_{t-1} + \lambda_{34}\Delta D_t + \varepsilon_{v,t}$$

- With
  - R = rent, C = net construction, V = vacancy, D = demand driver

4 Regression based VAR



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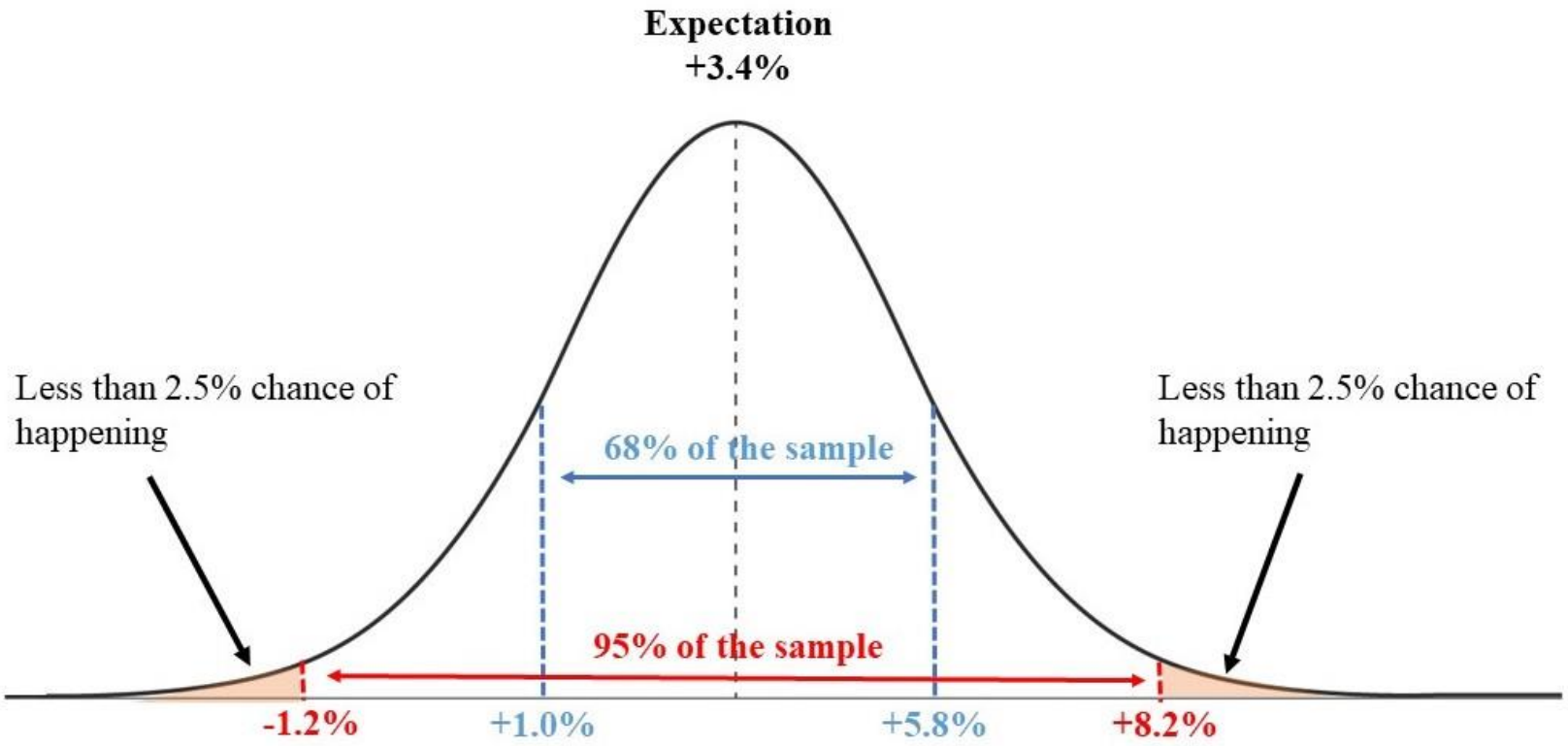
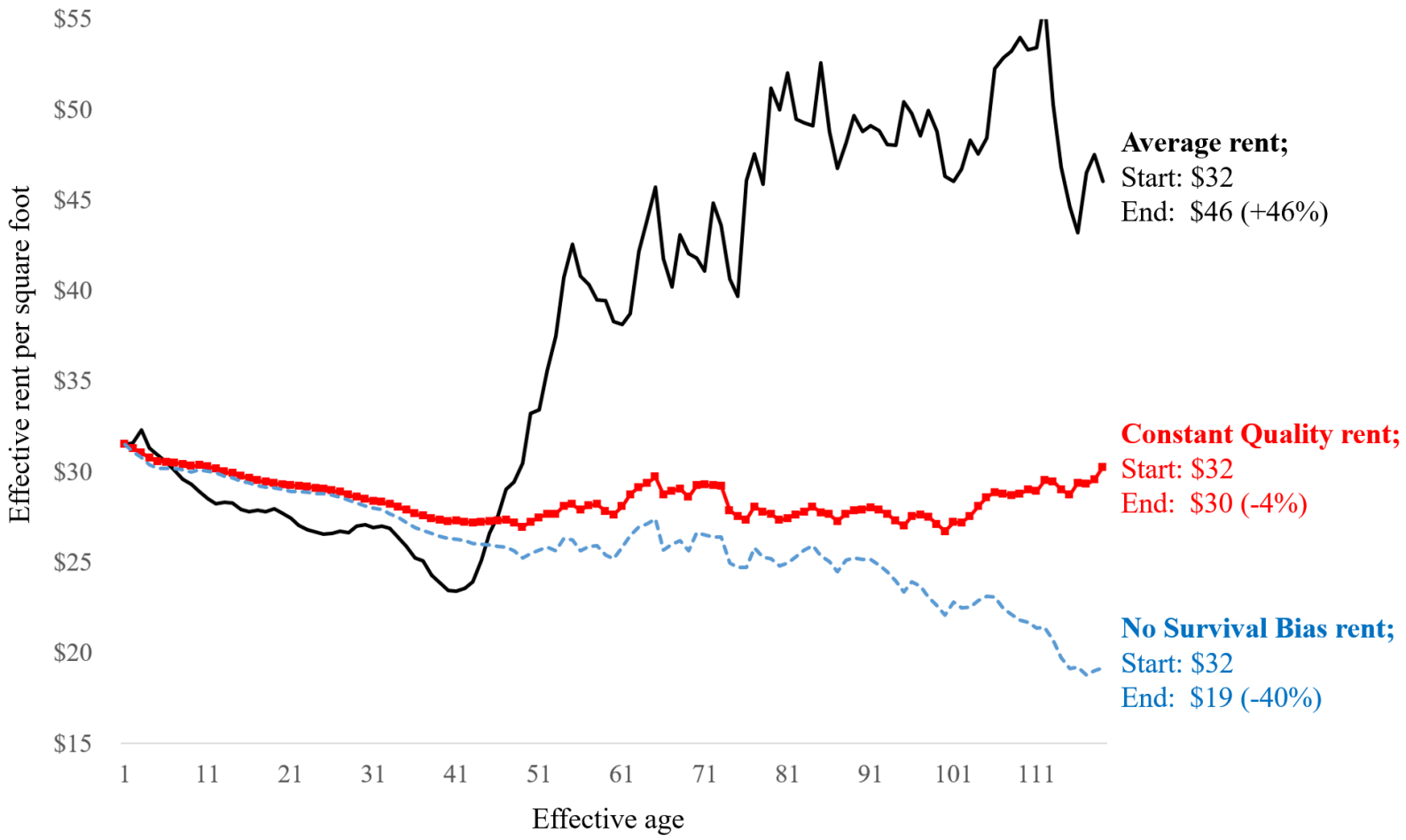


5 Depreciation of Cash Flows

- Depreciation consists of three components;
  - **Physical Deterioration**. Physical wear-and-tear of using the building.
  - **Functional Obsolescence**. Caused by changes in technology and tastes over time.
  - **External Obsolescence**. Changes in HBU can drive prices down (but also up… although never compared to its HBU).

- Related, but not depreciation;
  - **Vintage**. Certain styles that correspond with certain eras can be valued more.
  - **Survival bias**. Only the best of the best survive.

5 Depreciation of Cash Flows



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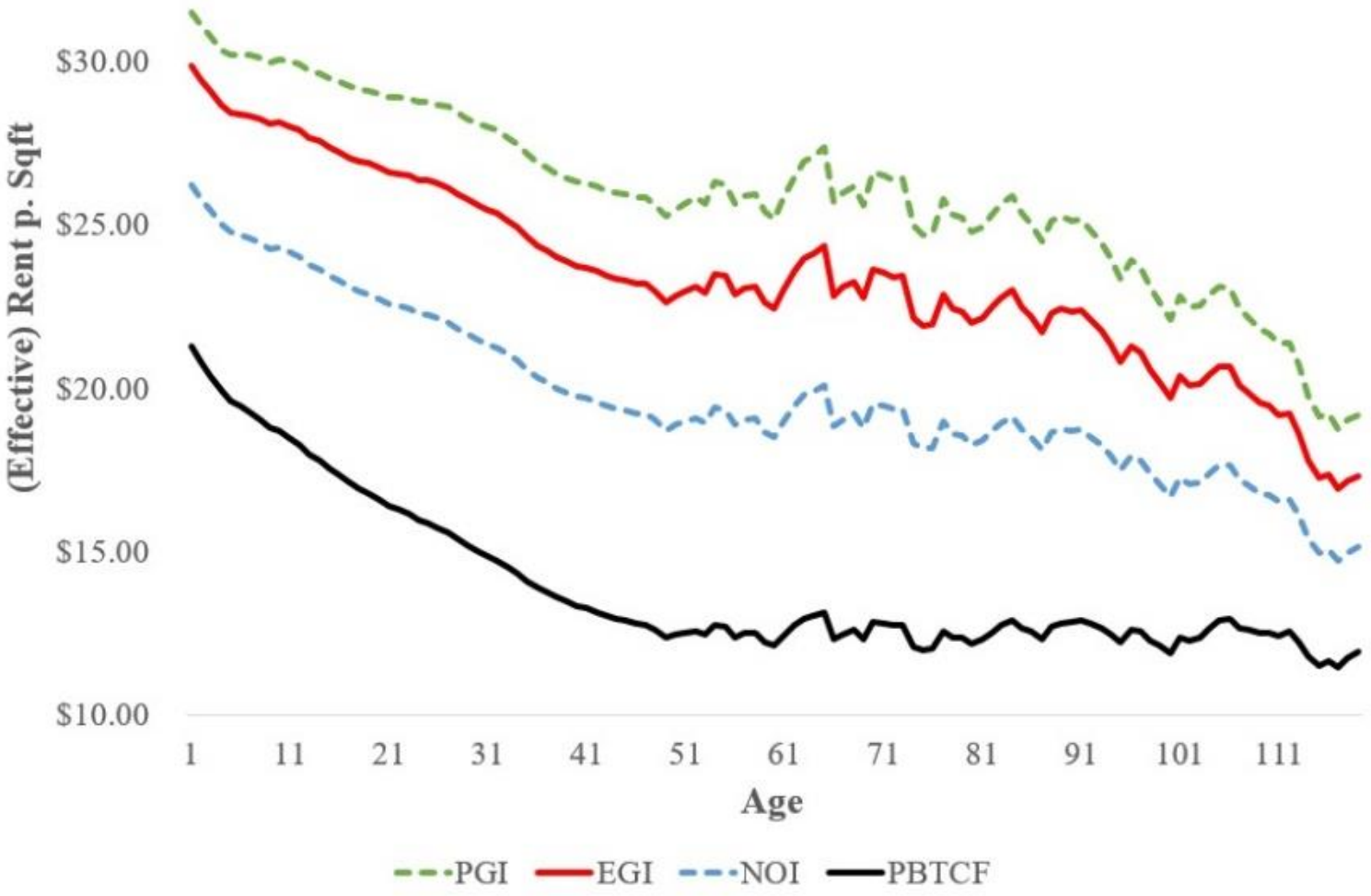

5 Depreciation of Cash Flows

- Interesting stuff, but what does any of this have to do with rental growth?
- Everything!
  - Market forecasts of rent are based on the entire market as a whole.
  - Younger properties' **cash flow** depreciates faster compared to the market, whereas very old properties' **cash flow** does not depreciate as much.

- Thus, you need to make a micro adjustment to your forecast.
- To get a sense of the depreciation, you can always do a **rent-comparable** analysis of properties that are 10 years older.

6 PGI and Vacancy

- Say our building has **three** spaces of **10,000** sqft each.
- Rental growth is predicted to be 1% annually.
- Market rent in year 1 is **$10 per square foot**.
- Thus, in normal circumstances, the PGI is $300,000 in year 1.
- However, say that space 1 has a rent of $10.50. Then, the PGI in year 1 is **$305,000**.

- Vacancy at time of renewal is calculated by;

(1 - Probability of Renewal) x Market Rent x Expected Length of Vacancy if Nonrenewal

- Typically, we multiply the market rent by 0.50 or 0.75.

6 PGI and Vacancy

	Year									
	1	2	3	4	5	6	7	8	9	10
Market Rent/SF:	$10.00	$10.10	$10.20	$10.30	$10.41	$10.51	$10.62	$10.72	$10.83	$10.94
Potential Revenue:										
Gross Rent Space 1 (10,000SF)	$105,000	$105,000	$105,000	$103,030	$103,030	$103,030	$103,030	$103,030	$108,286	$108,286
Gross Rent Space 2 (10,000SF)	$100,000	$100,000	$100,000	$100,000	$100,000	$105,101	$105,101	$105,101	$105,101	$105,101
Gross Rent Space 3 (10,000SF)	$100,000	$101,000	$101,000	$101,000	$101,000	$101,000	$106,152	$106,152	$106,152	$106,152
Total PGI	$305,000	$306,000	$306,000	$304,030	$304,030	$309,131	$314,283	$314,283	$319,539	$319,539
Vacancy allowance:										
Space 1	$0	$0	$0	$51,515	$0	$0	$0	$0	$54,143	$0
Space 2	$0	$0	$0	$0	$0	$52,551	$0	$0	$0	$0
Space 3	$100,000	$0	$0	$0	$0	$0	$53,076	$0	$0	$0
Total vacancy allowance	$100,000	$0	$0	$51,515	$0	$52,551	$53,076	$0	$54,143	$0
Total EGI	$205,000	$306,000	$306,000	$252,515	$304,030	$256,581	$261,207	$314,283	$265,396	$319,539

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Space 1: rented for "too much"

6 PGI and Vacancy

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Space 1: End Year 3 lease ends

Lease reverts back to market level

However, we might lose 50% of the income in that year, due to vacancy

6 PGI and Vacancy

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Space 1: We expect it to be rented out for another 5 years, at market rent (year 4)

6 PGI and Vacancy

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	1	2	3	4	5	6	7	8	9	10
Market Rent/SF:	$10.00	$10.10	$10.20	$10.30	$10.41	$10.51	$10.62	$10.72	$10.83	$10.94
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Space 2: rented for market rent

Space 2: runs through end of year 5

6 PGI and Vacancy

	Year									
	1	2	3	4	5	6	7	8	9	10
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Space 3 is expected to be vacant in year 1

6 PGI and Vacancy

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Space 3 is subsequently leased for 5 years

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- Remember EGI = PGI – vacancy allowance
- Typically, ARGUS® will do this for you