REAL ESTATE THEORY AND MODELLING

The Chronicles of Christophe Pineau, Senior Advisor, IEIF

INSTITUT DE L'ÉPARGNE IMMOBILIÈRE & FONCIÈRE

CHRONICLE N°19

Net operating income: indexation versus market rent over nine years - detailed analysis

For this ninth Chronicle on net operating income, and for the following Chronicles on this theme, we will make the simplifying assumption (which will be lifted later) that we are working on the case of a single-tenant building leased in part (between 0 and 100% of the building) at the initial date t_0.

As in the general case discussed in **Chronicle 17**, we will assume that the tenant has signed a standard 3/6/9 lease. He therefore has the option of renegotiating the financial terms of the lease with his current landlord every 3 years, or of terminating his lease and finding another premises to let at the current market rent. In this case, the landlord will have to find another tenant who will rent the premises at the market rent. No account will be taken of the frictional costs incurred by landlords and tenants when moving (costs of finding tenants/premises, costs of refurbishing premises/costs of moving, etc.).

We will focus our analysis on the impact on net operating income of the difference between the indexation of the running rent and the change in the market rent (no support measures, no management costs and no vacancy).

In this Chronicle, we will add the simplifying assumption that indexation and the rate of increase in market rent are constant, and we will deal only with what happens over a 9-year period. These two assumptions will be discussed and relaxed in subsequent Chronicles.

Thus, by adding the assumption of constant growth rates, the systems of equations (1) to (4) in **Chronicle 17** can be simplified and written as follows:

In this framework, in the 1st year, net operating income is equal to the market rental value (mrv) at the time the lease is signed in t_0:

$$(1)\ noi_{0,1} = mrv_0$$

with: noi : net operating income
mrv : market rental value

In the 2nd year, the net operating income is equal to the running rent for the second year, i.e. the rent for the first year plus rent indexation ($ri\%$) while on the anniversary date of the lease, the market rental value follows its own trend ($mrv\%$) in line with market tensions.

$$(2)\begin{cases} noi_{1,2} = rrent_{1,2} \\ mrv_1 = mrv_0.(1+mrv\%) \\ rrent_{1,2} = rrent_{0,1}.(1+ri\%) = mrv_0.(1+ri\%) \end{cases}$$

with: $rrent$: running rent

In the 3rd year, the same principle applies.

$$(3)\begin{cases} noi_{2,3} = rrent_{2,3} \\ mrv_2 = mrv_1.(1+mrv\%) = mrv_0.(1+mrv\%)^2 \\ rrent_{2,3} = rent_{1,2}.(1+ri) = mrv_0.(1+ri)^2 \end{cases}$$

In the 4th year, the tenant has the option of terminating the lease. He may therefore choose to leave his current premises if the market rent is lower than the running rent (which they are currently paying). In this case, the landlord will have to find another tenant who will rent the premises at the market rent. Apart from friction costs, this is equivalent to the current tenant being able to renegotiate his rent every three years.

The rental income for the 4th year can then be written as:

$$(4)\begin{cases} \boldsymbol{if}\ mrv_3 > rrent_{3,4}\ \boldsymbol{then}\ noi_{3,4} = rrent_{3,4} \\ \boldsymbol{if}\ mrv_3 < rrent_{3,4}\ \boldsymbol{then}\ noi_{3,4} = mrv_3 \\ mrv_3 = mrv_2.(1+mrv\%) = mrv_0.(1+mrv\%)^3 \\ rrent_{3,4} = rrent_{2,3}.(1+ri\%) = mrv_0.(1+ri\%)^3 \end{cases}$$

The same principle applies on each three-year anniversary from the end of the firm term of the lease.

Chronicle 18 presents the various calculations and graphical results of these situations in detail, using 3 examples.

This time we will look at the impact on the average growth rate of net operating income, calculated over 9 years, when indexation and the growth rate of the market rental value are varied between 0 and 5% in steps of 0.5%.

We will deal successively with the case of a standard 3/6/9 lease, a firm 6-year lease and a firm 9-year lease.

For a 3/6/9 lease over 9 years, applying formulae (1) to (4), here is the result in terms of the average growth rate of net operating income:

average growth rate of net operating income (noi%)

ri%											
5	1,43	1,77	2,11	2,46	2,81	3,17	3,53	3,89	4,26	4,63	5,00
4,5	1,27	1,61	1,96	2,31	2,67	3,03	3,39	3,76	4,13	4,50	4,50
4	1,11	1,46	1,81	2,17	2,53	2,89	3,26	3,63	4,00	4,00	4,00
3,5	0,96	1,31	1,67	2,03	2,39	2,76	3,13	3,50	3,50	3,50	3,50
3	0,81	1,17	1,53	1,89	2,26	2,63	3,00	3,00	3,00	3,00	3,00
2,5	0,67	1,03	1,39	1,76	2,13	2,50	2,50	2,50	2,50	2,50	2,50
2	0,53	0,89	1,26	1,63	2,00	2,00	2,00	2,00	2,00	2,00	2,00
1,5	0,39	0,76	1,13	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50
1	0,26	0,63	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
0,5	0,13	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5

mrv%

For example, if rent indexation (**ri%**) is 4% and the growth rate of the market rental value (**mrv%**) is 1.5%, then the average growth rate of net operating income is approximately 2.17%.

Clearly, when indexation is less than or equal to the growth rate in market rental value, the growth rate in rental income is equal to indexation. (blue parts)

However, **when indexation is strictly higher than the growth rate of the market rental value, then the average growth rate of net operating income is significantly lower than indexation.** (green parts)

In the case of a firm 6-year lease, taken over 9 years, applying formulae (1) to (4), here is the result in terms of the average growth rate of net operating income:

average growth rate of net operating income (noi%)

ri%											
5	1,67	1,97	2,27	2,59	2,91	3,24	3,57	3,92	4,27	4,63	5,00
4,5	1,47	1,77	2,09	2,41	2,74	3,07	3,42	3,77	4,13	4,50	4,50
4	1,27	1,59	1,91	2,24	2,57	2,92	3,27	3,63	4,00	4,00	4,00
3,5	1,09	1,41	1,74	2,07	2,42	2,77	3,13	3,50	3,50	3,50	3,50
3	0,91	1,24	1,57	1,92	2,27	2,63	3,00	3,00	3,00	3,00	3,00
2,5	0,74	1,07	1,42	1,77	2,13	2,50	2,50	2,50	2,50	2,50	2,50
2	0,57	0,92	1,27	1,63	2,00	2,00	2,00	2,00	2,00	2,00	2,00
1,5	0,42	0,77	1,13	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50
1	0,27	0,63	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
0,5	0,13	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5

mrv%

We find the same type of result but with a slight increase in the average rate, linked to the change from 3 to 6 firm years.

In the case of a firm 9-year lease, taken over 9 years, applying formulae (1) to (4), here is the result in terms of the average growth rate of net operating income:

average growth rate of net operating income (noi%)

ri%											
5	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00
4,5	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50
4	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00
3,5	3,50	3,50	3,50	3,50	3,50	3,50	3,50	3,50	3,50	3,50	3,50
3	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00
2,5	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
2	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
1,5	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50
1	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
0,5	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5

mrv%

This time, indexation protects rental income perfectly, whatever the market rental value rate. This is normal, since we are only dealing with the first 9 years and the lease is firm for 9 years. But what about 10 years or more? That's what we'll be looking at in the next Chronicle.

It should therefore be remembered that, taken over 9 years, property protects against inflation in the majority of cases, but not in all. This is not entirely the case when indexation is higher than the growth rate of the market rental value.

In this latter situation, the average growth rate of net operating income is between the indexation rate and the growth rate of the market rental value. Again in this situation, and quite logically, the longer the firm term of the lease, the higher the average net operating income growth rate at defined indexation and market rental value growth rates.

In our next Chronicle, we'll look at what happens from the tenth year onwards, when the landlord regains control and can align the rent charged with the market rental value...

These chronicles are linked to my activity at the IEIF. a Paris based think tank on real estate where I conduct research into the modelling of major property variables.
For those less familiar with property analysis. these chronicles can be a source of information and a knowledge base. For experts in the field. their purpose is to launch discussions and exchanges on the various subjects I cover.
Some of the chronicles will be based on known and familiar elements. while others will deal with research elements and present some of the results of my work.