REAL ESTATE THEORY AND MODELLING

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CHRONICLE N°10

Net operating income: an introduction

As we have seen in previous Chronicles, net operating income is a key factor in property valuation.

It is included in the initial definition of total return as part of income return (Chronicle 1):

$$(1)\ tr = ir + cr = \frac{\boldsymbol{noi}}{Pp + capex} + \left(\frac{\Delta p}{Pp + capex} - \frac{capex}{Pp + capex}\right)$$

with:
- *tr* : total return
- *ir* : income return
- *cr* : capital return/capital growth
- *noi* : net operating income
- *⊿p* : price variation
- *Pp* : purchase price including transaction costs
- *capex* : capital expenditure

It is then used in our transformation of capital return in the form of its growth rate (Chronicle 3):

$$(2)\ cr \cong (1 + \boldsymbol{\partial noi})/(1 + \partial ir) - 1 - capex\%$$

with :
- ∂noi : the growth rate of net operating income
- $\partial rdln$: the growth rate of income return
- $capex\%$: the capex rate

It is also found in the definition of the price of an asset as the discounted sum of future incomes (Chronicle 6):

$$(3)\ P_0 = \sum_{t=1}^{\infty} \frac{\boldsymbol{noi_t}}{(1+r)^t}$$

with : P_0 : the price today
noi_t : the net operating income for period t
r : the discount rate

It is finally found as the keystone of the Gordon-Shapiro model in the form of its initial value in period 1 and its growth rate imposed as constant (Chronicle 6):

$$(4)\ tr = ir_1 + \boldsymbol{g} \Leftrightarrow P_0 = \frac{\boldsymbol{noi_1}}{r - \boldsymbol{g}}$$

with : ir_1 : the initial income return
$rvln_1$: the initial net operating income
g : the growth rate of the net operating income (imposed constant)

As we can see, net operating income plays an essential role, especially in terms of its growth rate. This is why we are now going to spend several Chronicles analysing it and its growth rate.

In our first series of articles on net operating income, we will start from the simplifying assumption that we are working on a single-tenant property. We will relax this very restrictive assumption later.

The breakdown of net operating income (*noi*) into its elements, which are net rental value (*nrv*), rent indexation (*ri%*), average support measures (the average rate over the firm term of the lease) (*asm%*), management costs (*mc*) and the vacancy rate (*vac%*)/occupancy rate (*occ%*), will enable us to understand the link and distance between net operating income and rent, but also the growth rate of net operating income and the growth rate of the rent indexation index.

$$(5)\ noi = (nrv.(1+ri\%).(1-asm\%) - mc).(1-vac\%)$$

$$(6)\ noi = (nrv.(1+ri\%).(1-asm\%) - mc).(occ\%)$$

These equations will be explained and commented on extensively in forthcoming Chronicles.

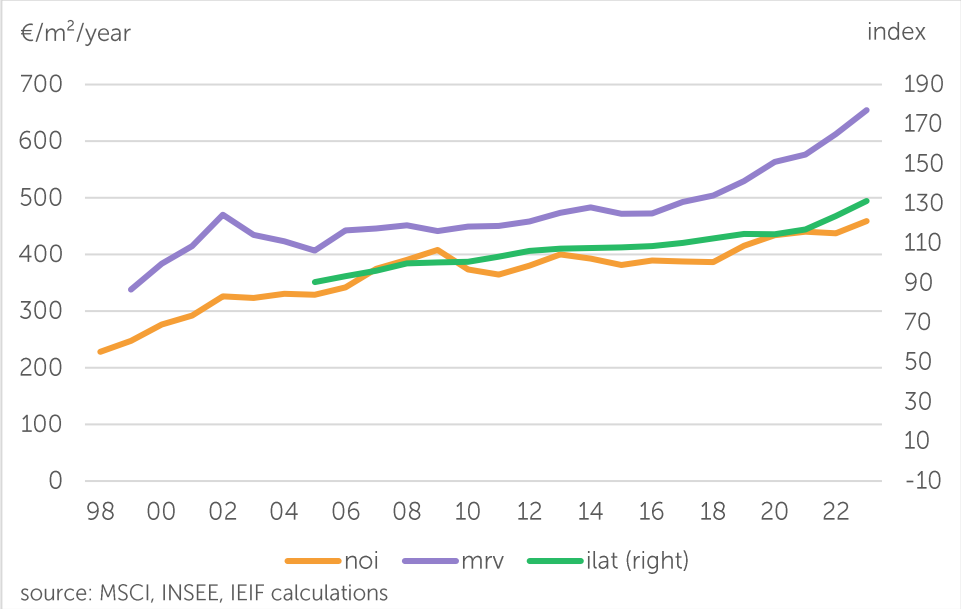
To conclude, and before getting to the core of the analysis, let's look graphically at these different series: net operating income (*noi*), market rental value (mrv) and the French office rent index (*ilat*).

As we will be using MSCI data for the Paris office market, we will be substituting the average market rent (i.e. transaction values) with the market rental value calculated by MSCI (i.e. appraisal values). I am well aware that the two series have very different characteristics, which we will analyse in a later Chronicle.

For the purposes of this first series of Chronicles on the analysis of net operating income, using the market rental value does not pose any problems. If you think otherwise, don't hesitate to mention it in your comments.

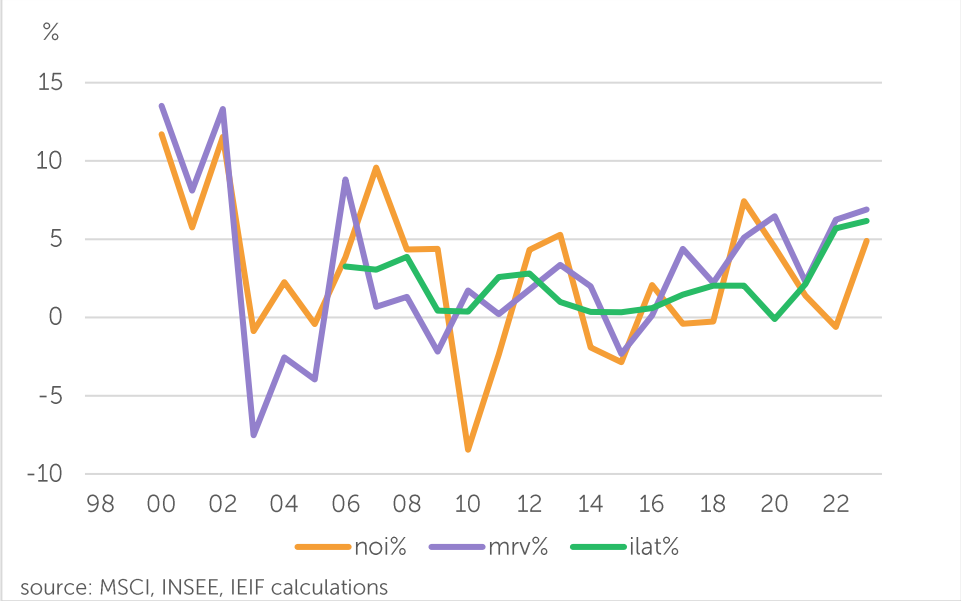
The ilat stands for "Indice des Loyers des Activités Tertiaires" (Index of rents for tertiary activities) and is used in France to index professional leases for non-commercial activities. You can find its methodology here:
https://www.insee.fr/fr/metadonnees/source/indicateur/p1641/documentation-methodologique
The series is available at this address:
https://www.insee.fr/fr/statistiques/serie/001617112#Tableau

Here are the three series in levels.



The trend in net operating income and *ilat* is very similar, while the trend in mrv sometimes diverges. Logically, the average market rental value is always higher than the average net operating income. But the gap between them varies over time.

Looking at these same series in terms of growth rates, there are certain similarities between the growth rate of net operating income and the growth rate of market rental value, especially at the beginning of the period, but there are also sometimes strong divergences.



source: MSCI, INSEE, IEIF calculations

Finally, if I examine the average geometric growth rate of the three series over their common period, between 2005 and 2023, I find that net operating income (+1.9%) and *ilat* (+2.1%) move very close together on average, while the market rental value series grows significantly faster on average (+2.7%).

As we did previously with total return, we will be analysing net operating income based on an analysis of all its components over the next few Chronicles.

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.