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Investment Analysis and Valuation in the Office Buildings Market: Back to Basics

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Abstract
The quality analysis of investments in OFFICE BUILDINGS FOR LEASING (EEL), as well as the valuation of these assets, should be treated using suitable analytical models, especially with regard to the analysis horizon and the set of variables present in the long term scenarios. Analytical models represent behavior simulation structures for evaluating an investment's capability to generate revenue and measurements derived from the model, due to their link with behavioral definition scenarios, are not suitable for working with deterministic scenarios. It is necessary to consider scenarios which EEL´s behavior fluctuate between boundaries. When investment decisions are taken in market environments in which REITs already are highly significant, this refers to investing in securities, whose income is derived from the EEL portfolio. These securities have reasonable liquidity such that the investors tend to evaluate the investment's quality based on the preceding short term, projecting mirrored scenarios of these conditions for the future, short term. The procedure is only valid in this case, because, on investing directly in property (private REITs) or deciding on a property investment (public REITs management) effects caused by fluctuations in market behavior which impact flows of available revenue should be evaluated over 20-year cycles. In a long term investment, over short cycles, the investment's quality becomes dependent on the investment's alienation value, which is a much more open variable than the behavior scenario. Evidence from the São Paulo market, using a PROTOTYPE EEL, allows us to show why analyses should be undertaken over 20-year cycles and why it is necessary to work within bounded scenarios, abandoning the idea of scenarios with deterministic behaviors, even when these take into account the possible occurrence of real estate cycles.

Keywords
Office Buildings, investment analysis, valuation.

ASSUMPTIONS

Generally, real estate investment decisions tend to be made on weak foundations, mainly because investors assume that the investment's natural protection resides in the asset's physical existence, in its low rate of depreciation and on evidence that transaction prices do not tend to alter sharply in

short cycles. Investments in office buildings for leasing are the most expressive representatives of this line of investments.
In developed markets, in which the EEL property is represented by widely dispersed investment instruments (equity REITs) with reasonable liquidity, these investments are analyzed using short and medium term horizons, because the [return x value] ratio is the most significant expression for comparing with other business opportunities and for pricing the asset. This ratio remains the main indicator of an investment's quality because the accepted argument is that, using security instruments as vehicles in their competitive market, the investments tend to have prices which fluctuate slightly, because they tend to maintain steady revenue flows.
If we consider macro-economic effects, which may affect the competitiveness of a market segment, the intended homogeneity of revenue flows over short cycles can be an advantage when interest rates tend to fall, or a disadvantage, in the opposite case. This is because leasing revenue flows do not have the same elasticity as the capital market, as they remain steady during contract cycles and may only be altered, case by case, between cycles, depending on how movement in market interest rates affects the market segment's attractiveness.
This causes dissociation between the relative quality of investment in real estate (EEL) and other assets in the market, without the existence of efficient hedge mechanisms against this asymmetry. Large investment portfolios, sheltered under REITs, even when there are rigid cycles in each leasing agreement, can hedge the investment, because the universe of properties in the portfolio contributes to re-balancing the dissociations due to the non-coincidence of individual cycles for each leasing agreement.
When the investment strategy is focused on real estate property, as is the case in private REITs in the U.S. economy (Pagliari, Scherer and Monopoli, 2005), or in economies such as the Brazilian (Rocha Lima and Tavares, 2004), in which the market is predominantly still ruled by physical fixed asset purchases, investing signifies purchasing dissociation risks for which no hedge is possible.
For this text we use these evidences: [i] – the more developed markets, in which investments are made using securities backed by large portfolios and not directly by properties, tend to analyze the quality of the investment by their short (or medium) term profitability; [ii] – the more incipient markets, in the sense that real estate property is the object of investment and the investor is directly linked to leasing agreements, should have more sophisticated means of evaluating the investments, than merely relating the rentals practiced on the market with the price of the assets, to infer the static profitability and based on this, make an investment decision; [iii] - however, considering that the investment portfolios in the developed markets can only be constituted by purchasing the EEL assets, one at a time, each investment should undergo an analysis by the portfolio's administration similar to that carried out in incipient markets.

SYSTEMS OF ANALYSIS

Considering that invest in EEL trough REIT structures has, apparently, the same pattern that invest in any type of security fund, the investigations and valuation procedures seen in the majority of studies, articles and analysis reports are supported by behavior scenarios based on the past performance, on a macro-economic point of view.
I disagree with these procedures, stressing that EEL business merits a return to the origins, in analyzing investments, going back to basics, emphasizing the formation of qualified analytical systems, under penalty of, from time to time, consolidate in steel and concrete the errors of decisions biased by an understanding that the future necessarily reflects the present or past performance.
Thus, qualified systems should be able to work with speculation on investments' performance,

using suitable quality models, processing: [i] - reference scenarios, defined in planning, to recognize the quality configuration expected for the investment, in a 20 years operational cycle ; [ii] - stressed scenarios, defined in planning, to recognize the most conservative boundaries for the investment's quality; [iii] - pursuing the objective to calculate an appropriate set of indicators, capable of illustrating the investment's quality.
Analytical systems have quality the more clearly they are able to show risks, through exploring reference and stressed scenarios. In the case of EELs, in particular, noticeable aspects are the arbitrage of occupancy rates and the price of leases, variables which should not be explored using deterministic scenarios, but sets of scenarios which produce laboratory samples to measure indicators.

THE INVESTMENT CYCLE ON A DEVELOPMENT

The analysis of an EEL investment should respect the doctrinal assumptions recommended for real estate commercial development, which begin with the indication of an operating cycle, followed by the exhaustion period.
The 20-year operating cycle, together with the collection of funds to set up the asset rejuvenate reserve, which when reinvested provide the means of supporting the development 's capacity to maintain its competitiveness in the market, maintaining a stable insertion factor, is a defined premise for the analysis. Also the routine of imposing a further 20-year exhaustion period, to establish the development's market value at the end of the operating cycle, is also known. The investor's strategy, as regards maintaining his position in the EEL, should not be confused with these two parameters.
Whatever the size of the portfolio which contains one EEL, two analytical routines should be followed: [i] – the investment should be evaluated in isolation, applying the complete operating cycle, to measure indicators which are, according to the choice of scenario at the time of analysis, intrinsic quality characteristics of the EEL, because they are measured taking into account the life of the investment and, [ii] – the investment should be evaluated in accordance with the investor's assumptions, with respect to his strategy of retaining the investment's position.
The shorter the period the investor chooses to maintain his investment, in relation to the operating cycle horizon, the more the quality of the investment will be referred to the evolution of the EEL's market value. As the arbitrage of alienation value is more vulnerable than the arbitrage of revenue flow, the earlier the goal of withdrawing from the investment, the more speculative it will be.
As in the developed markets a significant share of the EEL investment funds are held in investment securities, tradable even daily, one understands that there is a tendency to work with short analysis cycles. However, for markets where the investment are still focused on the product (the EEL) and for portfolio managers who trade EELs rather than securities, the investment's quality evaluation should necessarily be based on 20-year cycles.
Short term scenarios, when used to analyze EEL investments, are suitable for measuring revenue but not for rates of return or valuation. To measure the rate of return, the withdrawal value assumed from the investment position intensely affects the rate's level the shorter is the analysis cycle. Using a PROTOTYPE reference for the city of São Paulo, for a 5 years investment cycle, the withdrawal value supports 65% of the investment at the expected rate of return. The true withdrawal value, which will effectively be practiced, not the one calculated in the investment moment, will be determined at the end of this 5-year cycle by the scenario of expected revenue generation from then forward. At this point, the next cycle (year 6 to year 10) will be considered for valuation of the EEL, and so on. Using the PROTOTYPE, at the end of 10 years, 40% of the investment is protected by the withdrawal value at the rate of return, while the balance (60%) is

protected by the revenue flow which took place over these 10 years. At the end of 15 years, 23% of the investment will be protected by the withdrawal value and, at the end of 20 years, 13%, which is still a significant amount.
In this PROTOTYPE, at the end of the 20 years, a 9.84% rate is granted by the revenue flow and the expected rate of return, 2 points higher (11.84%), is only guaranteed if the EEL is sold at the value defined at the beginning of the 20-year cycle.
As an investment in EEL can be sustained in a competitive form for many cycles beyond 20 years, maintaining the investment, the effect of the value of the property is diluted over time. Retaining 30 years, the alienation value will have supported 4% of the investment and at 40 years, a little more than 1%.

THE STRUCTURE OF INVESTMENT-RETURN FLOW AND MEASUREMENTS WHICH RELATE THE INVESTMENT IN A DEVELOPMENT TO THE EXPECTED AVAILABLE REVENUE FLOW

An analysis of the quality of an investment in an EEL requires the development to be broken down into two successive businesses;
[i] – the first corresponds to the investment in implementation, until the EEL is ready to operate and takes place in the implementation cycle. In this cycle there is a pronounced investment risk and this operation's quality is associated with how much can be obtained as a sales price for the ready and operating development. The dealing of implementation will be attractive if the price (PRE-0) at which it is possible to sell is higher than the developer's exposure (EXP-0) at this point, calculated with an attractiveness rate that is also a market reference.
[ii] – on completion of the implementation cycle, for the developer who is building to operate, the value of his stock should be remunerated rather than the investment to produce the value. In this way, entering the operating cycle the investment should be considered as the EXP-0 value and this should be contrasted with the return flow. In the case where there is a purchase for exploitation, the investment will be PRE-0. As this text does not discuss quality in the implementation cycle, we always start the analysis with a sight investment at the beginning of the operating cycle.
Within the operating cycle, the flow of return on investment (EXP-0) is structured considering the following financial movements: the development collects the gross operating revenue (rent payments for EEL leases); the revenue resources are used to pay the operating, administration and expense accounts; from the balance, a reserve fund FRA (an asset regenerating fund) is set up; the resulting revenue flow balance is for the investor, within the concept of available (free) operating profit flow RODi.
The flow RODi, is added to the EEL value calculated for the end of the operating cycle, to comprise the investment's return flow, which will serve to measure the development's quality indicators.
EEL's value at the end of the operating cycle is calculated based on the following assumptions:
[i] – the value of the development at this stage is the price which would be paid by a risk-averse investor who invests funds at the sector's rate of attractiveness;
[ii] – this virtual investor will promote the recycling necessary for the asset to run through another 20-year cycle, an operating cycle for this second virtual investor and an exhaustion period for the original investor.
[iii] – the revenue flow in the exhaustion period will be in line with the EEL's same market insertion parameters
In this way, the value at the end of the operating cycle (VOI-20) considering a specific investment

for recycling (IR) respects the expression: $VOI20 = \frac{(Rex - IR)\cdot Rop\cdot(1+t)^{20}}{(IR - Rex) + Rop\cdot(1+t)^{20}}$,

where $Rop = \sum_{k=1}^{20} \frac{RODi_k}{(1+t)^k}$; $Rex = \sum_{k=21}^{40} \frac{RODi_k}{(1+t)^{k-20}}$; t = sector's rate of attractiveness

The investment IR is defined by evaluating the life of the different components in the building, and then estimating its replacement cost in year 20, the end of the operating cycle. In a quick analysis, VOI-20 = 70% Rex may be used, which represents a sufficiently conservative position, equivalent to recycling something in the order of 70 to 80% of the building.

The return flow for the investment (EXP-0) is represented by $\{ RODi \}_1^{20}$, added to VOI-20 at the end of the cycle. This flow is the measurement source of all the investment's quality indicators.

The most elementary indicator which is the rate of return (TR) expected over the 20-year operating cycle, will be that given by the expression $EXP0 = \frac{VOI20}{(1+TR)^{20}} + \sum_{k=1}^{20} \frac{RODi_k}{(1+TR)^k}$.

VALUATION

An investment in EEL will have its value calculated with the same routine as previously indicated, considering that the value is EXP-0 in the expression given above by replacing TR for the desired rate of return for the investment.

BEHAVIOR SCENARIOS

Behavior scenarios outline assumptions on the state of the variables which result in investment return flows for a 20-year operating cycle horizon.

The development's performance depends on systemic variables associated with operating costs and the EEL's insertion in the market.

The greatest vulnerability in EEls lies in market insertion, where variables are not susceptible to monitoring, as: [i] - competitive prices, because they are dispersed, [ii] – occupancy in the competitive segment, because it depends on the global relationship between supply and demand and the global level of economic activity; [iii] - rate of inflation, which provokes losses in revenue, as under prevailing market practices, the rental prices may only be adjusted in distinct cycle of at least one year.

An EEL investment is protected not by the stability of the property's value but by the EEL's performance in its competitive market environment. Fluctuations in occupancy tend to make the market reduce EEL valuations and this happens because of investors' tendency to consider long cycles as reflections of the short term. The consequence is that the perception of EEL's value in the market tends to vary in accordance with fluctuations, both up and down, in the capacity to generate revenue. This posture, which investors assume, is frequently copied by planners and consultants and explains what are conventionally called real estate cycles. Some researchers refer to these cycles as being of the nature of the market. I disagree, stating that cycles can occur, because in times of crisis, investors' conservative nature tends to draw behavior scenarios for the long term which reproduce present situations, and which when generalized, induce a market trend. With regard to the virtuous element of the circles – growth which ends in a flood of

uncontrolled offers, provoking crisis – these can occur as a response to the speculative frenzy present in real estate markets where the price practiced is confused with value. In general, during the virtuous cycle, the developers who build to sell, speculate on the investors more lenient attitude to risk, which leads them to purchase EELs on a false conclusion that high prices can be sustained over long cycles.

DETERMINISTIC SCENARIOS

There is no way of supporting the assumption that any market will have a stable behavior over long cycles. To the contrary, there is a great deal of evidence to support the statement that markets' behavior varies over long cycles. The real estate market fluctuates in behavior over long cycles, so that measuring quality indicators of an investment in an EEL should be based on forecasts of behavior fluctuations over 20 years. Behavior factors defined for 20 years represent an element of risk for the investment decision, because they can not be validated as reflections of the conjuncture in which they are designed, but should contain an accentuated speculative facet.

When the EEL behavior scenarios for analyzing the investment is designed the market works at a certain price level and the supply and demand relationships, measured indirectly by the occupancy rate shown by the market, serves as the point of departure for the 20-year scenario.

If it is probable that the market fluctuates within this horizon, what should be the basis for forecasting the behavior and what risk is associated with the decision based on the scenarios thus conceived?

Some scholars propose that the real estate market necessarily goes through cycles and even tried to determine the duration and interval of fluctuation in each cycle, using historical data, with the goal of designing behavior scenarios to validate investments. I envision the cycles in a different form. I do not consider that they are either characteristics of the market or that they have a deterministic cause. All markets are susceptible to speculation and the greater the delay in the effect of an unsuccessful play or the more hidden the effect of a successful one, the more difficult it is to educate the market to dampen the intensity of speculative movements. Cycles occur in any market, ultimately caused by greed for wealth and by a negative perception of risk.

Whatever scenario is designed it can only represent a 20-year trend, in the case where no macro-economic factor causes impact on the EEL market. Hence, there would be support for and confidence in a deterministic speculation for a shorter cycle than the 20 years required to make the analysis of the development's quality. This demands that building a scenario beyond the horizon in which one can detect the effects on the market (around 5 years), should be based on a foundation of speculations on the result of market reactions to the effects produced by investments within the shorter term horizon (the 5 years), apart from other macro-economic impacts, as the EEL market, in this sense, is always passive.

The evidence is that it is impossible to infer confidence in quality indicators in EEL investments produced with support from deterministic scenarios, because apart from the short cycles (around 5 years), what happens depends on the form in which the agents react to the state of the market at the formative moment of the investment decision. The scenarios for supporting the quality analysis of investments in EEL should have another formatting structure.

SCENARIOS SUPPORTED BY BOUNDARIES

Evidence of past behavior and an evaluation of the effects of the economy on the EEL segment, always allow three reference points to be drawn with a certain degree of confidence:

[i] - a conservative behavior boundary is one from which the investment becomes unattractive. In this way, recognizing the segment's attractiveness standards, a boundary is found for the virtual behavior, measured in models, which corresponds to the configuration of an acceptable extreme rate of return. A market operating on this boundary should provide a disincentive for investments, so that should demand appear later, the behavior will escape from this conservative boundary;
[ii] - an aggressive behavior boundary is one which represents a quality standard for the investment above the risks presented by the segment. Using suitable benchmarks, a quality reference above the segment's attractiveness can be established as boundary. The market will never stabilize in an aggressive position, because this would represent a paradox, but in topical situations, during a certain interval of time, the remuneration of investments in EELs can be favored;
[iii] - the reference behavior configuration is represented by an intermediate position between boundaries, associated with perceived market attractiveness.
Hence, the scenario for the 20-year operating cycle, supported by boundaries thus designed, will be any one, in which, each year, the average behavior of the EEL will be in a defined position between the boundaries. This reasoning does not conclude for determined indicators, but indicators in bands. If EXP-0 or the acquisition price PRE-0 are defined, then the rate of return and other quality indicators of the investment, such as simple payback, duration and the recovery and investment return curves will be measured or drawn in bands, with a certain degree of confidence. If the investor's rate of attractiveness for the investment is defined, then the valuation will lead to a band of values that are valid for making the investment with, naturally, the value most protected from risk being the floor of the band.

THE SIGNIFICANCE OF USING SCENARIOS SUPPORTED BY BOUNDARIES

To show the influence of the scenarios' structure on the analysis of an EEL investment, we use the PROTOTYPE references for the market in the city of São Paulo, validated for July-2005. We draw three behavior 20-year scenarios, as registered in Table 1: [i] - extremely conservative, deterministic, with an insertion into the market in five years; [ii] - even more conservative, deterministic, showing rhythmic 10-year cycles of increasing and falling occupancy rates, and [iii] - with boundaries for occupancy rates and for the leasing values.

Table 1. Occupancy rate and rental rate.

OCCUPANCY RATE

SCENARIO [**i**]

	YEAR **1**	YEAR **2**	YEAR **3**	YEAR **4**	YEAR **5** & REGIMEN
market average	65%	80%	85%	87%	90%
PROTOTYPE	65%	80%	95%	100%	100%

SCENARIO [**ii**]

	YEAR **1**	YEAR **2**	YEAR **3**	YEAR **4**	YEAR **5**	YEAR **6**	YEAR **7**	YEAR **8**	YEAR **9**	YEAR **10**	YEAR **11**
market average	**65%**	80%	85%	87%	90%	85%	81%	77%	73%	69%	**65%**
PROTOTYPE	**65%**	80%	95%	100%	100%	94%	90%	85%	81%	76%	**72%**

SCENARIO [**iii**]

	YEAR **1**	YEAR **2**	YEAR **3**	YEAR **4**	YEAR **5**	BOUNDARIES IN REGIMEN
market average	65%	80%	85%	87%	90%	
PROTOTYPE	65%	80%	95%	100%	100%	+ 0 points - 18 points

RENTAL RATE (R$ / sqm GLA)

SCENARIOS [**i**] and [**ii**]

	YEAR **1**	YEAR **2**	YEAR **3**	YEAR **4**	YEAR **5** & REGIMEN
market average	52	55	65	68	70
PROTOTYPE	44	55	65	68	70

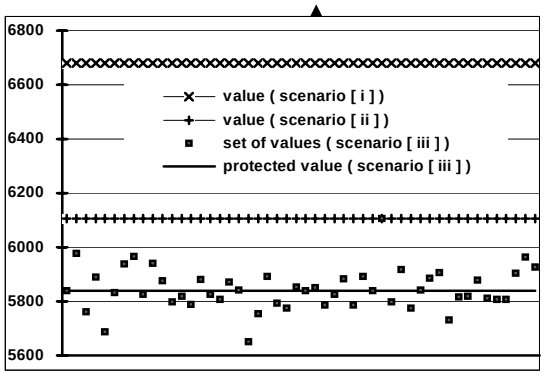
SCENARIO [**iii**]

	YEAR **1**	YEAR **2**	YEAR **3**	YEAR **4**	YEAR **5**	BOUNDARIES IN REGIMEN
market average	52	55	65	68	70	
PROTOTYPE	44	55	65	68	70	+ 4% - 12%

Internal Rate of Return. Using the July-2005 market costs to build the PROTOTYPE and a 22% wacc rate above inflation, for investments made in the implementation, we register an EXP-0 of R$ 5,106 / sqm GLA. Considering EXP-0 as investment, at the beginning of the 20-year operating cycle: [i] – the behavior of the EEL according to the deterministic scenario-[i] leads to a 13.08 % annual rate of return, effective above inflation; [ii] – according to scenario-[ii], also deterministic, 12.31%, and [iii] – working with a suitable sample of values, constructed based on the reference of fluctuations between the scenario-[iii]'s boundaries, with 90% degree of confidence, the rate of return will be situated between 11.58% and 11.60%. It should be noted that the cyclic market behavior scenario is as deterministic as scenario-[i]. The scenario-[iii] with boundaries infers much greater confidence from the information, because the only deterministic assumption is that the frontiers will not be surpassed, such that when its elasticity represents comfortable information for the investor, its use support the decision to invest with greater safety.

Valuation. Defining the rate of attractiveness at 10% per year, as the mark at which a risk-averse investor would invest in the PROTOTYPE, the value of the investment opportunity according to the scenario adopted for calculate, will be: R$ 6,680/sqm GLA with scenario-[i]'s behavior, R$ 6,106 with scenario-[ii] and R$ 5,840 with scenario-[iii].

Graphic 2. Set of Values (R$ / sqm GLA)



The value calculated under scenario-[iii] represents the floor of the confidence interval, for 90% degree of confidence. It is measured via a sample of values, each one derived from a particular behavior scenario in which, over the 20-year operating cycle, the rate of occupancy and the rent value fluctuate randomly between the scenario's boundaries. Even considering cycles, which for some researchers could represent an advance in the criterion for formatting scenarios, the defined value

represents less protection. The pure deterministic scenario necessarily represents the highest value and consequently the lowest implicit protection for the investor. Graphic 2 illustrates the different values of the sample, the boundaries and also the values associated with the deterministic scenarios.

CONCLUSION

Methods for valuation and analysis of the quality of an investment in EEL should be supported by models that are capable of exploring scenario configurations without deterministic roots. The simplification of adopting deterministic scenarios can lead to high risk investments, hidden behind the image of real estate deals being implicitly protected by the underlying assets. A long-lived underlying physical asset does not mean stable underlying physical asset value. The value of an EEL is a function of its ability to generate revenue and how this is exploited over further 20-year cycles, the scenario for sustaining this should be defined considering aggressive and conservative behavior positions, so that the defined value already includes a risk protection component.
When the analysis required refers to the quality of an investment at a certain price, the indicators should also be supported by defined scenarios within boundaries, so that the indicators are presented in intervals and not at a specific point.

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