Chapter 3
Financing

Abstract Given the substantial commitment of capital required by a real estate investment, the use of financial instruments is usually necessary. The loan involves a double cost: the first is explicit and corresponds to interest payable to the creditor, while the second is implicit, because it has to compensate for the higher investment risk arising from the use of borrowed capital. This chapter gives the necessary information in order to understand if there is a limit to the amount of financed capital able to define the advantages and disadvantages of the investment.

3.1 General Information on Financial Markets

The purchase of investment goods that require a significant financial commitment, as in the case of real estate, normally involves the use of external financing. In this case, one needs to contact a lender for a loan operation for a part (or the total) of the necessary capital. The investor will therefore have to pay interest on the amount financed. The same promoter, who wants to pursue a building transformation, often needs to borrow to deal with the high cost of production. In economic terms, it is well known that an entrepreneur differs from a capitalist: the former is the person who arranges the factors of production and assumes the technical and economic risks associated with it, while the second provides the first factors, the capital and receives the interest as compensation for the services rendered. In reality, the actual contractor can also be a capitalist (or partial capitalist). The use of financial instruments in the field of real estate is usually inevitable; the question is, whether there is a limit to the amount of capital loan defining the advantages and disadvantages of the investment. The relationship between the capital loan and equity is defined as leverage. The most widespread financing option, mainly used by families who buy homes is a mortgage.

However, the financial market is rich in possibilities for those working in the field of investment property. Companies, for example, if structured in the form of joint stock companies, can finance through the issue of shares. The choice between

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the different types of financial instruments available is never immediate and depends crucially on the type of investment, as well as the goals of those who provide and those who receive money.

Beyond these considerations, the right financing is an important factor for the success of the investment. One has to carefully consider the convenience of the loan and one has to keep in mind that over-indebtedness has, as one will see below, two fundamental implications:

- The intensification of risks;
- Rising costs.

3.2 The Leverage

A favourable financial leverage, one for which the costs associated with financing are lower than the rate of return on investment, leads to an increase on return on capital directly involved and may result in tax savings. These effects are amplified in transactions with a high degree of financial leverage. However, the advantages associated with this investment are outweighed by the danger of being greatly damaged if the leverage became minimally unfavourable. A high leverage and unfavourable financial leverage can turn an investment of modest success in to a disaster.

Examples 3.1 and 3.2 clarify these aspects.

Example 3.1 From a property, whose market value is €1.5 million the investor expects to gain an annual net operating income of €210,000 corresponding to 14 %. A financial institution is willing to finance up to the amount of 1.2 million euro compared with a repayment schedule that provides the monthly instalments (of €10,797) to be paid for the next 20 years at an annual interest rate of 9 %. The amount to be repaid annually is €129,564 (€10,797 × 12). Table 3.1 represents, in addition to the hypothesis that involves the utilization of the maximum indebtedness, assumptions relating to two other financing alternatives.

Moving on the alternative that does not provide any loan to those using higher funding, due to the annual growth of debt, it also reduces the available cash flow for the investor. Looking at the relative indices, one can observe that an increase in leverage—when the ratio of debt and the annual loan amount is less than the ratio of net operating income and the purchase price, or when the interest rate on the debt is less than the rate of return of the investment—produces an increase in the return on equity.

The leverage allows, therefore, to start investments without having all the necessary funds, to improve the return on capital employed and to take advantage of any tax benefits. Moreover, as seen in Example 3.2, it allows to

Table 3.1 Cash flows for the three alternatives of financing

	No loan	Loan of €1,000,000	Loan of €1,200,000
Net operating income	€210,000	€210,000	€210,000
Annual debt	0	−€107,964	−€129,564
Cash flow	€210,000	€102,036	€80,436
Index			
Annual debt/Loan	–	0.108	0.108
NOI/purchase price	0.140	0.140	0.140
Cash flow/Invested capital	0.140	0.204	0.268

boost the gain obtainable from the sale of a property whose value has increased during the holding period.

Example 3.2 An investor is interested in buying an agricultural land located in an area subject to rapid urban expansion. The price was set at €600,000, but he expects a quick appreciation of the soil in relation to the possible change of use (from agricultural to building). The investor provides that in 5 years the value of the land is likely to double for such change planning. At that point, the property will be sold. During the holding period, the land will be leased to a nearby farm, for a rent just enough to cover the taxes. The cash flows, net of tax, will therefore be null. There is the possibility of obtaining a loan of €450,000 for the purchase of the land. The debt, including accrued interest at an annual rate of 9 % will be paid in one instalment at the end of the fifth year.

The amount to be disbursed at the end of 5 years for the repayment of the loan is €692,381:

$$Loan_{5th} = €450{,}000 \times (1 + 0.09)^5 = €692{,}381$$

In Table 3.2 return rates of capital committed by the investor are calculated in the event he decides to finance part of the purchase, or to pay out the entire amount necessary for the transfer of ownership.

One notes that since the interest rate of the debt is less than the growth rate of the value of the property, the leverage works by amplifying the gain on the capital invested in the purchase of the land.

Table 3.2 Cash flows as a function of investment alternatives

	With loan	Without loan
Revenue from sale to the 5th year	€1,200,000	€1,200,000
Accumulated debt to the 5th year	−€692,381	€0
Cash Flow to the 5th year	€507,619	€1,200,000
Committed capital for purchase	€150,000	€600,000
Rate of return on invested capital	27.6 %	14.9 %

3.2.1 The Measure of Leverage

A favourable financial leverage is an assumption that is based on a prediction that by its nature is uncertain. If the estimates on revenue had been too optimistic and net income falls below the cost of the loan, the negative consequences of this wrong investment strategy grow proportionally with the amount of debt.

The leverage works in both directions: it can turn a good investment into a huge success but can also change quickly into an unsuccessful investment. This means that, with increasing financial exposure, the spectrum of possible outcomes is wide, and this increased dispersion around a desired outcome involves the raising of the level of risk.

The level of leverage is measured by the relationship between the equity and the total value of the properties acquired. Some of the most commonly used indices to represent this relationship are the debt-to-equity ratio, i.e. the ratio between the funds borrowed and the funds committed by the investor directly (self-financing), and the ratio between the amount of the loan and the value market of the properties being financed (loan-to-value ratio).

The second of these indices is a measure of the safety margin to guarantee the lender in the event of failure of the operation. In a possible auction of the mortgaged property, the lender expects to recover the money granted to the insolvent. The loan-to-value ratio is, therefore, an expression of the risk of being unable to cover the total amount of the loan through the sale of the asset financed.

Into investment analysis, loan-to-value ratio performs a different function: it provides a measure of the value of real estate that can be controlled with a given amount of equity employed. If, for example, the loan-to-value ratio available is 0.67, then the investor can gain control of about €3 of properties for each euro invested: $1/(1-0.67) = 3.03$.

Another useful parameter to define the risk associated with leverage is the debt coverage ratio:

$$Debt\ coverage\ ratio = \frac{Net\ Operating\ Income}{Debt\ service}$$

It is a measure of how net operating income may fall below expectations before it is insufficient to cover mortgage debt.

3.2.2 How Much Finance?

A favourable leverage magnifies gains on employed capital. However, there are limits to the amount of credit that lenders are willing to concede. The first issue to be clarified is, therefore, what is the limit. Only then, will it be necessary to establish the convenient measure of leverage.

The property's capacity to generate a high enough cash flow is, for the lenders, a guarantee of the payment of debt instalments. In this sense, the coverage ratio of debt is a security measure related to the recovery of the loan. The banks often specify a lower threshold for the coverage ratio, below which they are not willing to grant the loan. By dividing the net operating income estimated for minimum coverage ratio, one can calculate the maximum annual instalment for repayment of the loan. Finally, once the terms of the loan are known, the maximum loan obtainable is determined (Example 3.3). In addition to a minimum coverage ratio, lenders usually also establish the acceptable loan-to-value ratio maximum. The amount of funding will be determined by the most restrictive of these conditions.

Example 3.3 From a survey in the financial market, it has emerged that the minimum debt coverage ratio is 1.2. The interest charged is 9 % per annum and the loan must be repaid over a period of 20 years with constant monthly instalments. It is estimated that in the first year, the property will generate a net operating income of €400,000.

The rate of annual depreciation may not exceed €400,000/1.2 = €333,333. This means that the maximum loan that can be obtained for the purchase of the property is:

$$€333{,}333 \times \frac{(1+0.09)^{20}-1}{0{,}09 \times (1+0.09)^{20}} = €3{,}042{,}845$$

Assuming that the property has a value of €4 million and that the maximum loan-to-value ratio is 0.7, then the amount eligible for financing will be limited to 0.7 × €4 million, amounting to €2.8 million, instead of the approximately € 3 million fixed based on the index of debt coverage.

3.3 Financing Costs

The investor who uses a loan must bear a cost that depends primarily on the amount of money received. With the increase of amount financed, the lender requires higher earnings to compensate for the higher risk exposure. These can be

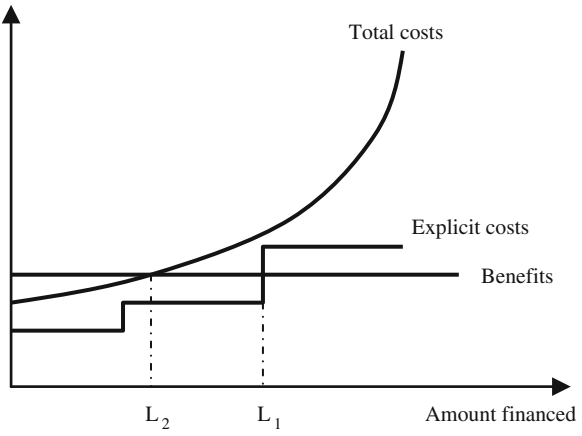

Fig. 3.1 Cost of financing

obtained through the tightening of bank fees and the interest rate charged. This results in increased explicit costs (those loaded by the creditor).

The investor should also consider the rising implicit costs, due to the need to compensate for the additional risk to the investor, linked to the use of borrowed money.

The explicit costs, as seen in Fig. 3.1, follow a pattern with jumps set to the limits of the different financing thresholds. Since the source of the funds does not affect the results of the investment, the line of expected returns assumes a horizontal trend. If the investor did not consider the financial risk (implicit costs), the lever would be pushed to point L1 where revenues are equal to explicit costs associated with the loan. This type of situation maximizes the return on equity capital.

The total cost curve also incorporates the implicit costs of uncertainty, and describes a situation closer to reality. The optimal level of funding is reduced, in this case, to L2.

The explicit costs do not end with the payment of the interest on the amount financed. In fact, the lender updates the debtor of additional costs through the imposition of bank charges, taxes to pay off the liability and the possible penalties for early repayment of the amount lent. One must distinguish between the interest that is stated in the contract (effective interest rate) and the annual percentage rate (APR). The latter represents the true cost that the borrower must pay for the use of borrowed capital, because it generally incorporates one-time charges such as front-end fees.

The additional charges reduce the amount available to the debtor at a fraction of the amount stated in the contract. The APR, therefore, is always higher than the effective interest rate. Example 3.4 clarifies this situation.

Example 3.4 An investor signs a mortgage loan of €100,000 to be repaid with constant monthly instalments over a period of 25 years. The effective interest rate is 9 %. The creditor demands a fee of the borrowings amounting to 2 % of the amount financed.

$$monthlyinstallment = C_o \times \frac{r/12 \times (1 + r/12)^{12 \times n}}{(1 + r/12)^{12 \times n} - 1} = €839.20$$

C_o = €100,000
r = 0.09
n = 25

The debtor has the availability of only €98,000:
€100,000 − (0.02 × €100,000) = €98,000
The effective interest is calculated according to the monthly payment of €839.20 and the amount of €98,000. By solving the above formula with respect to the interest rate:

$$€839.20 = €98,000 \times \frac{r_e/12 \times (1 + r_e/12)^{12 \times n}}{(1 + r_e/12)^{12 \times n} - 1}$$

One gets a monthly interest (r_e/12) of 0.77 % and an annual percentage rate $APR = r_e/12 \times 12 = 9.25$ %.
One has to refer to this rate to make comparisons between the different financing alternatives. Of course, the choice between various possibilities of loan is also based on other parameters (amount granted, the period of amortization, collateral requirements, and penalties for early refunds, etc.).

Among the factors that have greater influence on the rate of interest is inflation. The lender is induced to compensate for inflationary expectations, increasing by a few points the rate applied. This is justified by the fact that the money lent will be returned when it will have less purchasing power. Therefore, a nominal interest rate I_n is distinguished from a real interest rate Ir, calculated as follows:

$$I_r = \frac{I_n - p}{1 + p}$$

where p is the inflation rate.

In periods of low inflation (rate close to zero), it can be assumed that the denominator is close to 1, so a good approximation the formulas become:

$$I_r = I_n - p,$$
$$I_n = I_r + p.$$