Efficiency Analysis of Taking out Real Estate Loans for Profit-Making Organizations

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Abstract

This article presents modified factors to analyze efficiency of getting real estate loans by profit-making organizations. These factors make allowance for the characteristic features of real estate lending transactions such as their long-termness, and uneven stream of cash-flows. Total value of net cash return from a real estate lending transaction is typically discounted revenue, which we calculated both pretax and post-tax. Taxation is shown to exert a considerable impact on discounted revenue position. Real estate lending transaction financial leverage effect is calculated for the whole duration of the investment project, with allowance for time value of money.

Keywords: analysis, real estate loan, real estate lending efficiency, financial leverage, borrowings

1. Introduction

Economic benefits from calling for a credit on real estate and credit funds will be derived by to those organizations which invest these money means. The encumbered estate and credit object can be either the same or different.

As any other investment decision, employment of considerable amount of borrowed funds is based on economic calculation of expediency of their attraction. But there is no complex method to deal with real estate lending transactions and this issue does not receive its due attention. This determines relevance of this research, as well as theoretical and practical importance of its findings.

While estimating efficiency of obtaining a credit on real estate for investments, Russian and foreign scientists usually confine themselves to computating cash receipts from the real estate lending transaction and financial leverage effect according to the classical method. However these indexes do not make allowance for the characteristic features of real estate lending transactions such as their long-termness, and uneven cash-flow during the year.

This research aims to work out modified indexes to analyze efficiency of employing credits on property, with due regard to the characteristic features of real estate lending transactions.

2. Methods

Many scientists, including Raberto, M., A. Teglio, A. and S. Cincotti [1], Ilat, V. and W. Pontoh [2], Wellalage, N.H. and S. Locke [3], Shvab, O. [4], mention the need for an in-depth economic efficiency analysis of borrowed funds.

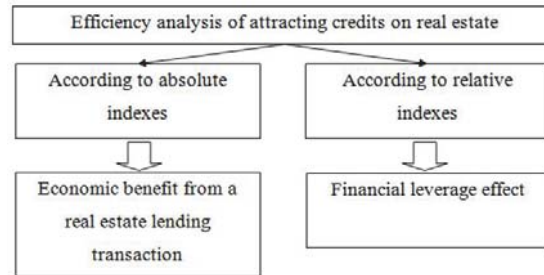To assess efficiency of employing real estate credits we can use both absolute and relative indexes (fig.1).

Fig.1. Indexes to assess efficiency of attracting real estate credits.

Economic effect from real estate lending transactions will be beneficial for the investor if net operating income from the borrower exceeds the debt expense (including principal debt repayment) and amount of owner's equity invested in the capital investment project. Net operating profit index is widely used by such scholars as Devaney, M. and W.L. Weber [5], Lu, S.-C. and X. Luo [6] to assess the return on fixed asset investments.

Net operating income is calculated as a difference between real total revenue brought by the investee, and operating expenses to manage it. That is net operating income equals to annual return from delivering production, labor and services, produced with the help of the given fixed asset, together with annual depreciation of the object. If to acquire a fixed asset the investor requires a real estate credit, than he will have additional annual expenses associated with financing terms, such as principal debt repayment and interest payment. Difference between net operating profit and debt service payment reflects the investor's net cash returns, which will present the real estate lending transaction effectiveness.

In our opinion net cash returns value for capital investment project should be calculated both yearly and totally. While calculating total project cash receipts the key method is that of cash flow discounting, which makes allowance for longevity of real estate lending transactions. Efficiency of attracting borrowed funds by the investor largely affects financial leverage, an objective factor which appears when debt funds penetrate the employed capital, and allows the company to bolster profit margins on their core capital. Financial leverage is necessarily taken into consideration while assessing optimal capital structure of a company, which is mentioned in researches by Chung, Y.P., H.S. Na and R. Smith [7], Al Shaher, T. [8], Calabrese, T.D. [9], Chod, J. and J. Zhou [10].

To evaluate increase in investor's capital gains it will be necessary to calculate financial leverage effect. The calculation methodology to be employed must take into account the specific nature of real estate lending transactions.

3. Result

Given the fact that receipts and payments associated with investment projects and real estate credit servicing are usually received during several years, and vary from year to year, we find it necessary to estimate the total effect from investments during the whole project lifecycle. If the investment project lifecycle is indefinitely long, we recommend adopting credit length as the calculation period. In so doing we should consider time element by discounting cash flows and bringing their amount to the capital investment project initiation date. The effect of a real estate lending transaction can be more accurately calculated by correcting profit tax rate. We suggest calculating pretax discount effect (DE) by the following formula:

$$DE = (1 - TR) \cdot (DP - DI) + DD - DMC - C,$$

Where
TR – is income tax rate, expressed in unit fractions;
DR – is discounted value of return on investment;
DI – is discounted sum of credit interest payment;
DD – is discounted investee depreciation amount;
DMC – is discounted loan principal repayment amount;
C – is amount of investor's equity.

When DE > 0 the effect if benefitial, i.e. the capital investment project will be profitable; when DE < 0 the effect is adverse, that is, the project will be losing.

Let us illustrate the method of calculating discounted effect from taking out a credit on real estate by the following examples.

Example 1. A company took out a real estate credit to purchase production machinery in the amount of 1.7 mln. rubles for two years at 15 % per annum. The encumbered property is the industrial building. The production machinery costs 1.9 mln. rubles. The investor steered 200 thousand rubles of his own resources to the purchase. The machinery has a useful life of five years. According to the credit contract the interest is delivered at the end of each year during the loan disbursement period, and the principal amount of the loan is repaid at the end of the loan term. The chosen discount rate for the computations is 14%.

Table 1 shows the machinery depreciation amount, estimated sum of operating surplus by years, discounted amount of net operating income, debt service payments and the discount effect of the transaction analyzed.

Table 1. Calculation of the discount effect from obtaining machinery by raising a real estate loan, rubles.

Index	Years					Total
	1st	2nd	3rd	4th	5th	
1. Present value factor	0,8772	0,7695	0,6750	0,5921	0,5194	x
2. Annual depreciation amount	380000	380000	380000	380000	380000	1900000
3. Annual discount sum (p. 2 · p. 1)	333333	292398	256489	224991	197360	1304571
4. Amount of return	200000	250000	260000	240000	230000	1180000
5. Discounted amount of return (p. 4 · p. 1)	175439	192367	175493	142099	119455	804852
6. Discounted net operating profit (p. 3 + p. 5)	508772	484765	431982	367090	316815	2109423
7. Loan interest	255000	255000	–	–	–	510000
8. Discounted loan interest (p. 7 × p. 1)	223684	196214	–	–	–	419898
9. Principal redemption	–	1700000	–	–	–	1700000
10. Discounted amount of principal redemption (p. 9 · p. 1)	–	1308095	–	–	–	1308095
11. Discounted debt service payments (p. 8 + p. 10)	223684	1504309	–	–	–	1727993
12. Own resources	–	–	–	–	–	200000
13. Pretax discount effect (p. 6 – p. 11 – p. 12)	x	x	x	x	x	181430
14. Income tax ratio	x	x	x	x	x	0,2
15. Post-tax discount effect [(1 – p. 14) · (p. 5 – p. 8) + p. 3 – p. 10 – p. 12]	x	x	x	x	x	104439

As described in Table 1, taxation exerts a significant influence on the amount of discount effect from taking out a credit on property. The pretax discount effect amounts to 181,430 rubles and post-tax – only to 104,439 rubles.

Let us consider financial leverage effect resulting from the real estate lending transaction. Financial leverage depends not only on the interest rate, loan term and credit repayment profile, but also on the fraction of fixed assets value funded with the loan. We calculate the return on owner's equity rate when employing borrowed funds for the investment project and compare it with the project profitability when funded without raising a loan. To assess various financing options the following formula for counting financial leverage effect is typically used.

$$EFL = (1 - TR) \cdot (R - IR) \cdot (MC / C),$$

Where

EFL - is financial leverage effect, which consists in return on equity increase, %;

IR – is real estate loan interest rate;

MC – is real estate credit value;

R – return on the investment, made by using a loan:

$$R = P / CIP \cdot 100 \%,$$

Where

P – is pretax profit from investment;

CIP – is price tag for the investment project.

The above mentioned financial leverage effect formula consists of the following three basic elements: tax corrector, financial leverage differential, debt-to-equity ratio [11]. They are shown in Figure 2.
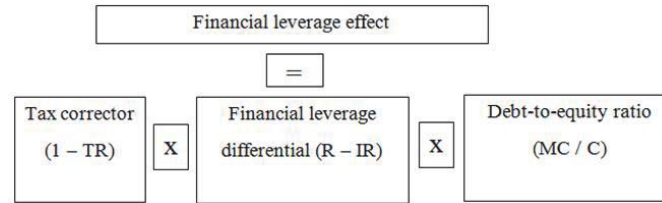
Fig.2. Elements needed to calculate financial leverage effect

When calculating financial leverage from a real estate lending transaction, tax corrector and debt-to-equity ratio are comparatively stable variables, but financial leverage differential is a highly dynamic one. This results from instability of income from the investee and changes in credit interest rates (for rescheduled real estate loans).

This being so, financial leverage effect can vary from year to year, from favorable to unfavorable one. That is the reason why it is important for the investor to specify financial leverage effect during the whole period of the investment project life cycle. In this connection we recommend transforming the formula for calculating financial leverage as follows:

$EFL = (1 − TR) \cdot [(DNOI − CIP) / CIP − (DDSP − MC) / MC] \cdot (MC / C) \cdot 100 \%,$

Where

DNOI – is discounted net operating profit;

DDSP – is discounted debt service payment.

Let us illustrate the method to calculate financial leverage effect for the whole investment period of the investor's share of the investee's profit.

Example 2. We will combine the data given in the first example and the calculation data in Table 1. Financial leverage effect calculation is presented in Table 2.

Table 2. Financial leverage effect evaluation

Index	Index equation	Expected value
Tax corrector	1 − 0,2	0,8
Financial leverage differential	(2 109 423 − 1 900 000) / 1 900 000 − − (1 727 993 − 1 700 000) / 1 700 000 = = 0,1102 − 0,0165	0,0937
Debt-to-equity ratio	1 700 000 / 200 000	8,5
Financial leverage effect, %	0,8 · 0,0937 · 8,5 · 100	63,72

The calculations testify that taking out a real estate credit to purchase machinery will increase the rate of return on equity capital, invested in the project, at the rate of 63,72 % for the whole crediting period, as compared to return on equity when employing own resources only.

Such a financial leverage effect calculation makes it possible to estimate increment in investor's equity profit, due to attracting a real estate loan to finance an investment project, during the whole credit term, with allowances made for irregular distribution of cash receipts from the project by years.

4. Conclusion

The factors offered to analyze effectiveness of taking out a credit on real estate, i.e. post-tax discount effect, and financial leverage effect during the whole investment project period, make it possible to pay due regard to such significant features in real estate lending transactions as their longevity and irregularity of cash-flow from period to period.

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