ANALYZING LOAN ALTERNATIVES THROUGH SPREADSHEET MODELING

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ABSTRACT

Real estate investors, brokers, agents and business consultants regularly face financing alternatives that contain a variety of complex variables. Although electronic spreadsheet programs are well equipped to handle the required computational difficulties, the formulation of basic loan comparison problems must be carefully considered. The purpose of this paper is to look at a powerful yet simple means to evaluate financing alternatives. Detailed instructions are provided to allow the reader to replicate an Excel spreadsheet model that will provide a powerful tool which can be used when comparing alternative financing arrangements. Key Words: loan analysis; modeling; spreadsheet.

INTRODUCTION

The prudent investor considers all reasonably available alternatives when evaluating investment decisions. Real estate investors must be prepared to make comparisons between the financing alternatives available to them. There are three classic comparison problems: a) comparing unlike mortgages, where the mortgage amounts, term, points and bank charges may differ; b) the refinancing, and c) the loan assumption problem.

These problems are part of the class of problems known as mutually exclusive investments. If two investments are mutually exclusive be they a machine or a financing alternative, then investing in one means rejecting the other. The problem is, given mutually exclusive investments, which investment should be chosen? The solution to this question involves calculating either the internal rate of return (IRR) or the net present value (NPV) of the project. An issue develops however, when the IRR and NPV methodologies result in a conflicting decision. That is, the IRR suggests the selection of project E while the NPV suggests the selection of project D.

Uniformly, corporate finance textbooks use the mutually exclusive investment problem as proof positive that the NPV methodology always provides the "correct answer" and that the IRR methodology is therefore inferior. Unfortunately for such pronouncements, analysts prefer to talk in terms of rates of return rather than dollars of net present value. In particular, real estate mortgage decisions universally refer to rates of interest/return rather than NPV.

It is important to observe, especially with respect to real estate mortgage decisions, a marginal analysis application of the IRR methodology will result in the same investment selection as the NPV.

The purpose of this paper is to present a spreadsheet model that will aid the real estate investor in creating, where applicable, marginal analysis when comparing loan alternatives that are mutually exclusive investment vehicles. Detailed instructions are provided to allow the reader to replicate the model. Numerous examples are also provided that demonstrate some of the model's capabilities. We should also note that the creation of this model, is a useful learning experience for students in real estate

classes, since various components of real estate analysis and basic present value concepts must be mastered in order to create the model.

THE MODEL

Typically, borrowing alternatives are compared to determine which is the most advantageous under a variety of possible assumptions. The model described in this paper allows the financial consultant, investor or client to compare loans with differing attributes including: interest rates, holding periods, prepayment penalties, loan origination fees and bank charges, to name a few.

The model was prepared using Microsoft Excel 2003 and works perfectly well in Excel 2007, but the approach and formulation would be similar under most modern spreadsheet programs. Since the formulas for each cell are shown, it should be a simple matter to apply comparable formulas for other spreadsheet applications to achieve similar results. While it is true that the analysis could be performed on a good financial calculator, the process would be more time consuming and the results would be piecemeal. If multiple variations or analyses are contemplated, the advantage of the spreadsheet approach over the calculator approach is significantly magnified.

One aspect of the model is the reliance on NPV to calculate the marginal internal rate of return or alternatively the crossover rate of return. The Excel IRR function can be used to solve for the crossover rate in our simple example. However in the world of mortgage comparison, where mortgages have different terms, rates and other costs, a general model where the IRR function can be consistently used is difficult if not impossible to create. Alternatively, by observing that at the crossover rate the NPV of two mutually exclusive projects will be identical, we can by trial and error, discover a rate that will cause the NPVs to be equal. Excel's solver function is ideal for this situation and it is possible to create a general model that will work across a large number of different values for the critical variables in the model.

ADAPTATION TO THREE PAGES

The full version of this paper contains a detailed explanation of the construction and use of the Excel spreadsheet model accompanied by figures illustrating the completed model. The model is then applied to several typical loan analysis scenarios. For example, a situation is presented analyzing a refinancing option. The example supports the benefits of refinancing when the loans are held to maturity. The example is then extended to determine if the refinancing is still a good decision if the holding period of the loan is shortened to two years. The holding period is further examined to determine the break-even holding period for the refinancing option to look attractive. The examples briefly described here along with several other examples are described and illustrated in the full version of the papers.