

UTILITY OF NET PRESENT VALUE (NPV) FOR FIRMS IN TODAY'S ECONOMY

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Abstract

In last forty or so years firms made use, in their pursuit of building their investment decisions around a quantitative approach, of such an model – and respective index – as internal rate of return (IRR), and, of course, of its main derivative products of basic IRR model, such as financial IRR (FIRR), economic IRR(EIRR), sqq. This being said, quantifying a rate of return for any investment project is, at least sometimes, not enough; in such cases, there is still a pressing need to compute net present value of investment projects, and not only for the sake of investment strategy, but in the benefit of general development strategy of a firm.

Keywords: *net present value, rate of return, investment.*

JEL classification: D81, E22, G31, L25.

1. Introduction

In our times, market economies are constantly – through diligence of their administrations – fighting off distortions and all pitfalls that can be possibly imagined, not to mention the aftereffects of 2008 economic and financial crisis; but, if economies themselves fare more or less satisfactorily, firms, being, as they are, in a far less dominant position as to economic environment and (toxic or simply unfavorable) influences, are, in comparative terms, pushed to the wall – save for a number of instruments they can use, some of them designed for rational management of firm itself, some for rational management of firm's projects.

In first case, financial structure can be considered an instrument in its own right; for, in second case, Net Present Value (NPV) *index* – and *not* IRR or (its) derivative indexes – is an instrument *whose* very existence, arguably, is more or less built *around* financial structure.

Dynamics of determining factors of financial structure is, verily, directly linked to very conceiving of NPV index, given investment process is, usually, one designed and implemented on a multi-annual basis, with the result it can be analyzed in an adequate manner using *any* mathematical instrument able to compute, the *actual* value of an investment project:

- a) whose application *begins* in present
- b) which will be completed in a moment in *future*, after several years will have past.

Estimating actual value is essential for firm's management, which needs to take decisions regarding the *choice* of investing its financial funds in a *specific* investment

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project – i.e. one firm will be sure to benefit from – fully aware of circumstances and variables one must take into account *before* actually investing anything. As NPV index measures size of *net* present value of a project, it is an adequate tool for firm's management.

The technique of NPV use comprises following stages:

- I. the *value* of NPV is computed, using NPV formula and data regarding the specific investment project (where r stands for interest rate¹ – as (reasonable)² approximation of *discount rate*, PV for size of present value, B for benefits produced by investment project, C for costs generated by same project and t , respectively T number of years in which firms *must* bear costs, respectively receive benefits)³:

$$NPV = PV_B - PV_C \Leftrightarrow$$

$$\Leftrightarrow NPV = \left[\frac{B_1}{(1+r)^{t+1}} + \dots + \frac{B_T}{(1+r)^T} \right] - \left[\frac{C_1}{(1+r)^1} + \dots + \frac{C_t}{(1+r)^t} \right].$$

- II. Decision of investing firm's financial funds in a specific investment project is taken once calculus reveals that, for respective project, $NPV > 0$.

All this might just sound straightforward enough, but, at the end of the day, NPV's *utility* can only be ascertained after sifting all of available knowledge concerning NPV index. For, in first place, even NPV's formula – determined, in objective terms, by 'average' *dynamics* of an investment project – sound, if perfectible, is worth, in fact an inspection.

We observe, as for NPV – e.g., for *design* of NPV's formula –, a couple of non-negligible methodological constraints an investment strategy must put up with, namely⁴:

- (a) costs appear at the beginning *physical* process of investment starts to unfold, and respectively are recorded *until* the moment of *materialization* proper of investment project;
- (b) benefits are recorded *from that very moment* of *materialization* proper of investment project, for a number of periods (e.g., years), until material object(s) which constituted the object of investment projects are spent.

2. Content

Economic principles used to construct NPV model – and index – can reliably be used for describing 'average', so to speak, dynamics of economic projects; it is reliable enough, at least, to make possible for us to observe – and underline – an undeniable fact, namely NPV design, respectively the concepts which brought forth this index present a number of weak points, that is, a simplified – in more than one point – model of reality, for whose correction, should be added, more complex economic and mathematic instruments, such and IRR, were developed.

¹Maddala, G.S., Miller, E. (1989), p. 565.

²For computation of NPV –as far as a *typical* firm's investment projects are concerned.

³Cf. Maddala, G.S., Miller, E. (1989), p. 567.

⁴Ibid.

From this perspective, NPV is computed for quantification of investment performances of a firm *supposed* to function in an economic environment in which⁵:

- 1) uncertainty regarding existence and (dynamic) coherence of cash flows, in principle, negligible – and, in practice, non-existent;
- 2) the investor can make use *in perpetuum* of *borrowed* financing sources, e.g. must take into account it will support (negligible) costs – also in principle.

NPV concept starts from a premise – a rather important one – for actually estimating practical ‘value’ of this concept, namely that the value of NPV index is *positive* on behalf, not that much a *conscientiously* efficient use (made possible through the will of firm’s management) of, but merely the ‘simple’ *existence* and dynamics of:

1. cash-flows (e.g., of costs and benefits) whose emergence – *as result* of investment project – and, respectively, levels is predicted;
2. **opportunity cost of capital** – type of cost whose dynamics determines actual value of NPV, entered into NPV formula as (average) interest rate (e.g., interest rate granted for bank deposits).

As for opportunity cost, it must be underlined its being *identical*, from an economic and financial perspective, to discount rate, given fact computation of (net) *present* value of an investment project implies identification of opportunity cost of capital with *unit of measure* of firm’s efforts and results, namely:

- (a) *unitary cost* – as for costs’ perspective
- (b) *unitary revenue*⁶ – as for revenues’ perspective.

The effective and conscientious use of entities named above by firms is, in fact, taken for granted, as NPV theory *assumes* the fact efficiency of putting together investment project is *independent* of⁷:

- a. intentions (from investment perspective) of firm’s management;
- b. procedures used by firm’s management;
- c. firm’s own accounting methods and procedures;
- d. overall *actual* profitability of firm – if it own subsidiaries, etc.
- e. quality of *other* investment projects undertook by firm.

From the specific angle of this analysis, NPV index is fruitful, that is it is often effective, but by no means is it perfect; especially, dynamics of determining factors of financial structure, at macroeconomic level, is neither always *recorded* accurately, nor is it, in principle, absurd respective dynamics turns out to have been – in all its details – simply overlooked.

⁵Maddala, G.S., Miller, E. (1989), p. 569.

⁶This is the result of the fact underlying premise of determining (computing) *future* (net) value of firm’s output is identical to fundamental premise (equation) of quantifying *present* value of firm, namely *Marginal revenue = Marginal cost*.

⁷Brealey, R.A., Myers, S.C., Allen, F. (2014), pp. 109-110.

Thus:

- (I) on one hand, NPV index does *not* take into account any firm's vital need to (drastically) reduce its own expenses, inclusively investment related expenses;
- (II) furthermore, what can be denoted as *NPV rule* – according to which *any* investment project can be financed (until its completion) as long as $NPV > 0$ is a condition true for that project – *does not* conceive *an* investment project as an entity which takes second place to the need to provide for firm's **long-term** financial needs, from which perspective firm's development *strategy* takes into account the multi-year planning of investment process.

This detail is important, firstly because from strategic orientation of investment planning firm's management derives another type of planning, namely employment of (investment) financing sources made up of *own* (financial) funds, respectively drawing/maintaining financial sources made up of *borrowed* funds sufficient for firm to attain its (main) goals (inclusive of investment goals).

- (III) from the same perspective, firm's management will face, at least sometimes, difficulties, as regards enforcing corporate governance in firm and for its sake, if, in order to conscientiously choose what investment projects are eligible for financing and – ultimately – completion management will use nothing *else* – or more – than NPV; for, a basic principle of corporate governance is that, *to all intents and purposes*, the main goal of firm is **attaining its objectives, in long term**.

All in all, any firm's quandary concerning its investment policy/strategy is reduced to it not being able – at least, not always – to choose between bolstering and expanding its activities and influence on the market –which, as for the latter, requires *extensive* development, usually obtained through implementing ever-larger investment projects, or, at any rate, ever *more* investment projects – of any size. The *wishes* of any firm's owners, usually, focus on earning more, with or without *building* (e.g. firm's activities) more.

On the other hand, however, whilst investing more, or wishing it, does not always means *earning* more, earning *more* is simply impossible in absence of a development *of some kind* of firm, and the *concept* – at least – of corporate governance is that firm's management must manage firm's activities either taking into account owner's (**short-term**) agendas or *countering them*, if need be.

- (IV) For large-sized firms, which tend to be, or want to consolidate in their market role of *oligopolies*, NPV cannot be used but as a first approximation – as to its use for quantifying *benefits* (whatever they might take the appearance of) investment projects can yield; especially, NPV is in a sticky spot once it is needed to make clear(er):
 - a. neither a – or *any* – rise in sales volume, brought forth by completion of investment project and
 - b. nor – apart from basic evaluation (of) – *global* rise of firm's profits – i.e., not only of any of its subsidiaries, branches, etc. whose task is, at some point, implementation of an investment project.

3. Conclusions

It is worth underscoring – and, at least on equal footing, *understanding* – NPV (both its concept and related index) is not complex (or ‘subtle’) *enough* so that to be able to precisely ‘oversee’ dynamics of financing a firm, at least not its *short-term* component.

This dynamics, often utterly important for firm’s achievement of (or consolidation in) place of *dominant firm* on the market (achievement, as it is, *financed* – through use of financial structure for e.g. completion of investment project), as long as it is – or, it can be – used *intensively*, is outside NPV grasp, since NPV’s methodology does not distinguishes between short-term and long-term financing (e.g., financial sources), not even been designed for this purpose.

Finally, a *positive* NPV is useful, but not sufficient for management’s need of accurately pinpointing *quality* of an investment project; if and when value of NPV is on the rise, successive to an errant evolution of firm’s *profitability* (i.e. a series of negative yields follows one of positive yields, or *vice versa*), a decision could be taken as to financing a certain investment project only if quantified value of project’s IRR – one smaller than that of capital’s opportunity cost – is also computed.

4. Acknowledgements

This work was supported by the project “Studii doctorale și postdoctorale Orizont 2020: promovarea interesului național prin excelență, competitivitate și responsabilitate în cercetarea științifică fundamentală și aplicată românească” co-funded from the European Social Fund through the Development of Human Resources Operational Programme 2007-2013, contract POSDRU/159/1.5/S/140106.

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