

## THE MARGINAL EFFICIENCY OF CAPITAL: REJOINDER

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*ABSTRACT:* This paper is a rejoinder to “The Marginal Efficiency of Capital: Comment” by Lucas M. Engelhardt. What Engelhardt calculates in his comment is not the Marginal Efficiency of Capital. Engelhardt incorrectly ranks investment projects by Present Value instead of Net Present Value. Engelhardt does not prove that Keynes has a wealth maximizing theory of investment, so his comment is not a successful defense of Keynes’s theory.

*KEYWORDS:* John Maynard Keynes, marginal efficiency of capital, net present value

*JEL CLASSIFICATION:* E12, E22, E52, E58

### INTRODUCTION

This paper is a rejoinder to “The Marginal Efficiency of Capital: Comment” by Lucas M. Engelhardt. Engelhardt attempts to show that Keynes’s Marginal Efficiency of Capital (MEC) and the Net Present Value (NPV) always give identical rankings if factor prices are flexible. Engelhardt is unsuccessful. Therefore,

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Engelhardt does not prove that Keynes has a wealth maximizing theory of investment.

## ENGELHARDT'S EXAMPLE

Engelhardt uses an example to illustrate that Keynes's MEC and the NPV always give identical rankings if factor prices are flexible. However, his example is problematic. What Engelhardt (p. 522) represents as the MEC is not Keynes's MEC. Engelhardt calculates something much different: "I assume that the project's startup cost is equal to the greater of the two present values. Then I calculate the interest rate that would be required to make the Net Present Value of each project zero" (Engelhardt, p. 521). This is not the definition of the MEC. Keynes's MEC is the "rate of discount which would make the present value... equal to *its* supply price" (Keynes, p. 135 emphasis added). The calculation of Keynes's MEC does not involve two investment projects. Keynes's MEC only involves one project, but Engelhardt's calculation involves two projects. Since Engelhardt does not use Keynes's MEC, he does not prove that the NPV and Keynes's MEC always give identical results if factor prices are flexible.

In table 1 of his comment, Engelhardt (p. 521) incorrectly ranks investment projects according to the Present Value (PV) instead of the Net Present Value (NPV): "we calculate the Present Values (not the Net Present Values)... Fuller's NPV was really just present value, but subtracting an arbitrary constant" (Engelhardt, p. 520). This is a fundamental error. Investors do not rank projects by PV. Investors rank projects by NPV. The NPV is the investor's entrepreneurial profit, and "business always tends to adopt those practices and that scale of activity which maximize profits" (Rothbard, p. 1118). According to Mises (1922, p. 119),

the motive force of the whole process which gives rise to market prices for the factors of production is the ceaseless search on the part of the capitalists and the entrepreneurs to maximize their profits by serving the consumers' wishes.... It is only the prospect of profit which directs production into those channels in which the demands of the consumer are best satisfied at least cost.

Engelhardt's Internal Rate of Return (IRR) rankings are identical to his PV rankings. However, PV rankings are not wealth maximizing

rankings. Therefore, Engelhardt's IRR rankings are not wealth maximizing. Even if Keynes had used Engelhardt's IRR, his theory would still be flawed. Engelhardt's IRR is not a substitute for the NPV or Keynes's MEC. Engelhardt does not clarify the difference between the Austrian and Keynesian approaches to economic calculation because he does not use the NPV or Keynes's MEC.

## CLARIFICATIONS

According to Engelhardt (p. 520), "the result that the two approaches result in different rankings will only hold if factor prices are held constant." This is not true, and Fuller (p. 393) does not assume that factor prices are constant to show that the MEC contradicts the NPV. Economic calculation must take place at a certain point in time. Balance sheets and NPV calculations "describe as well as possible the state of affairs at an arbitrarily chosen instant while life and action go on and do not stop" (Mises, 1949, p. 215). Prices are always changing, but the investor must use *current* market prices at the time he is ranking projects. Given factor prices at the time of economic calculation, Keynes's MEC contradicts the NPV when the interest rate is below the crossover rate. Factor prices can change in the future, but what matters is that the MEC contradicted the NPV at the time of the investor's economic calculation.

Engelhardt does not distinguish between independent projects and mutually exclusive projects. This is clear in table 3 of his comment. Engelhardt (p. 523) says, "if the interest rate is less than 23.38 percent, then both Project 1 and Project 2 are undertaken." Engelhardt does not realize that he is dealing with mutually exclusive projects. According to Mises (1949, p. 694), "there is the embarrassing multitude of producers' goods and the infinite variety of procedures that can be resorted to for manufacturing definite consumers' goods." Furthermore,

it can very easily be decided which kind and what number of consumption goods should be produced. No one has ever denied that. But once this decision has been made, there still remains the problem of ascertaining how the existing means of production can be used most effectively to produce these goods in question. In order to solve this problem it is necessary that there should be economic calculation (Mises, 1922, p. 123)

The wooden bridge and the steel bridge are mutually exclusive projects. The investor-entrepreneur can only build one bridge. He cannot build both bridges in the same place. The investor in Fuller (p. 385) uses the NPV to decide which bridge to build. It is not a simple accept or reject decision as Engelhardt (p. 522) suggests. Engelhardt's example in table 3 does not prove that the MEC and NPV give identical results because Engelhardt does not distinguish between independent and mutually exclusive projects.

## CONCLUSION

Fuller (p. 393) shows that Keynes has a flawed theory of investment. To Keynes, investment is the fundamental problem with the free market economy: "The weakness of the inducement to invest has been at all times the key to the economic problem" (Keynes, pp. 347–348). Keynes's theory of investment is absolutely essential to his critique of Say's Law and the free market economy. According to Alvin Hansen (p. 34),

The slope of the consumption function... is indeed a necessary pillar for the overthrow of Say's law. But it is not sufficient. In addition, it must also be shown that there is no reason to suppose that the price system will operate in a manner so that investment outlays will automatically tend to fill the ever-widening gap, in absolute terms, between consumption and output.

Keynes's critique of the free market economy is problematic because Keynes's theory of investment is flawed. Moreover, since the MEC is not a wealth maximizing theory of investment, the MEC rules out the Austrian Business Cycle Theory.

One great advantage of Roger Garrison's capital-based framework is that it is a comparative framework. It can be used to compare the Austrian theory with Keynes's theory. However, there is no place for the individual entrepreneur conducting economic calculation in the capital-based framework. The NPV diagram injects the individual entrepreneur into the capital-based framework. The NPV diagram is also a comparative framework that can be used to compare the Austrian theory and Keynes's theory. The NPV diagram shows that "Keynes's internal rate of return [MEC] did not give an investment demand function according

to the maximum present wealth criterion of choice by investors” (Alchian, p. 941). The NPV diagram illustrates that Keynes’s critique of the free market economy is problematic because Keynes had a flawed theory of investment. Engelhardt does not prove that Keynes has a wealth maximizing theory of investment. Engelhardt has not successfully defended Keynes’s theory.

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