

## CAN IT WAIT? A REAL OPTIONS VALUATION APPROACH TO EVALUATING NON-FUNGIBLE TOKEN BASED PROJECTS

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[dx.doi.org/10.18374/JABE-23-4.4](https://dx.doi.org/10.18374/JABE-23-4.4)

### ABSTRACT

*NFT-based projects, while being risky, represent great business opportunities for existing businesses and start-ups. In this paper, we propose the use of the Real Options Valuation (ROV) method in evaluating their investment decisions, in which flexibility is defined as the capability to wait for making the investment. The real option model is developed under the assumption that the opportunity to invest is available for a limited time horizon. The resulting partial differential equation for the value of the option to wait can be solved through a convenient approximation that computes the ratio between project value and investment costs. Using several numerical examples, this paper examines how the input parameters entering the valuation model affect the value of its outputs: the value of the flexibility to invest and the ratio at which investment decision becomes optimal. Unlike in a static Net Present Value decision, the examples based on the ROV method show that the ratio of the project value to the investment cost must be substantial to justify the investment. In our hypothetical examples, the initial ratio between project value and investment cost, their respective volatility, and the time horizon have a great influence on the decision to invest.*

**Keywords:** Non-Fungible Token, real options valuation, option to wait

### 1. INTRODUCTION

Over the last few decades, we have witnessed many innovative business models driven by emerging information and communications technologies (ICTs). For instance, the Internet and the World Wide Web are the technologies that enabled e-commerce businesses in the late 1990s, transforming the retailing industry since then. More recently, the pervasive adoption of smartphones in the 2010s has driven the development of sharing economy, such as ride hailing and social media platforms. For startups and existing businesses, the ICT-driven innovations represent many opportunities for them to grow business in existing or emerging markets. In addition, some innovations impose disruptive forces on the existing business landscape. As such, the decisions regarding whether to make investments on ICT-driven innovations have become strategic from many perspectives.

Non-fungible token (NFT) is an emerging innovation that has attracted attention from many entrepreneurs and businesses. A NFT is a unique digital identifier that cannot be copied, substituted, or subdivided. Once created, a token is recorded in a blockchain, which itself is a relatively new technology for storing digital contents in a decentralized way. NFTs typically contain references to digital files such as photos, videos, and audio. The ownership of an NFT is recorded in the blockchain and can be transferred by the owner, allowing NFTs to be sold and traded. The NFT market grew dramatically from \$82 million in 2020 to \$17 billion in 2021 (Colicev, 2023). The global NFT market size is expected to reach USD 231.98 billion by 2030, growing at a compound annual growth rate of 33.7% from 2022 to 2030 (Verified Market Research, 2022).

While some NFT-based business models have been developed and implemented by startups, many traditional businesses also took the lead in adopting the innovation to expand their market. For example, Starbucks is one of the first companies to integrate NFTs with its loyalty program: members can earn and buy digital collectible stamps (NFTs) that will unlock access to new, immersive coffee experiences (Sato, 2023). Sporting goods giant Nike recently launched a new platform called Swoosh that will offer NFT shoes to its customers (Roth, 2022). To these companies, NFT brings many potential benefits to their marketing