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Real options analysis applied to investment projects in planted forests of *Pinus*

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Photo 1.
Planted forests *Pinus* in Brazil.
Photo D. Simões.

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RÉSUMÉ

Analyse des options réelles appliquée aux projets d'investissement dans les forêts plantées à *Pinus*

Les forêts plantées sont des projets à long terme qui impliquent un apport monétaire important et qui nécessitent généralement l'intégration de flexibilités managériales. Comme la méthodologie traditionnelle d'évaluation économique ne permet pas l'intégration de ces flexibilités, notre étude visait à analyser la faisabilité économique des projets d'investissement dans les forêts plantées de *Pinus elliottii* Engelm., en appliquant une analyse des options réelles. Nous avons utilisé les données empiriques provenant d'un hectare de forêt plantée de *P. elliottii* avec un horizon de planification à 14 ans. Les flexibilités managériales ont été intégrées ensemble et séparément, en tant qu'options de report, d'extension ou d'abandon du projet d'investissement. A l'aide d'une simulation de Monte-Carlo, la valeur actuelle de 1,016 USD a été conditionnée aux valeurs de rendement anticipées de la deuxième à la quatorzième année, avec un rendement de volatilité de 14,5 %. Dans l'analyse des options réelles, la valeur des options combinées était de 29 USD, ce qui, en termes de valeur actuelle nette traditionnelle, a donné une valeur nette actualisée plus importante, de 468 USD. L'analyse des options réelles montre donc que les projets d'investissement dans les forêts plantées à *P. elliottii* sont économiquement faisables. Étant donné que l'analyse des options réelles est une méthodologie peu utilisée dans le secteur forestier pour l'analyse économique des projets d'investissement, cette étude peut être choisie pour aider les gestionnaires forestiers à analyser les risques et les décisions d'investissement, notamment ceux liés aux fluctuations du marché des forêts plantées de *Pinus* spp., dans l'hypothèse où les options réelles de report, d'expansion et d'abandon d'un projet d'investissement sont mises en œuvre.

Mots-clés : options combinées, valeur nette actualisée augmentée, économie forestière, flexibilité managériale, gestion des risques, sylviculture, Brésil.

ABSTRACT

Real options analysis applied to investment projects in planted forests of *Pinus*

Planted forests are long-term projects involving a large monetary contribution, and generally require the incorporation of managerial flexibility. As the traditional methodology for economic evaluation does not allow for the incorporation of these flexibilities, our study aimed to analyze whether investment projects in planted forests of *Pinus elliottii* Engelm. are economically feasible, by applying a real options analysis. We used empirical data from one hectare of a planted forest of *P. elliottii* with a 14-year planning horizon. Managerial flexibilities were incorporated in combinations and also separately, as options to defer, expand or abandon the investment project. Through Monte Carlo simulation, the present value of USD 1.016 was conditioned to anticipated return values from the second to the fourteenth year, with a volatility return of 14.5%. With real options analysis, the value of the combined options was USD 29, which, in terms of traditional net present value, showed an expanded net present value of USD 468. The real options analysis thus shows that investment projects in planted forests of *P. elliottii* are economically feasible. Given that real options analysis is a methodology not widely used in the forestry sector for economic analysis of investment projects, this study can be used to assist forest managers in analysing investment risks and decisions, specifically those related to market fluctuations of planted forests of *Pinus* spp., assuming that the real options of deferral, expansion and abandonment of an investment project are used.

Keywords: combined options, expanded net present value, forest economy, managerial flexibility, risk management, silviculture, Brazil.

RESUMEN

Análisis de opciones reales aplicadas a proyectos de inversión en plantaciones forestales de *Pinus*

Las plantaciones forestales son proyectos a largo plazo que implican una importante inversión económica y, por lo general, requieren flexibilidad en la gestión. Dado que la metodología tradicional de evaluación económica no permite incorporar esta flexibilidad, nuestro estudio pretendía analizar si los proyectos de inversión en plantaciones forestales de *Pinus elliottii* Engelm. son económicamente viables, aplicando un análisis de opciones reales. Utilizamos datos empíricos de una hectárea de un bosque plantado de *P. elliottii* con un horizonte de planificación de 14 años. La flexibilidad de gestión se incorporó en combinaciones y también por separado, como opciones para aplazar, ampliar o abandonar el proyecto de inversión. Mediante una simulación de Montecarlo, el valor actual de 1,016 USD se condicionó a los valores de rendimiento previstos del segundo al decimocuarto año, con una volatilidad de rendimiento del 14,5 %. Con el análisis de opciones reales, el valor de las opciones combinadas era de 29 USD, lo que, en términos de valor actual neto tradicional, representaba un valor actual neto ampliado de 468 USD. El análisis de opciones reales muestra, pues, que los proyectos de inversión en bosques plantados de *P. elliottii* son económicamente viables. Dado que el análisis de opciones reales es una metodología poco utilizada en el sector forestal para el análisis económico de los proyectos de inversión, este estudio puede servir de ayuda a los gestores forestales para analizar los riesgos y las decisiones de inversión, concretamente los relacionados con las fluctuaciones del mercado de las plantaciones forestales de *Pinus* spp., suponiendo que se utilicen las opciones reales de aplazamiento, ampliación y abandono de un proyecto de inversión.

Palabras clave: opciones combinadas, valor actual neto ampliado, economía forestal, flexibilidad de gestión, gestión de riesgos, silvicultura, Brasil.

Introduction

The planted forests of *Pinus* spp. they are medium to long-term projects that require a significant monetary contribution and, in addition, are conditioned to the economic return only in the thinning year and at the end of the planning horizon. Allied to market fluctuations that influence the implementation and maintenance of these forests, it is necessary to consider the intrinsic uncertainties and incorporate managerial flexibilities for strategic decision-making.

The genus *Pinus* is widely used in pulp and paper, wood, and resin extraction industries. The costs of establishing forests represent the largest part of the investment until the cutting of the forest. Due to the financial support, investment analyzes are necessary that incorporate the uncertainties inherent in the plantations of *Pinus* spp., as for example, the value of inputs, revenues, wood price, and forest risks (Akita and Ohe, 2021; Soliño *et al.,* 2018).

By not considering these uncertainties, the traditional techniques of economic analysis of investment projects become inadequate. Given this, Lambrecht (2017) and Ragozzino *et al.* (2016) point out that real options analysis is presented as the most accurate approach, as it allows incorporating these uncertainties and managerial flexibilities that can limit exposure to risks inherent to the project, capture the real value of the project and provide greater security to forest managers.

Managerial flexibilities arise from the recognition that uncertainty significantly affects the expected performance of an investment project. Thus, real options analysis focuses on finding strategies that improve expected performance. With this analysis, the planning and execution of investment projects can be adapted to changing of conditions market in order to maintain or increase the profitability of the investment project (Cardin *et al.*, 2017; Kozlova, 2017).

Real options analysis is widely used in the economic analysis of investment projects (Gorupec *et al.*, 2022). In the forestry sector, it assists in the analysis of investment risk and in decision making. Despite the positive characteristics, studies involving analysis of real options in forestry investment projects are incipient, specifically those related to *Pinus* spp. (Tschulkow *et al.*, 2021; Sauter *et al.*, 2016).

A real option is a right, but not an obligation, to take future actions at opportune moments for the forest manager (Trigeorgis and Reuer, 2017; Black and Scholes, 1973). It captures the irreversibility of an investment project, which makes it possible to postpone and adapt decisions in a volatile economic scenario. Thus, the deferral option allows delaying the beginning or each stage of an investment project. By waiting for new information associated with the investment project or market environment, it is possible to add value by providing the right strategic path to investors (Ayodele and Olaleye, 2021).

The expansion option captures the possibility of building additional assets on top of the base asset. Forest managers are motivated by the possibility of adding value to the project by investing capital. In favorable market times, the option to expand should be considered. This option can explore the ideal expansion strategy, considering the time and amount to be invested (Chen *et al.*, 2018; Vo and Le, 2017).

Exercised in situations where the expected present value of cash flows is unsatisfactory, the option to abandon equalizes or diminishes the shortfall in the value of the project. If it is exercised, the forest manager can receive all the money generated by the project's cash flows before the abandonment of the investment, or receive the residual value defined in the period of choice of option. This option offers the possibility of avoiding major losses in your planning (Deeney *et al.*, 2021; Adkins and Paxson, 2017).

Due to the uncertainties associated with investment projects, analyses that consider managerial flexibilities can show the real value of a biological asset. In this context, this study aimed to analyze whether investment projects in planted forests of *Pinus elliottii* Engelm. are economically viable through real options analysis.

Materials and methods

Data characterization

We carried out the study in one hectare of forest planted with *Pinus elliottii* Engelm., with a 14-year rotation and thinning at eight years, with an average annual increment of 28.6 m^3/ha/year, in a 3 m x 2 m spacing (1,666 trees/ha), located in the State of Santa Catarina, Brazil. The soil was classified as dystrophic haplic Cambisol and the relief was flat, with a slope from 0.0% (flat) to smooth wavy (3.0% to 8.0%) according to dos Santos *et al.* (2018) and Speight and Landform (2009).

Considering the Köppen-Geiger classification, the region had a temperate oceanic climate – Cfb (always humid, with mild summers, dry winters, and occurrence of frosts). The average temperature in the region was 18.7 °C and average annual rainfall of 2,300 mm, with evenly distributed rainfall (Carvalho, 2018).

The silvicultural operations that took place in the year zero for the implantation of the planted forest consisted of the construction of firebreaks, topography services, mechanized application of herbicide, manual control of leaf-cutting ants with baits, soil preparation with a subsoiler coupled to the tractor, and planting pit. In planting and replanting, *Pinus elliottii* Engelm. seedlings produced in polyethylene tubes were used.

The other silvicultural operations, such as maintenance of firebreaks were carried out in year one, manual control of leaf-cutting ants with baits and mechanized application of post-emergence herbicide were carried out from year zero to year two and mechanized weed cutting was carried out from year zero to year three of the investment project in planted forests of *Pinus elliottii* Engelm.

Thinning was carried out in year eight and, according to the pre-harvest forest inventory, 496 trees were sampled with an average diameter at breast height of 17.0 cm and an average total height of 12.8 m, totaling 49.8 m^3 of wood. At the end of the 14-year cycle, 1,170 trees were sampled with an average diameter at breast height of 24.3 cm and an average total height of 45.7 m, totaling 350.7 m^3 of wood, estimated using the Schumacher and Hall linear equation. The wood production was divided into three assortments, the first for the manufacture of cellulose and the two other for the supply of raw material for sawmills.

Economic analysis

Cash flow

The components of the project's cash flow were gross revenue, costs with forestry operations, overhead, lease of the land, forest exhaustion, and taxes in accordance with current legislation in the country. Further details regarding the components of costs, year of occurrence, and monetary values in our study are provided in the Supplementary Material. The input and output components of the investment project budget were sequenced and equated until year-14, the period of the planning horizon, due to the clear-cutting of the *Pinus elliottii* Engelm. planted forest. The cash flow can be characterized as unconventional since it has several outputs and only one input.

Project discount rate

In capturing the potential of the investment project, we chose to place it in the context of risk in the Brazilian wood and paper sector, in order to configure the appropriate reflexes of this investment alternative for forest managers. Thus, we apply the weighted average cost of capital methodology associated with the asset pricing model (Equation 1), as Franc-Dabrowska *et al.* (2021).

$$WACC = \left(\frac{E}{V}\right) K_E + \left(\frac{D}{V}\right) K_D(1 - t_c) + \left(\frac{P}{V}\right) K_P \qquad (1)$$

where: E is the value of equity, D is the company's debt, P is the company's preferred stock, V is the total capital $(E + D + P)$, K_E is the cost of equity, K_D is the cost of debt, K_p is the cost of preferred stock, and t_c is corporate tax.

The creditor's capital estimate was calculated according to the spread of 2.6% for speculative credit countries in the Ba2 category, Brazil's current risk classification, according to Moody's (2021), added to the risk-free rate of return of 5.2%, obtained by the geometric average of the period between January 2, 1962 and January 25, 2021 of the US Treasury bond rate, called the 10-year rate on Treasury bonds, according to the United States Department of the Treasury (2021). According to Damodaran (2018), by preferring to consider long-term data, it is possible to reduce some type of unwanted trend to the data during the period considered.

The weighted average cost of capital (Equation 2) was applied to asset pricing (Cuervo *et al.*, 2021).

$$K_E = R_f + \beta_l (R_m - R_f) + RP_{Col.} \qquad (2)$$

where: R_f is the expected return on a risk-free asset; β_l is the leveraged beta, which represents the risk associated with investment activity and the risk associated with financial leverage; $(R_m\text{-}R_f)$ is the market premium over a well-diversified market index; $RP_{Col.}$ is the country risk premium.

The estimate of the systematic risk coefficient was leveraged with the sensitivity of the asset's return. In contrast, what is predicted by the benchmark of publicly traded companies with shares traded on the Brazilian stock exchange B3 S.A. - Brasil, Bolsa, Balcão (2021) namely: Dexco S.A., Eucatex S.A. Indústria e Comércio, Klabin S.A. e Suzano S.A.

The market risk premium of -0.3 was obtained through the expected return on the forest market portfolio for a period of 10 years, resulting in an annualized return of 4.9%, based on the S&P Global Timber & Forestry Index (2021) with the rate of return on the risk-free asset.

The country risk premium of 3.9% was obtained through the geometric mean of the historical series of Brazil risk between April 29, 1994 and January 22, 2021, which represented the Emerging Markets Bond Index Plus, published by Morgan (2021). The rate that determined the cost of equity capital was 9.0%. Considering the proportion of third-party capital of 91.1%, calculated from the ratio between the assets and onerous liabilities of the company that owns the planted forest, and the proportion of equity of 8.9%, it was estimated 5.5% as the project discount rate.

Deterministic net present value

The deterministic net present value was used as an input to the dynamic model (Equation 3).

$$NPV = \sum \frac{R_j}{(1 + WACC)^j} - \sum \frac{C_j}{(1 + WACC)^j} \qquad (3)$$

where: NPV is the deterministic net present value; R_j is the revenue at the end of year j; C_j is the cost at the end of year j; $WACC$ is the project discount rate; j is the period of occurrence of the cost or revenue.

Investment project volatility and dynamic modeling

There are several sources of uncertainty in an investment project, mainly due to the dynamics of the financial market. We assume the price of wood (USD m^{-3}) as a source of uncertainty, therefore, the volatility of the investment project in forests planted with *Pinus elliottii* Engelm. According to the uncertainty approach, developed by Copeland and Antikarov (2001), the volatility of the stochastic process of the fixed asset price follows a Geometric Brownian Motion (GBM) described in Equation 4:

$$P_t = P_{t-1} \cdot e^{(\alpha - \frac{\sigma^2}{2})\Delta t + \sigma \cdot \varepsilon \Delta t} \qquad (4)$$

where: P_t is the price of the underlying asset at time t; P_{t-1} is the price of the underlying asset at time t-1; α is the growth rate of P (drift); σ is the volatility; ε is the error with standard normal distribution; Δt is the increment of a Wiener process (increment of the random path of the selected variable, with normal distribution and definite time).

The source of uncertainty with the greatest influence on the present value of the considered project was the volatility (σ) of the value of wood (USD m^{-3}). Thus, according to Brandão *et al.* (2012), we estimated the project value at $t = 1$

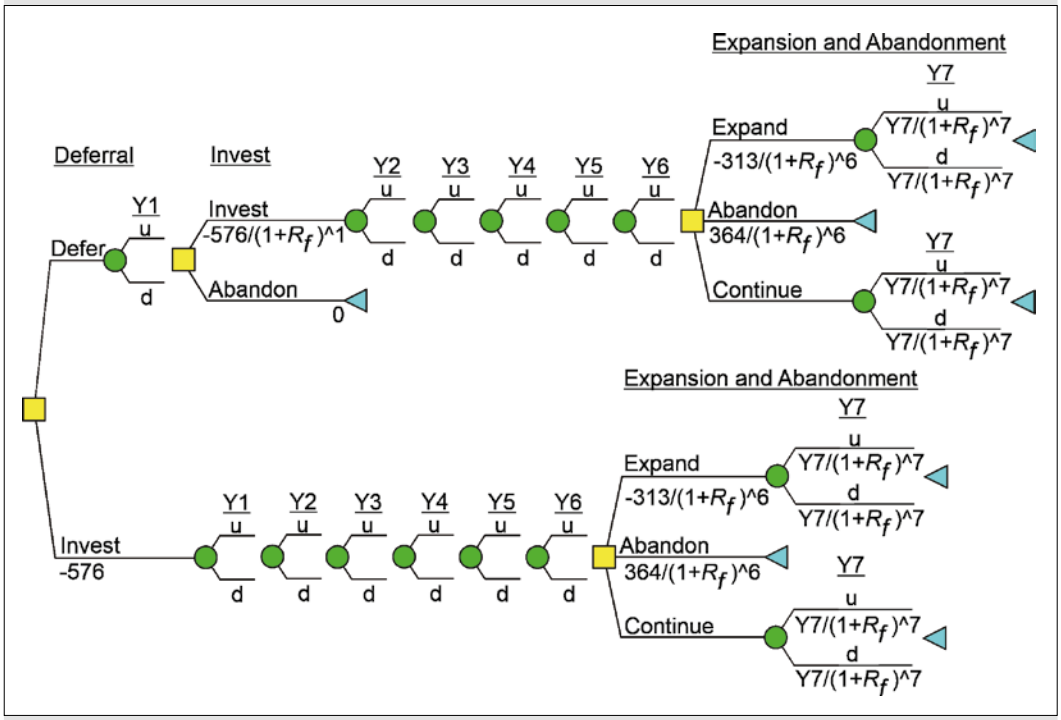

Figure 1.
Binomial tree of underlying asset of *Pinus elliottii* Engelm. planted forest investment project with defer, expand, and abandon options combined. Where: *Y* is the year of the planning horizon; *u* is the increment level; *d* is the level of decrease; R_f is the risk-free rate..

and, in consonance with Marques *et al.* (2021), we adopted standard deviation of variable (£) as the volatility of stochastic project value (Equation 5).

$$£ = \ln\left(\frac{\sum_{t=1}^{t=n}\frac{F_t}{(1+wacc)^{t-1}}}{V_0}\right) \quad (5)$$

where: ln is the Napierian logarithm; F_t is the cash flow structure of the project at time t; V_0 is the present value of the project.

The simulation was implemented using the Monte Carlo method from 100,000 iterations, using the software @Risk Copyright© 2022 (Palisade Corporation, 2022). The parameters developed by Cox *et al.* (1979), derived from volatility (σ) and the risk-free rate (R_f), were used in the construction of a binomial mesh projected through GBM, which allowed modeling of the underlying asset (figure 1), that is, the project free of real options.

The binomial mesh allows two possibilities of movement, the increase movement (u) being described through Equation 6. The decreasing movement (d) was calculated according to Equation 7. We calculate the risk-neutral probability (p) with Equation 8 and its complementary (q) contemplated by Equation 9.

$$u = e^{\sigma\sqrt{\Delta t}} \quad (6)$$

$$d = \frac{1}{u} = e^{-\sigma\sqrt{\Delta t}} \quad (7)$$

$$p = \frac{e^{R_f\Delta t} - d}{u - d} \quad (8)$$

$$q = (1 - p) \quad (9)$$

where: e is the Napierian number; σ is the exponential of project volatility; Δt is the time variation, corresponding to the step size between the nodes of the binomial decision tree; R_f is the expected return on a risk-free asset.

Once the underlying asset has been modeled, we incorporate the real options of deferral, expansion, and abandonment into the investment project, assumed to be executables by managers, as applied by Munis *et al.* (2022). The inclusion of real options took place through the Decision Programming Language - DPL software (Syncopation Software, 2022).

The deferral option was the first to be included, making it possible to postpone the investment from the focal date to the end of year one at a cost of USD 576. Another managerial flexibility was to expand the project's capacity by 20.0% in the sixth year, at a cost of USD 313. In addition, in an economically divergent scenario, the possibility of abandoning the investment at the bonus of USD 364.

Furthermore, capturing the effect of options could be intensified by combining them. When considering the combined options, was considered the flexibility in the hierar-

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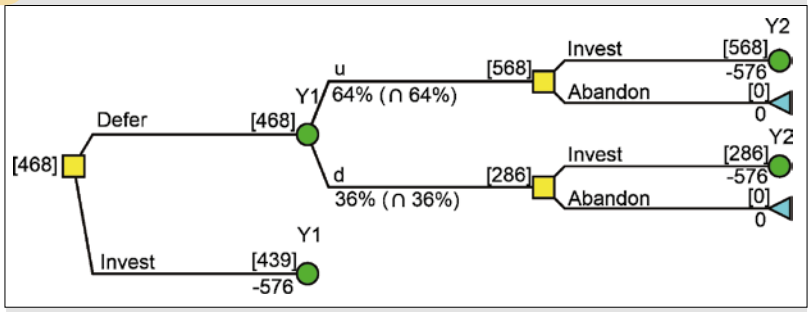

Figure 2.

Decision tree of the option to defer from year zero to year one of the investment project in planted forest of *Pinus elliottii* Engelm. Where: *Y* is the year of the planning horizon; *u* is the increment level; *d* is the level of decrease.

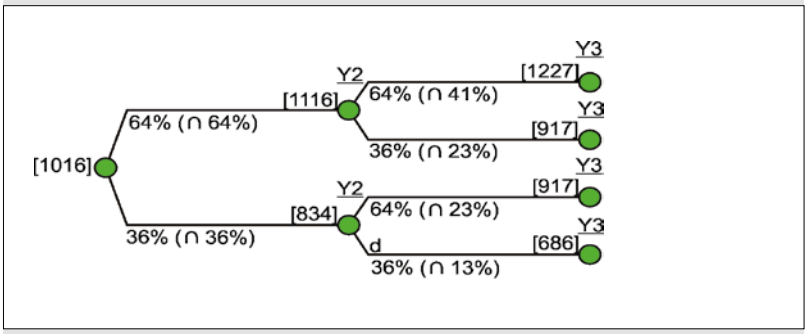

Figure 3.

Decision tree for the 20.0% expansion option in year six of the investment project in planted forest of *Pinus elliottii* Engelm. Where: *Y* is the year of the planning horizon; *u* is the increment level; *d* is the level of decrease.

Table I.
Input values of the decision tree binomial model of the investment project in planted forest of *Pinus elliottii* Engelm.

Parameters	Unit	Values
Average present value	USD	4,081
Standard deviation of present value	USD	±593
Random rate of return	-	1.3
Volatility	%	14.5
Increase movement	-	1.2
Decreasing movement	-	0.9
Risk-neutral probability	-	3.4
Complementary of risk neutral probability	-	-2.4

chy of relations. Thus, the deferral supported the exercise linked to the successive options of abandonment or expansion. The abandonment option was considered a pseudo-American option due to the configuration of the investment project for forest managers. From a pseudo-American option strategy, it was possible to incorporate greater flexibility to the abandonment option in two moments of the planned horizon. This American put option assumes exercise on the date that the highest value occurs.

Results

The costs of silvicultural operations related to the implementation represented 60.5% of the total costs of the investment project in planted forests of *Pinus elliottii* Engelm. The present value and the deterministic *NPV* were USD 1,016 and USD 439, respectively. With the results of the Monte Carlo simulation and the parameters of the construction of the binomial tree (table I), it was possible to incorporate the options to defer, expand and abandon the underlying asset.

The value of the deferral option was USD 29, calculated from the difference between the expanded NPV (figure 2) and the deterministic NPV.

The value of the option to expand did not contribute to investment project returns when assuming the 20.0% expansion configuration in year six. Similarly, the value of the abandonment option was USD 0, as it was not an option to be exercised in the investment project in forests planted with *Pinus elliottii* Engelm (figure 3).

The value of the combined options was USD 29 (figure 4). The expanded NPV of USD 468 was 6.6% higher than the deterministic NPV of USD 439.

The probability of exercising the option to defer was 100.0% (figure 5), indicating the optimal option to delay the start of the investment project by one year. The expansion option was 0.0%, indicating that the best scenario was the permanence of the initial area of the project. The abandonment option resulted in 0.0%, demonstrating that proceeding with the project according to the initial planning was economically viable.

In investment projects in planted forests of *Pinus elliottii* Engelm. volatility represents the fluctuation in the price of wood. As it is directly related to the dispersion of the investment project's source of uncertainty, elevated volatility values impact higher returns (figure 6).

Discussion

The costs of investment projects are decisive in the economic analysis, and consequently, in the feasibility of the investment project in forests planted with *Pinus elliottii* Engelm. When harvesting costs are not considered, as in commercial forestry plantations, the expenditures on forest implantation are the most expressive (Zastocki and

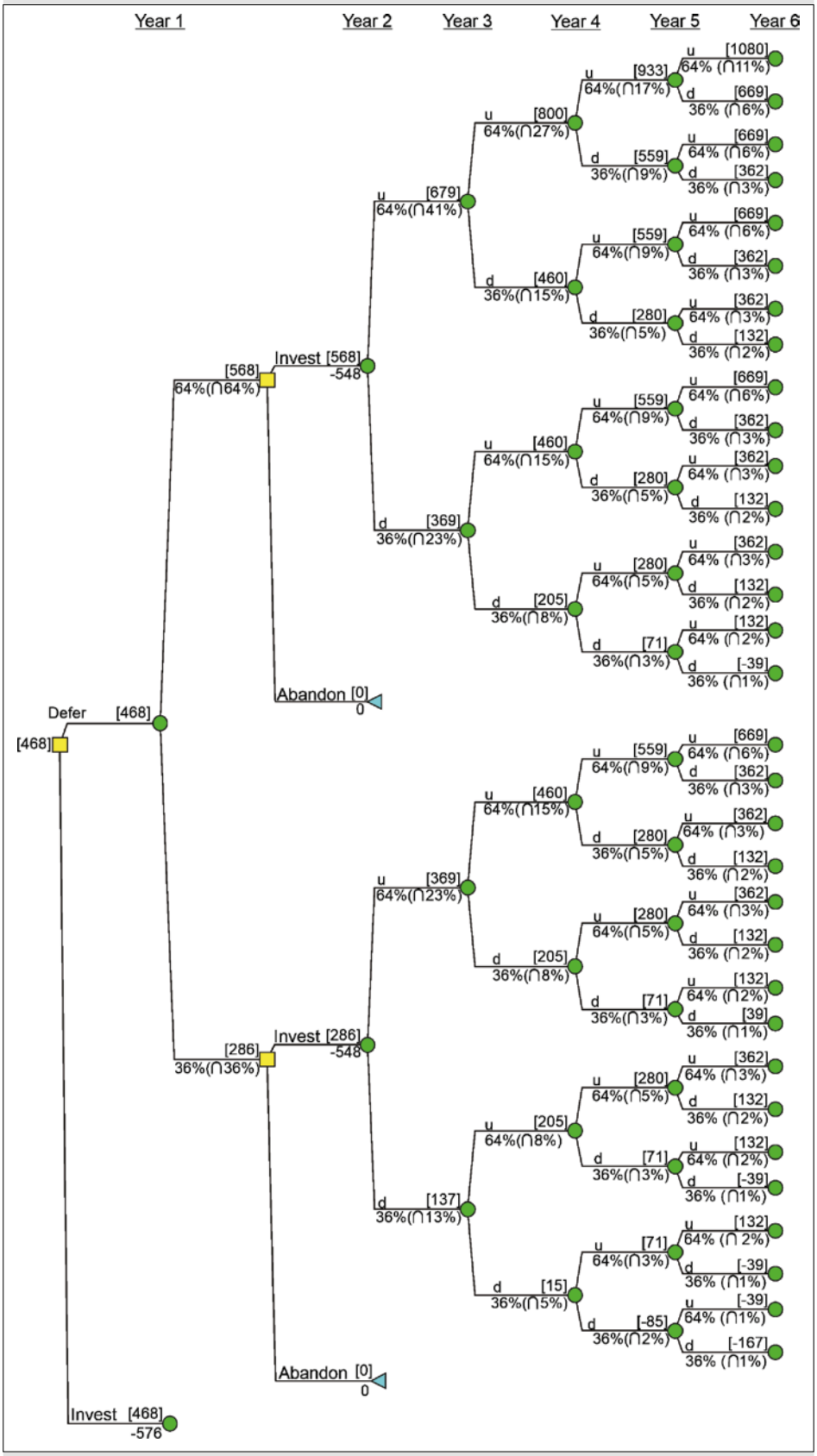

Figure 4.
Decision tree of combined defer, expand, and abandon options of the *Pinus elliottii* Engelm. planted forest investment project. Where: *u* is the increment level; *d* is the level of decrease.

Kaliszewski, 2021). According to Diana *et al.* (2019), a positive NPV demonstrates that the investment project is economically viable. In this way, the investment project in forests planted with *Pinus elliottii* Engelm. can be considered economically viable, taking into account the positive NPV as a parameter in decision making.

Deferral provided forest managers with a less risk for waiting and obtaining more information before investing the capital (Nunes *et al.*, 2021). By presenting unconventional cash flow, investment projects of planted forests of *Pinus* spp., with revenue only in the year of thinning and clear cutting, the deferral promotes greater security in decision making for forest managers, when planning the optimal time to invest.

The deferral option must be evaluated as a call option. Thus, as the investment project does not pay dividends to its shareholders, the deferral option is always exercised. Investment never takes place before the maturity date when the underlying assets do not pay dividends.

The expansion option can be considered a complex call option (Berger *et al.*, 1996). As in the investment project of forests planted with *Pinus elliottii* Engelm options do not always add value to an investment project. Forest managers must be in synergy with the context in which they are inserted and, according to Bensoussan and Chevalier-Roignant (2019), find predictions about the optimal time for investment.

The abandon option helps forest managers investigate whether or not to abandon the investment under conditions of uncertainty (Liu *et al.*, 2019; Long *et al.*, 2020). The function of the abandonment option is not limited to monetary return, but evidence managers who

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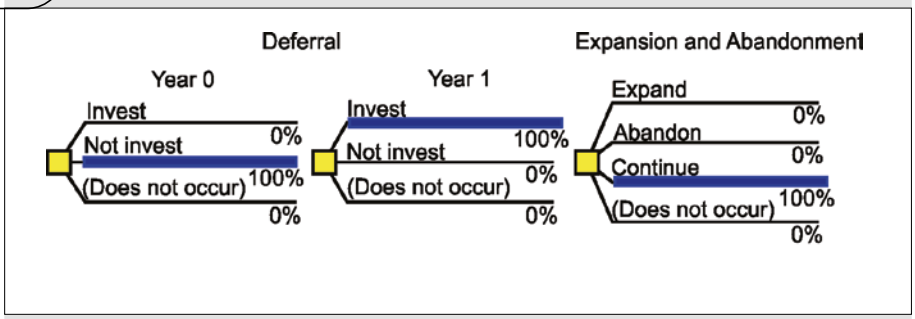

Figure 5.
Probability of execution of an optimal option considering the combined options of the *Pinus elliottii* Engelm. planted forest investment project.

are aware of the risks and uncertainties to which they are exposed.

The combined options provide forest managers with the necessary support for more accurate strategic decisions, indicating the path to be followed along the planning horizon of the investment project of forests planted with *Pinus elliottii* Engelm. When the proposed options were exercised, the risk was reduced, and a greater return was obtained when compared to the traditional methodology.

The oscillation in volatility exerts a direct influence on the value of the investment project. Miranda *et al.* (2017) and Foo *et al.* (2018) corroborate that volatility impacts expected yields according to uncertainties, and it is essential to consider it in the analysis of the economic viability of investment projects for forests planted with *Pinus elliottii* Engelm.

The costs of silvicultural operations, the medium to long-term planning horizon and the associated uncertainties and risks, undervalue investment projects for forests planted with *Pinus elliottii* Engelm. when analyzed using traditional techniques of economic analysis. With the analysis of real options, it was possible to incorporate uncertainties and managerial flexibilities, reducing investment risks, demonstrating the real value of the investment project.

Conclusion

Investment projects in planted forests of *Pinus elliottii* Engelm. with assortments for pulp and sawmills are economically viable from the perspective of uncertainties and flexibilities attributed through real options analysis.

Deferring the initial investment in investment projects in planted forests of *Pinus elliottii* Engelm. minimizes the risks associated with the biological asset, granting the opportunity to gather more information before the application of capital.

The expansion option does not contribute to the economic returns from the investment project in planted forests of *Pinus elliottii* Engelm.

The abandonment option, although not exercised, can highlight the uncertainties that forest managers are exposed too.

The valuation of the biological asset occurs when the combined real options of the investment project in planted forests of *Pinus elliottii* Engelm. are incorporated, simulating the practice of forest management, when uncertainties affect the course of the investment.

Considering that in the forestry sector real options analysis is a methodology not widely used for economic analysis of investment projects, this work contributes to adding information to the literature in this field study. Furthermore, this work can be used to assist forest managers in the analysis of investment risk and in decision-making, specifically those related to market fluctuations of planted forests of *Pinus* spp., given that we use the real options of deferral, expansion, and abandonment of investment project. Thus, this study contributes to making the real options

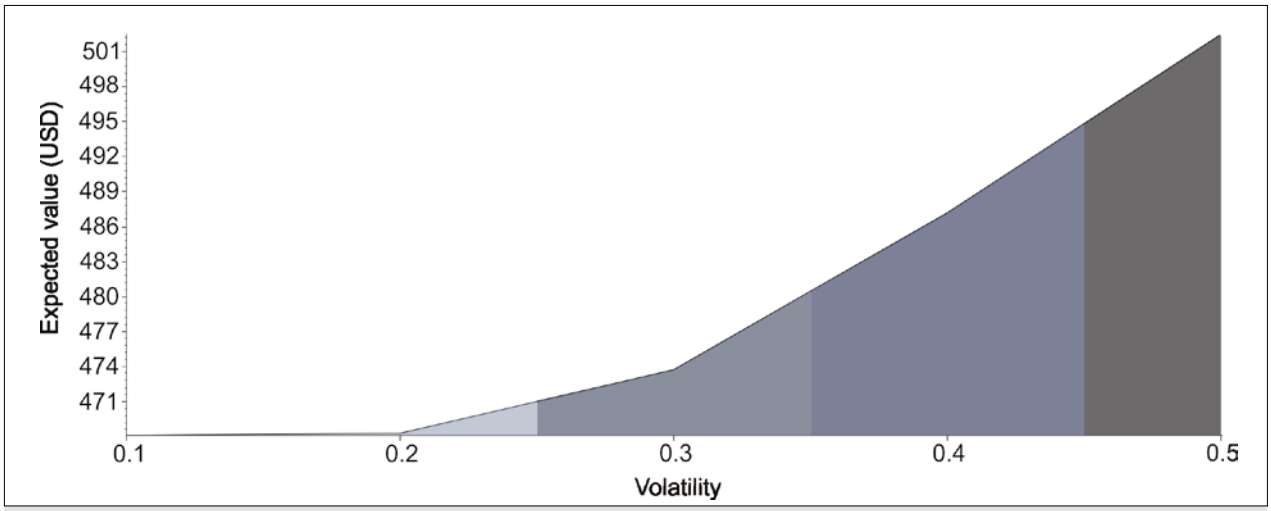

Figure 6.
Expected value of the investment project in *Pinus elliottii* Engelm. planted forest as a function of volatility.

analysis more accessible and safer to forest managers, allowing it to increase its use in planted forest investment projects.

Based on the present findings, and on results in the literature, further research is recommended in order to test whether the real options analysis can identify the economic viability of forest investment projects with other species used in planted forests.

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Data access
The data is available by using the following Internet link and citing the origin with the citation:
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