Tiedekunta-Fakultet-Faculty
Valtiotieteellinen tiedekunta

Laitos-Institution-Department
Department of Economics

Tekijä-Författare-Author
Nordlund, Toni

Työn nimi-Arbetets titel-Title
A Real-Option model for venture projects with near-optimal stopping rules

Oppiaine-Läroämne-Subject
Economics

Työn laji-Arbetets art-Level
Licentiate thesis

Aika-Datum-Month and year
2003-08-20

Sivumäärä-Sidantal-Number of pages
69 s., 13 liites.

Tiedekunta-Fakultet-Faculty
Valtiotieteellinen tiedekunta

Työn nimi-Arbetets titel-Title

A Real-Option model for venture projects with near-optimal stopping rules

Oppiaine-Läroämne-Subject
Economics

Työn laji-Arbetets art-Level
Licentiate thesis

Aika-Datum-Month and year
2003-08-20

Sivumäärä-Sidantal-Number of pages
69 s., 13 liites.

Työssä käsitellään venttiilin sijoitusten arvostelua, jossa on mahdollisuus lopettaa sijoittamista parhaan oikeuden mukaan. Tämä määritelmä on perusteltu kahden yhteistyökumppanin avulla, jota on käytetty kaikkiin osuuksissa. 投资者, or the venture capitalist, keeps the project running by supplying additional capital, while the entrepreneur collaborates by supplying unique human capital. The key factor in the model is that the infusion of capital is staged, so that the venture capitalist in the capacity of an inside investor exercises strategic discretion to periodically rescreen the current state of the project along with the future prospects. If the project turns out a failure, the venture capitalist exits immediately with a zero scrap value. His primary objective is however to find the optimal timing for an initial public offering (IPO), where the accumulated equity stake is sold in the market. It follows that the rational valuation emerges as an optimal stopping problem, which is approached by means of real options.

Drawing on the optimality principle of dynamic programming and the general stopping theory, the rational value and the optimal stopping rule are derived in detail. The concepts of regularity and an excessive majorant are introduced as elemental building blocks in the analysis. It is in fact shown that the rational value conforms to a specific smallest excessive majorant that incorporates in a simple way the time-to-build element created by the staging of capital infusion. As a novelty in the venture-financing literature, we also introduce the concept of a near-optimal stopping rule in conjunction with the optimal rule. Near-optimality simply means that a rule may call for stopping even if the time-to-build element implicit in the venture project is larger in value than the gain obtainable by immediate stopping. Both the optimal rule and near optimal rules are made use of to study some absorbing aspects of venture financing. We for example establish the effect of entrepreneurial exit options on the optimal stopping behaviour of the venture capitalist, and on the rational real-option value.

Equipped with the optimal rule, the study lastly derives sufficient conditions under which stopping, and an IPO in particular, is not optimal to the venture capitalist.


Avainsanat-Nyckelord-Keywords
venture capital
real options
optimal stopping
near-optimal stopping

Säilytyspaikka-Förvaringsställe-Where deposited

Muita tietoja-Övriga uppgifter-Additional information