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# The Path Integral Approach to Financial Modeling and Options Pricing

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#### **Computational Economics**

Aims and scope →

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theory (weighted Asian options, floating barrier options, and barrier options with ladder-like barriers).



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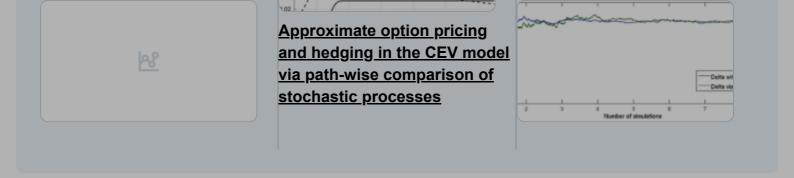
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#### References

Babel, D.F. and Eisenberg, L.K. (1993). Quantity adjusting options and forward contracts, *Journal of Financial Engineering* **2**(2), 89-126.

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Cox, J. and Ross, S. (1976). The valuation of options for alternative stochastic processes, *Journal of Financial Economics* **3**, 145-166.

**Google Scholar** 

Creutz, M., Jacobs, L. and Rebbi, C. (1983). 'Monte Carlo computations in lattice gauge theories', *Physics Reports* **95**, 203-282.

**Google Scholar** 

Dash, J. (1988). *Path Integrals and Options*, Part I, CNRS Preprint CPT-88/PE.2206.

Dash, J. (1989). Path Integrals and Options, Part II, CNRS Preprint CPT-

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Durrett, R. (1984). *Brownian Motion and Martingales in Analysis*, Wadsworth Publishing Co., Belmont, California.

**Google Scholar** 

Esmailzadeh, R. (1995). Path-Dependent Options, Morgan Stanley Report.

Eydeland, A. (1994). A fast algorithm for computing integrals in function spaces: financial applications, *Computational Economics* **7**, 277-285.

**Google Scholar** 

Feynman, R.P. (1942). The Principle of Least Action in Quantum Mechanics, Ph.D.

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Garman, M. (1985). Towards a semigroup pricing theory, *Journal of Finance* **40**, 847-861.

**Google Scholar** 

Geman, H. and Eydeland, A. (1995). Domino effect, RISK 8(April).

Geman, H. and Yor, M. (1993). Bessel processes, asian options, and perpetuities, *Mathematical Finance* **3**(October) 349-375.

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FinanceWorking Paper.

Harrison, J.M. and Kreps, D. (1979). Martingales and arbitrage in multiperiod security markets, *Journal of Economic Theory* **20**(July) 381-408.

**Google Scholar** 

Harrison, J.M. and Pliska, S.R. (1981). Martingales and stochastic integrals in the theory of continuous trading, *Stochastic Processes and Applications* **11**, 215-260.

**Google Scholar** 

Heynen, R.C. and Kat, G. (1994). Crossing barriers, RISK 7(June) 46-51.

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Karatzas, I. and Shreve, S. (1992). *Brownian Motion and Stochastic Calculus*, Springer-Verlag, New York.

Google Scholar

Karlin, S. and Taylor, H.M. (1981). *A Second Course in Stochastic Processes*, Academic Press.

Kemna, A.G.Z. and Vorst, A.C.F. (1990). A pricing method for options based on average asset values, *Journal of Banking and Finance* **14**, 113-124.

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Levy, E. and Turnbull, S. (1992). Asian intelligence, RISK, (February) 53-59.

Linetsky, V. (1996). Step options and forward contracts, University of Michigan, IOE Technical Report 96-18.

Merton, R.C. (1973). Theory of rational options pricing, *Bell Journal of Economics* and *Management Finance*, **2**, 275-298.

**Google Scholar** 

Merton, R.C. (1990). Continuous-Time Finance, Blackwell, Cambridge, MA.

**Google Scholar** 

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Rubinstein, M. and Reiner, E. (1991). Breaking down the barriers, *RISK* **4**(September), 28-35.

**Google Scholar** 

Schulman, L.S. (1981). *Techniques and Applications of Path Integration*, Wiley, New York.

**Google Scholar** 

Simon, B. (1979). Functional Integration and Quantum Physics, Academic Press, New York.

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Zhang, P. (1995b). A unified formula for outside barrier options, *Journal of Financial Engineering* **4**(4), 335-349.

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