A Cautionary Note on the Put-Call Parity under an Asset Pricing Model with a Lower Reflecting Barrier

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The put-call parity is free from distributional assumptions. It is tempting to assume that this parity also holds when an asset pricing model includes reflecting barriers. This paper shows that in the case of geometric Brownian motion with reflection such barriers cause the standard put-call parity to differ from the risk-neutral parity. This paper then analyzes the error that arises when the diffusion is bounded and the standard put-call parity is applied in a risk-neutral framework as a shortcut to impute put prices from call prices, and vice versa. The risk-neutral parity that is derived for a reflected geometric Brownian motion is then used to analyze the impact that the Swiss National Bank's minimum exchange rate regime vis-à-vis the euro has had on foreign exchange hedging costs. The analysis shows that in the analyzed period domestic investors may have incurred substantial costs as a result of hedging exposure to the euro currency and may have been overexposed to foreign exchange risk.
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