

Notations for Directional Change (DC) research

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Background:

Many researchers from multiple sites are working on Directional Changes. I suggest we use the same language and notations. This way we can avoid misunderstanding and improve communication efficiency.

Name / Description	Notation
Threshold	θ
Extreme point	EXT
Directional Change	DC
Upward Directional Change	DC \uparrow
Downward Directional Change	DC \downarrow
Directional Changes of threshold θ	DC(θ), DC \uparrow (θ), DC \downarrow (θ)
Current price	P_c
Price at extreme point	P_{EXT}
Price at upward Directional Change Confirmation point	$P_{DCC\uparrow} \geq P_{EXT} \times (1 + \theta)$
Minimal price at upward Directional Change Confirmation point	$P_{DCC\uparrow}^* = P_{EXT} \times (1 + \theta) \leq P_{DCC\uparrow}$
Highest price in the current trend	P_{Hi}
Lowest price in the current trend	P_{Lo}
Overshoot value At DC confirmation, OSV=0; At $P_c=P_{EXT} \times (1+2\theta)$, OSV = 1; in general: At $P_c=P_{EXT} \times (1+k\theta)$, where $k>0$, OSV = $k-1$ At $P_c=P_{EXT} \times (1-k\theta)$, where $k>0$, OSV = $-k+1$	$OSV = ((P_c - P_{DCC^*}) \div P_{DCC^*}) \div \theta$
Number of DCs of threshold γ over time period τ	NDC(γ , τ)
Given a threshold θ that took time T, the Number of DCs of threshold $\theta \div d$ over a time period from Now – $(T \div k) * (t+1)$ to Now – $(T \div k) * t$ In other words, when $t=0$, NsDC(θ , d , 2, 0) counts NDC($\theta \div d$, [Now – $(T \div k)$, Now])	NsDC(θ , d , k , t) = NDC($\theta \div d$, [Now – $(T \div k) * (t+1)$, Now – $(T \div k) * t$])

Let "Now" be the time now.

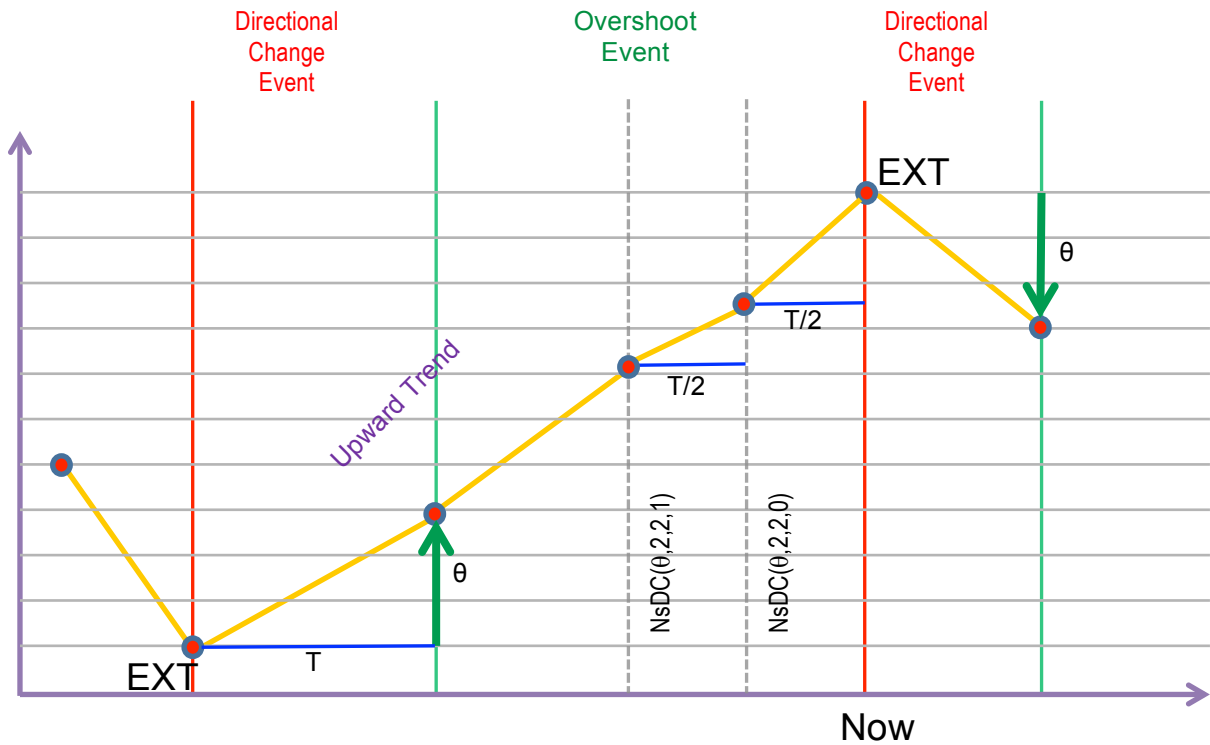
Suppose EXT point is at time 1000, and DCC point is at time 1200.

Suppose the next EXT point is 1500.

Then in this trend, DC takes 200 units of time to happen, so $T = 200$.

$NsDC(\theta, 2, 2, 0)$ counts the number of DCs of threshold $\theta/2$ between time points 1400 and 1500.

$NsDC(\theta, 2, 2, 1)$ counts the number of DCs of threshold $\theta/2$ between time points 1300 and 1400.



$$NsDC(\theta, d, k, t) = NDC(\theta \div d, [Now - (T \div k) * (t + 1), Now - (T \div k) * t])$$

where $NDC(\gamma, \tau) =$ number of DCs of threshold γ over time period τ