Algobot
Maximize Your Profits

# First Passage Drift Bias

Expert Advisor Documentation

| PLATFORM | TYPE | TIMEFRAME | WEBSITE |
| --- | --- | --- | --- |
| MetaTrader 5 (MT5) | Directional / Drift Detection | Any (H1 recommended) | www.algobot.live |

> ⚠ **Important Disclaimer** This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

## Overview

**First Passage Drift Bias** is an original directional model built from **first-passage-time theory** — not from any indicator, price-action pattern, or published methodology. It treats the stream of closing prices as a stochastic path and asks a single, physically motivated question: from any point in time, does the path tend to travel a fixed distance *up* sooner than it travels the same distance *down*, or vice versa?

For a perfectly efficient, driftless random walk the two directions are reached in the same average time — the hitting-time distributions are identical by symmetry. A genuine directional pressure breaks that symmetry: the barrier aligned with the drift is reached **sooner**. First Passage Drift Bias measures that timing imbalance directly and trades in the direction it reveals.

Because the signal is derived from the *timing* of first passage rather than the size of the net move, it is invariant to price level, robust to fat-tailed single-bar spikes, and — critically — distinct from ordinary momentum. Everything is computed from raw OHLC data on a single timeframe.

> **Why this is not just momentum.** A momentum signal reacts to the *magnitude* of the net move. First Passage Drift Bias reacts to *how quickly* a fixed displacement is reached. A steady one-way grind hits its aligned barrier fast from nearly every anchor (strong signal), whereas a violent move that later retraces reaches both barriers at similar times (weak signal) — even if the two windows have the exact same net displacement.

## How It Works

### The core statistic

Treat the close series as a path `X(t)`. Choose a symmetric displacement barrier of size `θ`. From any anchor point `a`, define the two **first-passage times**:

```
t_up(a) = bars after anchor a until (X − X(a)) first reaches +θ
t_dn(a) = bars after anchor a until (X − X(a)) first reaches −θ
```

Averaging over many anchors and normalizing gives the signed **hitting-time asymmetry**:

```
A = ( mean_t_dn − mean_t_up ) / ( mean_t_dn + mean_t_up )     ∈ (−1, +1)
```

- **A > 0** → the up-barrier is reached faster → **upward bias** (go long).
- **A < 0** → the down-barrier is reached faster → **downward bias** (go short).
- **A ≈ 0** → no directional edge; both barriers are reached at similar times.

### The math as implemented

- **Barrier size:** `θ = ThresholdMult × s`, where `s` is the **median** of `|ΔClose|` over the buffer. Using the median (not the mean) makes the volatility scale robust to outlier bars.
- **Anchors:** the oldest `AnchorCount` closes that still have a full `Horizon`-bar forward window inside the buffer. For each anchor the path is scanned forward `j = 1…H`, recording the first `j` at which it crosses `+θ` (`t_up`) and the first at which it crosses `−θ` (`t_dn`).
- **Censoring:** if a barrier is never reached within `H` bars, its hitting time is censored to `H+1`. This keeps the estimator symmetric and automatically damps `|A|` toward 0 in quiet regimes — the correct low-confidence behaviour.
- **Regime gate:** a trade is only taken when a healthy share of anchors actually resolved (reached at least one barrier). If too few resolve, `θ` is too large for the current volatility and `A` is not trusted.

### Entry logic

The EA acts once per newly-closed bar. On each new bar it recomputes `A` over the current buffer and opens a position when **both** conditions hold:

- `|A|` exceeds `BiasEntry` (the timing asymmetry is strong enough), and
- the number of resolved anchors is at least `max(4, AnchorCount / 4)` (the regime is alive).

If `A > 0` it buys at the Ask; if `A < 0` it sells at the Bid. Only **one position at a time** is held.

### Exit logic

The strategy uses two independent exit mechanisms:

- **ATR-based stop-loss and take-profit** attached at entry (see below).
- **Active exit on bias flip:** if the temporal edge reverses against an open position — a long while `A < -0.5 × BiasEntry`, or a short while `A > 0.5 × BiasEntry` — the position is closed immediately, because the edge that justified the trade is gone.

### Risk sizing

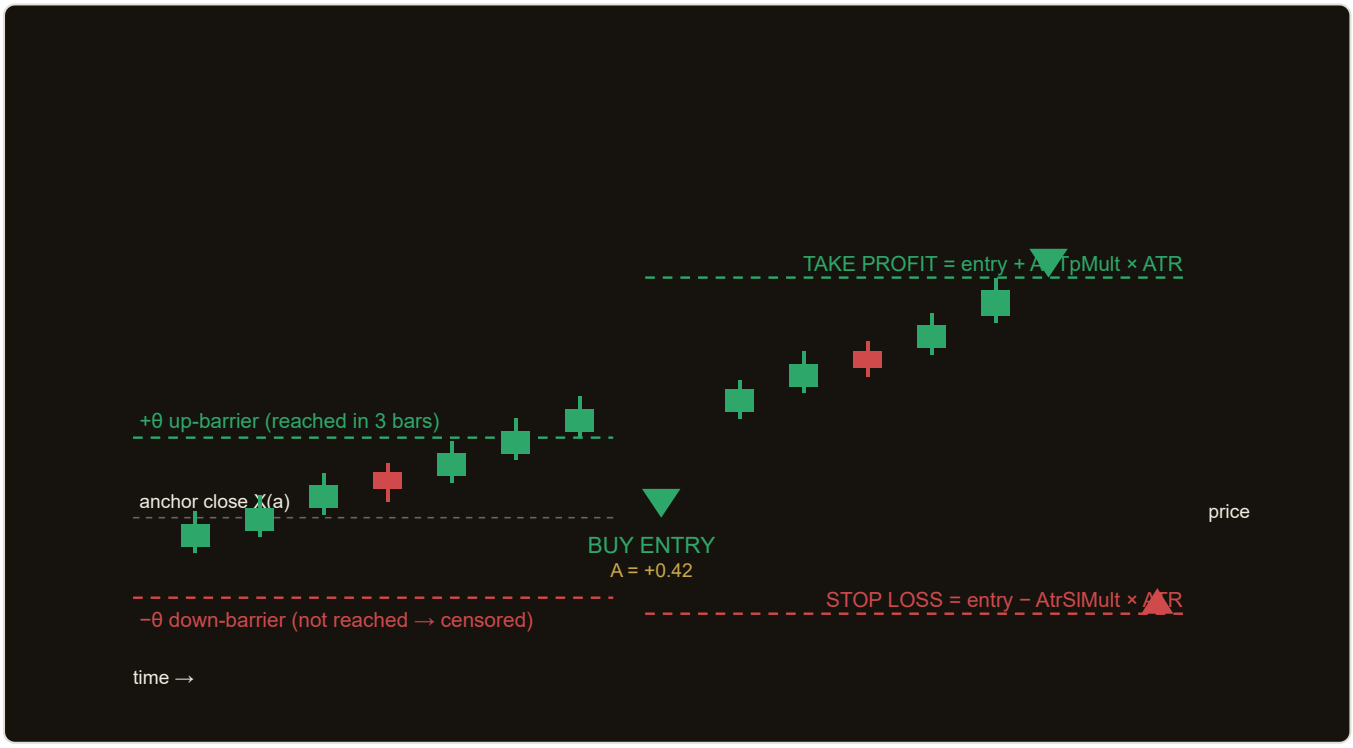
Stops and targets are volatility-adaptive, sized from the Average True Range:

```
Stop-Loss   = entry ∓ AtrSlMult × ATR
Take-Profit = entry ± AtrTpMult × ATR
```

With the defaults (`AtrSlMult = 2.0`, `AtrTpMult = 3.0`) the take-profit is 1.5× the stop distance, giving a positive reward-to-risk ratio on each resolved trade.

## Strategy in Action

The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.




*Illustrative example only. Actual market behaviour varies.*

**Reading the chart**

From the anchor close, price reaches the `+θ` up-barrier in only a few bars, while the `−θ` down-barrier is never reached within the horizon (censored). Averaged across anchors this produces a positive asymmetry `A = +0.42`, exceeding `BiasEntry`. The EA buys, places an ATR stop below and an ATR target above, and the steady grind carries price up to the take-profit.

## Parameters

| Parameter | Default | Description |
|---|---|---|
| **Lots** | `0.10` | Trade volume in lots. Range 0.01–1.00, step 0.05. |
| **AnchorCount** | `40` | Number of past closes used as first-passage anchors — the sample size of the estimator. Range 15–100, step 5. |
| **Horizon** | `12` | Forward horizon in bars over which each anchor's up/down barrier may be reached. Range 4–40, step 1. |
| **ThresholdMult** | `1.50` | Barrier size θ as a multiple of the median absolute one-bar close change. Range 0.50–4.00, step 0.25. |
| **BiasEntry** | `0.30` | Minimum \|A\| (hitting-time asymmetry) required to open a trade. Range 0.05–0.70, step 0.05. |
| **AtrPeriod** | `14` | ATR period used for stop / target sizing. Range 5–40, step 1. |
| **AtrSlMult** | `2.00` | Stop-loss distance as a multiple of ATR. Range 0.50–6.00, step 0.25. |
| **AtrTpMult** | `3.00` | Take-profit distance as a multiple of ATR. Range 0.50–8.00, step 0.25. |
| **Magic** | `1001` | Magic number identifying this EA's positions on the account. |

## Recommended Settings

The defaults are a balanced starting point. Adjust with the following intuition in mind:

- **AnchorCount & Horizon** together define the estimator's memory. A larger `AnchorCount` yields a smoother, more stable `A` but reacts more slowly; a larger `Horizon` gives each anchor more room to resolve but requires more history.
- **ThresholdMult** controls the barrier distance relative to volatility. Lower it if too few anchors resolve (the regime gate keeps blocking trades); raise it to demand larger, more decisive displacements.

- **BiasEntry** is the conviction threshold. Higher values trade less often but only on the clearest asymmetries; lower values trade more frequently with weaker edges.
- **AtrSlMult / AtrTpMult** set the risk profile. The default 2.0 / 3.0 pairing targets a 1.5:1 reward-to-risk ratio.

> **Tip.** Start on **H1** with the default parameters and confirm on the Strategy Tester that a healthy share of anchors resolve on your chosen symbol. If most bars are skipped by the regime gate, lower `ThresholdMult` or increase `Horizon` before touching `BiasEntry`.

> **Always backtest and forward-test on a demo account first.** The optimal `ThresholdMult`, `Horizon`, and ATR multiples depend on the symbol's volatility and the selected timeframe. Validate on your broker's data before risking live capital.

## How to Install on MetaTrader 5

1. Copy `FirstPassageDriftBias.ex5` to your MT5 `MQL5\Experts\` folder
2. Restart MetaTrader 5 and refresh the Navigator panel
3. Drag the EA onto a chart matching the recommended symbol and timeframe
4. Configure the input parameters and click **OK**
5. Enable **Algo Trading** in the MT5 toolbar

## Risk Warning

> Trading foreign exchange, CFDs, and other leveraged financial instruments involves substantial risk of loss and is not suitable for all investors. The strategies and tools described in this document are provided for **educational purposes only** and do not constitute financial advice, investment recommendations, or solicitation to trade. Always consult a qualified financial adviser before making trading decisions. Past backtest performance is not indicative of future results.