MCP SERVER | NO CODE | CLOUD HOSTED

CAPM Calculator MCP for AI Agents

Determining required rates of return and assessing asset performance in finance

The CAPM Calculator MCP determines an asset's required rate of return using the Capital Asset Pricing Model. It helps investors assess systematic risk by computing expected returns based on Beta, risk-free rates, and regional Equity Risk Premiums (ERP). Use it to measure Alpha and quickly determine if any investment is genuinely attractive.

B Quality Score 85/100

capm | finance | beta | alpha | investment-analysis

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vinkius.com/mcp/capm-calculator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

CAPM Calculator MCP

0 tools available
Cloud-hosted on Vinkius

Need a quick, reliable way to figure out if an asset justifies its risk? This MCP handles the math behind required returns using the Capital Asset Pricing Model. You feed your agent basic inputs—like Beta or regional rates—and it computes what the expected return *should* be, factoring in everything from the global market to specific regions like Europe or Brazil. The system pulls standardized risk compensation values for major markets so you don't have to look them up manually. Once you know the expectation, your agent can then compare that figure against an asset's actual performance, calculating Alpha and telling you if it's genuinely attractive or just mediocre. Connecting this MCP through Vinkius gives any compatible AI client immediate access to professional-grade investment analysis, letting you spend time making decisions instead of running calculations.

Core Capabilities

01 — Calculate Expected Returns

Computes the theoretical required rate of return for an asset using Beta, a risk-free rate, and the regional Equity Risk Premium.

02 — Fetch Regional ERP Data

Retrieves standardized Equity Risk Premium values specific to major financial regions (USA, Europe, Brazil).

03 — Analyze Asset Performance

Calculates Alpha by comparing an asset's actual return against its expected return to determine investment attractiveness.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/capm-calculator** — connect your AI agent in three steps.

01 Start by providing your agent with the necessary inputs, such as the asset's Beta and the desired regional Equity Risk Premium.

02 The MCP first uses a tool to calculate the expected return, giving you the baseline required rate of return for that specific market.

03 Next, give it the asset's actual historical performance; the system then analyzes this against the expectation to report Alpha and its attractiveness status.

The bottom line is: Instead of running multiple spreadsheet formulas manually, you prompt your agent with a single request, and it executes the entire multi-step financial calculation automatically.

Built For

Portfolio managers and investment analysts need this. If calculating required rates of return or assessing Alpha is part of your routine, you're wasting time manually cross-referencing risk data from different regions. This MCP lets you get the definitive numbers instantly.

Investment Analyst

Determines if a potential investment meets required benchmarks by calculating expected returns using Beta and regional ERP values.

Portfolio Manager

Compares the actual performance of existing assets against theoretical models to identify underperforming or overperforming holdings.

What Changes When You Connect

01 Stop guessing about risk. Use the `calculate_expected_return` tool to get a precise, model-backed expected return rate for any asset.

02 Quickly compare assets without manual work. The system uses `analyze_asset_performance` to calculate Alpha and instantly label an investment as 'Attractive' or 'Unobstructive'.

03 Avoid data gaps. With `get_regional_erp`, you can pull standardized risk compensation values for USA, Europe, or Brazil markets with a single prompt.

04 Cut down analysis time. You move from spending hours cross-referencing regional ERPs to getting the required rate of return in seconds.

05 Focus on strategy, not math. By automating the calculation and comparison steps, you free up time for high-level portfolio decisions.

Real-World Applications

Evaluating a Cross-Border Investment

A PM is considering an asset in Brazil. They ask their agent to pull the regional risk premium using `get_regional_erp` and then calculate the expected return for that specific market, ensuring compliance with local benchmarks.

Initial Due Diligence Check

When reviewing a new asset, the user provides Beta and RFR. The agent uses `calculate_expected_return` to instantly establish the minimum acceptable return threshold for the investment.

Spotting Underperforming Stocks

An analyst wants to know if a stock is truly valuable. They provide the actual returns and let the agent use `analyze_asset_performance` against the expected return to see if the Alpha suggests an immediate buy or sell.

Patterns to Avoid

Assuming Market Data

✗ AVOID

Manually using a general risk-free rate without checking if it accounts for regional differences, leading to an inaccurate expected return calculation.

✓ INSTEAD

Always start by calling `get_regional_erp` to pull the specific market's standardized risk compensation values. Then, use these validated numbers in the `calculate_expected_return` tool.

Ignoring Alpha

✗ AVOID

Only calculating the expected return and assuming that rate is enough. This misses whether the asset actually outperformed its prediction.

✓ INSTEAD

After getting the expected return, immediately run `analyze_asset_performance`. The resulting Alpha figure tells you if the investment added value beyond what was predicted.

Mixing Tool Inputs

✗ AVOID

Attempting to pass an actual return into a function designed only for calculating the required rate of return, causing the whole analysis to fail.

✓ INSTEAD

Keep your steps separate: first calculate the expectation using `calculate_expected_return`, then use that calculated number as input for `analyze_asset_performance`.

The Right Fit

Use this MCP if your job involves comparing assets against systematic risk models (CAPM). You need to know what a return *should* be, not just what it was. Specifically, use it when you must factor in regional variances because the market isn't uniform. Don't use this if all you need is simple arithmetic; don't run calculations that require subjective judgment or qualitative data review. If your task is simply summarizing a portfolio's historical performance without needing to establish a theoretical benchmark, a basic reporting tool will suffice. But if you need the definitive rate of return and Alpha analysis, this MCP is necessary.

CAPM Calculator: Assessing Required Returns in Investment Analysis

Currently, determining an asset's true required rate of return means juggling three variables: the market's overall risk premium, the specific region you're working in, and the general risk-free rate. You spend time opening multiple spreadsheets, looking up ERP values for the USA versus Europe, and then carefully plugging everything into a complex CAPM formula just to get one number.

With this MCP, your agent handles the entire process. You ask it for the expected return, providing only the core inputs like Beta. It automatically fetches the standardized risk compensation (ERP) for the correct region and delivers the calculated required rate of return instantly. That's a massive time save.

CAPM Calculator: Determining Investment Attractiveness Using Alpha

After you calculate the expected return, the next manual step is comparing that expectation to what actually happened. You have to feed two numbers into a comparison model to figure out if the asset performed better or worse than predicted—that's where calculating Alpha comes in.

This MCP wraps up the full loop for you. Once your agent knows the expected return, it runs `analyze_asset_performance` against the actual figures. You don't just get a number; you get a clear status label: 'Attractive' or 'Unobstructive'. It’s that level of definitive insight that changes everything.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U What is the expected return for an asset with a beta of 1.2, a risk-free rate of 3%, in the USA market?

CAPM Expected Return Calculation

Based on your inputs:
- Beta: 1.2
- Risk-Free Rate (RFR): 3.0%
- USA Equity Risk Premium (ERP): 6.9%

The calculated expected return is **10.8%**.

U If an asset in Brazil has a beta of 0.8 and the risk-free rate is 5%, what's its expected return?

Expected Return Analysis (Brazil)

We used the standardized regional data for Brazil to compute the required rate of return.

METRIC	VALUE
Beta	0.8
RFR	5.0%
Brazil ERP	7.2%
Expected Return	**9.76%**

The asset needs to deliver at least 9.76% to meet market expectations.

U An asset has an actual return of 8% and the expected return was calculated at 7.5%. Is this investment good?

Performance Analysis Results

- Actual Return: 8.0%
- Expected Return: 7.5%
- Calculated Alpha: **+0.5%**

✅ The asset is considered **Attractive**. It outperformed its expected return by a positive margin of 0.5%, suggesting strong management or market conditions.

Frequently Asked Questions

01 **How does the CAPM Calculator MCP determine if an investment is genuinely attractive?**

The MCP calculates Alpha by comparing the asset's actual returns against its expected return. If the result is positive, the tool classifies it as 'Attractive,' meaning it outperformed what was predicted.

02 **Do I need to manually find the risk premiums for different countries?**

No. The CAPM Calculator MCP handles that. It uses a dedicated tool to fetch standardized Equity Risk Premium values automatically for major markets like Europe, Brazil, and the USA.

03 **What inputs are absolutely required when I use the CAPM Calculator MCP?**

You must provide the asset's Beta value along with a risk-free rate. The system then uses that data to calculate the theoretical expected return, which is the foundation of all subsequent analysis.

04 **Can I use this MCP to compare multiple assets in different regions?**

Yes. You can run the calculation repeatedly for various assets and regions. This allows you to build a comparative matrix, seeing exactly how each market's specific ERP affects the required return.

05 **Is the expected return calculated by the CAPM Calculator MCP based on historical data or theory?**

It is based on theoretical financial models using systematic risk. It tells you what the rate of return *should* be, according to established market principles.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"capm-calculator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

CAPM Calculator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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