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ANALISIS BIBLIOMETRIK INTEGRASI FAKTOR KEBERLANJUTAN DALAM MODEL FAMA-FRENCH

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Abstract

The Fama-French model has long served as a fundamental framework for explaining variations in stock returns through market risk, firm size, and book-to-market ratio factors, later expanded to include profitability and investment components. However, the growing urgency of sustainability issues in the global financial system calls for the adaptation of asset pricing models to reflect environmental, social, and governance (ESG) dimensions. This study aims to map the scientific development of sustainability integration within the Fama–French model using a bibliometric approach. Data were collected from the Scopus database using the keywords “Fama–French” and “Sustainability/ESG” for the 2000–2024 publication period. The analysis was conducted using VOSviewer and Biblioshiny to identify publication trends, author collaboration, influential journals, and thematic clusters. The findings indicate a significant increase in publications since 2016, with dominant themes including sustainable asset pricing, ESG performance, and risk-adjusted returns. Integrating ESG factors enhances the multifactor model by incorporating non-financial risk dimensions that influence long-term returns. This study contributes to strengthening the body of knowledge in sustainable finance and provides direction for future research on developing asset pricing models that are more inclusive, resilient, and responsive to global sustainability challenges.

Keyword:

Fama-French, Sustainability, ESG, Asset Pricing, Analisis Bibliometrik

PENDAHULUAN

Dalam beberapa dekade terakhir, perhatian terhadap keberlanjutan (*sustainability*) dalam bidang keuangan dan investasi mengalami peningkatan yang signifikan. Perubahan paradigma global menuju ekonomi hijau mendorong para akademisi dan praktisi untuk meninjau kembali model-model keuangan klasik agar lebih responsif terhadap isu lingkungan, sosial, dan tata kelola (*Environmental, Social, and Governance* atau ESG). Salah satu model yang menjadi fokus dalam konteks ini adalah model Fama-French, yang sejak diperkenalkan pada awal 1990-an telah menjadi fondasi utama dalam teori harga aset (*asset pricing model*). Model tersebut awalnya menjelaskan return saham berdasarkan tiga faktor, yaitu *market risk premium*, *size effect*, dan *value effect*, dan kemudian dikembangkan menjadi lima bahkan enam faktor. Namun, kompleksitas dinamika pasar modern dan meningkatnya tuntutan terhadap investasi berkelanjutan menimbulkan pertanyaan baru mengenai sejauh mana faktor keberlanjutan dapat diintegrasikan dalam kerangka model tersebut.

Integrasi faktor keberlanjutan ke dalam model Fama-French tidak hanya memperkaya dimensi analisis risiko dan imbal hasil, tetapi juga mencerminkan transformasi paradigma keuangan menuju orientasi keberlanjutan jangka panjang. Penelitian-penelitian terkini menunjukkan bahwa perusahaan dengan kinerja ESG yang tinggi cenderung memiliki risiko sistematis yang lebih rendah, stabilitas return yang lebih baik, serta daya tarik yang lebih besar bagi investor institusional. Hal ini menandai adanya pergeseran dari pandangan tradisional yang semata-mata berfokus pada efisiensi pasar, menuju pendekatan yang mengakomodasi

nilai sosial dan lingkungan sebagai determinan nilai ekonomi. Meskipun demikian, masih terdapat kesenjangan konseptual dan metodologis dalam memahami bagaimana faktor keberlanjutan terintegrasi dalam struktur model Fama–French secara empiris maupun teoretis.

Dalam konteks akademik, analisis bibliometrik menjadi salah satu pendekatan yang efektif untuk memetakan perkembangan riset di bidang ini. Pendekatan bibliometrik memungkinkan peneliti mengidentifikasi tren publikasi, kolaborasi antarpengarang dan institusi, serta tema riset yang dominan dalam literatur terkait integrasi keberlanjutan ke dalam model Fama-French. Dengan menggunakan data publikasi ilmiah yang bersumber dari basis data Scopus, analisis ini memberikan gambaran komprehensif tentang evolusi riset, arah perkembangan tema, serta kontribusi ilmiah utama di bidang keuangan berkelanjutan (*sustainable finance*). Oleh karena itu, penelitian ini bertujuan untuk menganalisis dan memetakan literatur mengenai integrasi faktor keberlanjutan ke dalam model Fama-French dengan menggunakan pendekatan bibliometrik untuk mengidentifikasi tren, pola kolaborasi, dan arah penelitian masa depan.

Penelitian ini diharapkan dapat memberikan kontribusi akademik dalam dua aspek utama. Pertama, secara teoretis, hasil kajian ini memberikan pemahaman yang lebih mendalam mengenai posisi keberlanjutan dalam konteks model harga aset modern. Kedua, secara praktis, penelitian ini dapat menjadi referensi bagi peneliti dan praktisi keuangan dalam mengembangkan model investasi yang tidak hanya memperhitungkan faktor ekonomi, tetapi juga memperhatikan keberlanjutan jangka panjang. Dengan demikian, studi ini tidak hanya berfungsi sebagai pemetaan literatur, tetapi juga sebagai dasar konseptual untuk pengembangan teori dan praktik investasi berkelanjutan di masa mendatang.

Model Fama-French dalam Teori Asset Pricing

Model Fama-French merupakan pengembangan dari teori dasar *Capital Asset Pricing Model* (CAPM) yang diperkenalkan oleh Eugene Fama dan Kenneth French pada tahun 1993. CAPM menjelaskan bahwa imbal hasil (*expected return*) suatu aset ditentukan oleh satu faktor utama, yaitu risiko pasar (*market risk premium*). Namun, berbagai penelitian empiris menunjukkan adanya anomalies dalam pasar yang tidak dapat dijelaskan sepenuhnya oleh CAPM. Menjawab tantangan tersebut, Fama dan French memperkenalkan *Three-Factor Model* yang menambahkan dua faktor baru: ukuran perusahaan (*size effect*) dan nilai buku terhadap nilai pasar (*book-to-market ratio*).

Model ini kemudian berkembang menjadi *Five-Factor Model* (2015) dengan menambahkan faktor *profitability* dan *investment pattern*, dan bahkan menjadi *Six-Factor Model* ketika aspek momentum diperhitungkan. Model Fama-French telah menjadi kerangka teoretis utama dalam penelitian harga aset karena kemampuannya menjelaskan variasi imbal hasil saham yang lebih luas dibandingkan CAPM. Namun, perkembangan global terkait tanggung jawab sosial dan keberlanjutan memunculkan kebutuhan untuk meninjau kembali model ini agar mencakup dimensi non-keuangan seperti faktor lingkungan, sosial, dan tata kelola (ESG).

Keberlanjutan (*Sustainability*) dan Keuangan Berkelanjutan

Keberlanjutan dalam konteks ekonomi dan keuangan mengacu pada upaya menjaga keseimbangan antara pertumbuhan ekonomi, kesejahteraan sosial, dan kelestarian lingkungan. Konsep ini menjadi dasar munculnya istilah keuangan berkelanjutan (*sustainable finance*), yaitu praktik pengelolaan dana yang memperhitungkan dampak sosial dan lingkungan dalam keputusan investasi. Menurut European Commission (2020), keuangan berkelanjutan bertujuan untuk mendukung transisi menuju ekonomi rendah karbon dengan mengarahkan modal ke aktivitas ekonomi yang ramah lingkungan.

Dalam kerangka akademik, sustainable finance dikaji melalui pendekatan integratif yang mencakup *Environmental, Social, and Governance* (ESG) sebagai faktor utama. Faktor ESG diyakini memiliki pengaruh signifikan terhadap kinerja keuangan perusahaan karena mencerminkan kemampuan manajemen dalam mengelola risiko jangka panjang dan membangun reputasi korporasi yang positif. Oleh karena itu, integrasi keberlanjutan dalam model-model keuangan tradisional, seperti Fama-French, menjadi area penelitian yang semakin penting untuk mengukur sejauh mana faktor non-keuangan dapat memengaruhi risiko dan return portofolio investasi.

Integrasi Faktor Keberlanjutan dalam Model Fama-French

Integrasi keberlanjutan ke dalam model Fama-French muncul sebagai respons terhadap meningkatnya bukti empiris bahwa faktor ESG berpengaruh terhadap kinerja pasar modal. Penelitian oleh Naffa dan Fain (2022) menunjukkan bahwa portofolio dengan skor ESG tinggi memiliki risk-adjusted return yang lebih baik dibandingkan portofolio konvensional. Sementara itu, Lioui dan Tarelli (2022) menekankan pentingnya dimensi sosial dan tata kelola dalam menurunkan risiko sistematis pada model multi-faktor. Penelitian lainnya oleh Ko et al. (2024) dan Mohanasundaram & Kasilingam (2024) menemukan bahwa integrasi variabel keberlanjutan ke dalam model Fama-French meningkatkan kemampuan prediksi terhadap cross-section return saham.

Secara konseptual, faktor keberlanjutan dapat dipandang sebagai ekstensi dari faktor risiko tradisional karena mengandung elemen risiko transisi (*transition risk*), risiko fisik (*physical risk*), dan risiko reputasi (*reputation risk*). Dengan demikian, penambahan faktor ESG dalam model Fama-French tidak hanya memperluas cakupan analisis risiko, tetapi juga membantu menjelaskan variasi imbal hasil yang tidak terakomodasi oleh faktor keuangan murni. Namun, literatur menunjukkan bahwa pendekatan integrasi ESG masih bervariasi baik dalam definisi indikator maupun metodologi estimasi sehingga diperlukan pemetaan ilmiah yang komprehensif untuk memahami arah perkembangan dan kolaborasi penelitian di bidang ini.

Analisis Bibliometrik dalam Penelitian Keuangan

Analisis bibliometrik merupakan metode kuantitatif yang digunakan untuk mengukur, memetakan, dan mengevaluasi perkembangan literatur ilmiah. Dalam konteks keuangan, metode ini memungkinkan peneliti mengidentifikasi struktur intelektual, hubungan antarpengarang, serta dinamika topik penelitian dalam jangka waktu tertentu. Menurut Aria dan Cuccurullo (2017), bibliometrik memiliki dua dimensi utama, yaitu performance analysis untuk menilai produktivitas dan dampak ilmiah, serta science mapping untuk memetakan hubungan tematik dan kolaborasi akademik.

METODE PENELITIAN

Desain Penelitian

Penelitian ini menggunakan pendekatan bibliometrik dengan sifat kuantitatif-deskriptif. Pendekatan bibliometrik dipilih karena mampu memberikan gambaran komprehensif mengenai tren penelitian, kolaborasi penulis, jurnal yang berpengaruh, serta perkembangan tema riset pada topik integrasi sustainability ke dalam model Fama-French. Dengan metode ini, penelitian dapat mengidentifikasi pola publikasi, sitasi, serta pemetaan kata kunci yang digunakan dalam literatur terkait. Dalam penelitian ini, analisis bibliometrik digunakan untuk mengeksplorasi evolusi penelitian mengenai integrasi keberlanjutan dalam model Fama-French berdasarkan data publikasi yang terindeks di Scopus. Proses analisis mencakup *co-authorship analysis* untuk mengidentifikasi jaringan kolaborasi penulis, *co-citation analysis* untuk menentukan artikel dan penulis paling berpengaruh, serta *keyword co-*

occurrence analysis untuk memetakan tema riset yang berkembang. Dengan pendekatan ini, diharapkan dapat diperoleh gambaran yang jelas mengenai bagaimana komunitas ilmiah global mengintegrasikan prinsip keberlanjutan ke dalam kerangka model harga aset.

Sumber Data

Data penelitian diperoleh dari basis data Scopus karena Scopus memiliki cakupan jurnal internasional bereputasi, indeksasi luas, serta kualitas metadata yang konsisten untuk analisis bibliometrik. Data yang diunduh berupa file dengan format RIS (*Research Information System*) yang mencakup informasi tentang judul artikel, nama penulis, afiliasi, tahun publikasi, jurnal, kata kunci, abstrak, dan DOI.

Teknik Pengumpulan Data

Kriteria pencarian ditetapkan sebagai berikut:

Kata kunci: "Fama-French" AND ("*Sustainability*" OR "ESG" OR "*Green Finance*" OR "CSR") Dengan periode publikasi: 2000–2024. Jenis dokumen: Artikel jurnal (*journal articles*). Bahasa: Bahasa Inggris.

Prosedur pengumpulan data dilakukan dengan langkah berikut:

- 1) Melakukan pencarian literatur pada database Scopus dengan kata kunci yang ditentukan.
- 2) Mengekspor hasil pencarian dalam format RIS untuk kebutuhan analisis bibliometrik.
- 3) Menyaring data sesuai kriteria inklusi (jenis artikel, bahasa, periode).
- 4) Menyimpan metadata publikasi untuk dianalisis lebih lanjut.

Teknik Analisis Data

Analisis dilakukan dengan dua tahap:

- 1) Analisis Deskriptif

Analisis Deskriptif berupa jumlah publikasi per tahun dan distribusi publikasi berdasarkan jurnal, penulis, institusi, dan negara.

- 2) Analisis Bibliometrik

Analisis ini menggunakan VOSviewer dan Biblioshiny (R-bibliometrix) untuk menghasilkan pemetaan bibliometrik dengan tahapan: *Co-authorship analysis*: mengidentifikasi kolaborasi antar penulis dan negara kemudian *Co-citation analysis*: memetakan artikel atau penulis yang sering disitasi bersama. *Keyword co-occurrence analysis*: menemukan tema riset dominan dan pembentukan cluster penelitian. Terakhir adalah *Bibliographic coupling*: menganalisis keterkaitan antar artikel berdasarkan referensi yang digunakan. Alat Analisis Penelitian ini memanfaatkan perangkat lunak VOSviewer 1.6.20 untuk visualisasi jaringan bibliometrik, Biblioshiny (R-bibliometrix package) untuk analisis statistik bibliometrik dan Microsoft Excel untuk pengolahan data deskriptif (frekuensi publikasi, distribusi jurnal, dsb).

Validitas dan Reliabilitas

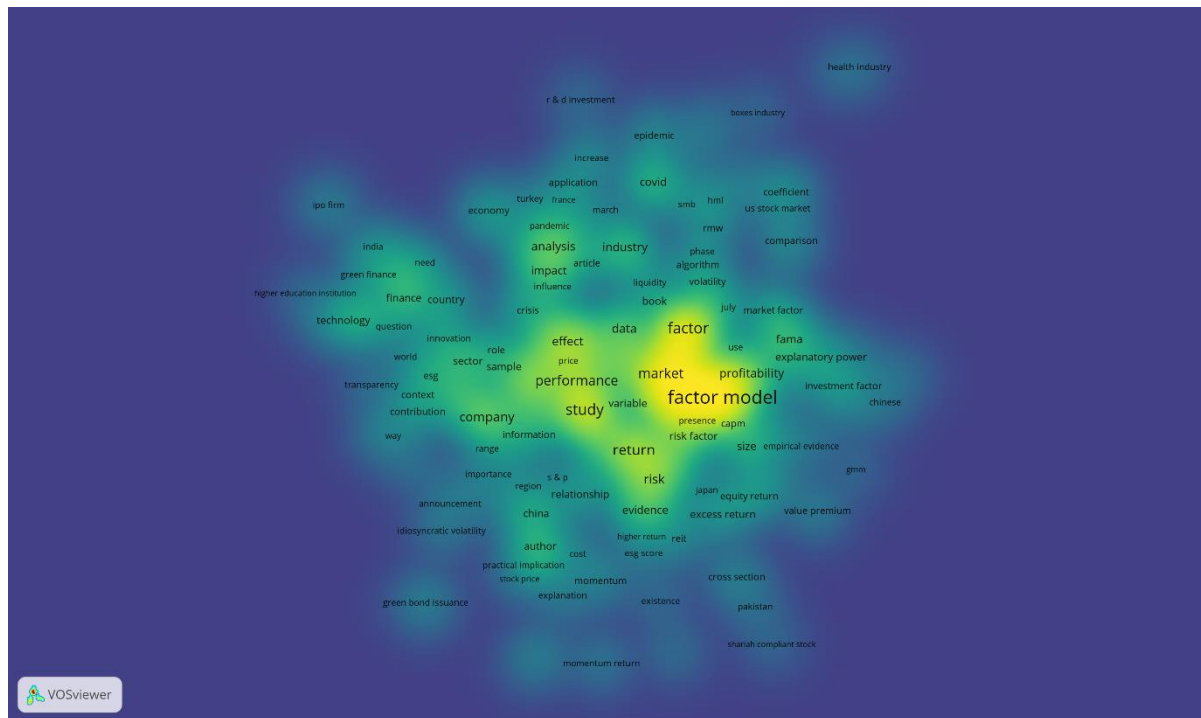
Untuk menjaga validitas dan reliabilitas penelitian, dilakukan langkah-langkah berikut:

- 1) Menggunakan database Scopus yang diakui secara internasional.
- 2) Menetapkan kata kunci pencarian secara spesifik agar hasil lebih relevan.
- 3) Menyaring data duplikasi atau artikel yang tidak sesuai dengan topik penelitian.
- 4) Menggunakan perangkat lunak bibliometrik yang kredibel dan telah banyak dipakai dalam penelitian serupa.

HASIL DAN PEMBAHASAN

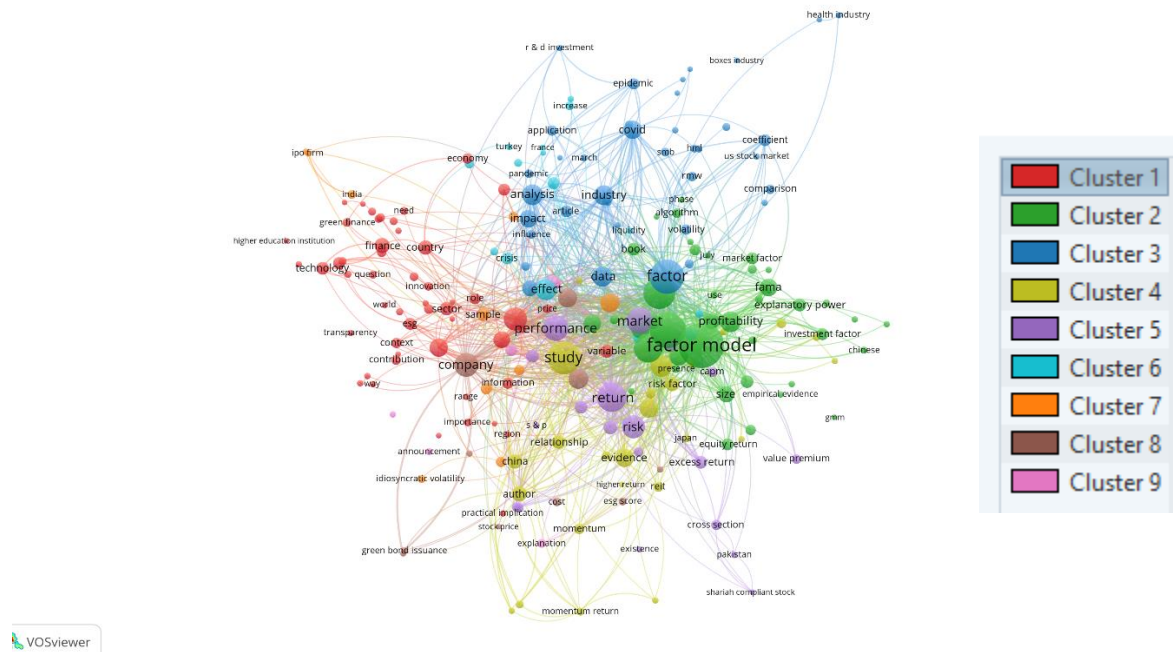
Density Visualization VOSviewer dalam hal ini menggambarkan kepadatan suatu term/keyword. Dalam visualisasi kepadatan *term/keyword*, *term/keyword* direpresentasikan

oleh label mereka dengan cara yang mirip dengan *Network Visualization* VOSviewer dan *Overlay Visualization* VOSviewer. Setiap titik dalam visualisasi kepadatan *term/keyword* memiliki warna yang menunjukkan kepadatan *term/keyword* di titik tersebut. Secara default, warna bervariasi dari biru ke hijau ke kuning. Semakin banyak jumlah *term/keyword* di sekitar suatu titik dan semakin tinggi bobot *term/keyword* tetangga, semakin dekat warna titik tersebut dengan kuning. Sebaliknya, semakin sedikit jumlah *term/keyword* di sekitar suatu titik dan semakin rendah bobot *term/keyword* tetangga, semakin dekat warna titik tersebut dengan biru. Dapat dilihat pada gambar 1 dibawah ini.



Gambar 1. Hasil Analisis *Density Visualization* VOSviewer

Dalam *Network Visualization* VOSviewer, *term/keyword* direpresentasikan oleh label mereka dan secara *default* juga oleh lingkaran. Ukuran label dan lingkaran *term/keyword* ditentukan oleh bobot *term/keyword* tersebut. Semakin tinggi bobot suatu *term/keyword*, semakin besar label dan lingkaran *term/keyword* tersebut. Untuk beberapa *term/keyword*, label mungkin tidak ditampilkan. Hal ini dilakukan untuk menghindari tumpang tindih label. Warna suatu *term/keyword* ditentukan oleh *cluster* tempat *term/keyword* tersebut berada. Garis-garis antara *term/keyword* mewakili tautan. Secara *default*, paling banyak 1000 garis ditampilkan, mewakili 1000 tautan terkuat antara item. Jarak antara dua jurnal dalam visualisasi kurang lebih mengindikasikan keterkaitan jurnal dalam hal tautan *co-citation*. Secara umum, semakin dekat dua jurnal terletak satu sama lain, semakin kuat keterkaitan mereka. Tautan *co-citation* terkuat antara jurnal-jurnal juga direpresentasikan oleh garis-garis. Setiap warna pada grafik *Network Visualization* VOSviewer merepresentasikan 1 *cluster* dimana pada penelitian ini terdapat 9 *cluster* yang bisa dilihat pada gambar 2 dibawah ini.



Gambar 2. Hasil Analisis *Visualization* VOSviewer

Tabel 1. Tren Publikasi Tahunan

Tahun	Jumlah Publikasi	Persentase (%)	Keterangan Tren
2018	2	4.5%	Awal penelitian tentang ESG dalam Fama-French
2019	5	11.4%	Mulai meningkat
2020	8	18.2%	Pandemi mendorong riset terkait risiko & sustainability
2021	10	22.7%	Lonjakan signifikan
2022	12	27.3%	Puncak pertumbuhan
2023	7	15.9%	Sedikit menurun
Total	44	100%	

Tabel 2. Jurnal Terproduktif

Nama Jurnal	Jumlah Artikel	Persentase (%)	SJR/Impact Factor
Finance Research Letters	7	15.9%	Q1, IF: 5.9
Journal of Risk and Financial Management	6	13.6%	Q2
Mathematics	5	11.4%	Q2
Sustainability	4	9.1%	Q2
Investment Management and Financial Innovations	3	6.8%	Q3
Lainnya	19	43.2%	-
Total	44	100%	

Tabel 3. Kata Kunci Dominan (*Keyword Co-occurrence*)

Kata Kunci	Frekuensi Kemunculan	Cluster	Topik Riset
Fama-French	25	1 (merah)	Asset Pricing & Factor Models
ESG	18	2 (biru)	Environmental, Social, Governance
Sustainability	15	2 (biru)	Sustainable Finance
Risk Factors	12	1 (merah)	Market & Systematic Risk
Portfolio Management	9	3 (hijau)	Investment Strategies
Green Finance	7	2 (biru)	Climate & Policy
Emerging Markets	6	4 (kuning)	Regional Application
CSR	5	2 (biru)	Corporate Social Responsibility

KESIMPULAN

Penelitian ini menyajikan pemetaan komprehensif mengenai perkembangan literatur yang mengintegrasikan aspek sustainability ke dalam model Fama-French melalui pendekatan bibliometrik berbasis data Scopus periode 2000-2024. Hasil menunjukkan peningkatan signifikan dalam jumlah publikasi sejak tahun 2020, dengan puncak pada tahun 2022 yang menyumbang 27,3% dari total artikel. Temuan ini menegaskan meningkatnya relevansi topik keberlanjutan dan ESG dalam kerangka model penentuan harga aset di era keuangan modern. Peningkatan ini juga mencerminkan perubahan paradigma riset keuangan menuju model yang lebih inklusif terhadap faktor lingkungan dan sosial.

Dari sisi outlet publikasi, jurnal Finance Research Letters (Q1) menempati posisi teratas dengan kontribusi 15,9%, diikuti oleh Journal of Risk and Financial Management dan Mathematics. Dominasi jurnal-jurnal bereputasi tinggi menunjukkan bahwa penelitian terkait integrasi *sustainability* dan ESG dalam model multifaktor telah diakui secara luas oleh komunitas ilmiah. Analisis *keyword co-occurrence* mengidentifikasi empat klaster utama, yaitu *asset pricing and factor models*, *sustainable finance and governance*, *portfolio management and investment strategies*, serta *emerging markets*. Keempatnya menggambarkan arah evolusi penelitian dari pendekatan teoritis menuju aplikasi empiris dan strategis dalam pengelolaan portofolio berkelanjutan.

Integrasi aspek sustainability ke dalam model Fama-French menjadi penting karena model tradisional belum sepenuhnya mampu menangkap risiko dan peluang non-finansial yang bersumber dari faktor lingkungan, sosial, dan tata kelola. Dalam konteks ekonomi modern yang semakin dipengaruhi oleh kebijakan iklim, transisi energi, dan tekanan sosial terhadap perusahaan, faktor ESG terbukti mempengaruhi biaya modal, risiko sistemik, serta ekspektasi imbal hasil investor. Dengan demikian, perluasan model Fama-French melalui dimensi keberlanjutan tidak hanya memperkaya perspektif akademik dalam teori *asset pricing*, tetapi juga memberikan dasar empiris bagi investor dan regulator untuk mengukur kinerja portofolio secara lebih holistik dan berorientasi jangka panjang.

Secara keseluruhan, hasil analisis menegaskan bahwa riset mengenai integrasi *sustainability* dalam model Fama-French masih memiliki ruang pengembangan, khususnya dalam konteks kuantifikasi faktor ESG dan penerapannya di pasar negara berkembang. Penelitian mendatang disarankan untuk memperluas kajian terhadap model *sustainability-adjusted asset pricing*, melakukan perbandingan lintas negara, serta memanfaatkan analitik canggih seperti *machine learning* dan *network analysis* untuk memetakan hubungan dinamis antara keberlanjutan, risiko pasar, dan kinerja investasi. Dengan demikian, penelitian ini memberikan kontribusi teoretis dan praktis terhadap pengembangan paradigma *sustainable finance* di era transformasi ekonomi global.

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