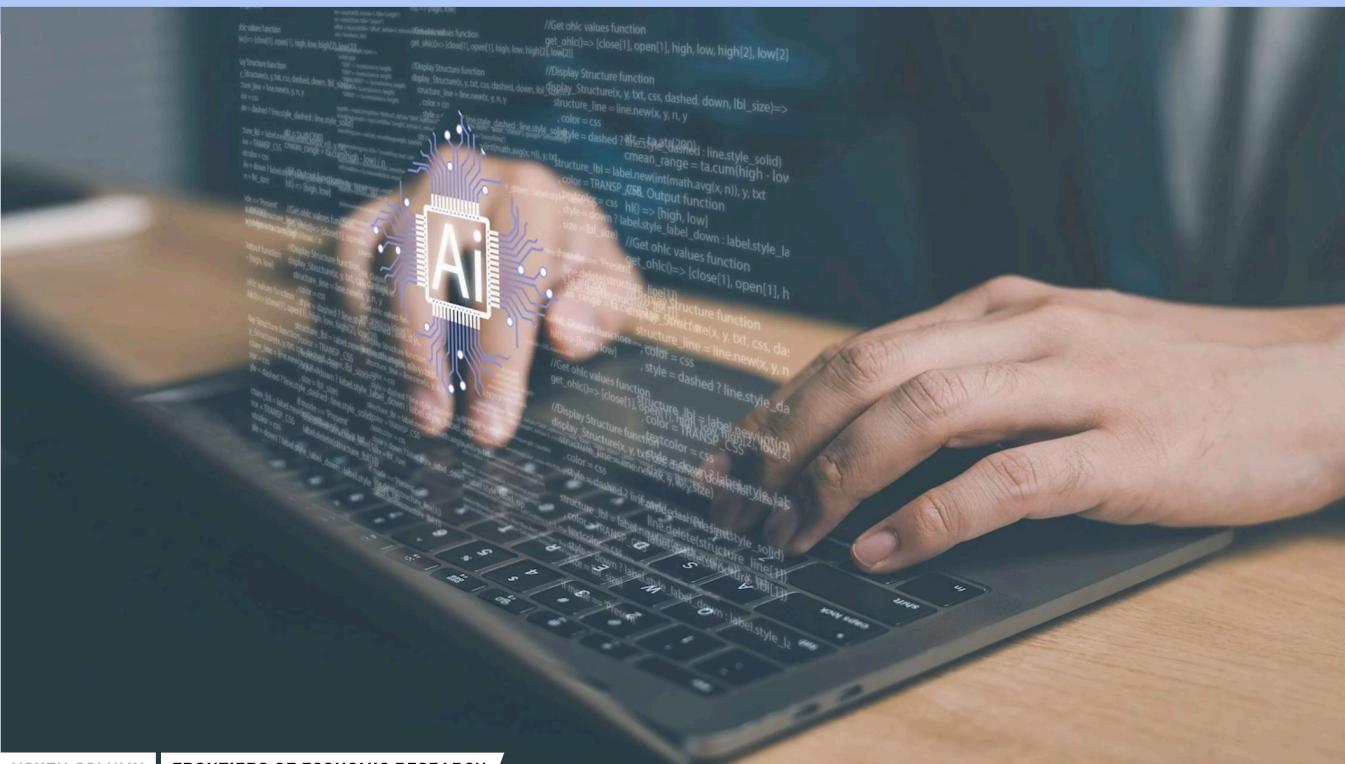


## In this section



VOXEU COLUMN

FRONTIERS OF ECONOMIC RESEARCH

## AI-powered research generation: Promise and perils for academic finance

Robert Novy-Marx, Mihail Velikov / 25 Feb 2025

Artificial intelligence is transforming academic research, raising both opportunities and concerns. This column shows how large language models can generate entire research papers, integrating empirical findings with plausible theories. While this boosts efficiency, it also threatens academic integrity, making it harder to distinguish rigorous scholarship from AI-generated content. Existing safeguards may not scale, requiring updated peer review processes, AI disclosure standards, and new quality metrics. The challenge is to ensure that AI enhances knowledge production rather than overwhelming it with quantity over quality.

---

### AUTHORS



**Robert Novy-Marx**



**Mihail Velikov**

Assistant Professor of Finance, Penn State University

The rise of artificial intelligence is transforming academic research in ways that were unimaginable just a few years ago. While recent developments in generative AI have sparked intense debate about its impact on the economy (Brynjolfsson et al. 2024, Agrawal et al. 2018), less attention has been paid to how AI might fundamentally change the way academic research is produced and validated. Our recent study demonstrates both the remarkable capabilities and concerning implications of using AI to automate academic research production at scale (Novy-Marx and Velikov 2025).

The academic finance community, like many scientific fields, faces growing pressure to produce novel insights while maintaining rigorous

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so. More info

**ACCEPT**

**NO, THANKS**

research process presents an even more fundamental challenge to academic integrity – these systems can now generate not just data analysis, but complete theoretical frameworks and fully-formed academic papers.

Our recent study reveals both the remarkable capabilities and alarming implications of AI-powered research generation. We document these capability by implementing a complete pipeline for automated academic research production. Using stock return predictability as our testing ground, we first identify over 30,000 potential stock return predictors from accounting data. Through statistical validation using the Novy-Marx and Velikov (2024) protocol, we isolate 96 robust predictive signals. We then use LLMs to generate three distinct versions of complete academic papers for each signal, producing 288 papers. Each version presents different theoretical justifications while maintaining consistency with the empirical findings.

The efficiency gains are substantial. While initial data analysis requires approximately one day of computation time, the paper generation process takes minutes. The AI-generated papers demonstrate several notable characteristics: consistent naming conventions for complex financial signals, plausible economic mechanisms linking signals to returns, integration with existing literature through appropriate citations, and coherent theoretical frameworks aligning with empirical findings. These papers follow standard academic conventions in structure and presentation, making them nearly indistinguishable from human-authored research in format and style.

This capability raises serious concerns for academic integrity and knowledge production. The profession's existing safeguards against data mining and post-hoc theorising rely on mechanisms that may not scale to AI-generated content. These include scholarly reputation built through sustained contribution rather than publication quantity, peer review screening of theoretical foundations, and requirements for public data and code sharing. The practice of presenting work at research seminars creates opportunities for detailed questioning about theoretical mechanisms, but these discussions assume human authorship and reasoning.

The emergence of AI systems capable of generating multiple plausible theoretical frameworks presents novel challenges to these traditional mechanisms. When AI can rapidly produce hundreds of seemingly coherent theoretical explanations for mined empirical results, maintaining meaningful quality control becomes difficult. The ability to generate convincing theoretical frameworks that seamlessly integrate with existing literature creates new forms of potential academic arbitrage. Each AI-generated paper naturally includes citations to support its hypothesis development, potentially creating artificial citation networks when scaled to hundreds or thousands of papers.

The increasing emphasis on replicability in empirical finance adds another layer to consider. While AI makes testing easier and raises overfitting concerns, it also lowers the bar for replication and independent verification. This duality suggests that traditional metrics of research quality may need recalibration in an AI-enabled environment. The focus should shift from simply documenting statistical significance to demonstrating practical relevance and novel economic insights.

The academic community needs new standards for research evaluation that reflect these realities. These should include enhanced validation systems for citations and theoretical frameworks, updated peer review processes for AI-generated content, and new metrics for assessing scholarly contribution that emphasise practical relevance over theoretical plausibility. Clear disclosure requirements for AI involvement would help readers evaluate methodological rigour and theoretical contributions. Economic theories justifying observed phenomena should be evaluated by their ability to generate novel testable predictions beyond the primary findings they were designed to explain.

Implementation of these recommendations requires significant coordination within the academic finance community or mechanisms that incentivise their adoption. The profession should establish standardised protocols for AI disclosure in research, create shared databases for validation, and develop community-wide standards for evaluating AI-assisted research. These efforts are essential for maintaining research integrity as AI capabilities continue to advance.

The integration of AI into academic research is inevitable and potentially beneficial for processing large amounts of information and identifying research directions. However, without proper safeguards, we risk an environment where quantity overwhelms quality and where advancing knowledge becomes secondary to generating content. The standards implemented today will determine whether AI enhances or diminishes the quality of academic discourse.

## References

Agrawal, A, J Gans and A Goldfarb (2018), "Economic policy for artificial intelligence", VoxEU.org, 8 August.

Brynjolfsson, E, A Korinek and A Agrawal (2024), "A Research Agenda for the Economics of Transformative AI", Stanford Digital Economy Lab Working Paper, November 2024.

Chen, A Y, A Lopez-Lira and T Zimmermann (2024), "Does peer-reviewed research help predict stock returns?", Working Paper.

Novy-Marx, R and M Velikov (2024), "Assaying Anomalies", Working Paper.

Novy-Marx, R and M Velikov (2025), "AI-Powered (Finance) Scholarship", NBER Working Paper.

---

## AUTHORS

 Robert Novy-Marx

 Mihail Velikov

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

## THEMES

FRONTIERS OF ECONOMIC RESEARCH

## KEYWORDS

ARTIFICIAL INTELLIGENCE    LARGE LANGUAGE MODELS

ACADEMIC RESEARCH

## SHARE



VoxEU COLUMN

Leveraging large language models for large-scale information retrieval in economics

Prashant Garg, Thiemo Fetzer

19 FEB 2025    FRONTIERS OF ECONOMIC RESEARCH

```
    raise Exception("Input language could not be determined")
    return None
  parsedInput = self.parseInputToLanguageModel(inputString, inputLanguage, context)
  if not parsedInput or not self.model:
    return None
  context.append(parsedInput) # Add new conversation entry to context
  return (self.model.generateLLMOutput(parsedInput), context)

def parseInputToLanguageModel(self, inputString, inputLanguage, context):
  if self.model is None or self.model.language != inputLanguage:
    # LLM is not initialised or has wrong language, load LLM
    self.model = self.loadAILanguageModelFromDatabase(inputLanguage)
    if self.model is None or not self.model.runModelSel10LanguageModel():
      raise Exception("AI language model load failed")
    return None
  self.model.setLLMContext(context) # Put past conversation context into NL
  llmInputParser = self.model.getInputParser()
  llmInputParser.parseInput(inputString)
  return llmInputParser.parseInput(inputString)

def generateLLMOutput(self, parsedInput):
  context = self.model.getLLMContext()
  self.model.convertInputToIntermediateKeyWords(parsedInput)
  return self.model.generateLLMOutput(parsedInput, context)
```

VoxEU COLUMN

Large language models for economic research: Four key questions

Elliott Ash, Stephen Hansen

27 JUL 2023    FRONTIERS OF ECONOMIC RESEARCH



AI is reshaping economic research

Anton Korinek

10 MAR 2023    FRONTIERS OF ECONOMIC RESEARCH /

PRODUCTIVITY AND INNOVATION

## THEMES & CURRENT ISSUES

Business Cycles

Exchange Rates

Migration

Central Banking

Finance and Fintech

Monetary Policy

Climate Change

Financial Markets

Political Economy

Competition Policy

Financial Regulation and Banking

Poverty and Income Inequality

COVID-19

Health Economics

Productivity and Innovation

Development & Growth

Inflation

Taxation

Economic history

International Finance

Ukraine Initiative

Energy

International trade

Women in Economics

FII Economic Architecture

Labour Markets

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

Your email address

SIGN UP

[Contact Us](#) [Cookies](#) [Privacy Policy](#) [RSS Feeds](#)

Copyright 2025 CEPR /designbysoapbox.com

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.