Accounting & Finance PhD Research Topic

Artificial Intelligence Innovation and Asset prices

Supervisory Team:

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Abstract:

In today's knowledge-driven economy, where industries are increasingly defined by rapid technological advancements, firms that leverage AI innovation gain a competitive edge. By integrating AI-driven predictive analytics, algorithmic trading, and data-driven decision-making, these firms enhance market efficiency, optimise risk management, and unlock new investment opportunities, ultimately influencing asset price dynamics. This project aims to provide a comprehensive analysis of the impact of AI innovation on asset prices, focusing on how firms' adoption of AI technologies affects their market valuation, volatility, and long-term return potential.

Project:

The rapid pace of technological advancements has transformed the corporate landscape and redefined competitive advantage. The intersection of technological innovation and asset pricing has garnered significant attention in the finance and economics literature. Studies show that technological advancements can serve as a catalyst for growth by enhancing productivity and creating new market opportunities. However, while previous research emphasizes the role of innovation in competitive advantage and profitability, fewer studies specifically address the impact of AI innovations on asset prices.

Research on asset pricing traditionally considers risk factors such as firm size, industry classification, and market-to-book ratios. However, AI innovation as a factor remains underexplored in terms of its distinct impact on stock returns. AI innovation encompasses a broad spectrum of advancements, from developing intelligent systems and predictive analytics to enhancing decision-making processes, each with distinct implications for a firm's financial performance and risk. For instance, AI-driven innovations like ChatGPT's natural language

processing or Tesla's autonomous driving algorithms create new revenue opportunities and improve customer engagement, while AI-powered process enhancements, such as automated trading or fraud detection, boost efficiency and operational resilience. However, firms investing in AI innovation often encounter significant entry barriers, including high development costs, regulatory challenges, and the need for specialised expertise.

Additionally, the literature suggests that investor behaviour may vary depending on economic and market conditions. For instance, during periods of economic expansion, investors may be more willing to take risks on high-growth, innovative firms, whereas, during economic downturns, there may be a flight to safety, with investors favouring more stable, established firms. These insights form a foundation for exploring how economic cycles and market conditions interact with innovation to shape asset prices.

The following indicative research questions arise from the above outline of the project:

- How does AI innovation affect firms' stock returns and valuation multiples?
- What role does AI innovation play in shaping firms' risk-return profiles?
- How do investors price the different types of AI innovations, such as AI-related tangible assets versus the intangible assets, such as proprietary algorithms and machine learning capabilities?
- How does the impact of AI innovation on asset prices vary across different phases of the economic cycle and financial market conditions?
- What underlying mechanisms mediate the relationship between AI innovation and asset prices?
- How do cybersecurity threats and AI-related biases impact investor confidence and asset prices?

The following articles help provide a backdrop of the literature pertaining to this field. A number of papers are by the lead supervisor to allow candidates to understand her background work on asset pricing and forecasting.

Hsu, P. H. (2009). Technological innovations and aggregate risk premiums. *Journal of Financial Economics*, *94*(2), 264-279.

Cockburn, I. M., Henderson, R., & Stern, S. (2018). *The impact of artificial intelligence on innovation* (Vol. 24449). Cambridge, MA, USA: National bureau of economic research.

Pástor, Ľ., & Veronesi, P. (2009). Technological revolutions and stock prices. *American Economic Review*, *99*(4), 1451-1483.

Papanikolaou, D. (2011). Investment shocks and asset prices. *Journal of Political Economy*, *119*(4), 639-685.

Garleanu, N., Panageas, S., & Yu, J. (2012). Technological growth and asset pricing. *The Journal of Finance*, *67*(4), 1265-1292.

Kung, H., & Schmid, L. (2015). Innovation, growth, and asset prices. *The Journal of Finance*, *70*(3), 1001-1037.

Bannigidadmath, D., Narayan, P. K., Phan, D. H. B., & Gong, Q. (2022). How stock markets reacted to COVID-19? Evidence from 25 countries. *Finance Research Letters*, *45*, 102161.

Golab, A., Bannigidadmath, D., Pham, T. N., & Thuraisamy, K. (2022). Economic policy uncertainty and industry return predictability–Evidence from the UK. *International Review of Economics & Finance*, *82*, 433-447.

Bannigidadmath, D., & Narayan, P. K. (2021). Economic news and the cross-section of commodity futures returns. *Journal of Behavioral and Experimental Finance*, *31*, 100540.

Narayan, P. K., & Bannigidadmath, D. (2021). Financial news and CDS spreads. *Journal of Behavioral and Experimental Finance*, *29*, 100448.

Narayan, P. K., Bannigidadmath, D., & Narayan, S. (2021). How much does economic news influence bilateral exchange rates?. *Journal of International Money and Finance*, *115*, 102410.

Bannigidadmath, D., & Narayan, P. K. (2016). Stock return predictability and determinants of predictability and profits. *Emerging Markets Review*, *26*, 153-173.

Narayan, P. K., & Bannigidadmath, D. (2015). Are Indian stock returns predictable? *Journal of Banking & Finance*, *58*, 506-531

Desired skills: Quantitative research (Stata, R, or Python)

Project Area: Accounting and Finance

Project level: PhD or MbR