

Equity Risk Premium Adjusted for Geopolitical Risks: Sectoral Distributions and the Impact of Trade Wars, Sanctions, and Technological Rivalries

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Abstract

The technological advances observed for more than a decade have set the stage for a Second Cold War between the US and China (Schindler et al. 2023; Li, He, Lin 2018). Technology is a crucial weapon in this conflict about the new geopolitical order and economic domination of the world. The rivalry observed between China and the US has emerged as a significant geopolitical risk factor influencing financial markets. This has shaped the equity risk premium in many technology-related sectors.

The equity risk premium (ERP) is a fundamental concept in financial economics, representing the excess return that investors require for holding equities over risk-free assets. The literature on the equity premium puzzle began with the seminal paper by Mehra and Prescott (1985) and was later analyzed through both a behavioral finance perspective (Benartzi and Thaler, 1995; Barberis et al., 2001) and in terms of more traditional factors (Heaton and Lucas, 1997; Fama and French, 2002; Bekaert et al., 2014; Jordà et al., 2019; Bouras et al., 2019; Huang et al., 2023). Our research contributes to both areas, while focusing on the semiconductor sector in the US, Taiwan and China.

In this paper, our aim is to identify and assess the equity risk premium in various sectors in the US, Taiwan and China, and to explain this in terms of changes in investor risk aversion resulting from geopolitical uncertainty. First, we calculate the equity premium in 23 market sectors in the three aforementioned countries. We then calculate the risk aversion parameters for each sector within the sample using the modified Lucas utility function (Lucas, 1978; Mehra and Prescott, 1985; Barberis et al., 2001). Based on the

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results obtained, we then propose our own risk index. Finally, we compare this with the Geopolitical Risk Index (GPR) of Caldara and Iacoviello (2021).

There are two hypotheses that we intend to test in our three-step approach:

Hypothesis 1: Technological warfare between major global powers—characterized by trade restrictions, sanctions, and innovation competition—significantly elevates the equity risk premium, with disproportionately larger effects observed in sectors directly exposed to geopolitical supply-chain disruptions, such as semiconductors.

We expect that geopolitical disruptions in critical industries create non-diversifiable risks not fully captured by traditional macroeconomic variables. This hypothesis extends the consumption-based model of Mehra and Prescott (1985) by positing that geopolitical disruptions in critical industries create non-diversifiable risks not fully captured by traditional macroeconomic variables

Hypothesis 2: Sector-specific risk premiums diverge based on strategic importance, reliance on global supply chains, and susceptibility to political interventions.

We expect that geopolitical risk differentially impacts risk premiums across economic sectors as strategic sectors (e.g., semiconductors, energy) are acutely sensitive to trade restrictions (e.g., U.S. chip export bans to China) or supply disruptions (e.g., Ukraine war's impact on gas markets).

The results obtained can be summarised as follows. Firstly, we analysed the equity risk premium across our sample of 23 sectors in the US, Taiwan and China between 1990 and 2025. Our results suggest that the US premium is, on average, almost three times higher than the premiums observed in Taiwan and China. This may imply that a different investment approach is required for each of the three analysed markets, given the different cultural backgrounds of investors and the specifics of each market. This is consistent with our previous finding that an increase in geopolitical risk in the Chinese market leads to a decrease in price uncertainty.

Secondly, an in-depth analysis of the equity premium in specific US, Taiwanese and Chinese sectors reveals significant differences in investor perception of each sector. The equity premium observed in the Taiwanese semiconductor sector is nearly five times higher than the market average, whereas in the US it is only twice as high, and even lower in China. Notably, the highest equity premium is observed in China's defence sector, whereas in the US it is in the technology and semiconductor sectors.

Next, we used the modified Lucas approach to identify the risk aversion parameters of investors in the US, Taiwan and China. Interestingly, US and Chinese investors tend to seek risk, whereas Taiwanese investors adopt a more risk-averse approach. The next step was to analyse risk aversion parameters in particular sectors, which revealed that Chinese

investors mainly seek risk in technology-driven sectors. In the US, a negative risk aversion factor was observed in technology-related sectors, and an extremely high factor was observed in the financial sector. Compared to the other two countries, Taiwan's semiconductor sector is driven by an unusually high aversion to risk. Furthermore, the values of the observed risk aversion factors suggest that investors may be susceptible to behavioral biases.

Our study provides a detailed analysis of the equity premium in traditional and technology-driven sectors in the US, Taiwan, and China. Our findings contribute to the extensive literature on the equity premium puzzle (Bouras et al., 2019; Baldwin, 2020; Chen et al., 2024) and the behavioral aspects that shape investors' approaches (Benartzi & Thaler, 1995; Barberis et al., 2001; Statman, 2019) in different countries. This makes our research a relatively broad examination of investors' risk perception in different markets, particularly in the semiconductor industry.

Last but not least, our study contributes to practice by helping investors track the factors that shape market premiums and adjust their investment and hedging strategies according to the geopolitical situation.