

DOCTORAL PROGRAMME

IMPACT OF CENTRAL BANK SPEECHES – A NEW APPROACH IN TEXT ANALYSIS

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Abstract

This thesis examines the impact of central bank communication on market return. The central bank communication is proxied by speeches delivered by the respective governors/chairpersons. The tone from central bank speeches is extracted and analyzed with respect to its impact on the stock market returns across a varied array of economies. The impact of market returns is analyzed independently as well as in the presence of existing tone variables. Similar exercise has been attempted in the past (Lee et al. (1991), Neal & Wheatley (1998), Baker & Wurgler (2006), Baker & Wurgler (2007), Schmelting (2009) and Szu et al. (2015)). An important distinction in this study is with respect to the process of tone quantification from central bank communication. One of the major questions in tone quantification is how many word/s should be considered as a batch (primary unit)? The previous studies in related literature have ranged the same from “one word at a time” (bag-of-words approach)(Tetlock (2007), Loughran & McDonald (2016)) to ngram analysis (n-words at a time)(Li (2008), Tetlock et al. (2008)). However, all the approaches in this array of one to n words have their share of critics due to the presence of multiple adverbs and adjectives with a corresponding word. For example, the phrase ”not so good financial year” will lead to incorrect tone quantification for one word to ngram ($n = 2$) approach as the corresponding noun phrase “financial year” has three adverbs/adjectives. Also, the number of adverbs/adjectives can vary widely in any text (including central bank communication). In this work, we suggest an alternate solution to this issue by identifying a sentence as a base unit of tone quantification. Also, we assign appropriate weights to adverbs/adjectives (“valence shifters” henceforth) to ensure each cluster of noun phrases is quantified correctly within a sentence. To the best of our knowledge, this is the first attempt at the use of valence shifters to financial text. The impact of the extracted tone is tested across varied economies i.e. developed (U.S., U.K., Japan, Germany, and

France) in chapter 2 and emerging (India, China, Russia, South Korea, and Indonesia) in chapter 3, independently and in the presence of existing tone variables as additional controls. This is so because in the case of developed economies the impact of existing tone variables is well established and thus it is interesting to see what role does the central bank communication hold in such markets. Also, the efficacy of the new speech tone extractor can be compared before applying to newer markets. On the other hand, the role of existing tone variables, such as the Baker and Wurgler Index ([Baker & Wurgler \(2006\)](#)) (with the original six variables) and Consumer Confidence Index (as made available by the respective central bank/government, has not been analyzed in detail across emerging markets. The role and impact of central bank speeches in emerging markets can be different than that of developed economies due to differences in the market micro-structure and technological advancements. Thus, it becomes important to analyze the importance of central bank speeches in emerging market settings independently and in the presence of existing tone variables to ensure the impact of speeches is not just due to characteristics pertaining to developed economies. With respect to both these studies, we find that majority of developed and emerging markets are significantly impacted by the tone from central bank communication, even in the presence of existing tone variables. Also, in the majority of cases, the speech tone variable renders the existing tone variable insignificant. The fourth chapter in this study deals with a unique case of central bank communication provided by the eurozone. In the eurozone, each of the member countries has its own central bank addressing economic and financial activities in the country; at the same time all the countries are subject to the supranational central bank - European Commercial Bank (ECB), which decides for the entire zone and such decisions take precedence over individual sovereign decisions. Thus, it provides an interesting opportunity to analyze the importance of ECB and central banks' communication independently as well as on the days where both sets of economic institutions give the speeches on the same day. The results show that majority of nations in the eurozone

are affected significantly by the speeches of ECB and the same renders the central bank communication of the specific nations insignificant.