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## Growing pains: The evolution of new stock index futures in emerging markets

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### ABSTRACT

Analyzing the first seven years of trading in Turkish stock index futures (BIST 30) and contrasting that to the progress of Korean (KOSPI 200) and Taiwanese (TAIEX) markets, we find that BIST 30 initially experiences a persistent mispricing and speculative trading similar to KOSPI 200 but it also experiences the largest increase in hedge effectiveness, becoming hedger-dominated similar to TAIEX. Most significantly, we demonstrate that spot market short-sell quote volume is a good measure of short-sale constraints and a significant determinant of mispricing in BIST 30. A methodological contribution of this paper is a four-equation multivariate VAR framework to analyze the volatility impact of futures.

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## 1. Introduction

Following the recent financial crisis that primarily affected developed markets, investment in emerging equity markets has increased. In particular, stock index futures stood out as one of the most attractive securities for foreign investors by providing a convenient exposure to the local stock markets. However, the index futures in most emerging markets are relatively new compared to the ones in developed markets, and previous research on index futures in developed markets shows that the pricing efficiency and hedging benefits of index futures contracts are not as accurate during the early years of their trading.

McMillan and Ülkü (2009), investigating a recently introduced index futures contract in an emerging market, find that during the first 18 months of trading, BIST 30 Index futures trading at Borsa Istanbul (formerly ISE 30 index contract of Turkish Derivatives Exchange-TurkDEX)<sup>1</sup> were significantly mispriced and conclude that results “invite arbitrageurs” to trade this

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index contract (p. 218). Given the increase in foreign capital flows to emerging markets in the aftermath of the crisis, our paper investigates the evolution of pricing and hedging efficiency of the Turkish stock index futures market throughout the first seven years of its trading. Throughout our analysis, we compare and contrast the progress of Turkish stock index futures to those of Korean and Taiwanese index futures during their initial years of trading to draw conclusions for the development of new emerging market stock index futures.

TurkDEX, founded in early 2005, has fared better than most other emerging derivatives markets during the global financial crisis. Significant and rapid development of the Turkish economy and its equity markets, even during the global financial crisis and afterwards, combined with the performance of TurkDEX, makes analyzing the evolution of its stock index futures an important contribution to the literature. Combining within our analysis evolution of the index futures contracts of Korea and Taiwan increases the relevance of our findings for the new emerging market index futures. This paper focuses on the evolution of futures contracts on the Borsa Istanbul Stock Exchange National 30 Index (BIST 30), which is the most commonly followed index in Turkey. We conduct a cross-market analysis between the futures and spot markets spanning the first seven years of trading, February 2005 through February 2012.

We investigate four aspects of trading in the BIST 30 Index futures: mispricing, price discovery, volatility and, most importantly, we analyze the evolution of hedging effectiveness of the BIST 30 Index futures. As [Merrick \(1988\)](#) argues both theoretically and empirically, in a futures market with mispricing, hedges that are not held to expiration will not be riskless, and the initial hedge ratios will be affected by the existence of a mispricing component in returns. This situation is likely to deter hedgers as well as arbitrageurs from entering the futures market. As a result, the lack of their participation further prolongs the correction of potential mispricing and reduces the hedging benefits of the contract.

Supplementing the analyses of the progress in the Turkish index futures market is the inclusion of two other emerging markets in which stock index futures trading started several years earlier: Korea and Taiwan. Investigating their respective initial seven years of trading data, we are able to draw conclusions not only for the futures market in Turkey, but for new emerging market index futures contracts globally. In both Korea and Taiwan, stock index futures were introduced in the late 1990s. Their early years of trading have pricing-related resemblances to the Turkish market as documented in the literature. For Korea, it is persistent mispricing, mostly in the form of underpriced futures. Analyzing the first two years of trading, [Gay and Jung \(1999\)](#) find an average of 1.85% daily price deviation for the Korea Exchange's KOSPI 200 Index contract compared to its theoretical value, which represented 1% underpricing even after including trading costs that non-exchange members face. [McMillan and Ülkü \(2009\)](#) report even higher levels of underpricing that averages around 5–8% for the BIST 30 index futures within the first two years of its trading, while they estimated transaction costs to be around 1%.

On the other hand, similarity between the Turkish and Taiwanese stock index contracts is the uncommon finding that the spot market prices lead the index futures prices.<sup>2</sup> In their analysis of the TAIEX Index futures, [Roopé and Zurbrugg \(2002\)](#) conclude that the underlying index prices lead the futures in the Taiwanese market. Similarly, for the Turkish futures market, the results of [Kasman and Kasman \(2008\)](#) indicate that the direction of both long- and short-run causality is from spot prices to futures prices.

Our research makes three main contributions to the literature. First, an extensive analysis of stock index futures combines four strands of literature, mispricing, price discovery, impact on volatility, and hedging effectiveness. Second, we analyze a relatively young index futures market in an emerging country and contrast the findings with two other emerging market stock index futures launched earlier but exhibiting similarities to the Turkish market in their initial years. Finally, a major contribution is on the methodology front: The volatility analysis we conduct in a VAR framework uses all four key variables together in a dynamic model, spot volume, spot volatility, futures volume, and futures volatility. To the best of our knowledge, this is the first paper to apply this four-equation VAR in futures literature.

The paper is organized as follows. Section 2 provides a brief literature review. Section 3 gives an overview of the BIST 30 index futures market along with the data, variables, and descriptive statistics. The empirical methodology is explained in Section 4. Section 5 presents the results and Section 6 the conclusions.

## 2. Literature review

The potential hedging benefits that a stock index futures contract provides become even more vital in the case of emerging markets where the cash markets are more prone to high volatility. Therefore, an efficiently functioning index futures market becomes even more important to both domestic and foreign investors. There is abundant research on the various dynamics of index futures and their hedging benefits. However, the bulk of this research is conducted on developed markets partly due to the delayed introduction of index futures in most emerging countries. An important addition to futures markets literature is our investigation of the relatively young stock index futures market in Turkey, launched in early 2005 approximately 20 years after establishment of its underlying spot equity market.

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<sup>2</sup> A substantive number of the lead-lag studies find that futures markets lead the spot markets, e.g. [Booth et al. \(1999\)](#).

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