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# Hedging inflation with individual US stocks: A long-run portfolio analysis



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### ABSTRACT

This paper examines whether individual stocks can act as inflation hedgers. We focus on longer investment horizons and construct in- and out-of-sample portfolios based on the long-run relationship (cointegration) of stock prices with respect to consumer prices. Empirical evidence suggests that investors are better off by holding a portfolio of stocks with higher long-run betas as part of asset selection and allocation strategy. Stocks that outperform inflation tend to be drawn from the Energy and Industrial sectors. Finally, we observe that the companies average inflation hedging ability declined steadily over the past ten years, while the number of firms that hedge inflation has decreased considerably after the recent downturn of the US economy.

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## 1. Introduction

Recent developments in the US economy, notably the rise in government deficits and debt levels, the increase in macroeconomic volatility, dollar weakness and the large volume of reserves being created by Fed, raised consumers and investors concerns of a potential inflation surge. Inflation erodes purchasing power of retirement savings, redistributes wealth from lenders to borrowers, and threatens private investors' long-term objectives which are often specified in real terms (see e.g., [Bodie, 1989](#); [Doepke & Schneider, 2006](#)). The theoretical framework in this area is attributed to the seminal work of [Fisher \(1930\)](#), who posited that the market interest rate comprises the expected real

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interest rate and expected inflation.<sup>1</sup> Conventional financial theory holds that equities should compensate for movements in inflation since they represent claims against real rather than nominal assets (Boudoukh, Richardson, & Whitelaw, 1994; Mishkin, 1992). It is therefore of importance to examine whether inflation risk can be easily hedged in financial markets.

Different kinds of equities could offer contrasted inflation-hedging benefits. Blanchard (1982) examines the heterogeneity across sectors and finds that the variability of goods prices early in the chain production (food, energy) is larger than those of intermediate goods sector. In a similar vein, Clark (1999) argues that the response of producer prices to monetary shocks depends upon the manufacturing stage they belong to. Furthermore, there is a wide variation in the level of market pricing power across companies (Bresnahan, 1989). Fabiani et al. (2005) support that services firms change prices less often than others while retail firms do it more frequently. Gautier (2006) observes that the sectoral heterogeneity in the frequency of price change is quite similar in the euro area and in the US, with the prices of primary goods frequently modified. Accordingly, it is conceivable for investors to select stocks or sectors on the basis of their ability to hedge against inflation (hedging demand), as opposed to selecting them as a function of their outperformance potential (speculative demand).<sup>2</sup> Early on, Johnson, Reilly, and Smith (1971) find that the individual stocks in the Dow–Jones Industrial Average were not consistent inflation hedges. Ang, Brière, and Signori (2012) examine the inflation hedging capabilities of S&P 500 stocks by utilizing the covariance of a stock's return with inflation. They postulate that only a small subset of stocks has covaried positively with inflation and the average stock has been a poor inflation hedge in-sample as well as out-of-sample. Portfolios poor performance is mainly attributed to the substantial time variation of inflation betas.

In contrast to the Fisher hypothesis, many empirical studies document a negative relation between inflation and stock returns in the US (Geske & Roll, 1983; Jaffe & Mandelker, 1976; Nelson, 1976), with this phenomenon being universal rather than country-specific (Gultekin, 1983). Following attempts to resolve the puzzling negative short-run evidence the literature has since moved towards investigating the long-run hedging properties of stocks. A plausible explanation is that for investors with long term horizons, the question of inflation protection via stock investments is less about annual correlation and performance and more about the fundamental assurance that, over the long term, these investments earn returns that systematically exceed the inflation rate and, thus, protect purchasing power. In order to recover the long-run (*LR*) information, two alternative methodologies have been adopted: regressions of long holding-period stock returns on inflation using long span of data (Boudoukh & Richardson, 1993; Cagan, 1974; Lothian & McCarthy, 2001), and cointegration analysis of stock prices and consumer prices (Anari & Kolari, 2001; Anari & Kolari, 2010; Ely & Robinson, 1997). Both proxies are shown to yield results more favourable to a positive long-run relationship between stock returns (prices) and inflation (consumer prices) with estimated coefficients broadly in line with the generalized Fisher effect (GFE, henceforth).

Our focus is on the inflation hedging properties of individual stocks from a long-run perspective. Within the GFE framework, we investigate the hedging ability of individual stocks that have shown significant cointegrating relationship with consumer price index. We construct in-sample and out-of-sample portfolios sorted on the long-run stock-level (individual) prices betas. In the first case, we conduct an *ex post* analysis of the companies and sectors that provided the strongest realized comovement with consumer prices using the entire dataset. In the second case, for the *ex ante* analysis, we employ an estimation approach through which the estimated parameters of the model used to test the stock prices/consumers prices relation are updated sequentially over time.<sup>3</sup> The latter is accomplished using rolling cointegrating regressions.

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<sup>1</sup> The Fisher Hypothesis about interest rates can be generalized to all assets in efficient markets (see e.g., Bodie, 1976 and Solnik, 1983 for stocks, Beckmann & Czudaj, 2013 for gold). Jaffe and Mandelker (1976, p. 450) term generalized Fisher effect, the hypothesis of independence between the expected real return in the stock market and the anticipated inflation rate. Arnold and Auer (2015) provide an up-to-date review of the literature on inflation hedging and the Fischer effect.

<sup>2</sup> A comprehensive discussion on this topic is provided by Amenc, Goltz, Martellini, and Milhau (2011, p. 173).

<sup>3</sup> Alexander and Dimitriu (2005) argue that the theoretical benefits of trading strategies based on cointegration relationships are more robust out-of-sample than the relationships that are identified on returns.

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