

## Handout 11: Understanding Market Efficiency

Corporate Finance, Sections 001 and 002

### Definitions of Market Efficiency:

- Weak form Prices reflect all information available in past prices.
- Semi-strong form Prices reflect all public information.
- Strong form Prices reflect all private information.

Note: Markets are strong-form efficient → markets are semi-strong form efficient → markets are weak-form efficient.

### Tests of Market Efficiency:

One of the main ways market efficiency is tested is using *event studies*. Event studies look at the pattern of prices and returns around a public event (e.g. cuts in dividend payouts, announcements of stock buy-backs, positive or negative earnings surprises). Almost all studies have found that the market's response to news has the following pattern:

- A sudden drop or rise in the stock price on the announcement.
- Comparatively little movement in prices in the days following the announcement
- Occasionally there is drift in the “right” direction prior to the announcement.

This evidence suggests that markets are semi-strong form efficient.

## Why this is not the end of the story

In discussions of market efficiency, you will often hear the following mentioned:

1. Actively managed mutual funds do not outperform the overall stock market once fees and expenses are accounted for.
2. Small stocks have higher returns on average than large stocks, even after adjusting for their beta with the market.
3. “Value” stocks, i.e. stocks that have high book-to-stock-price ratios (sometimes called book-to-market ratios) or earnings-to-stock-price ratios have higher returns than “growth” stocks, i.e. stocks with low book-to-stock-price or earnings-to-stock-price ratios.
4. Times of high price-earnings ratios or high price-dividend ratios for the overall stock market tend to be followed by periods of low returns.

Often these statements get cited as evidence for or against market efficiency. How is it that we can interpret them this way? We now answer this question.

## Market efficiency and “abnormal returns”

We need to make our notion of market efficiency more specific so that we can evaluate evidence like that described above. Modified definitions:

- Weak form Prices reflect all information available in past prices. That is, there are no abnormal returns to trading on information based on past prices,
- Semi-strong form Prices reflect all public information. That is, there are no abnormal returns to trading on publically available information.
- Strong form Prices reflect all private information. That is, there are no abnormal returns to trading on private information.

Note that these statements are still vague because they rely on a notion of “abnormal” returns. The CAPM predicts that one can earn returns in excess of the market by taking on greater risk. Without adjusting high returns for risk, there is no way of knowing whether they truly represent a desirable strategy or not. “Abnormal” returns are returns that have been adjusted for risk.

### **The joint-hypothesis problem**

Thus most evidence for and against market efficiency (except for event studies) suffers from a *joint hypothesis problem*. One hypothesis is the CAPM. Another hypothesis is market efficiency. In the above examples it is impossible to tell which hypothesis fails: the CAPM or market efficiency. Abnormal returns in excess of the CAPM may represent a way of adding return without taking on more risk, or they may represent a return for risk that we do not understand or cannot easily quantify.