## Perfectly Competitive Markets - Economics

In economics, firms operating in a perfectly competitive market should make zero economic profits. These markets are characterized by:

- Zero barriers to entry and exit;
- Zero transaction costs;
- Homogenous products (commodities);
- Perfect information.

A single petrol station selling fuel (a commodity) on a highway with lots of other nearby competitors would be a good example. This petrol station should make zero economic profit.

## Stock Markets

Stock markets are highly competitive since:

- It's easy to setup a stock trading account with a brokerage;
- The cost of holding shares is free and the cost of trading them is quite low;
- All stocks in a single company are the same;
- The cost of collecting information is negligible thanks to the internet (though analysing the information is still costly).

If stock markets are perfectly competitive then stock trading should make zero economic profit. The NPV of buying or selling any stock should be zero since their price is equal to the present value of their expected future cash flows.

## The Efficient Markets Hypothesis (EMH)

- The EMH implies that stocks are 'fairly' priced. They are not over-priced or under-priced.
- If markets are efficient (so the EMH holds), then you should not be able to earn 'abnormal' or 'excess' returns above the required or deserved return.
- The return you deserve is dictated by the pricing model, such as the capital asset pricing model (CAPM). The more systematic risk you take on, the more return you deserve. $\mu_{i}=r_{f}+\beta_{i}\left(\mu_{M}-r_{f}\right)$
- Efficient markets imply that investors can only earn a return commensurate with the level of systematic risk (or beta risk) they take on.
- This means that fairly priced stocks plot on the SML.
- Under-priced stocks have returns that are too high compared to their level of systematic risk (beta) and they plot above the SML. Their price should increase until their return falls and reaches the SML. Then they will be fairly priced.
- Vice-versa for over-priced stocks.



## What Makes Markets Efficient?

There are many investors out there doing research.
As new information comes to market, buyers and sellers analyse it as quickly as possible and adjust their bids and offers accordingly.

Therefore, prices should reflect all available public information.

## Paradox: Perfect Market Efficiency

## Sanford Grossman and Joseph Stiglitz formally outlined the

 paradox in their paper ${ }^{1}$ :"...because information is costly [to obtain and analyse], prices cannot perfectly reflect the information which is available, since if it did, those who spent resources to obtain it would receive no compensation."
"We propose here a model in which there is an equilibrium degree of disequilibrium: prices reflect the information of informed individuals (arbitrageurs) but only partially, so that those who expend resources to obtain information do receive compensation."

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## Common Misperceptions about the EMH

The EMH does not mean that you can't make money.
If the EMH is correct, it means that:

- You should expect to earn a return appropriate for the systematic risk of the asset;
- There is no bias in prices that can be exploited to earn excess returns;
- Ignorant and uneducated buyers in liquid markets such as the stock market are protected since prices should reflect true value. If an ignorant investor buys a stock then they will pay the 'fair' price, which is good for them.

About the first point: "You should expect to earn a return appropriate for the systematic risk of the asset"

This return is calculated based on the current market price of the asset, not the past price that you originally bought it for.

Question: You bought a stock for $\$ \mathbf{1 0 0}$ with a beta of 1 .
The risk free rate is $4 \%$ and the market risk premium is $6 \%$ pa so the market and stock's required returns are $\mathbf{1 0} \% \mathrm{pa}$. The stock re-invests all free cash flow so there's no dividends, therefore all returns are capital returns.

One year later, the stock experienced bad news and the price fell to $\mathbf{\$ 2 0}$. The stock's required return is unchanged at $10 \%$ pa. What do you expect the price will be one year later again?

Answer: Based on the current share price of $\$ 20$, with medium luck the price next year is expected to be $\$ 22$ $\left(=20^{*}(1+0.1)^{\wedge} 1\right)$.

Note that the original $\$ 100$ price is now a sunk cost, it's a past price point that has no relevance to the future. The $\$ 20$ current price is the current market value.

When you originally bought the stock for $\$ 100$ you expected the price to be $\$ 110\left(=100^{*}(1+0.1)^{\wedge} 1\right)$ the next year with medium luck. But this was not guaranteed, there was risk, and unfortunately there was bad news about the company or economy so the stock price fell to $\$ 20$.

In the future, you could have good luck and see the stock price rise above $\$ 100$ or $\$ 1000$ if there happens to be good news.


[^0]:    ${ }^{1}$ 'Grossman, S. and Stiglitz, J. (1980), 'On the Impossibility of Informationally Efficient Markets', The American Economic Review, Vol. 70, No. 3 (Jun., 1980), pp. 393-408.

