Exchange Rate Arbitrage
Steps to finding exchange rate arbitrage opportunities.

1. To check for **two-point arbitrage** opportunities, calculate the inverse of rates on each exchange (i.e. if $/£ = 2 in New York, it should be £/$ = .5 in London)

If any of the inverses are different, there is an opportunity for two-point arbitrage.
As an example, consider the foreign exchange markets below:

<table>
<thead>
<tr>
<th>New York</th>
<th>London</th>
<th>Tokyo</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/£ = 2.0</td>
<td>£/$ = 0.4</td>
<td>¥/$ = 125</td>
</tr>
<tr>
<td>$/¥ = .008</td>
<td>£/¥ = .002</td>
<td>¥/£ = 500</td>
</tr>
</tbody>
</table>

The inverse of the $/£ rate in NY is different than London.
- The £ is cheaper in NY, so buy £ in NY and sell them in London.
- $2.00 will buy 1£ in New York but the £ sells for $2.50 in London.
- Earn a profit of $0.50 on each £ traded.

If all rates are inverses, there are no two-point arbitrage opportunities.

2. To check for **three-point arbitrage** opportunities, calculate the cross-exchange rates on each exchange (If the cross rate between the ¥ and the £ in NY is not ¥/£ = 500).

If any of the cross rates are different, there is an opportunity for three-point arbitrage.
As an example, consider the exchange rates below:

<table>
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Calculate the cross rate between the ¥ and the £ in NY:

$$
\frac{2.5}{.008} = \frac{¥}{£} = 312.5
$$

The cross rate in N.Y. does not equal the rate in Tokyo, so arbitrage is possible.

- The ¥ price of the £ is cheap in NY relative to Tokyo, so
- Use dollars to buy £’s in N.Y.
- Sell £’s for where they are expensive (i.e., sell £’s for ¥ in Tokyo).
- Return to N.Y. and buy your $ back for a profit (Earn $0.60 on each $ traded).

**Note**: If the cross rate on one exchange is different from the corresponding rate on another exchange, the cross rates on all exchanges will be inconsistent.