Lectures 11: Futures and Forward Contracts: Valuation.

I. Reading.
II. Futures Prices.
III. Forward Prices: Spot Forward Parity.

Lecture 11: Market Efficiency

I. Reading.
II. Definition of Market Efficiency.
III. Features of Market Efficiency.
IV. Costly Information Acquisition and Costly Trading.
V. Levels of Market Efficiency
VI. How efficient are U.S. financial markets.
VII. Performance of the U.S. Mutual Fund Industry.
VIII. Problems with Testing Market Efficiency
IX. Example of Semi-strong Form Inefficiency
X. Predictability of Returns.
Lecture 11: Futures and Forward Contracts: Valuation.

I. Reading.
   A. BKM, Chapter 22, Sections 22.4.
   B. BKM, Chapter 23, omit Sections 23.3 and 23.5.

II. Futures Prices.
   A. Applicability of Spot Forward Parity.
      1. In general, the futures price need not equal the forward price and so spot forward parity need not hold exactly for futures contracts.
      2. However, spot forward parity can be expected to hold approximately for futures.

III. Forward Prices: Spot Forward Parity.
   A. Introduction.
      1. Interested in determining how the forward price is determined.
      2. Turns out that no arbitrage implies that the forward price must be related to the spot price in a very particular way.
      3. Example. WSJ 4/20/05.

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Spot</th>
<th>Forward - deliver on 12/05</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold-1oz</td>
<td>432.90</td>
<td>442.2</td>
<td>2.1%</td>
</tr>
<tr>
<td>Cotton-100 lb</td>
<td>51.37</td>
<td>57.09</td>
<td>11.1%</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>1152.78</td>
<td>1165.10</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Why the differences?
### Cash Prices

**Fibers and Textiles**

<table>
<thead>
<tr>
<th></th>
<th>TUE</th>
<th>MON</th>
<th>AGO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlap, 10 oz 40-in NY yd</td>
<td>nw $4.15</td>
<td>.42</td>
<td>.36</td>
</tr>
<tr>
<td>Cotton, 1 1/16 str lw-md Mphs lb</td>
<td>$51.37</td>
<td>.4984</td>
<td>59.09</td>
</tr>
<tr>
<td>Wool, 64s Staple, Terr. Del. lb</td>
<td>uw $1.82</td>
<td>1.82</td>
<td>2.425</td>
</tr>
</tbody>
</table>

**Food and Fiber Futures**

**Cotton (NYBOT)**-50,000 lbs; cents per lb.

<table>
<thead>
<tr>
<th>Month</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>53.40</td>
<td>55.00</td>
<td>53.35</td>
<td>54.18</td>
<td>54.80</td>
<td>56.00</td>
<td>57.00</td>
<td>58.00</td>
</tr>
<tr>
<td>Change</td>
<td>1.40</td>
<td>7.25</td>
<td>41.71</td>
<td>23.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est vol</td>
<td>29,220; vol Mon 31,308; open int 124,026, -2,791</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Metal Futures**

**Gold (CMX)**-100 troy oz; $ per troy oz.

<table>
<thead>
<tr>
<th>Month</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>426.00</td>
<td>435.00</td>
<td>435.20</td>
<td>435.00</td>
<td>435.00</td>
<td>435.00</td>
<td>435.00</td>
<td>435.00</td>
<td>435.00</td>
</tr>
<tr>
<td>Change</td>
<td>5.40</td>
<td>460.50</td>
<td>380.00</td>
<td>293</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est vol</td>
<td>55,000; vol Mon 41,302; open int 277,189, -1,569</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Index Futures**

**S&P 500 Index (CME)**-$525 x index

<table>
<thead>
<tr>
<th>Month</th>
<th>June</th>
<th>Sept</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>114720</td>
<td>115700</td>
<td>114660</td>
</tr>
<tr>
<td>Change</td>
<td>115570</td>
<td>890</td>
<td>123410</td>
</tr>
<tr>
<td>Est vol</td>
<td>41,186; vol Mon 53,412; open int 680,213, -749.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idx pr: Hi 1154.67; Lo 1145.98; Close 1152.78, +6.80.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Example 1:
   a. Consider a forward contract to deliver 1 oz of gold on 4/06 entered into on the 4/05. The spot price for 1 oz of gold is $400. The price of a U.S. T-bill ($100 face value) maturing on 4/06 is 80.
   b. What is the relation between the forward price and the spot price?
   c. Can replicate a forward contract by going long the stock and shorting discount bonds that mature on the settlement date with a face value equal to the forward price.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>4/05</th>
<th>4/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy a forward contract on 4/05 which delivers 1 oz of gold on 4/06</td>
<td>0</td>
<td>S(4/06) - F(4/05)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategy</th>
<th>4/05</th>
<th>4/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy 1 oz of gold on 4/05 and sell on 4/06</td>
<td>-400</td>
<td>S(4/06)</td>
</tr>
<tr>
<td>Sell 1-yr U.S. T-bills on 4/05 with face value of F(4/05)</td>
<td>F(4/05) 0.8</td>
<td>-F(4/05)</td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>F(4/05) 0.8 -400</td>
<td>S(4/06) - F(4/05)</td>
</tr>
</tbody>
</table>

d. Can see that these two strategies have the same cash flows.

e. By definition, no money changes hands today under the forward contract; so the law of one price says

\[ F(4/05) 0.80 - 400 = 0; \] and so

\[ F(4/05) = 400 / 0.8 = 500. \]

f. Note:

1. if \( F(4/05) 0.80 - 400 > 0 \) (i.e., \( F(4/05) > 500 \)), the buyer of the forward contract must be paid money today to be induced to enter the contract.

2. if \( F(4/05) 0.80 - 400 < 0 \) (i.e., \( F(4/05) < 500 \)), the buyer of the forward contract would pay money today to be allowed to enter the contract.
2. Thus, have shown that the forward price is just the future value of the spot price at the settlement date (invested today in a discount bond maturing at the settlement date):

\[ F_T(0) = \frac{S(0)}{d_T(0)} \text{ or } F_T(0) = S(0) [1 + y^*_T(0)]^T \]

where

a. \( T \) is time to settlement.  
b. \( S(0) \) be the value of the underlying at time 0.  
c. \( d_T(0) \) be the price of a \( T \) period discount bond with a $1 face value.  
d. \( y^*_T(0) \) be the effective 1-period yield on a \( T \) period discount bond.  
e. \( F_T(0) \) be the time 0 forward price of the underlying for delivery in \( T \) periods.

3. So at any point in time expect the forward price of gold to increase as the settlement date becomes more distant since the future value of the spot price increases with maturity.
C. General Case: Carrying Costs.
   1. Suppose there are certain costs associated with holding or carrying an asset between time 0 and the settlement of the forward contract at time $T$.
      a. Example: When a physical commodity is the underlying, any storage costs are a carrying cost.
      b. Example: If the underlying is a stock index, dividend payments by the stocks in the index are a negative carrying cost.
   2. Assume the carrying costs are known at time 0.
   3. Example 2:
      a. Consider a forward contract to deliver 100 lb of cotton on 4/06 entered into on the 4/05. The spot price on 4/05 for 100 lb of cotton is $71. The price of a U.S. T-bill ($100 face value) maturing on 4/06 is 80. The cost of storing 100 lb of cotton from 4/05 to 4/06 is $10 payable on 10/05. The price of a U.S. T-bill ($100 face value) maturing on 10/05 is 90.
      b. What is the relation between the forward price and the spot price?
      c. Consider the following two investment strategies:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>4/05</th>
<th>10/05</th>
<th>4/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy a forward contract on 4/05 which delivers 100 lb cotton on 4/06</td>
<td>0</td>
<td>0</td>
<td>$S(4/06) - F_1(4/05)</td>
</tr>
<tr>
<td>Buy 100 lb cotton on 4/05 and sell on 4/06</td>
<td>-71</td>
<td>-10</td>
<td>$S(4/06)</td>
</tr>
<tr>
<td>Buy a 1/2-year discount bond on 4/05 with face value of 10 and close out at maturity</td>
<td>-10 x 0.9</td>
<td>10</td>
<td>$F_1(4/05) 0.8</td>
</tr>
<tr>
<td>Sell a 1 year discount bond on 4/05 with face value of $F_1(4/05) and hold to maturity</td>
<td>$F_1(4/05) 0.8</td>
<td>-$F_1(4/05)</td>
<td></td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>$F_1(4/05) 0.8 - 10 x 0.9 - 71</td>
<td>0</td>
<td>$S(4/06) - F_1(4/05)</td>
</tr>
</tbody>
</table>
d. Can see that these two strategies have the same cash flows.
e. By definition, no money changes hands today under the forward contract; so the law of one price says:

\[ 0 = F_t(4/05) 0.8 - 10 \times 0.9 - 71 \]

f. So

\[ F_t(4/05) = (71 + 9)/0.8 = 100. \]

4. Thus, get a relation between the current spot price and the forward price:

\[ F_T(0) d_t(0) = S(0) + C(t_c) d_{tc}(0) \]

or

\[ F_T(0) \frac{1}{[1 + y^*_T(0)]^T} = S(0) + C(t_c) \frac{1}{[1 + y^*_T(0)]^{tc}} \]

where:

a. the carrying costs \( C(t_c) \) are paid at time \( t_c \) between times 0 and \( T \) (usually will take the settlement date \( T \) to be the date at which the costs are paid).
b. \( S(0) \) be the value of the underlying at time 0.
c. \( d_t(0) \) be the price of a \( \tau \) period discount bond with a $1 face value.
d. \( y^*_T(0) \) be the effective 1-period yield on a \( \tau \) period discount bond.
e. \( F_T(0) \) be the time 0 forward price of the underlying for delivery in \( T \) periods.

5. This relation is known as spot forward parity and can be rewritten:

\[ F_T(0) = [1 + y^*_T(0)]^T \left[ S(0) + C(t_c) \frac{1}{[1 + y^*_T(0)]^{tc}} \right] \]

6. Can see that

a. a positive carrying cost implies a higher forward price.
b. a negative carrying cost (e.g., dividend-paying underlying) implies a lower forward price.

7. Example 3:

a. The S&P 500 index is 800 on 4/05. The price of a discount bond (face value of 100) maturing on 4/06 is 80. The stocks in the index will pay dividends amounting to 40 of index value on 10/05. The price of a discount bond (face value of 100) maturing on 10/05 is 90. What is forward price on 4/05 for delivery of the index on 4/06?

b. Use spot-forward parity

\[ F_t(4/05) 0.8 - (-40) 0.9 = 800 \Rightarrow F_t(4/05) = (800 -36)/0.8 = 955. \]
D. Application to Foreign Currency Forward Contracts: Covered Interest Parity.

1. In the case of foreign currency forward contracts, spot forward parity is known as covered interest parity.

2. For a forward contract to deliver a foreign currency in T years, the underlying is the foreign currency. The negative carrying cost is the interest received from investing the foreign currency in a discount bond maturing in T years.

3. Example 4:
   a. The spot price for a British pound on 4/05 is $1.60: i.e., \( S^\$/£(4/05) = 1.60 \). The yield on a 1 year discount bond denominated in U.S. dollars is 25% while the yield on a 1 year discount bond denominated in pounds is 10%. What is the forward price on 4/05 for delivery of one £ on 4/06?
   
   b. Consider the following two strategies:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Time 0</th>
<th>Time T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell a forward contract which delivers £ \left( \frac{1}{1.6} \right) [1+0.1] = £ 0.6875 on 4/06</td>
<td>0</td>
<td>{ F_1^{$/£(4/05)-£1} } x \left( \frac{1}{1.6} \right) [1+0.1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= F_1^{$/£(4/05)} \left( \frac{1}{1.6} \right) [1+0.1] - £ \left( \frac{1}{1.6} \right) [1+0.1]</td>
</tr>
<tr>
<td>Buy $1 worth of £ on 4/05 (£1/1.6) and invest in 1-year £-denominated discount bonds and hold til maturity.</td>
<td>-1</td>
<td>£ \left( \frac{1}{1.6} \right) [1+0.1]</td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>-1</td>
<td>F_1^{$/£(4/05)} \left( \frac{1}{1.6} \right) [1+0.1]</td>
</tr>
</tbody>
</table>

   c. The first strategy is buying a 1-year $-denominated discount bond while the second is creating a synthetic 1-year $-denominated discount bond on 4/05 by:
      (1) buying pounds on 4/05,
      (2) investing the proceeds in 1-year £-denominated discount bonds, and
      (3) locking in on 4/05 the exchange rate (the forward rate) at which the pounds can be converted back to dollars on 4/06.
Can see that these two strategies cost $1 on 4/05 and generate a
certain dollar cash flow on 4/06. The law of one price says that the
certain dollar cash flows on 4/06 must be the same:

\[ 1 + 0.25 = F_{1}^{S/E}(4/05) \left[ \frac{1}{1.6} \right] \left[ 1 + 0.1 \right] \]

and so \( F_{1}^{S/E}(4/05) = \$1.8181/\text{£} \).

4. Thus obtain the following result which is the covered interest parity
    theorem:

\[
[1 + y^{*S}(0)]^T = [1 + y^{*E}(0)]^T \frac{F_{1}^{S/E}(0)}{S^{S/E}(0)} \quad \text{or} \quad \frac{[1 + y^{*S}(0)]^T}{[1 + y^{*E}(0)]^T} = \frac{F_{1}^{S/E}(0)}{S^{S/E}(0)}
\]

where
a. \( y^{*S}(0) \) is the effective per period yield on a T period discount
   bond denominated in U.S. dollars.
b. \( y^{*E}(0) \) is the effective per period yield on a T period discount
   bond denominated in £.
c. \( S^{S/E}(0) \) is the spot price of 1 £ at time 0.
d. \( F_{1}^{S/E}(0) \) be the forward price at time 0 for 1 £ delivered in T
   periods.

5. Can see that:
a. if the yield on the foreign currency discount bond is lower than on
   the dollar-denominated discount bond, the forward price of the
   foreign currency (in $s) is higher than the spot price (in $s).
b. if the yield on the foreign currency discount bond is higher than on
   the dollar-denominated discount bond, the forward price of the
   foreign currency (in $s) is lower than the spot price (in $s).
E. Spot Forward Parity and Arbitrage.

1. If spot forward parity is violated, there is an arbitrage opportunity.

2. Example 1 (cont):
   a. Suppose the forward price on 4/05 for delivery of 1 oz of gold on 4/06 is 520 which is greater than the 500 implied by spot forward parity.
   b. So the forward price is too high which implies that you want to sell forward contracts and buy the underlying:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>4/05</th>
<th>4/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell a forward contract on 4/05 which delivers 1 oz of gold on 4/06</td>
<td>0</td>
<td>520 - S(4/06)</td>
</tr>
<tr>
<td>Buy 1 oz of gold on 4/05 and sell on 4/06</td>
<td>-400</td>
<td>S(4/06)</td>
</tr>
<tr>
<td>Sell 1-yr U.S. T-bills on 4/05 with face value of 520</td>
<td>520 x 0.8</td>
<td>-520</td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

   c. This strategy is an arbitrage opportunity.

3. Example 4 (cont):
   a. Suppose the forward price on 4/05 for delivery of a £ on 4/06 is $2 which is higher than $1.8181 implied by covered interest parity.
   b. Want to buy the synthetic 1-year $-denominated discount bond and sell the 1-year $-denominated discount bond:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>4/05</th>
<th>4/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell $1 of 1-year $-denominated discount bonds on 4/05 and close out on 4/06</td>
<td>1</td>
<td>-1.25</td>
</tr>
<tr>
<td>Sell a forward contract which delivers £ [1/1.6][1+ 0.1] = £ 0.6875 on 4/06</td>
<td>0</td>
<td>{2 - £1} x 0.6875 = 2 x 0.6875 - £ 0.6875</td>
</tr>
<tr>
<td>Buy $1 worth of £ on 4/05 (£1/1.6) and invest in 1-year £-denominated discount bonds and hold til maturity.</td>
<td>-1</td>
<td>£ 0.6875</td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>0</td>
<td>2 x 0.6875 - 1.25 = 0.125</td>
</tr>
</tbody>
</table>

   c. This strategy is an arbitrage opportunity.
Lecture 11: Market Efficiency

I. Reading.
   A. BKM, Chapter 12. Read Sections 12.1 and 12.2 but only skim Sections 12.3 and 12.4.

II. Definition of Market Efficiency.
   A. In an efficient market, the price of a security is an unbiased estimate of its value.
   B. Notice that the level of efficiency in a market depends on two dimensions:
      1. The amount of information incorporated into price.
      2. The speed with which new information is incorporated into price.

III. Features of Market Efficiency.
   A. To assess the level of market efficiency need to know the security’s value:
      1. Which requires knowing how assets are priced.
      2. Need to know the expected return on an asset given the appropriate
         pricing model for the economy.
   B. Market efficiency means that over any period:

      Realized return = Expected Return + Unpredictable Mean-zero Surprise.

      and so (ignoring dividends):

      Period-end’s Price = Today’s Price \((1 + \text{Expected Return}) + \text{Unpredictable Mean-zero Surprise}\).

   C. Market efficiency says that:
      1. If a piece of news is always followed by a another piece of news than the
         market incorporates the likely impact of the second piece of news at the
         time that the first piece of news becomes available.
      2. So even if news is correlated, return surprises will not be.
   D. Implications of market efficiency for return patterns.
      1. If expected returns are constant through time:
         a. Unpredictable mean-zero return surprises imply unpredictable
            returns
         b. So returns will be uncorrelated.
      2. If expected returns vary through time.
         a. Unpredictable mean-zero return surprises do not imply
            unpredictable returns.
         b. If past returns forecast future expected returns then returns will be
            autocorrelated.
      3. So autocorrelated returns need not imply market inefficiency
E. Implications of market efficiency for portfolio manager/investor performance:
1. Need to distinguish skill from luck.
2. In an efficient market:
   a. expected performance (e.g., Jensen’s alpha in a CAPM world) of a
      manager/investor over any period is zero.
   b. but in any given period will see really good portfolio performances
      by some managers/investors due to chance.
3. Need to be skeptical when someone tells you about good performance.
4. However, the longer the period of good performance, the more likely it’s
   skill and not luck.

IV. Costly Information Acquisition and Costly Trading.
   A. A Contradiction
      1. if markets are efficient, all information is reflected in price.
      2. but then there is no incentive to gather costly information and trade on it.
      3. so how does the information get into price?!
   B. An Alternate Argument.
      1. Could have an equilibrium where some investors choose to gather
         information and some do not.
      2. Those that do earn better returns which offset the costs of acquiring the
         information and trading on it.
      3. The market is not fully efficient in the sense discussed above.
V. Levels of Market Efficiency
   A. Weak form.
      1. Price reflects all information contained in past prices: so an investor can
         not use past prices to identify mispriced securities.
      2. Technical analysis:
         a. refers to the practice of using past patterns in stock prices to
            identify future patterns in prices.
         b. is not profitable in a market which is at least weak form efficient.
   B. Semi-strong form.
      1. Price reflects all publicly available information: so an investor can not use
         publicly available information to identify mispriced securities.
      2. Fundamental analysis:
         a. refers to the practice of using financial statements and other
            publicly available information about firms to pick stocks.
         b. is not profitable in a market which is at least semi-strong form
            efficient.
      3. If a market is semi-strong form efficient, then it is also weak form efficient
         since past prices are publicly available.
   C. Strong form.
      1. Price reflects all available information: so an investor can not use any
         available information to identify mispriced securities.
      2. Insider trading:
         a. refers to the practice of using private information about firms to
            pick stocks.
         b. is not profitable in a market which is at least strong form efficient.
         c. is illegal.
      3. If a market is strong form efficient, then it is also semi-strong and weak
         form efficient since all available information includes past prices and
         publicly available information.

VI. How efficient are U.S. financial markets.
   A. Probably semi-strong form efficient but not strong form efficient.
      1. Can find rare examples of semi-strong form inefficiency.
      2. But in general it’s difficult to generate abnormally good performance
         using only publically available information.
   B. Implications for mutual fund management:
      1. Unlikely to be successful using only publicly available information.
      2. Need to use “smarts” or non-public information in forming portfolios to
         generate good abnormal performance.
VII. Performance of the U.S. Mutual Fund Industry.

A. Performance of funds net of trading costs, expenses and fees relative to Fama-French type pricing models:

1. Average performance is negative
   b. -1.8% per annum abnormal bad performance that is strongly significantly different from zero.

2. More negative for the funds with the highest turnover.

3. More negative for the funds with the highest expense ratios.
B. Performance persistence

1. Bad performance shows some persistence: likely due to high expenses and turnover.

2. Good performance is not persistent at all: suggests good performance by a fund is most likely due to luck than skill.
VIII. Problems with Testing Market Efficiency
   A. Joint Test Problem.
      1. The question whether price fully reflects a given piece of information always depends on the model of asset pricing that the researcher is using. It is always a joint test.
      2. Example:
         a. Know value stocks lie above the SML
         b. Implies semi-strong market inefficiency if the CAPM is the appropriate pricing model.
         c. But in an ICAPM world: the high expected return could also be compensation for high covariance with a state variable that individual’s care about.

   B. Data-mining Issue.
   1. “seek and thou shall find”
   2. Many researchers and market participants are looking for patterns in returns.
   3. Even truly random samples, however, appear to have patterns.
   4. In-sample predictability need not imply out-of-sample predictability.
IX. Example of Semi-strong Form Inefficiency  
A. Stocks added and deleted from the S&P 500.

*Panel A: Clean Additions*  
*Panel B: Clean Deletions*  
*Figure 2. MCAR plots for firms added to and deleted from the SP500, 1990-1995.*

Mean cumulative abnormal returns (MCARs) around the announcement date (AD) and the effective change date (CD) for firms added to the S&P 500 (clean sample). Since the number of trading days between AD and CD varies across firms, the interval AD+1 through CD-2 inclusive is displayed as 5 days (actual average 4.56 days) for additions and 3 days (actual average 3.40 days) for deletions. The MCARs are displayed as if each daily MAR over this interval were the interval’s MCAR divided by 5 for additions and by 3 for deletions.

*Panel A: Clean Additions*  
*Panel B: Clean Deletions*  
*Figure 3. MFV plot for firms added to and deleted from the SP500, 1990-1994.*

Mean volume as a fraction of shares outstanding (MFV) around the announcement date (AD) and the effective change date (CD) for firms added to and deleted from the S&P 500 (clean sample). Since the number of trading days between AD and CD varies across firms, the interval AD+1 through CD-2 inclusive is displayed as 4 days (actual average 4.00 days) for additions and as 4 days (actual average 3.57 days) for deletions. The MFVs are displayed as if each daily MFV over this interval were the interval’s mean cumulative FV divided by 4.00 for additions and 3.57 for deletions.
Economic Trends

BY GENE KORETZ

STRONG DOLLAR, WEAK EFFECT
U.S. foreign earnings still roll in

It wasn't supposed to happen. After soaring nearly 30% last year, U.S. corporate receipts from foreign direct investment were expected to sag this year because of sluggish global growth and a strong dollar's impact on the dollar value of overseas profits. Instead, first-quarter foreign earnings rose 12% over their year-earlier level, and economist Joseph P. Quinlan of Dean Witter Reynolds Inc. expects them to keep that edge through 1996 (chart).

Quinlan thinks many of the policies that have boosted competitiveness of U.S. companies at home are affecting their foreign subsidiaries. Despite Europe's recessionary climate, for instance, receipts from direct investment there upturned. Latin America is on the mend, and growth in Central Europe and emerging Asia remains solid.

The upshot, says Quinlan, is that America's huge direct investment abroad—which hit $90 billion last year—should continue to bolster corporate earnings despite the strong dollar.

IT PAYS TO JOIN THE S&P 500
New stock additions get a boost

When the Standard & Poor's 500-stock index adds or drops a stock, so-called index funds—which mirror the index's composition—adjust their holdings accordingly. And that process, report economists Anthony W. Lynch of New York University and Richard B. Mendenhall of the University of Notre Dame, can create some nifty profit opportunities for smart investors.

Before 1989, S&P used to announce changes in its index in the evening (after trading ceased) of the day before the changes were to take place. Sure enough, prices of stocks added or dropped usually surged about 3% the next day, while deleted stocks fell. To avoid such price swings, S&P in late 1989 began giving the market a week's notice before the index changes went into effect. The idea was to give fund managers ample time to act before the switch and thus smooth out any price fluctuations.

Apparently, however, the plan hasn't worked. According to a new study by Lynch and Mendenhall analyzing all 71 changes in the S&P 500 from March, 1990, to April, 1996, the resulting price movements have increased significantly.

Looking only at close index changes (not resulting from mergers or breakups), the researchers found that stock prices of additions rose an average 3.2% on the first day after the announcement and a further 3.3% in the intervening week. Once the stocks were added, however, their prices dropped—about 0.75% the first day and 1.25% more over the next week. So they still wound up a net 5% higher.

What's behind these rises? Pointing to the huge growth of index funds and index-investing vehicles, the economists estimate that some 10% of the shares of companies in the S&P 500 are now tied up in index investments. Thus, being added to the index can cause a big decline in the effective supply of a stock—and a nice jump in its price.
X. Predictability of Returns.
   A. Can forecast long horizon returns using:
      1. Past long horizon returns (negative relation).
      2. Information variables related to the business cycle:
         a. aggregate dividend yield at the start of the return period (positive relation).
         b. term spread (long term high grade corporate bond yield less one month T-bill rate) which is known at the start of the return period (positive relation).
         c. these information variables are counter cyclical.
   B. These findings are consistent with two stories:
      1. Time varying expected returns and semistrong market efficiency.
      2. Constant expected returns and semistrong market inefficiency.
Slopes, $t$-statistics, and $R^2$ from multiple regressions of excess returns on the term spread ($TERM$) and the value-weighted dividend yield ($D/P$) or the default spread ($DEF$): 1941–1987.*

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FIGURE 24.13 Short- and long-term serial correlations by size.