“Investing in Yourself: An Economic Approach to Education Decisions”

February 2013

Classroom Edition

An informative and accessible economic essay with a classroom application.

Includes the full version of the Page One Economics Newsletter, plus questions for students and an answer key for classroom use.

Common Core Standards (see page 13)

Prepared by Scott A. Wolla
Economic Education Group of the Federal Reserve Bank of St. Louis

© 2013, Federal Reserve Bank of St. Louis. www.stlouisfed.org/education
Permission is granted to reprint or photocopy this lesson in its entirety for educational purposes, so long as this copyright notice is included on all copies.
Investing in Yourself: An Economic Approach to Education Decisions

Scott A. Wolla, Senior Economic Education Specialist

“When I travel around the country, meeting with students, business people, and others interested in the economy, I am occasionally asked for investment advice...I know the answer to the question and I will share it with you today: Education is the best investment.” —Federal Reserve Chairman Ben S. Bernanke, September 24, 2007

One of the most important investment decisions you will ever make is the decision to invest in yourself. You might think that investment is only about buying stocks and bonds, but let’s take a step back and consider investment a little differently. Economists use the word investment to refer to spending on capital, which can be either physical capital (tools and equipment) or human capital (education and training). Let’s briefly look at each type.

Investing in Physical Capital

A firm invests in itself by buying capital that it uses to improve what it does. In other words, it invests in physical capital to earn higher profits in the future. For example, a firm might invest in new technology to increase the productivity of its employees. The increased productivity raises future revenue (income earned by the firm) and profits (revenue minus costs of production). Seems like an easy decision, right? Well, before a firm invests in physical capital, it must consider three very important points.

First, a firm invests in technology now with the expectation that it will lead to higher revenue and expected profits in the future. But this expectation might not be realized. For example, the technology might not increase productivity as much as the firm expected. Or the demand for the good the firm produces might decrease, resulting in less revenue than expected.

Second, a firm considers other investment alternatives. A firm can invest in many ways to raise future profits. For example, maybe investment in technology A results in profits, but investment in technology B, which is more expensive, leads to much larger profits.

Third, a firm also considers the potential return on investment (ROI). The ROI is a performance measure of the effectiveness of an investment. It is calculated as the net gain (gain from investment minus cost of investment) divided by the cost of investment. A firm compares the expected gain with the investment cost to make a sound decision. Of course, the result of any investment lies in the future and must be projected. Predicting the future is always tricky; therefore, any uncertainty about the result must also be considered.

Investing in Human Capital

Investment in human capital is the effort that people expend to acquire education, training, and experience. People invest in their human capital for the same reason a firm invests in physical capital: to increase productivity and earn higher income. An added benefit is the increase in job
opportunities for those with more education: The unemployment rate for those with a bachelor’s degree is 4.1 percentage points lower than for those with only a high school diploma (see the first graph). Of course, higher education is expensive. To increase the likelihood that the investment will pay off, let’s consider three points.

First, an investment in human capital might not pay off. Just as a firm’s investment in physical capital involves risk, there is also a risk that the expected outcome from investing in human capital will not be realized. Research consistently shows a correlation between more education and higher income (see the second graph), but there is no guarantee. One way to think about the ROI in human capital is the college wage premium, which is the percent increase in earnings of those with a bachelor’s degree compared with those with only a high school diploma. Recent research suggests that the college wage premium has been growing—from 40 percent in the late 1970s to 84 percent in 2012.2

Second, people should consider what kind of an investment to make. Getting an education will most likely lead to higher income, but there are vast differences in the projected income and job opportunities of the various courses of study available. For example, according to the Bureau of Labor Statistics (BLS), an elementary schoolteacher with a four-year degree earned $51,380 (median) in 2010,3 while a computer programmer with a four-year degree earned $71,380 (median) in 2010.4 Both earned a higher income than they would have if they had not acquired a college degree, but the difference between the median earnings is significant.

The job opportunities available in different professions also vary. The BLS forecasts job outlooks for various occupations. For mechanical engineers (2010-20), the BLS forecasts job growth of 9 percent,5 while for registered nurses job growth of 26 percent is expected.6 Again, there is a signifi-
Given these facts, does that mean that you should not become an elementary schoolteacher? Does it mean that you should consider only computer programming or nursing? No, but the median income and the expected job growth rate are two factors to consider when making decisions about future education and training. In fact, there are many opportunities to gain training and valuable job skills besides the usual college route. Vocational, technical, and trade schools teach specific, practical jobs skills that can lead to a good job within 2 to 4 years. For example, many such schools offer programs in computer-aided design and drafting (CADD); law enforcement; heating, ventilation, and air conditioning (HVAC); and information technology (IT).

Third, people should consider the cost of various kinds of educational institutions when they think about investment in education. For example, the average cost of attending a four-year public university (tuition, room, and board) from 2007 to 2011 was $58,623, while the average cost at a four-year private university for that same period was $125,604. Does that mean you should consider only public universities? No, but cost should be considered in making your decision. The ROI for a would-be elementary schoolteacher would be higher if he or she chose to attend a four-year public university.

Conclusion

A firm invests in physical capital in an attempt to increase its revenue (income) and potential profit, but only after considering the return on investment. People might consider using a similar strategy when deciding whether and how to invest in their own human capital.
NOTES


GLOSSARY

Capital: Goods that have been produced and are used to produce other goods and services. They are used over and over again in the production process.

Human capital: The knowledge and skills that people obtain through education, training, and experience.

Investment: The purchase of physical capital goods (e.g., buildings, tools and equipment) that are used to produce goods and services.

Investment in human capital: The efforts people put forth to acquire human capital. These efforts include education, training, and experience.

Productivity: The ratio of output per worker per unit of time.

Profit: The amount of revenue that remains after a business pays the costs of producing a good or service.

Return on Investment (ROI): A performance measure of the effectiveness of an investment. ROI is calculated as the net gain (gain from investment minus cost of investment) divided by the cost of investment.
After reading the article, answer the following questions.

1. Why does a firm invest in physical capital?

2. Why do people invest in human capital?

3. How does the average unemployment rate differ for those with more education?

4. What is the college wage premium, and what has been its trend in recent decades?

5. Explain why it is important to consider the income earning potential of various college degree programs.

6. When considering an investment, it is important to also think about the cost. What is the average difference in the cost of attending a public versus a private university?
After reading the article, answer the following questions.

1. Why does a firm invest in physical capital?
   A firm invests in physical capital to increase the productivity of its employees. The increased productivity raises future revenue (income earned by the firm) and profits (revenue minus costs of production).

2. Why do people invest in human capital?
   People invest in their human capital (themselves) for the same reason a firm invests in physical capital: to increase productivity and earn higher income. An added benefit to investing in human capital is the increase in job opportunities for those with more education.

3. How does the average unemployment rate differ for those with more education?
   The unemployment rate for those with a bachelor's degree is 4.1 percentage points lower than for those with only a high school diploma.

4. What is the college wage premium, and what has been its trend in recent decades?
   The college wage premium is the percent increase in earnings for those with a bachelor's degree compared with those with only a high school diploma. Recent research suggests that the college wage premium has been growing—from 40 percent in the late 1970s to 84 percent in 2012.

5. Explain why it is important to consider the income earning potential of various college degree programs.
   Getting an education will most likely lead to higher income, but there are vast differences in the projected income and job opportunities of the various courses of study available. For example, an elementary school-teacher with a four-year degree earned $51,380 (median) in 2010, while a computer programmer with a four-year degree earned $71,380 (median) in 2010. Students should also consider vocational, technical, and trade schools.

6. When considering an investment, it is important to also think about the cost. What is the average difference in the cost of attending a public versus a private university?
   The average cost of attending a four-year public university (tuition, room, and board) from 2007 to 2011 was $58,623, while the average cost at a four-year private university for that same period was $125,604.
Read the following or distribute the handout to your students; then lead a classroom discussion on the supply and demand for goods and services and for labor.

**The Supply and Demand for Goods and Services**

In the market for goods and services, there is a supply (S) of goods and services and a demand (D) for goods and services. The supply and demand determine the price (P) and quantity (Q) of the goods and services sold. In the graph below, the supply and demand for widgets looks like this:

![Graph of market for widgets](image)

P1 indicates the market price of widgets, and Q1 is the quantity of widgets sold.

**The Supply and Demand for Labor**

The market for workers, or labor, is very similar to the market for other goods and services. The supply of labor and the demand for labor determine the price of labor (the wage that workers earn, W) and the quantity supplied and demanded (the number of workers employed, L). Graphically, it looks like this:

![Graph of market for widget workers](image)

If the graph above represents the market for workers who produce widgets, the market wage of widget workers is W1 and the quantity of widget workers employed is L1.
Derived Demand

The two markets (goods and labor) are linked. The demand for labor is derived from—or is the result of—the demand for the goods and services that the labor produces. In other words, the demand for widgets determines the demand for workers to work the widget production line. If consumers demand more widgets, the demand for widget workers increases too as producers increase their level of production to meet the higher demand. Graphically, it looks like this:

![Graph showing the demand for widgets and widget workers](image)

Notice that the increase in the demand for the widgets (left graph, D1 to D2) resulted in an increase in both the price of widgets (P1 to P2) and the quantity of widgets sold (Q1 to Q2). This increase in the demand for widgets resulted in an increase in the demand for widget workers (right graph, D1 to D2), which resulted in an increase in wages (W1 to W2) and the quantity of widget workers employed (L1 to L2).

Similarly, if consumers demand fewer widgets, the demand for widget workers decreases. Graphically, it looks like this:

![Graph showing the decrease in the demand for widgets and widget workers](image)

Notice that the decrease in the demand for the widgets (left graph, D1 to D2) resulted in a decrease in both the price (P1 to P2) of widgets and quantity of widgets sold (Q1 to Q2). This decrease in the demand for widgets resulted in a decrease in the demand for widget workers (right graph, D1 to D2), which resulted in a decrease in wages (W1 to W2) and the quantity of workers employed (L1 to L2).
Use the following graphs to practice your knowledge of derived demand. First, shift the demand curve in the appropriate direction, then circle the correct options below each diagram. The first has been done as an example.

1. Assume an increase in the demand for rounds of golf.

   ![Graph](image1)

   **Price** (circle one): Increase Decrease  
   **Wage** (circle one): Increase Decrease  
   **Quantity** (circle one): Increase Decrease

2. Assume a decrease in the demand for automobiles.

   ![Graph](image2)

   **Price** (circle one): Increase Decrease  
   **Wage** (circle one): Increase Decrease  
   **Quantity** (circle one): Increase Decrease
3. Assume a decrease in the demand for Gizmo toys.

![Graph showing the market for Gizmos Toys and the market for Toy Factory Workers.]

**Price (circle one):** Increase  Decrease  **Wage (circle one):** Increase  Decrease

**Quantity (circle one):** Increase  Decrease

4. Assume an increase in the demand for houses.

![Graph showing the market for Houses and the market for Construction Workers.]

**Price (circle one):** Increase  Decrease  **Wage (circle one):** Increase  Decrease

**Quantity (circle one):** Increase  Decrease
1. Assume an increase in the demand for rounds of golf.

   **Market for Rounds of Golf**

   ![Graph showing increase in demand for rounds of golf](image1.png)

   **Market for Golf Course Workers**

   ![Graph showing increase in demand for golf course workers](image2.png)

<table>
<thead>
<tr>
<th>Price (circle one):</th>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (circle one):</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

   **Wage (circle one):**

   | Increase | Decrease |

2. Assume a decrease in the demand for automobiles.

   **Market for Automobiles**

   ![Graph showing decrease in demand for automobiles](image3.png)

   **Market for Auto Workers**

   ![Graph showing decrease in demand for auto workers](image4.png)

<table>
<thead>
<tr>
<th>Price (circle one):</th>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (circle one):</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

   **Wage (circle one):**

   | Increase | Decrease |

   | Quantity (circle one): | Increase | Decrease |

   | Increase | Decrease |
3. Assume a decrease in the demand for Gizmo toys.

**Market for Gizmos Toys**

- Price (circle one): Increase \(\text{Decrease}\)
- Quantity (circle one): Increase \(\text{Decrease}\)

**Market for Toy Factory Workers**

- Wage (circle one): Increase \(\text{Decrease}\)
- Quantity (circle one): Increase \(\text{Decrease}\)

4. Assume an increase in the demand for houses.

**Market for Houses**

- Price (circle one): \(\text{Increase}\) Decrease
- Quantity (circle one): \(\text{Increase}\) Decrease

**Market for Construction Workers**

- Wage (circle one): \(\text{Increase}\) Decrease
- Quantity (circle one): \(\text{Increase}\) Decrease
Common Core State Standards

Grades 6-12 Literacy in History/Social Studies and Technical Subjects

- **Key Ideas and Details**
  RH.11-12.1: Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.
  RH.11-12.2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.

- **Craft and Structure**
  RH.11-12.4: Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines *faction* in *Federalist* No. 10).