Factor Markets and Income Distribution

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Reading: Chapter 12, with appendix

In this topic we examine factor markets to understand how the demand-supply model can be used to understand how the prices of factors of production are determined, and how that in turn can used to understand how income is determined. We will also examine some problems with that theory, called the marginal productivity theory of distribution.

Factors of production

A factor of production is any resource that is used by firms to produce goods and services.

All inputs are not factors. There are intermediate inputs which are used up in production. Factors of production and their owners receive income over and over again.

Economists usually classify factors of production into four main types:

- Land
- Labor
- Physical capital - consists of manufactured resources such as buildings and machines. Sometimes referred to as capital
- Human capital - improvement in labor created by education and knowledge embodied in workers.

Factor markets

"Factors of production are bought and sold in factor markets."

Prices of factors of production are known as factor prices. Wage, rent, rental on capital.

"Factor markets work like goods and service markets in some ways:"

- They can be analyzed using supply and demand analysis
- Factor prices allocate resources among producers
- Factor markets are different from goods and service markets because:
  - Their demand is a derived demand – derived from firm’s output choices and the demand for goods and services
  - Most of our income is received from them; factor markets determine distribution of income

Income Distribution

- Income distribution: distribution of total income among different segments of the economy.
- Economists examine two main types of income distribution:
  - Personal income distribution: distribution of income among different people or income groups
  - Factor distribution of income: distribution of income among different factors of production, like labor, land and capital
- If we are interested in personal distribution of income we can examine factor income distribution and then examine how much of factor income goes to different people.
- To know who gets how much income we can examine who owns what factors and the price of each factor. Examples:
  - A disabled person who cannot work will get no labor income
  - A person who owns land will receive a large income if land rent is high

Factor Markets and Income Distribution

a. Factors of production
b. Income distribution
c. Marginal productivity and factor demand
d. Marginal productivity theory of income distribution
e. Problems with marginal productivity theory
f. Labor supply
Marginal Productivity and Factor Demand

Firm's employment decision
What determines how much of a factor a firm will employ.
Assume perfect competition and look at labor; same principle applies to other factors.
We can examine how much output firm produces as before and use the production function to find labor employed.
Here we examine the choice more directly.
Firm examines marginal benefit and marginal cost of hiring one more worker.
Marginal cost is the worker's wage, W.
Marginal benefit is the value of the additional amount that the firm produces with the additional worker, value of marginal product of labor = marginal product of labor x price of the good produced.

\[ VMPL = MPL \times P \]

Factor demand curve
A change in the wage shows a movement along the labor demand curve.
The labor demand curve shifts due to the following changes.
1. Change in the price of the good
2. Change in the amount of other factors used – example capital
3. Technological change: improvements in technology can shift the demand curve up or down.

Marginal productivity theory of income distribution
In equilibrium all factors of production are paid the value of their marginal product.
It holds with perfect competition.
True for all factors, including capital and land. For instance, capital is employed up to the point at which the marginal product of capital is equal to the rental rate of capital (the cost, explicit or implicit, of using capital for a given period of time).
If labor is homogeneous, all workers will receive the same wage, the value of marginal product of labor for the last worker hired. Each worker is not paid the value of marginal product of labor of hiring him or her – all get the same wage.
If labor is not homogeneous, for instance, because different workers have different levels of human capital due to education, they will receive a wage equal to the value of their marginal product which is higher for more skilled and educated workers.

Labor demand
All producers face the same wage, since each producer sets wage equal to value of marginal product of labor, hence the VMPL is the same for all producers.

Marginal Productivity and Factor Demand

Marginal Productivity Theory of Distribution
Equilibrium in the Labor Market
Assume that the supply curve of labor, showing how much labor is supplied for each wage, is positively sloped. Return to it later.
Equilibrium wage rate is \( W^* \), the equilibrium employment level is \( L^* \), and every producer hires labor up to the point at which VMPL = \( W^* \).

Labor is paid its equilibrium value of the marginal product, the value of the marginal product of the last worker hired in the labor market as a whole.
Problems with Marginal Productivity Theory

How valid is marginal productivity theory? Several arguments against it:

1. In real world large differences between prices of factors which seem to have same value of marginal product – like people of different races, sexes who get different wages.

2. In the real world some resources are not fully employed and seem to have prices higher than their value of marginal product or their market clearing levels.

3. It leads to the belief that the existing distribution of income is fair, that is, factors are paid according to what they contribute to society.

The last point arises from an erroneous belief. Even if marginal productivity theory of distribution is true in reality, it has no moral implication of fairness. For instance, if some people have property which they obtained unfairly, they would obtain income from it, without any implication that the distribution is fair. Consider first two objections.

Problems with Marginal Productivity Theory

Wage Inequality

Marginal productivity theory is not inconsistent with wage differentials which can:

1. compensate for unattractiveness of jobs due to danger and unpleasantness
2. arise due to differences in talent
3. arise due to differences in human capital because of education, on-the-job training and experience. See graph – education matters.

Nevertheless, appear to be many deviations from the theory in practice, leading to wage differentials and higher than market clearing wages:

1. Market power: some sectors are unionized and keep wage high and higher than non-unionized sectors because of monopoly power – empirically not very important for US

2. Efficiency wages: in some jobs where workers cannot be supervised easily, to get more productivity wages have to higher – high wages with unemployment; some jobs will pay more

3. Discrimination: some workers may be discriminated against because of wrong ethnicity and gender. Some argue that competition will undermine this as those who discriminate will not be able to get good workers who will go to employers don’t discriminate and who pay more. But discrimination often persists. Why?

- When labor markets don’t work well, there are unemployed workers, employers can discriminate – better to get some work than not
- Government can discriminate – apartheid system
- Discrimination can be profitable – divide and rule, weaken worker bargaining power

Discrimination in labor markets can result in low wages for some groups, low expected earnings for people, hence less education, hence continued low wages.

Problems with Marginal Productivity Theory

Labor Supply

Labor-leisure choice

- Decisions about labor supply result from decisions about time allocation: how many hours to spend on different activities.
- Choose between labor or work and leisure.
- Leisure is time available for purposes other than working to earn income. Includes time spent with family, friends, doing exercises.
- Like other consumer decisions, people can be seen to compare the marginal utility of additional hour spent on leisure to the wage received from an hour’s work. In equilibrium the two will be equal.
- What will people do when the wage increases?
  - Substitution effect: leisure more expensive – work more hours
  - Income effect: feel richer, have more leisure if it is a normal good – work fewer hours.
- So people can supply more or less labor when the wage is higher
- Doesn’t always work like this – people often don’t have choice over labor hours.
If the income effect dominates, a rise in the wage rate can actually cause the individual labor supply curve to slope downward. It can also be backward bending.

The market supply curve for labor is the horizontal sum of all individual supply curves for labor in a market. Movements along the market supply curve are caused by a change in the wage.

The market supply curve shifts because of:
- changes in preferences and social norms: women joining labor force shifts supply curve to right
- changes in population: larger population (caused by immigration, for instance) shifts supply curve to right
- changes in opportunities: new opportunities in other markets shift supply curve to the left; loss of opportunities in other markets shift it to the right.
- changes in wealth: reduced labor supply because of higher wealth shifts supply curve to left.