

CHAPTER 2

The Economy and Economic Theory and Models

In the previous chapter, a picture of the British economy was set out; but the picture itself does not define the economy per se or does it explain the activities of the economy. To go from just seeing the picture to seeing with perception and understanding requires an interpretation of what is happening. This interpretation is known as economic theory and the analytical form of the interpretation can be literary, mathematical, or a combination of both. If mathematics is involved the interpretation generally takes the form of a mathematical model which can then be used to analyze changes in the picture. To make this discussion a little more concrete, let us take a closer look at the methodology of Post Keynesian economics.

Methodology

Post Keynesian economists approach their study of economic activity with a common sense understanding of the world. By common sense, it is meant a complex set of beliefs and propositions about fundamental features of the world which individuals assume in whatever they do in ordinary life. Hence, for Post Keynesians, they take particular features, characteristics, institutions, and human actors of economic activity as obvious and practical initial starting points for further research. To be obvious and practical means that the various features, institutions, and actors are considered ingrained and everyday properties of the real world of economic activity and are encountered when observing or participating in ongoing economic activity. On the one hand, the Post Keynesian

economist qua economist can as an observer see them in action as the participants in the economy carry out their activities; or they can directly experience them as direct participants in economic activity. Thus, the common sense beliefs and propositions provide the background against which Post Keynesian economists carry out their research. Hence, this common sense understanding of economic activity informs the methods which heterodox economists actually use to examine economic activity, particularly with regard to the way it is explained.

The Post Keynesians posit what they feel are common sense propositions about the economic world and how it should be understood and explained. The core set of common sense propositions can be simply stated as 'the actual economy is a non-ergodic, independent system with human agency and economic-social-political structures and institutions embedded in an historical process. Other propositions, which support and clarify the above, include the views that the actual economy and the society in which it is embedded are both real and exist independently of the individuals it includes; that change comes about through human action interacting with social, political, and economic structures and institutions; that human action is derived in part from ethical, cultural, political, and ideological beliefs so that economic outcomes are also ethical and political outcomes as well; and that a capitalist society is a class society and the economy is permeated with hierarchical power derived in part from it. The final common commonsense proposition is that the study of particular economic activity cannot be done independently of the whole economy or from the

social system in which it is embedded.

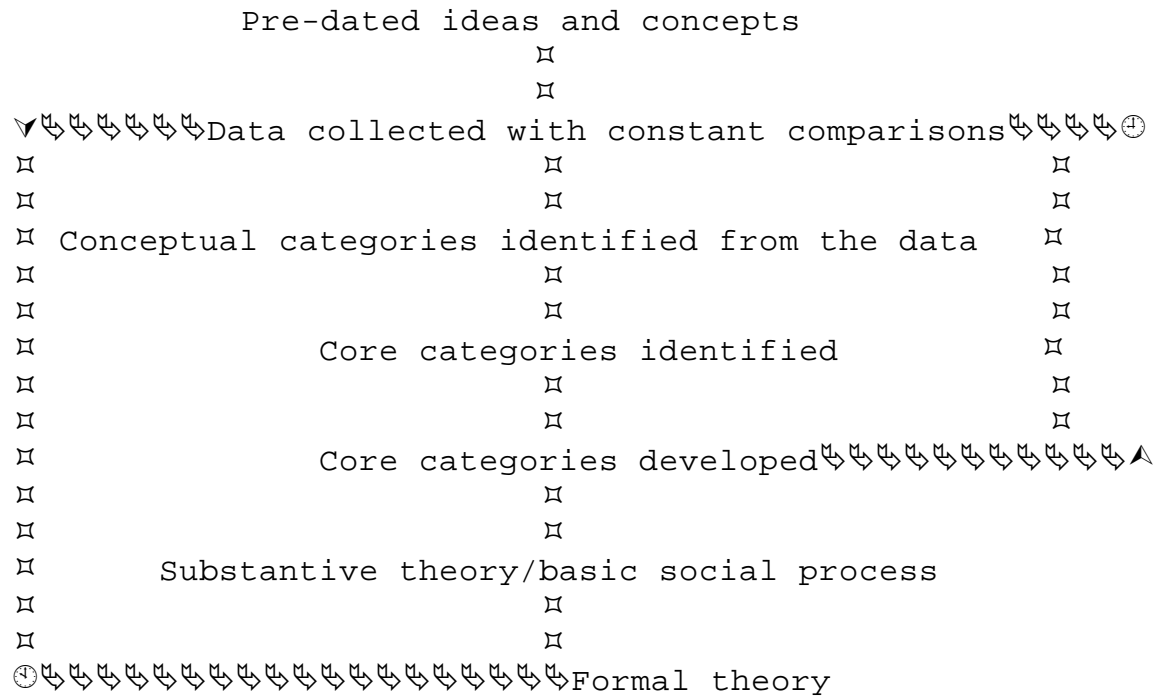
These commonsense propositions do not constitute Post Keynesian economics, but rather only provide the basis for its methodology. The basic methodology of Post Keynesian economics begins with the position that the economic world consists of events which are structured in that they consist of something more than simple empirical experience and are intransitive in that they exist and occur independently of their identification; that all economic events, whether reoccurring or not, are produced by an underlying diverse set of causal mechanisms and structures; and that the economic world is open in that each and all economic events are a result of interacting and counteracting causal mechanisms and structures. Examples of economic structures are technological networks such as input-output tables, economic norms of behavior, consumption patterns, and economic institutions such as trade associations. These economic structures do not cause economic events but they do help shape them as they interact with causal mechanisms. Causal mechanisms operate through human intentionality which mean that economic actors have independent power to initiate actions and the mechanisms produce the actual economic events. The point of Post Keynesian economics is to discover the economic structures and causal mechanisms and explain how they produce the economic events such as price changes, unemployment, and wage cuts. These explanations are called economic theories.

Post Keynesian uses a particular method to develop their theories, called the grounded theory method. The method of grounded theory can be described as a process by which theory is

'directly' developed from data and that data collection, theoretical analysis, and theory building proceed simultaneously-see Chart I. The use of the method begins with the economist

Chart I

Schema of the Grounded Theory Method



becoming familiar with, but not dogmatically committed to, the relevant theoretical literature which might assist him/her in approaching the data. Then, they engages in 'field work' by collecting comparable data from economic events from which a number of specific categories or analytical concepts and their associated properties are isolated and the relationships between them identified. With the concepts and relationships empirically grounded in detail, the economist then develops a theory in the form of a complex analytical explanation based on the data's core concept. An essential property of the theory is that it explains why and how the sequence of economic events represented in the

data take place. In constructing the empirically grounded theory, the economist does not try to simplify; rather they endeavor to capture the complexity of the data by empirically establishing many different secondary concepts and relationships and weaving them together with the core concept. This ensures that the resulting theory is conceptually dense as well as having broad explanatory power. The process of selecting the core concept and developing the theory brings to light secondary concepts and relationships which also need further empirical grounding as well as suggesting purely analytical concepts and relationships which need empirical grounding if they are to be integrated into the theory. After the theory is developed, the economist will 'test' it on additional data to see how well its explanation corresponds to ongoing economic events.

Post Keynesians subscribe to the correspondence theory of truth where the goal of the grounded theory is to uncover the real causes of economic events. Hence a grounded economic theory is evaluated as to how well it explains actual economic events, that is how well it has empirically identified and weaved together the causal mechanisms, structures, descriptions, and narrative corresponding to the economic events being explained. Consequently, the economic theories which emerge are historical in that they are derived from historical data and are designed to explain the process of economic events represented in them. In addition, the descriptions and the narrative components of the theories convey the feelings and understanding of the historical economic events being explained. Thus, grounded economic theories are historical economic theories explaining historical

economic processes in the context of relatively stable economic structures and causal mechanisms. Hence, they can be used to inform private and/or public policy discussions concerning the control of future economic events. That is, grounded economic theories give economists an understanding of past events which they can use to alter the structures and causal mechanisms and hence the nature of future economic events. In short historical economic theories are from the economist perspective instrumental theories which can be used to engage in deliberate economic and social change.

Economic Models

[To be completed]

Example: Modelling the Input-Output Table of the British Economy

As a descriptive table of the economy, the entries in the input-output table are in value terms and include all the various economic flows within the economy for a given period of time. To simplify our endeavours to derive a model from the input-output table, it is assumed that there are two industries each of which produces a single product and two types of labour power each of which is specific to one of the two industries; it is also necessary to assume to each value entry in the table can be separated into its quantity and price component; and finally to reduce the mathematical complexity of the model, taxes, government expenditures, imports and exports are not included in the model. Working with a two-product, two-industry input-output table, we can write the following:

Table 2.1

Input-Output Table

	product 1	product 2	wages	profits	total sales
industry 1	$q_{11}p_1$	$q_{12}p_2$	L_1w_1	Pr_1	Q_1p_1
industry 2	$q_{21}p_1$	$q_{22}p_2$	L_2w_2	Pr_2	Q_2p_2 .

where q_{ij} is read as the amount of product j (which comes from

the j th industry) needed to produce Q_i amount of product i . Thus, for example, q_{21} reads as the amount good 1 needed to produce Q_2 amount of good 2 in industry 2.

p_i is the price of good i .

L_i is the quantity of labour power needed to produce Q_i amount of product i .

w_i is the wage rate for L_i .

Pr_i are the profits obtained from producing and selling good i .

It should be clear that q_{11} and q_{12} and q_{21} and q_{22} represent the amounts of the intermediate material inputs needed to produce Q_1 and Q_2 respectively; thus $q_{11}p_1 + q_{12}p_2$ is the total material costs incurred when producing Q_1 and $q_{21}p_1 + q_{22}p_2$ is the total material costs incurred when producing Q_2 . Also L_1w_1 and L_2w_2 represent the total labour costs incurred when producing Q_1 and Q_2 respectively. Thus the total costs of producing Q_1 is equal to $q_{11}p_1 + q_{12}p_2 + L_1w_1$; and the same for the total costs of producing Q_2 . Consequently, the difference between total sales and total costs is profits:

$$Pr_i = Q_i p_i - q_{i1}p_1 + q_{i2}p_2 + L_i W_i .$$

The total sales of the economy, $Q_1 p_1 + Q_2 p_2$, is called the gross national product; and similarly, the total costs of producing Q_1 and Q_2 plus the profits acquired is called the gross national income. Thus we immediately see that gross national product equals gross national income. At this point let us introduce the concept of the surplus. The surplus refers to those products which are left over after the intermediate inputs have been subtracted from what is produced. In our simple model of the economy, the surplus products of the economy can be denoted as $Q^*_1 = Q_1 - q_{11} - q_{21}$ and $Q^*_2 = Q_2 - q_{12} - q_{22}$. While Q^*_1 and Q^*_2 represent the amounts of the surplus products, it should also be noted that they are also the physical components of the final demand of the economy. The final demand of the economy, $Q^*_1 p_1 + Q^*_2 p_2$, is called the net national product and it equals the economy's net national income which is the total amount of wages and profits. Finally, it is possible to divide final demand up into those amounts which will be consumed by the workers, bought by the capitalists for personal consumption, and bought by the capitalists for investment purposes; however, this will not be dealt with here, but delayed until a later chapter.

So far our simple input-output model represents an analytical snapshot of the economy. To make the model amendable for economic analysis, it is necessary to introduce input-output coefficients or production coefficients. Production coefficients for the intermediate material and labour power inputs are defined as:

$$a_{11} = q_{11} / Q_1 \qquad a_{12} = q_{12} / Q_1 \qquad l_1 = L_1 / Q_1$$

$$a_{21} = q_{21} / Q_2 \qquad a_{22} = q_{22} / Q_2 \qquad l_2 = L_2 / Q_2.$$

Thus, each a_{ij} reads as the amount of good j needed to produce one unit of good i ; and each l_i reads as the amount of labour power needed to produce one unit of good i . It is also possible to convert total profits Pr_1 and Pr_2 into profit margins, that is profits per unit of output, in a similar fashion:

$$pm_1 = Pr_1 / Q_1 \qquad pm_2 = Pr_2 / Q_2.$$

Finally, let us assume for the moment that the production coefficients and profit margins do not change with variations in production and sales. Thus, if Q_1 increased by 10%, q_{11} , q_{12} , L_1 , and Pr_1 would all increase by 10% with the results that a_{11} , a_{12} , l_1 , and pm_1 would not change. Given the production coefficients and profit margins, it is now possible to use the model to carry out an analysis of the economy. This will be done by dividing the model of the economy into a price model and a quantity model.

Price Model

The price model of the economy can be depicted as follows:

$$(1) \qquad a_{11}p_1 + a_{12} p_2 + l_1w_1 + pm_1 = p_1$$

$$a_{21}p_1 + a_{22} p_2 + l_2w_2 + pm_2 = p_2$$

where $a_{11}p_1 + a_{12} p_2 + l_1w_1$ equals the average total costs of producing good 1; and

$a_{21}p_1 + a_{22} p_2 + l_2w_2$ equals the average total costs of producing good 2.

The usefulness of the model is that it permits us to analyze what happens to prices when wage rates and profit margin change. To show this let us assumed that w_i and pm_i are determined outside

the model. Let us also assume that wage rates are denoted in terms of money, which this means that profit margins and prices will also be denoted in terms of money.¹ Now for any given wage rates and profit margins it is possible to determine prices. This can be seen in the following example.

Let $a_{11} = .5$, $a_{12} = .3$, $a_{21} = .2$, $a_{22} = .1$, $l_1 = 1$, and $l_2 = 1$; thus we have the following price model:

$$(2) \quad \begin{aligned} .5p_1 + .3p_2 + lw_1 + pm_1 &= p_1 \\ .2p_1 + .1p_2 + lw_2 + pm_2 &= p_2. \end{aligned}$$

If both wage rates are £1.00 and both profit margins are £2.00, then $p_1 = £9.23$ and $p_2 = £ 5.38$.² An increase in wage rates to, say, £2.00 (while profit margins stay at £2.00) will increase both prices to £12.30 and £7.17 respectfully; and similarly, an increase in both profit margins to £3.00 (while wage rates stay at £1.00) will increase prices to £12.30 and £7.17. Thus an increase in either wage rates or profit margins will increase prices. Further, if w_1 is increased to £2.00 (while w_2 remain at £1.00 and the profit margins remain at £2.00), both prices will increase to £11.69 and £6.15 respectfully; and if pm_1 is increased to £3.00 (while pm_2 remains at £2.00 and the wage rates remain at £1.00), both prices will increase to £11.69 and £6.15 respectfully. Consequently, a rise in wage rates or profit margins in any one industry will increase prices in all industries. This is because of the interdependent nature of the

¹This assumption may seem "of course", but many economists like to build models of the economy which have no money.

²When the values for wage rates and profit margins are substituted in (2), we have a two-equation model with two unknowns, and this can be easily solved.

two industries. Finally, for any given positive wage rates and profit margins, the price model will produce positive prices-- this is because the economy on which the model is based produces a surplus of goods over what is used up in production.

Quantity Model

The quantity model of the can be depicted as follows:

$$(3) \quad a_{11}Q_1 + a_{21} Q_2 + Q^*_1 = Q_1$$

$$a_{12}Q_1 + a_{22} Q_2 + Q^*_2 = Q_2$$

$$L = Q_1l_1 + Q_2l_2$$

where $a_{11}Q_1 + a_{21} Q_2$ represents the total amount of good 1 used up in the production in producing Q_1 and Q_2 ;

$a_{12}Q_1 + a_{22} Q_2$ represents the total amount of good 2 used up in the production in producing Q_1 and Q_2 ;

Q_1l_1 represents the total amount of labour needed to produce Q_1 ;

Q_2l_2 represents the total amount of labour needed to produce Q_2 ; and

L represents the total amount of labour employed in the economy.

The usefulness of the model is that it permits us to analyze what happens to total output when changes in the final demand occur.

Since investment goods are part of the final demand goods and business enterprises determine their demand for investment goods

independently, the quantities of Q^*_1 and Q^*_2 are given to and in fact drive the quantity model. For any quantities of Q^*_1 and

Q^*_2 , it is possible to solve, using the quantity model, for Q_1 and Q_2 , that is the amount of total output which will be

consistent with a surplus of Q^*_1 and Q^*_2 . Further, it can be

shown using the quantity model that any increase in investment, i.e. any increase in the demand for investment goods, will increase the total output of both products and total employment as well. This can be seen in the following manner. Assuming the same production coefficients as in equation (2), the quantity model can be written as

$$(4) \quad \begin{aligned} .5Q_1 + .2Q_2 + Q^*_1 &= Q_1 \\ .3Q_1 + .1Q_2 + Q^*_2 &= Q_2 \\ L &= Q_1 \times 1 + Q_2 \times 1 = Q_1 + Q_2 \end{aligned}$$

If Q^*_1 and Q^*_2 are both set equal to 10 units of good 1 and good 2 respectively, then $Q_1 = 28.2$ of good 1 and $Q_2 = 20.5$ units of good 2 and total employment, L , would be 48.7. Now if both Q^*_1 and Q^*_2 are increased by 10% because of an increase in the demand for investment goods, then the total amounts of goods 1 and 2 produced will be 31.02 and 22.56 respectively and total employment will be 53.58. Moreover, if only Q^*_1 was increased by 10% to 11 units and Q^*_2 was kept at 10 units, both Q_1 and Q_2 would increase to 30.51 and 21.28 respectively and total employment would increase to 51.79. Thus, any increase in the demand for investment goods will increase the total output in both industries in the economy and total employment as well; and this is due to the interdependent nature of the economy.

Economy as a Whole

The price and quantity models can be put together to provide a picture of the economy as a whole:

$$(5) \quad \begin{aligned} a_{11}Q_1p_1 + a_{12}Q_1p_2 + l_1Q_1 w_1 + pm_1Q_1 &= Q_1p_1 \\ a_{21}Q_2p_1 + a_{22}Q_2p_2 + l_2Q_2 w_2 + pm_2Q_2 &= Q_2p_2 \\ Q^*_1p_1 + Q^*_2p_2 &= \text{Final Demand} \end{aligned}$$

$$Q_1l_1 + Q_2l_2 = \text{Total Employment.}$$

For any given wage rates, profit margins, and quantities of Q^*_1 and Q^*_2 , it is possible to determine the prices, quantities, and employment for the economy. As noted previously, one property of input-output models is that net national product equals net national income, and for the above model this means that

$$(6) \quad Q^*_1p_1 + Q^*_2p_2 = l_1Q_1w_1 + pm_1Q_1 + l_2Q_2w_2 + pm_2Q_2.$$

Now if business enterprises increase their demand for investment goods, Q^*_1 and Q^*_2 will increase and so will total production and employment of workers, but prices, wage rates and profit margins will not change. On the other hand, if wage rates and/or profit margins increase, prices will increase, but there will no change in final demand, total output, or employment. Thus, in this model the driving force in the economy is the decision to invest, not the decision to save by raising profit margins. In fact, for a given monetary value of final demand, any increase in profit margins and thereby increasing prices will lead to a reduction in 'real final demand' and hence to a reduction in total output and employment. In this way, the model provides a particular interpretation of the economic activity represented in the input-output table of the British economy.

Terms

- Common sense
- Causal mechanisms
- Structures
- Grounded theory method
- Economic theories
- Price Model
- Quantity Model
- Profit Margin
- Surplus
- Production Coefficients
- Gross National Income

Gross National Product
 Net National Income
 Net National Product
 Total Costs
 Average Total Cost
 Profits

Exercises and Questions

1. What are the common sense propositions of Post Keynesian economics?
2. What is the grounded theory method? How are grounded economic theories evaluated? What is the relationship between a grounded economic theory and economic policy?
3. Consider the following price model:

$$.3p_1 + .5p_2 + 1w_1 + pm_1 = p_1$$

$$.2p_1 + .1p_2 + 1w_2 + pm_2 = p_2$$

- p_1
- a. if $w_1 = w_2 = \text{£}1.00$ and $pm_1 = pm_2 = \text{£}1.00$, then determine p_1 and p_2 .
 - b. if $w_1 = \text{£}1.00$ and $w_2 = \text{£}2.00$ and $pm_1 = pm_2 = \text{£}1.00$, then determine p_1 and p_2 .
 - c. if $w_1 = w_2 = \text{£}1.00$ and $pm_1 = \text{£}1.00$ and $pm_2 = \text{£}2.00$, then determine p_1 and p_2 .
 - d. what are the implications of these results?

4. Consider the following quantity model:

$$.3Q_1 + .2Q_2 + Q^*_1 = Q_1$$

$$.5Q_1 + .1Q_2 + Q^*_2 = Q_2$$

$$1Q_1 + 1Q_2 = L$$

- a. what do Q^*_1 , Q^*_2 , and L represent.
 - b. if $Q^*_1 = Q^*_2 = 10$ determine Q_1 , Q_2 , and L .
 - c. if $Q^*_1 = 10$ and $Q^*_2 = 20$ determine Q_1 , Q_2 , and L .
5. Describe the relationship between the quantity model and the price model with respect to the level of employment and net national income.
 6. Consider the following economy:

$$.25Q_1 + .25Q_2 + Q^*_1 = Q_1$$

$$.3Q_1 + .2Q_2 + Q^*_2 = Q_2$$

- a. determine Q_1 and Q_2 if $Q^*_1 = 10$ and $Q^*_2 = 20$.
- b. determine the change in output if Q^*_1 is increased by 10%.

7. Consider the following economy:

$$.4Q_1 + .3Q_2 + Q^*_1 = Q_1$$

$$.6Q_1 + .1Q_2 + Q^*_2 = Q_2$$

- a. determine Q_1 and Q_2 when $Q^*_1 = 10$ and $Q^*_2 = 20$.
- b. if Q^*_1 increases while Q^*_2 remains constant, why does Q_2 increase?

8. Consider the following economy:

Quantity Model

Price Model

$$.5Q_2 + Q^*_1 = Q_1$$

$$.3p_2 + 1w_1 + pm_1 = p_1$$

$$.3Q_1 + Q^*_2 = Q_2$$

$$.5p_1 + 1w_2 + pm_2 = p_2$$

- a. assume $Q^*_1 = 5$ and $Q^*_2 = 10$, solve for Q_1 , Q_2 , and L .
- b. assume $w_1 = w_2 = \text{£}1.00$ and $pm_1 = pm_2 = \text{£}3.00$, solve for p_1 and p_2

9. Consider the following economy:

Quantity Model

Price Model

$$.3Q_2 + Q^*_1 = Q_1$$

$$.4p_2 + 1w_1 + pm_1 = p_1$$

$$.4Q_1 + Q^*_2 = Q_2$$

$$.3p_1 + 1w_2 + pm_2 = p_2$$

- a. assume $Q^*_1 = 10$ and $Q^*_2 = 15$, solve for Q_1 , Q_2 , and L .
- b. assume $w_1 = w_2 = \text{£}2.00$ and $pm_1 = pm_2 = \text{£}1.00$, solve for p_1 and p_2 .
- c. determine the new values for Q_1 , Q_2 , and L if Q^*_1 is increased by 10%. Why does Q_2 increase even though Q^*_2 was not increased at all?

10. Consider the following economy:

Price Model

Quantity Model

$$.6p_2 + 1w_1 + pm_1 = p_1$$

$$.3Q_2 + Q^*_1 = Q_1$$

$$.3p_1 + 1w_2 + pm_2 = p_2$$

$$.6Q_1 + Q^*_2 = Q_2$$

Questions:

- a. assume that $w_1 = w_2 = \text{£}3.00$ and $pm_1 = pm_2 = \text{£}2.00$, determine p_1 and p_2 .
 - b. assume that $Q^*_1 = 20$ and $Q^*_2 = 15$, determine Q_1 , Q_2 , and L.
 - c. using the answers in (a) and (b) determine gross and net national product, net national income, the wage share in net national income, and the profit share in net national income.
 - d. assuming that Q^*_2 is increase by five units, with wage rates and profit margins remaining the same, determine the new gross national product, net national income, the wage share in net national income, and the profit share in net national income. Provide an explanation for these results.
 - e. assuming that w_1 and w_2 are increased to $\text{£}4.00$, with profit margins remaining the same and $Q^*_1 = 20$ and $Q^*_2 = 15$, determine the new gross national product, net national income, the wage share in net national income, and the profit share in net national income. Provide an explanation for these results.
 - f. assuming that pm_1 is increased to $\text{£}2.00$ and pm_2 is increased to $\text{£}3.00$ with wage rates and $Q^*_1 = 20$ and $Q^*_2 = 15$, determine the new gross national product, net national income, the wage share in net national income, and the profit share in net national income. Provide an explanation for these results.
 - g. compare the above answers and explain what factors affect the distribution of the net national income between wages and profits and what factors affect output and employment. If you wanted to increase employment, improve the living standards of those employed but not have any inflation, what would you do and why?
 - h. technological change reduces the production coefficients for the intermediate material and labour power inputs. Using the above price and quantity models as a base, who do you think benefits from technological change?
11. What is meant by the interdependent nature of the economy?

Readings

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