

## 8. The problem of Keynesian aggregation

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### INTRODUCTION

Where does Keynesian economics go wrong? In this chapter, I suggest that Keynesian economists go off track by treating the economy as if it were one gigantic business producing a single output called GDP using a known technology. This leads Keynesians to propose misguided theories of unemployment while ruling out by assumption the main likely source of unemployment. In a complex economy, unemployment is likely due to the time and cost that it takes for entrepreneurs to discover new products, processes, and trading patterns when existing patterns become unprofitable.

In the following sections of this chapter, I pose and answer four questions about Keynesian economics:

1. What is Keynesian economics?
2. What is the alternative?
3. Can we use macroeconomic data to confirm or reject Keynesianism?
4. Where does Keynesian economics go wrong?

In answering the first question, I will suggest that there are two main strands of Keynesian economics that differ from one another yet are used in complementary ways. One strand, which I term popular Keynesianism, is used to communicate with policy makers and with the public. The other strand, which I term rigor-seeking Keynesianism, is used to address issues raised by trained economists.

In answering the second question, an alternative explanation for unemployment suggested by conventional economics is one in which some existing patterns of specialization and trade become unprofitable. At that point, entrepreneurs face the challenge of discovering, through trial and error, new sustainable patterns of specialization and trade. This alternative explanation for unemployment is at a disadvantage in competing with Keynesianism, because the latter offers a relatively simple purported

cure for unemployment. In contrast, the alternative explanation suggests that public policy faces the same challenge as that faced by entrepreneurs. How do we find new patterns of specialization and trade that productively employ workers whose previous tasks are no longer needed?

Unfortunately, Keynesianism can neither be decisively confirmed nor decisively refuted by macroeconomic data. The challenges of using the data start with the fact that macroeconomic phenomena are observational, not experimental. This problem is compounded by the fact that, over any given period of macroeconomic history, there are many influential factors relative to the number of independent observations. This makes the range of possible empirical specifications wide and the selection from among those specifications arbitrary. Thus, even though the data are collected and presented in the form of Keynesian aggregates, the Keynesian framework cannot be decisively confirmed or falsified using data. However, there are many anomalies in the historical record that justify considerable skepticism about the Keynesian framework.

Finally, one can answer the question about where Keynesian economics got off track. I believe that the fundamental flaw in Keynesian economics is that it relies on aggregation and thereby ignores the need for discovery and adjustment. Treating the economy as if it were a single GDP factory is a defect in both popular Keynesianism and rigor-seeking Keynesianism.

## WHAT IS KEYNESIAN ECONOMICS?

Keynesian economics has always eluded a precise definition. The controversy over “what Keynes really meant” that began as soon as *The General Theory* was published remains active and unsettled. This poses a problem for those of us who would attack Keynesian economics. There is usually a rebuttal available that says “You are criticizing a straw man. What Keynesians *really* believe is . . .”

I think that this ambiguity, which one might expect to be an intellectual disadvantage, actually serves the Keynesian cause. In particular, Keynesians seem to me to fight with two fists. One fist is what I call popular Keynesianism, which arrives at appealing narratives and powerful policy conclusions while creating or glossing over some important theoretical difficulties. The other fist is what I call rigor-seeking Keynesianism, which attempts to grapple with the theoretical problems but connects only loosely with the narratives and policy prescriptions of popular Keynesianism.

What I call popular Keynesianism can be reduced to a bumper sticker: *Spending creates jobs, and jobs create spending*. Popular Keynesianism holds strong appeal to the intuition of non-economists and to policy

makers seeking a prescription for the problem of unemployment (and an excuse for tax cuts or increased spending). However, as an economic framework, popular Keynesianism does away with price adjustment, and thus it suffers from a nagging inconsistency with standard training in economics.

What I call rigor-seeking Keynesianism is the Keynesianism that one finds in academic journals. Rigor-seeking Keynesians have sought to allow for the price mechanism to operate (albeit imperfectly) while justifying policies that resemble Keynesian prescriptions.

Popular Keynesianism permeates economic journalism. In the everyday narrative of the economy, when the economy is “strong,” that is because consumers and businesses are spending freely. When it is “weak,” that is because consumers and businesses are reluctant to spend. Lack of spending causes businesses to cut back on employment, which in turn causes households to be reluctant to spend.

Popular Keynesianism also is embedded in first-year economics textbooks. Students are shown the “circular flow” of spending: households obtain goods and services from businesses, and businesses obtain labor and capital from households. In the opposite direction are money flows: businesses pay households for labor and capital, and households pay businesses for goods and services.

The circular flow presents an economy with no price mechanism. Completely divorced from the standard economics of supply and demand, the circular flow makes it appear that quantities depend only on other quantities.

Examining the circular flow, the student sees that the money that households have to spend comes from payments by businesses, and those payments in turn come from household spending on goods and services. It is easy to imagine a recession as something that interrupts or slows down this circular flow.

Factors that increase or decrease the circular flow can be termed injections and leakages. An increase in business investment provides an injection into the circular flow. Household saving provides a leakage out of the circular flow (even though it is by saving that households supply capital to businesses). When we add government to this framework, government purchases become injections and taxes become leakages. Thus, an increase in spending or a cut in taxes will increase the circular flow, leading to more output and employment.

The central bank also plays a role in popular Keynesianism. In textbooks, when the monetary authority reduces interest rates, this leads households and businesses to inject more spending into the circular flow. Economic journalists will even describe the central bank as giving households more money to spend, confusing monetary policy with tax cuts.

Popular Keynesianism offers the non-economist an appealing narrative to explain economic fluctuations. Every household understands that if the demand for its labor were to increase then it would have more money to spend. Every businessman understands that if the demand for the firm's output were to increase then it would have more reason to hire additional workers. If an economy is in a recession, it then seems quite natural to think of it as a business suffering from insufficient demand and as a household suffering from underemployment.

However, to someone well trained in conventional economics, popular Keynesianism is not intuitive at all. In fact, it violates a number of standard microeconomic precepts.

1. In conventional economics, we teach that the fundamental economic problem is scarcity. People have unlimited wants and limited resources. In popular Keynesianism, the notion of deficient aggregate demand describes an economy in which some resources are superfluous because wants are limited.
2. In conventional economics, saving promotes capital formation. Businesses deploy savings to acquire capital goods. The interest rate balances the rate of intertemporal substitution in production (how much businesses can increase output tomorrow by undertaking investment today) with the rate of intertemporal substitution in consumption (the consumer's preference to satisfy wants now rather than later). In popular Keynesianism, rather than financing investment, saving takes spending out of the circular flow and leads to unemployment. The interest rate does not play a balancing role.
3. In conventional economics, price adjustment serves to eliminate surpluses and shortages. In popular Keynesianism, a surplus of goods exists without any mitigating downward adjustment of prices. The shortfall in aggregate demand leads to a surplus of labor, without any mitigating

In Keynes's *General Theory*, as in popular Keynesianism, the interest rate does not balance saving and investment. Instead, saving and investment depend importantly on psychological factors. Consumers habitually save a proportion of their income. Business managers base their investment decisions on unreliable expectations about the future, and ultimately on "animal spirits," which I take to mean a desire to create a legacy.

For Keynes, saving represents an irrational urge to hoard. Such hoarding behavior is particularly harmful when households maintain their hoards in the form of money. When households are hoarding, they are not sending signals to businesses to invest.

In a well-known paper, John Hicks (1937) began the search for what I call rigor-seeking Keynesianism by reintroducing the interest rate as a determinant of investment. In what is known as the IS–LM model, a balance between saving and investment can be achieved at various combinations of income and interest rates. Other things equal, as income is higher (leading to more saving), interest rates must be lower (to induce enough investment to achieve balance). Also, there are combinations of interest rates and income that stabilize the demand for money (the supply of money is taken as fixed). As income rises, people want to hold more money to keep pace with transactions. To offset this, higher interest rates are needed to induce an increase in the velocity of money.

Combining these two sets of balancing considerations yields a single equilibrium level of income and the interest rate. One problem with IS–LM that would trouble future rigor-seeking economists is that there is some fudging going on in speaking of “the” interest rate. In fact, the interest rate that seems most appropriate for achieving balance in money demand is a short-term nominal interest rate. On the other hand, the interest rate that seems most appropriate for balancing investment and saving is a long-term real interest rate. The difficulty with this becomes apparent when inflation is introduced as a consideration.

The next development in rigor-seeking Keynesianism was the introduction of the concept of aggregate supply. This took place for two reasons. First, there arose an interpretation of the inverse relationship between inflation and unemployment, known as the Phillips Curve. This interpretation, promoted in an address by Milton Friedman (1967) and in a conference volume edited by Edmund Phelps (1970), was that changes in the inflation rate produce distortions in the real wage rate. Unexpectedly low inflation causes real wages to rise, reducing the demand for labor and raising unemployment. Conversely, unexpectedly high inflation causes a reduction in real wages, raising the demand for labor and lowering unemployment. This gives rise to an aggregate supply relationship in which higher inflation leads to higher output.

The next reason for a focus on aggregate supply was the empirical phenomenon of the “oil shock” of 1973–74. As the price of oil rose, the effect on the US economy was exactly what conventional economics would predict would happen to a single business using oil as an input: the price of output rose, and the quantity sold declined. An increase in the price of oil acted like an upward shift in the supply curve for the entire economy.

With the concept of aggregate supply, economists could depict the economy as a whole using the same sort of diagram that one might use to depict the market in a single industry. However, the concepts of aggregate demand and aggregate supply are awkward in several respects.

First, there is an ambiguity in the effect of higher prices on aggregate demand. Other things equal, a higher price *level* reduces aggregate demand, because it increases the demand for money and raises the short-term nominal interest rate. However, other things equal, a higher *rate of increase in the price level* (in other words, a higher rate of inflation) increases aggregate demand, because it reduces the long-term real interest rate.

Second, there arose a need to break inflation into two components – expected inflation and unexpected inflation – with different effects on employment and output. The component of inflation that is expected should be approximately neutral with respect to employment. When expectations of inflation are built into wage negotiations, the real wage should not be affected by inflation. Only inflation that is surprisingly high (low) should cause a fall (rise) in the real wage and a consequent increase (decrease) in labor demand.

This in turn leads to a focus on how expectations of inflation are formed. One approach was to presume that expectations adapt slowly to past behavior. This leads to a characterization of aggregate supply that in the short run behaves like an economy with inflexible prices (or perhaps only inflexible wages) and in the long run behaves like an economy with fully flexible prices and wages, operating at the “natural” rate of unemployment, or at the “non-accelerating inflation rate of unemployment” (NAIRU).

The next development was to suggest that this model of (backward-looking) adaptive expectations be replaced by an assumption of (forward-looking) rational expectations. As Robert Lucas (1972) pointed out, if expansionary demand policy works by fooling workers into accepting lower real wages, then workers may thwart the policy by looking ahead and trying to avoid being fooled.

What eventually emerged has been described by Olivier Blanchard in a paper that reported on the then-current consensus of leading macroeconomists. Blanchard wrote that what I am calling rigor-seeking Keynesianism presumes that although expectations are forward looking, there are important nominal rigidities, meaning that firms are inhibited in the short run from adjusting wages and prices. Taking such rigidities as given, the consensus has three central elements:

An aggregate demand relation, in which output is determined by demand, and demand depends in turn on anticipations of both future output and future real interest rates. A Phillips-curve like relation, in which inflation depends on both output and anticipations of future inflation. And a monetary policy relation, which embodies the proposition that monetary policy can be used to affect the current real interest rate (a proposition that would not hold absent nominal rigidities). (Blanchard, 2009, 213–14)

Blanchard then elaborates.

The aggregate demand equation is derived from the first-order conditions of consumers, which give consumption as a function of the real interest rate and future expected consumption. As there is no other source of demand in the basic model, consumption demand is the same as aggregate demand. (Ibid.)

This is a far cry from the Keynesian consumption function. The representative consumer, instead of being governed by habit, now solves a mathematically challenging problem of dynamic optimization under uncertainty. Blanchard notes that “The aggregate demand equation ignores the existence of investment, and relies on an intertemporal substitution effect in response to the interest rate, which is hard to detect in the data on consumers.”

On the translation of fluctuations in output to fluctuations in employment, Blanchard cites:

A parallel effort, developed over the past twenty years by, in particular, Peter Diamond, Chris Pissarides, and Dale Mortensen . . . In this approach, unemployment arises from the fact that the labor market is a decentralized market, where, at any time, some workers are looking for jobs, while some jobs are looking for workers. (Ibid., 214)<sup>1</sup>

Remarking that the disagreements that erupted in the 1970s seemed to have narrowed, Blanchard wrote that “the state of macro is good.” However, the paper was completed just as the financial crisis of 2008 was challenging the contentment regarding that consensus. As of 2015, rigor-seeking Keynesians do not seem to have coalesced around a single explanation for the deep recession that coincided with the financial crisis or the sluggishness of the recovery that followed.

In short, a precise definition of Keynesianism is elusive. Popular Keynesianism discards the price mechanism in favor of an intuition that spending creates jobs and jobs create spending. Rigor-seeking Keynesianism attempts to identify economy-wide obstacles to the ability of movements in wages, prices, and interest rates to achieve market clearing and full employment. However, rigor-seeking Keynesians generally use an aggregate production function, which treats the economy as if it were a single business.

## WHAT IS THE ALTERNATIVE TO KEYNESIANISM?

An alternative explanation for unemployment is to point to the time and cost involved in creating patterns of specialization that are sufficiently

profitable to be sustained. This alternative approach does not suffer from inconsistency with standard economic thinking. However, it does not yield the sort of appealing popular narrative or policy solutions that make Keynesianism so attractive.

Economists, beginning with Adam Smith, have pointed out that a modern economy is characterized by a high degree of specialization. Typically, we consume nothing of what we produce, and we could produce nothing that we consume. The knowledge and skills needed to provide the goods and services of today's economy are widely dispersed.

Every day, someone living in an advanced economy consumes goods and services that require millions of tasks to produce. Simply eating a piece of toast in the morning involves putting into a toaster a slice of bread baked by specialists, in ovens produced by other specialists, using ingredients produced by yet other specialists who used materials gathered by yet other specialists. The toaster that we use is assembled out of many metals and plastics refined by specialists in different parts of the world. It runs on electricity that is delivered by processes that require yet other specialists. Operating the supply chain for the stores who sold us the bread and the toaster required many specialists in transportation, logistics, wholesale and retail trade, finance, marketing, and more.

In contrast to the millions of tasks that go into producing the goods and services we consume in a day, our jobs involve only a few tasks. Those tasks pertain to particular stages of production, many of which, such as accounting or benefits administration or computer network management, are quite remote from final output.

The set of tasks that make up a job must add sufficient value to cover the cost of undertaking those tasks. The value added of a set of tasks is highly dependent on context. In 1900, the economy had a big need for horseshoe makers but not for software developers. Since then, innovations have caused that to reverse. Today, the opposite would be true.

Thus, we arrive at the following definition of a job:

A job is a context for performing a particular small set of tasks that can be exchanged for the means to obtain goods and services produced by a far larger set of tasks.

A modern economy consists of many jobs, which reflect highly developed forms of specialization and trade. The patterns of specialization and trade are very complex, and yet no single person is in charge of creating them. The patterns are created by entrepreneurs acting in a decentralized fashion, coordinated by the price system and by the profit incentive. For a pattern of specialization and trade to be sustainable, businesses must make profits.



Unprofitable patterns will disappear, and eventually new patterns will take their place.

In this alternative framework, which I call patterns of sustainable specialization and trade (PSST), unemployment increases when patterns of trade become unsustainable faster than entrepreneurs can create new, sustainable patterns. This is what happens during what we call a recession. For example, when there is overbuilding of houses in a region, some construction jobs become unsustainable. Moreover, businesses that provide goods and services to workers and firms in the construction sector in that region will find that some of their specialized jobs are no longer sustainable.

Another example was suggested by Joseph Schumpeter as a phase in the process of creative destruction. Prior to a recession, upstart businesses might be experimenting with new concepts, such as websites that deliver news, at the same time that incumbent businesses, such as traditional newspapers and magazines, are still operating. However, at some point one or both groups of businesses will experience disappointing sales and operating losses, leading to closures and loss of jobs.

The popular Keynesian story for job creation makes it seem as if the job structure in the economy is given. All that is needed is the pump-priming of more aggregate demand. People who lose jobs when demand falls will return to similar jobs once demand recovers.

In the PSST alternative, job creation requires entrepreneurs to experiment with new patterns of specialization. Will an Italian restaurant work in this neighborhood? Will the providers of a new service for social media marketing be able to convince businesses to use this service?

The problem of unemployment cannot be solved simply by adjusting wages and prices, or even by connecting the skills of workers with job openings. Entrepreneurs must discover, through trial and error, profitable enterprises for which they can use the skills of the unemployed.

For a worker, losing a job means that the particular set of tasks that one has been used to performing no longer adds sufficient value in its context. The options available to this worker include:

1. taking a different job at much lower wages;
2. waiting for another job to be created that requires similar tasks and pays similar wages;
3. obtaining training in a different set of skills, hoping that this will increase the likelihood of finding a new job.

In labor force statistics, only workers who choose to take a lower-wage job will be counted as employed. Workers who prefer to wait will be counted

as unemployed. Workers who choose to obtain training will show up as out of the labor force.

Keynesianism treats all workers and all jobs as identical. Keynesian theory implies that an increase in government spending raises demand, leading to increases in jobs.

In the PSST alternative, the effect of government spending on employment will depend on how well the spending is targeted. Even in a recession, 90 percent of the labor force is employed. If government spending adds to sales of businesses where jobs currently exist, nearly all of the demand may be satisfied by this already employed work force, with very little additional job creation.

Meaningful job creation comes from entrepreneurs creating a context in which workers who are currently unemployed can have sustainable jobs. It would seem that government spending must be wisely targeted in order to have an impact on this process. Government must spend on the products and services that are embedded in new patterns of specialization and trade that will be profitable going forward. In order to accomplish this, the government would have to be as insightful as a successful entrepreneur in identifying opportunities to utilize the skills of the unemployed.

The PSST alternative raises a number of questions. For example, in the United States, the Job Openings and Labor Turnover Survey statistics (JOLTS) show that millions of jobs are created and destroyed each month, even though on net it is typical to see net monthly gains or losses in employment of less than 300,000. Is a recession the result of jobs being destroyed at an unusually fast pace or jobs being created at an unusually slow pace?

Another question concerns the role of key sectors. Work by Acemoglu et al. (2015) using input-output analysis suggests that weakness in an industry does indeed spill over into related industries, with spillovers taking place in the expected direction (supply problems having an impact on later stages of production and demand problems having an impact on earlier stages of production). It seems plausible that when patterns of trade become unprofitable in an industry that is tightly connected to other large industries that this would have a large overall effect.

In the wake of the financial crisis, it is reasonable to ask whether the financial industry or credit conditions are particularly central to sustaining patterns of specialization and trade. It is plausible that patterns of trade are maintained more easily in a financial environment that is forgiving than in an environment in which entrepreneurs are required to quickly demonstrate the profitability of their experiments.

*Table 8.1 The effect of government purchases on GDP*

Year	Total GDP	Federal Government Purchases	GDP Excluding Federal Government Purchases
2007	14477.6	1049.8	13427.8
2008	14718.6	1155.6	13563
2009	14418.7	1217.7	13201
2010	14964.4	1303.9	13660.5
2011	15517.9	1303.5	14214.4

## CAN WE USE MACROECONOMIC DATA TO CONFIRM OR REJECT KEYNESIANISM?

It would be helpful to have an empirical basis for choosing between Keynesianism and the PSST alternative. Unfortunately, neither Keynesianism nor the PSST alternative is falsifiable using macroeconomic data. Macroeconomic events take place within an unfolding historical process. Determining the cause of a major macroeconomic event, such as a steep recession, is as fraught as trying to determine the reason that some countries industrialized earlier than others or why the First World War broke out when it did.

Consider Table 8.1 showing total GDP, the US federal government purchases component of GDP, and the sum of the remaining components of GDP in the years 2007 through 2011, in billions of current dollars.

From 2007 to 2009, federal purchases climbed by just over \$168 billion, or more than 15 percent. However, the remaining components of GDP fell even more, by almost \$227 billion, so that overall current-dollar GDP was slightly lower in 2009 than in 2007. Conversely, from 2010 to 2011, federal government purchases edged down, while the remaining components of GDP increased by almost \$554 billion, so that total GDP increased by close to 4 percent.

These observations appear to show that the “multiplier” for government purchases is negative. Does this constitute proof that Keynesian policies do not work? Unfortunately, one cannot make such a definitive statement. In fact, in a poll of leading economists, most agreed with the statement that “Because of the American Recovery and Reinvestment Act of 2009, the U.S. unemployment rate was lower at the end of 2010 than it would have been without the stimulus bill.”<sup>2</sup>

The problem is that macroeconomic data result from many different factors. The macroeconomists who believe that the fiscal multiplier was positive rather than negative would argue that other factors, such as credit

conditions and household balance sheets, affected the GDP data in the relevant years.

The challenge of empirical macroeconomics is to try to account for all of the possible causal factors. In the 1960s, American economists made extensive use of multi-equation multiple regression techniques to estimate statistically the properties of the US economy. These large-scale econometric models soon fell into disrepute. Their out-of-sample forecasting results were poor, and they ran into strong theoretical headwinds.

Starting in the mid-1970s, economists became particularly concerned about what became known as the Lucas Critique. Robert Lucas (1976) pointed out that if households and businesses are forward-looking but the econometrician treats them as backward-looking, then the structural parameters of a macroeconomic model will be unstable. With forward-looking rational expectations theories becoming overwhelmingly popular among macroeconomists, the older econometric models fell out of favor.

A different critique, and one that I think is ultimately more important, was made by Edward Leamer (1978). Leamer observed a deeply troubling discrepancy between statistical theory and econometric practice.

Much of the data that economists use, in both macroeconomic and microeconomic studies, do not come from controlled experiments. Instead, we make use of what are known as observational studies, in which data are generated by processes that are not under the control of the investigator. We use multiple regression techniques to attempt to control for the factors that one would like to hold constant if one were running an experiment.

What Leamer pointed out is that while in theory the specification of control factors should be done once, prior to examining data, in practice an econometrician engages in an iterative process of re-using the data, searching for a specification that leads to results that please the investigator.

Microeconomists have responded to Leamer's critique by relying much less on multiple regression and instead looking for "natural experiments" in which the observational data happen to be generated in a way that provides the sort of controls that an experimenter might have designed (see Angrist and Pischke, 2010). However, such "natural experiments" are generally not available to macroeconometricians. Each country has exactly one historical record of macroeconomic events, and there is no opportunity to observe what would have happened under different circumstances.

This problem is made much worse by the fact that there are many plausible causal factors at work in determining macroeconomic outcomes. Some of these factors primarily affect the economy at short time scales, such as month-to-month or quarter-to-quarter. Other factors primarily affect the economy at long time scales, meaning five years or more.

At short time scales, macroeconomic data are dominated by noise due

to imprecise measurement and by idiosyncratic events, such as unusual weather or labor strikes, or transitory policy changes, such as a tax rebate or a government hiring freeze. Statistically, when observed at short time scales, many macroeconomic time series appear to follow a random walk. Each macroeconomic aggregate appears to follow its own idiosyncratic path, rather than bearing a reliable relationship with other aggregates as assumed by Keynesian theory.

At long time scales, of five years or more, data appear to be better behaved. However, at long time scales, one must pay attention to additional factors, such as changes in the composition of the labor force. There are so many variables that obey long-term trends that at long time scales one can readily find correlations without being able to determine the magnitude of any causal relationship, or even to verify that a causal relationship truly exists.

The net result is that economists with very different macroeconomic theories have all been able to fit or calibrate the historical record to support their divergent points of view. It seems as though just about any interpretation of the record is possible, and no interpretation can be ruled out.

The inadequacy of macroeconomic data means that unlike physicists, whose theories can be tested rigorously, economists must work with interpretive frameworks that cannot be definitively falsified or confirmed. We will never be able to prove that a Keynesian interpretive framework is right or wrong.

However, we can say that a framework is weak if it suffers from many anomalies, meaning observations that are difficult to explain within the framework. The Keynesian framework has suffered from a number of such anomalies, such as the “negative multiplier” in recent US data. Another anomaly is that the large, rapid fiscal contraction that took place in the United States after the Second World War did not result in the long, deep recession that Keynesian theory would have predicted. The “stagflation” that took place in the United States in the 1970s was an anomaly relative to the Phillips-curve theory that previously had prevailed, and recent behavior of inflation also appears to confound the Phillips-curve story.

As noted earlier, the JOLTS data show that millions of jobs are created and destroyed each month. The Keynesian framework does not predict this phenomenon, and indeed its discovery appeared to take many macroeconomists by surprise.

## WHERE DOES KEYNESIANISM GO WRONG?

Keynesianism treats the economy as a single business producing one output, called GDP. This modeling strategy focuses all attention on the

problem of choosing how much to produce. It assumes away the problem of choosing among outputs or the problem of choosing from among many possible production methods or supply-chain configurations.

This single output, GDP, is produced by a single technique, called the aggregate production function. Thus, the Keynesian modeling strategy ignores the existence of multiple alternative patterns of specialization. Keynesians act as if there were exactly one pattern of specialization in the economy. There is no need to choose among alternative patterns, to discard outmoded patterns, or to discover new patterns.

In the Keynesian framework, jobs are only lost when there is a drop in demand. In the PSST framework, and in the real world, jobs are constantly being destroyed, for a variety of reasons.

Economic progress consists of rearranging production of output to be more efficient. It is an always-ongoing process that necessarily destroys jobs. A new consumer product makes other products obsolete, or at least less desirable. A new invention or managerial innovation makes it possible to produce the same output with fewer workers. A new configuration of trade uses labor more efficiently.

Consider the simple two-by-two model of comparative advantage, such as the Ricardian story of England and Portugal and wine and cloth. Prior to trade, both countries “waste” workers in industries that are not to their comparative advantage. Once trade is opened up, firms can shed excess workers in these industries. In the real world, there is no guarantee that when an opportunity for trade arises the industries that enjoy comparative advantage will want to employ all of the workers made redundant in other industries. Perhaps the unemployed workers will need to be retrained; or perhaps they will need to discover work elsewhere, in entirely new industries made possible by the efficiency that comes from new trading opportunities but which are not immediately apparent at the time that the efficiency is created.

In the Keynesian story, all unemployment looks like the temporary layoffs that used to occur in automobiles and steel when firms accumulated excess inventories. Once inventory balance was restored, workers were recalled to the same jobs.

In the PSST story, all unemployment looks like structural unemployment. That is, workers who lose jobs will not find that those jobs return in several months, or ever. Instead, displaced workers will have to be employed by different firms, often in different industries.

In the Keynesian story, the process of economic adjustment to a shock consists of arriving at the correct relationships between the money supply and the aggregate price level, and between the price level and the aggregate wage. In the PSST story, the process of economic adjustment to a shock requires entrepreneurs to discover new arrangements of tasks that add

sufficient value to generate sustainable profits. As with all entrepreneurial effort, this is a trial-and-error process. Some new businesses will fail, generating no sustainable employment. Only a few will be so successful that they create large numbers of new jobs. Sorting out this process will take time.

From the perspective of someone who finds that the PSST story fits well with economic thinking, the Keynesian modeling strategy seems contrived and misguided. By aggregating the economy into a single business, Keynesianism necessarily shoves the phenomenon of structural adjustment and the ferment of entrepreneurial trial and error into the background. Keynesians regard this as a useful simplification. Instead, Keynesianism is more like Hamlet without the Prince.

## NOTES

1. A year after Blanchard's paper was published, Diamond, Pissarides, and Mortensen were awarded the Nobel Prize in economics.
2. See Institute for Global Management Forum (2014).

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