Patterns of Sustainable Specialization and Trade

A Smith-Ricardo Theory of Macroeconomics

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1 Introduction

Adam Smith and David Ricardo explained the benefits of trade, based on specialization and comparative advantage. I believe that these concepts also can provide the basis for explaining fluctuations in employment. I want to suggest that unemployment occurs during an interval when old patterns of specialization and comparative advantage break down and new patterns have yet to emerge.

I propose that we jettison the Keynesian paradigm of aggregate supply and demand (AS-AD) in favor of this alternative paradigm, which I call patterns of sustainable specialization and trade (PSST). More fundamentally, I propose that we jettison the assumption that all production technologies are known, and instead recognize that time and effort are required to discover and develop new production processes.

2 A Concise History of Macroeconomics

The assumption that all technologies are known reduces the problem of economic organization to a mere mathematical exercise. The challenge, from the standpoint of either a central planner or the market, is to allocate resources as efficiently as possible. In the famous Walrasian system, this involves arriving at prices that solve a system of equations to equate supply and demand in every market.

In this Walrasian system, it is clearly inefficient for any resources to be unemployed. The macroeconomic question concerns how it is that this system can break down. The Keynesian answer is that there can be an excess supply of output in the aggregate. What breakdown in the market mechanism leads to this condition of excess supply and unemployment?

A number of explanations have been offered. One prominent approach suggests that the shortfall in demand for goods is the mirror image of an excess in the demand for money. That is, unemployment can be blamed on an increase in the demand for savings in the form of money, which does not require production. Another approach is to suggest that wage rates can get stuck too high, leading firms to cut back on employment and output. A third approach is to suggest that desired savings can exceed planned investment. In this analysis, when the rate of saving goes up, businesses do not invest to increase capacity in future output, but instead base their investment plans on what Keynes called "animal spirits."

Each of these approaches to explaining aggregate excess supply is vulnerable on conceptual and empirical grounds. These issues of Keynesian macroeconomics were the topic of intense debate in the 1970s and 1980s. I do not wish to revisit these controversies here, other than to say that the issue of the "microfoundations" of Keynesian macroeconomics was never resolved to everyone's satisfaction.

As an aside, one of the alternatives to Keynesian economics that emerged was the Real Business Cycle Model. In that model, lower employment and output is the result of a temporary downward shift in productivity, leading workers to shift into leisure. As we will see, PSST tells almost the opposite story: unemployment can result from an increase in productivity, when that increase takes place within one particular sector of the economy.

3 Discovering Production Processes

An important feature of both the Walrasian system and the Keynesian macroeconomics that followed is that patterns of sustainable specialization and trade (PSST) are taken as given. The most efficient division of labour for producing a particular good or service is understood. Everyone's comparative advantage is known.

The PSST approach drops the assumption that production technology is known. Instead, the Smithian division of labour and Ricardian comparative advantage are constantly being developed and improved. Entrepreneurs, through a process

of trial and error, figure out how best to configure production. In this process of ongoing discovery, there can be periods in which workers are unemployed, while the market mechanism tries to figure out how to utilize them.

Imagine a major construction project with a set of potential workers available on the site. In the absence of a general contractor, none of the workers knows how to proceed. They need to be told how the tasks will be broken down. They need to determine which worker has a comparative advantage in which task. Until the general contractor hands out assignments, the workers would just mill around aimlessly, unemployed.

Next, consider the U.S. economy as a whole. Each year, tens of thousands of new workers enter the labour force. In addition, each month, millions of workers separate from their current jobs. All of these workers need to find jobs. Otherwise, they will just mill around aimlessly, like the workers at a leaderless construction site.

The organization of these millions of workers is undertaken not by a single general contractor but by the decentralized decisions of entrepreneurs. As they develop new businesses and expand existing firms, entrepreneurs create new forms of specialization and comparative advantage. These in turn provide roles that employ workers.

The configuration of workers embodies a pattern of trade. In a highly indirect, roundabout way, someone with skills in, say, nursing, trades labour time for a myriad of goods and services that provide food, clothing, shelter, entertainment, and so on. The pattern of trade in a modern economy has become increasingly complex as economies have developed. Hundreds of years ago, people made for themselves a significant share of the goods and services they consumed. Today, there is almost nothing we consume that we can make for ourselves.

Ongoing innovation constantly shifts the patterns of specialization and comparative advantage. Smith's pin factory has been subjected to waves of Schumpeterian creative destruction. Ricardo's simple pattern of comparative advantage in wine and cloth has given way to far more complex patterns in

which comparative advantage is subtle and sophisticated.

After generations of increasing complexity, the contemporary forms of specialization and comparative advantage would seem unfathomable to someone from an earlier era. Suppose that we had with us a time traveler from 1800. Imagine taking a random sample of a dozen people working in different office buildings and trying to explain to our time traveler how those people contribute to the production process. Try to convey the role of a web programmer, a graphic designer, a data analyst, or a social media marketing specialist. Try to explain how in the United States fewer than 2 percent of the labour force is engaged in agricultural production and less than 6 percent of the work force consists of manufacturing production workers.

My point here is to emphasize that structural change is an important feature of the economy. Workers and entrepreneurs are dealing with an ever-changing environment.

If entrepreneurs had to start each day from scratch trying to figure out how to engage in profitable production, the task would be impossible. What makes business manageable today is the ability to use yesterday's configuration as a baseline. Entrepreneurs assume that what worked yesterday will be approximately what works today.

The term sustainable in "patterns of sustainable specialization and trade" refers to profitability. Patterns that are profitable can be sustained. Patterns that are not profitable must eventually shut down.

Experimenting with new patterns of specialization and trade is relatively easy. Discovering patterns of sustainable specialization and trade is much harder. Our economic well-being depends on the ability of entrepreneurs to make these discoveries.

In the short run, what would happen if many patterns of trade were to become unsustainable? For example, suppose that a new invention increases productivity in a large sector of the economy, releasing resources for use elsewhere. For the

purpose of employing these resources, entrepreneurs are almost starting from scratch. They have no historical pattern on which to rely, so that the discovery of sustainable patterns will take considerable time and effort.

4 Structural Unemployment

Conventional macroeconomics allows for unemployment that results from imbalances in the labour market. There can be frictional unemployment, meaning a temporary mismatch of workers and jobs, as might arise if unemployed workers and job vacancies are in different locations. There can be structural unemployment, meaning a more long-lasting mismatch between the skills of unemployed workers and the skill requirements of vacant jobs.

PSST provides a different perspective on structural unemployment. In conventional economics, the job definitions exists, and the problem is to adjust the relative labour supplies in order to fill positions where skills are in short supply while reducing unemployment where skills are in excess supply. From the PSST standpoint, structural unemployment is not just a problem of matching workers with slots. The market mechanism first must undertake a trial-and-error process to create production processes that exploit comparative advantage. The matching problem is secondary. The slots into which workers might be matched do not exist before they are created through a process of entrepreneurial experimentation. Until the patterns of sustainable specialization and trade are discovered, there are no job slots.

Another important difference between PSST and conventional macroeconomics is that the latter draws a sharp distinction between cyclical unemployment and structural unemployment. PSST treats all unemployment as structural. For conventional macroeconomics, structural unemployment is just a phenomenon that always exists in the background. It is not a factor in cyclical swings in unemployment.

There are challenges with interpreting cyclical unemployment as structural. Why would there be fluctuations in the rate of job creation and job destruction,

rather than a constant rate of structural unemployment? What produces large imbalances, in which declining sectors shed workers more readily than expanding sectors hire new employees? Why are increases in unemployment spread broadly across many sectors, rather than concentrated in a few industries? These questions will be discussed in the next section.

On the other hand, there are challenges with ignoring the structural aspects of unemployment. For example, the AS-AD paradigm does not explain the fact that for the most part unemployed workers do not return to their same jobs as the economy recovers. Instead, most unemployed workers take different jobs, and many others drop out of the labour force altogether.

One example of the structural aspects of economic fluctuations is the Great Depression. The job structure did not stand still in the 1930s. On the contrary, Alexander Field has argued that the decade of the 1930s saw the most technological progress, as measured by the improvement in total factor productivity, of any decade in American history.[1]

The PSST interpretation of the Great Depression in the United States would be that the internal combustion engine and the small electric motor disrupted patterns of specialization and trade. The tractor substituted for human labour in farming, leading to a dramatic decline in farm labour and sharecropping. Between 1910 and 1950, the share of farmers and farm labourers in the work force plunged from 33 percent to less than 15 percent. In the cities, the five-story factory running on a single large belt gave way to the horizontal factory using multiple electric motors. The resulting increase in efficiency dramatically increased productivity, so that the same goods could be produced with fewer workers. This allowed some workers to move into manufacturing other goods, but more importantly it allowed the share of blue-collar labour to fall relative to white-collar labour.

By 1950, the composition of the work force had shifted. The high school graduation rate was only 29 percent in 1931, but it had reached 59 percent

1 Alexander J. Field, *A Great Leap Forward: 1930s Depression and U.S. Economic Growth.* New Haven: Yale University Press, 2011.

by 1950. The nature of work had shifted, also. With machines doing more of the lifting and shaping, human work became more clerical. With lower manufacturing and transportation costs, wholesale and retail distribution expanded to accommodate the abundant consumer goods.

The new industries of the 1950s were geared toward the suburban lifestyle. Tract housing pioneered by Levittown, fast food exemplified by McDonalds, and shopping centers were important sources of new jobs.

Thus, the patterns of specialization and trade that emerged after the Depression were significantly different from those that existed prior to 1930. As important new technologies achieved broad penetration, many old jobs became uneconomical. Eventually, new jobs were created, and those jobs were filled by a labour force that was increasingly female and increasingly well-educated.

In the AS-AD paradigm, the unemployment of the Great Depression seems entirely unnecessary. The slump was a mistake, caused by bad luck and, above all, by incompetent macroeconomic management.

From a PSST perspective, one has to ask how full employment could have been maintained. Should the patterns of specialization and trade that were in place in 1929 been kept in place for ten or twenty years longer? This could not have been reconciled with the innovation in production methods that took place. On the other hand, could the patterns of specialization and trade in 1950 have been adopted sooner? That would have required incredible foresight and co-ordination on the part of entrepreneurs. Even with such foresight, the patterns in 1950 depended on developments, such as road and highway construction as well as a more educated labour force, that were not in place in 1929.

In our own time, we have seen computers and the Internet produce dramatic restructuring of economic activity. Telephone switchboard operators, a burgeoning occupation 50 years ago, have disappeared. Industries such as newspapers and music retailing have been disrupted, resulting in sharp declines in the number of firms and the number of jobs. The retail supply chain has been dramatically altered, enabling stores to stock a greater variety of goods from less

expensive producers, turn over their stocks faster, maintain leaner inventories, and adapt quickly to new consumer preferences.

Many mid-skill jobs have been shifted off shore or automated. labour economists now speak of the "polarization" of the American job market, with high skill jobs that lever the use of computers to replace mid-skill jobs, leaving mostly low-skill service jobs for workers who lack technical or professional education.[2]

People can no longer find their Ricardian comparative advantage in operating switchboards, working in record stores, or working in newsrooms. They can no longer engage in Smithian specialization in the context of a typing pool or a photo development lab.

The theory of aggregate demand would lead one to expect a recovery to consist of workers returning to the jobs that they held prior to the recession. That is not what happened after the Great Depression. It is not what has happened in recent recessions, particularly the one that ended in 2009. In both cases, regaining full employment could not take place without significant restructuring of the economy, rather than simply returning to the pre-slump status quo.

5 Cyclical Fluctuations and PSST

As noted earlier, the challenge for PSST is to explain fluctuations in unemployment. From a conventional macroeconomic perspective, structural unemployment is something that exists in the background at a more or less constant level. If that is the case, then it makes a poor candidate as an explanation for the large swings in unemployment that take place over what is called the business cycle.

I think that this would be a more damning criticism of PSST if the AS-AD approach were better established at predicting and controlling fluctuations in employment. However, the AS-AD approach does not produce reliable

2 David Autor, "Polarization of Job Opportunities in the U.S. labour Market: Implications for Employment and Earnings," paper produced for the Center for American Progress and The Hamilton Project, April, 2010.

predictions of macroeconomic performance. Moreover, policies enacted in accordance with the AS-AD model, such as the stimulus package in the United States approved by Congress in 2009, have not been successful.[3]

The term "cyclical fluctuations" comes from a pre-Keynesian notion, the "business cycle." Economists observed patterns in the behavior of economic indicators, with important indicators tending to move together. Of course, one hundred years ago, the economy was very different. Many of the original cyclical indicators dealt with agricultural production or the processing of raw materials.

More recently, Ed Leamer in his macroeconomic textbook (which is in many ways an original treatise) argues that fluctuations in housing construction and consumer durable goods production account for a large share of deviations from trend growth in output.[4] In his view, this pattern is consistent with a story in which those sectors are subject to a boom-bust cycle, within the paradigm of AS-AD.

I believe that instead the most recent business cycles appear to differ from their three predecessors. As shown in Table 1 below, in the recessions of 1970, 1973-75, and 1980-82, the drop in employment in the durable goods sector accounted for essentially all of the total drop in overall nonfarm payroll employment. However, the durable goods sector accounted for less than half of the drop in total employment in the three most recent recessions, and less than one fifth of the decline during the latest slump.

(Incidentally, the decline in residential construction employment during the most recent recession was only 263,000 workers, so this accounts for only three percent of the job losses. In general, the residential construction sector is a very small share of total employment. The impact of housing slumps on employment is felt largely in the durable goods industries that produce construction materials and household appliances.)

3 Of course, if one uses the approach of the Congressional Budget Office and evaluates the success of the stimulus by running it through a model of the economy that embodies the AS-AD characterization, then its success becomes non-falsifiable.

4 Leamer, Edward E., *Macroeconomic Patterns and Stories*, Springer Verlag, 2009.

Recession	Total	Durable Goods
1970	831	1247
1973-75	1260	1244
1980-82	2030	2036
1990-91	1240	468
2001	1599	799
2007-2009	7790	1519

Table 1. Loss in employment, in thousands, seasonally adjusted

Recession start and end dates taken from the NBER; employment data taken from the Bureau of labour Statistics.

The most recent recessions also had stronger productivity growth than their predecessors. Another difference was that the most recent recessions were followed by "jobless recoveries," in which GDP returned to its previous peak long before the unemployment rate. In the two most recent cases, the share of the working-age population that was employed continued to fall long after these recessions were declared officially over, in November of 2001 and June 2009, respectively. The "jobless recovery" represents a divergence between the path of output, as measured by GDP, and the path of employment.

The combination of rising productivity and slow employment growth is indicative of structural unemployment. The workers released by innovation have not found new ways to exploit specialization and comparative advantage.

Decade	Total Nonfarm	Durable Goods
1970-1979	78735	11050
1980-1989	96870	10984
1990-1999	116641	10425
2000-2009	133032	9107

Table 2. Average employment by decade, in thousands

Table 2 shows employment data in secular perspective. It looks at overall employment and employment in the durable goods sector by decade. In durable goods, one can see a noticeable downtrend in the two most recent decades. This may also be indicative of structural change in the economy.

The first three recessions in Table 1 can be described about equally well using either AS-AD or PSST. From an AS-AD perspective, a shortfall in aggregate demand caused a buildup in inventories of durable goods, resulting in temporary layoffs. Once sales and inventory levels were in balance, workers were recalled and employed. From a PSST perspective, one could say that the unwanted inventory accumulation indicated that patterns of specialization and trade were temporarily unsustainable, but balance was later restored.

The more recent three recessions pose some challenges for the AS-AD approach. Employment plunged in sectors that previously had shown little or no sensitivity to aggregate demand. Productivity rose, so that we did not observe a rise in unit labour costs, which means that employment fluctuations cannot be described as a movement along a labour demand schedule. Relatively few workers returned to the jobs they held prior to the recession.

PSST emphasizes the effect of technology on employment. In any industry where productivity rises faster than demand, employment will decline. This will be the case when the elasticity of demand is not sufficiently high to absorb the increase in productivity, so that labour resources are released from the sector where productivity is rising. In the long run, this should be offset by increases in employment in other industries where demand is rising faster than productivity. However, entrepreneurs have to discover which industries to enter, they have to design jobs within those industries, and workers have to adapt to fill those jobs. These adjustments can take many years.

The PSST story might be based on the pattern of diffusion of what economic historian Paul David calls general purpose technologies. The dynamo (small electric motor), the computer, and the Internet would be examples of such technogical innovations.

The first phase of diffusion might be dubbed the Solow phase, after Robert Solow's famous 1987 quip that "We see computers everywhere but in the productivity statistics." During this phase, firms experiment with new technology in order to learn. However, because the technology is in a relatively primitive state and its most effective uses have not yet been discovered, early adopters show little gain in productivity from the new technology and laggards see little threat. Thus, we get gains in employment in firms that are bullish on the new technology, with little or no displacement of existing workers. This might describe the 1980s with personal computers and the Internet boom of the late 1990s.

In the second phase of diffusion, which we might call the job-loss phase, the productivity gains kick in. Firms that have adopted the new technology gain market share without having to add workers (think of Amazon, the online book seller). Firms that lag in employing the new technology are driven out of business (think of Borders, the large bookstore chain that went bankrupt in 2011). This is the phase in which many workers suddenly become superfluous. Expanding firms are less labour-intensive than failing firms. Overall, the economy experiences a surge in unemployment.

In the third phase of diffusion, which we might call the renewal phase, entrepreneurs develop new firms and new industries to employ the surplus labour released by the productivity gains. These new industries, along with the adaptation of the labour force, foster a return to full employment.

The foregoing is something of a "just-so" story for the Great Depression and the most recent slump. For the Great Depression, the 1920s would be the Solow phase of the internal combustion engine and the dynamo, the 1930s were the job-loss phase, and the decade after the second World War the renewal phase. In the more recent cycle driven by the Internet, the 1990s would be the Solow phase, the current period would be the job-loss phase, and we have yet to experience the renewal phase.

In both of these episodes, the job-loss phase coincided with financial distress. In the AS-AD story, the financial distress is the causal factor. In the PSST story, the financial distress would be somewhat of a byproduct or symptom that

accompanies the real adjustment. Financial euphoria in the 1920s and 1990s might have served to amplify employment growth and perceived wealth during the Solow phase of these cycles. The financial euphoria that accompanied the housing bubble might have helped to delay the onset of the job-loss phase of the current cycle.

Indeed, the phenomenon of financial euphoria followed by financial crisis is important to address in either AS-AD or PSST. Economic historian Charles Kindleberger argued that euphorias tend to take place following what he calls "displacement," such as major wars.[5] In our terms, displacement creates a disruption in patterns of specialization and trade. New trading opportunities, like new technologies, can trigger a cycle. Perhaps if we look at these episodes, we can find evidence of the three phases, with the initial trading forays having little effect on productivity ("we see voyages to the New World everywhere but in the productivity statistics," so to speak) but eventually having disruptive effects.

6 Government Job Creation

From the AS/AD perspective, government spending creates jobs by raising aggregate demand. There is no distinction made between sustainable jobs and unsustainable jobs.

In contrast, the question of whether jobs are sustainable (meaning jobs that are embedded in patterns of trade that meet the market test of profitability) is central to PSST. In the years leading up to the financial crisis, both the United States and the United Kingdom experienced expansions in finance, residential real estate, and government services. However, not all of the jobs were sustainable. Instead, the property boom depended on a virtuous cycle of price appreciation that necessarily had to end at some point. The growth in finance reflected an excess of risk taking made profitable by misguided regulatory guidelines more

5 Kindleberger, Charles P. and Robert Z. Aliber, *Manias, Panics, and Crashes: A History of Financial Crises*, 5th edition. Wiley, 2005 (the first edition, with Kindleberger as sole author, was published in 1978.)

than an increase in actual value added in that sector.[6]

In addition to ongoing structural change in their economies, the US and the UK have to cope with the need for resources to shift out of unsustainable patterns of specialization and trade in real estate and financial services. Instead, these resources must find employment in sectors where they contribute profits that are not based on speculative manias or regulatory arbitrage.

In this context, government spending is not likely to solve the problem. Government jobs are not self-sustaining. Instead, they require subsidies from present taxpayers or, if the spending is deficit-financed, from savers (and, ultimately, future taxpayers). In fact, fiscal constraints have signalled that the US and the UK entered the crisis period with too many government jobs, not too few. The restoration of patterns of sustainable specialization and trade will have to come from the private sector. Short-term so-called stimulus programs may impede the necessary adjustment, rather than hasten it.

7 Conclusion

Entrenched in our current economic textbooks is a theory of economic fluctuations that is quite separate from what we teach in microeconomics. What I propose instead is a theory that Adam Smith and David Ricardo could recognize. It is a theory that economic progress involves creating new patterns of specialization and trade. When new opportunities suddenly emerge, there can be periods in which high productivity growth in industries with relatively inelastic demand creates a surplus of workers. It takes time for entrepreneurs to discover new ways to exploit specialization and comparative advantage, and it takes time for the labour force to adapt to new skill requirements. These real adjustments are needed in order to restore full employment.

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6 See Andrew Haldane, "The Contribution of the Financial Sector: Miracle or Mirage?" speech given at the Future of Finance Conference, London, July 14, 2010. *http://www.bankofengland.co.uk/publications/speeches/2010/speech442.pdf*. See also Arnold Kling, "Not What They Had in Mind: A History of Policies that Produced the Financial Crisis of 2008," Mercatus Center, September 2009. *http://mercatus.org/publication/not-what-they-had-mind-history-policies-produced-financial-crisis-2008*