

A New Theory of Unemployment: Globalization and the Wage-Productivity Gap*

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Abstract

A deep recession started in 2007 in the United States and quickly spread abroad. Keynesian policies were followed, sharply raising money supply and budget deficits all over the world. But even five years later, the globe suffered from high unemployment. This paper offers a new theory, and argues that joblessness occurs when a wage gap develops in that labor productivity rises faster than the real wage. This occurred in the 1920s that were followed by a depression, and also happened for several decades after 1980, only to be followed by a severe recession. Free trade may be partly responsible for a rise in this wage gap.

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Introduction

In a recent article, Robert Shiller (2001), a renowned economist and best-selling author, remarks: “A great embarrassment for modern macroeconomic theory is that it has never achieved any consensus on the basic questions of what makes the stock market rise or fall and what ultimately causes recessions....we have not been able to pinpoint what ultimately causes recessions” These words are astounding but highly credible. They are astounding because in view of all that has been written about macroeconomics over the past two hundred years, you would think that by now we understand the ultimate or basic cause of unemployment or recessions. They are also credible because a deep slump started all over the world in 2007, and, fully five years later, its ill effects of high poverty and unemployment continued to afflict the globe. If we really knew the ultimate cause, unemployment should have vanished soon after the NBER proclaimed

the end of the recession in 2009.^[11] Instead, in 2012 the official unemployment rate exceeded 8 percent in the United States, and, if part-time and discouraged workers are included, it exceeded 16 percent. The picture was not any brighter around the world. In fact, Europe was back in recession in 2011 with a jobless rate surpassing 11 percent, which was the highest since the record began in 1995.

Paul Krugman (2009) was just as blunt as Shiller, when he wrote, “Few economists saw our current crisis coming, but this predictive failure was the least of the field’s problems. More important was the profession’s blindness to the very possibility of catastrophic failures in a market economy” Let us face it: The popular theories of macroeconomics, both classical and Keynesian, do not know what ultimately causes a recession or high unemployment, or else the planet would have been free from this scourge soon after the proclaimed end of the slump. The purpose of this paper is to fill this gap. It argues that unemployment or recessions occur when there is a persistent rise in the wage-productivity gap. In other words, when labor productivity rises faster than the real wage for some time, a wage-productivity gap develops and ultimately leads to layoffs and a jump in the rate of unemployment. Furthermore, a major cause of the rising wage gap for some nations is free trade and outsourcing.

Popular Theories and the Great Recession

The American downturn that began in 2007 is now called the Great Recession, and was the worst since the Great Depression. Millions of workers were laid off and millions more suffered wage losses and poverty, and continue to do so. The unemployment rate jumped from less than 5 percent in 2006 to 10 percent in 2009. Naturally, a question arises: Did anyone foresee such a calamity? After all, a crisis does not occur in a vacuum. There were all sorts of premonitions of things to come. There was a housing bubble, and an oil bubble, along with a torrid stock market between 2003 and 2007. The general view encouraged by policy makers and the academia is that no one foresaw the coming slump. But this is not true. Some of those who base their thinking on empirical models and assumptions, rather than purely theoretical and frequently hypothetical assumptions regarding microeconomic foundations, warned the world in no uncertain terms about the looming economic crisis. According to Dirk Bezemer, “It is not difficult to find predictions of a credit or debt crisis in the months and years leading up to it, and of the grave impact on the economy this would have -- not only by pundits and bloggers, but by serious analysts from the world of academia, policy institutes, think tanks and finance.” (2009, p. 2) Roubini, Shiller and Batra, among a dozen writers, predicted the onset of a recession well before its arrival.^[12] In fact, in a

book published at the end of 2006 and released on January 9, 2007, Batra even pinpointed the year in which it could happen. Some of his words were:

The economy will steadily get worse with home prices falling and layoffs rising...(p.173)

The housing bubble appears to be a major event, which once had a lot of momentum but is now beginning to recede. Its starting point was 2001, when the interest rate started a panicky fall. It is likely to burst in 2008, give or take a year. The burst could start in 2007 and continue till 2009. (p.175)

The economy could still face a steep recession because of rising oil prices, but avoid the calamity of a depression. Unemployment could rise to the level of 10 percent or more...There could be more stock market crashes from 2008 to 2011 or 2012. (p.179)

The rest is history. The housing bubble punctured in mid-2007, whereas, according to the NBER, the recession began in December 2007 and ended in July 2009. In addition the stock markets crashed between October 2007 and March 2009, and had not fully recovered even by 2012, while unemployment approached 10% by November 2010. Thus, some economists did foresee the arrival of the Great Recession, but few macro experts and policy makers paid attention.

Why did most experts fail to heed the advance warnings that were obvious to some? This is because, as Shiller (2001) remarks, popular theories still “have not been able to pinpoint what ultimately causes recessions.” Let us focus on the word “pinpoint,” which suggests that there may be only one underlying cause of a downturn. This paper agrees and argues that ultimately the one major cause of a recession is the persistent rise in the wage gap. This happened in the 1920s, which were followed by the depression, and it happened from 1980 to 2007, only to be followed by a serious recession. In fact, the wage gap continues to rise, and that is why the slump persists and will not be over until its underlying cause is removed.

There is only one ultimate cause, although there are a lot of symptoms that masquerade as causes in popular macroeconomic models. The classical and neoclassical theorists argue that real wage rigidity induced by powerful labor unions or the minimum wage legislation results in long-term unemployment. Few policy makers take this idea seriously, although it still resonates with a lot of economists. On the other side, Keynesians and neo-Keynesians blame recessions on inadequate aggregate demand and see expansionary monetary and fiscal policies as panaceas to end the crisis. Such policies were indeed successful for a long time in ending recessions, but we argue that they only postponed the problems and, furthermore, new recessions usually required a stronger dosage of expansionary measures. Now Keynesian remedies no longer work in spite of the massive dosage administered to the ailing patient called the global economy. They may stabilize the patient’s illness but will not, and cannot, cure it into robust and self-sustaining health.

Another popular theory is offered by the Austrian school, which blames recessions on excessive expansion of money and credit by financial institutions and on the heavy debt burden of consumers prior to the crisis. This view also focuses on the symptoms. The big question is why consumers get hugely indebted prior to the slump. There is no doubt that bank loans and consumer debt rocketed in the United States during the years leading up to the recession.^[3] But the question is why. Our answer lies in the rising wage gap. Thus this paper searches for the ultimate or the primary cause of a recession and not for the symptoms.

The Wage Gap in the United States

Let us begin with the concept of the wage gap, which may be defined as the excess of a nation's labor productivity over its real wage. Suppose this excess is symbolized by E , then

$$E = (A - w)/w = (A/w) - 1 = \beta - 1$$

Where A is the average product of labor, commonly called productivity, and w is the real wage, and where

$$\beta = A/w$$

Thus, E is the wage gap, and moves up or down in accordance with variations in β ; so, β is the index of the wage gap. Let Y stand for real GDP or a nation's output, and L for the employment of labor. Then

$$A = Y/L$$

Normally, the wage-gap index remains constant over time as the real wage rises roughly in the same proportion as productivity, but once in a while it goes up in some decades. That is when trouble follows.

Table 1 furnishes the behavior of the US wage gap over two time periods, first from 1919 to 1929 and then from 1962 to 2010. Column 4 displays the wage-gap index during the 1920s and shows that it jumped sharply from 111 in 1919 to 156 in 1929, or by 40 percent in just one decade. This was the fastest rise in the index in US history and, as argued later, this could not but generate the worst depression. In any case, this information will come as a surprise to neoclassical economists, who believe that the real wage equals the marginal product of labor, which in turn is proportional to labor's average product, so that the wage gap is constant in the neoclassical world.

Column 2 presents the behavior of the wage gap between 1962 and 2010; these are the years for which the relevant data are readily available from the 2012 *Economic Report of the President*, and so the information is furnished for 5 decades to see how the wage gap behaves in good and bad times. This column is obtained by dividing the figures for hourly output in the business sector by real hourly compensation. The data start from 1962 and end in 2010.

Table 1: The Wage-Gap Index in the United States in Selected Years 1920s and 1962–2010

(1) Year	(2) Wage Gap	(3) Year	(4) Wage Gap
1962	72	1919	111
1965	74	1921	128
1970	73	1923	130
1975	77	1925	148
1980	77	1927	154
1985	84	1929	156
1990	86		
1995	88		
2000	94		
2005	100		
2010	107		

Source: Column 2 from Table B-49 of *The Economic Report of the President*, 2012, Council of Economic Advisers, Washington D.C.; Column 4 from *The Historical Statistics of the United States: Colonial Times to 1970* (Washington D. C., U. S. Department of Commerce, 1975), series D 685, D 727, and D 802.

The table shows that the wage gap remained constant during the 1960s and rose slightly in the 1970s. For all practical purposes, there was little change in the gap during these two decades, as its index varied between 72 and 77 over 18 years. However, from 1980 on, the wage gap began to rise steadily, as its index rose from 77 in 1980 to 107 in 2010, or by roughly 40 percent over three decades. Thus, the wage gap rose consistently, but compared to the 1920s it was a much slower rise.

By now we have seen that the wage gap rocketed during the 1920s and was followed by the worst depression, and then it rose steadily from 1980 on and was followed by the Great Recession. Is it a mere coincidence that in both cases trouble followed the rise in the wage gap? The next section argues that this was not a coincidence but an inevitable consequence of the growing gap.

A Simple Model of the Wage Gap

In order to clearly demonstrate our result, we begin with one simplifying assumption, namely all wage earnings go into consumption, and other types of incomes from interest, rent or dividends go into savings. In other words, people do not save anything out of their wages. This is just a simplifying assumption and will be relaxed later, although it is close to reality for the US economy where the general public lives from paycheck to paycheck, has little income from non-labor sources and its rate of saving prior to the recession approached zero. In fact, in the 2000s the saving rate was even negative in some months. With this assumption, the consumption function is given by

$$C = wL \quad (1)$$

where C is the pre-tax level of consumer spending. As our starting point, let the economy be closed with little government spending and no debt at all. Then

$$AD = C + I \quad (2)$$

where AD is income-based aggregate demand equaling consumption and pre-tax planned investment (I). Unless specified otherwise, all variables are in real terms. Let AS be aggregate supply, then

$$AS = Y = (Y/L)L = AL \quad (3)$$

In equilibrium,

$$AS = AD = Y \quad (4)$$

To all this we add our index of the wage gap given by

$$\beta = A/w \quad (5)$$

Thus, our starting point is a simple model with no consumer or government debt and no foreign trade. Layoffs or unemployment in any economy occur when $AD < AS$ and there is overproduction. Let us now set up a numerical example to see how this model works, ala' David Ricardo, who illustrated his profound theory of free trade by just using numerical values. In fact, Krugman also suggests that we simplify economic theory, when he writes, "As I see it, the economics profession went astray because economists, as a group, mistook beauty, clad in impressive-looking mathematics, for truth." (2009, p. 18) Another purpose of my paper is to show that we do not need complex math to derive meaningful results. In this spirit, suppose our initial values are as follows:

$$A = \$5, w = \$4, \beta = 5/4, \text{ and } L = 100$$

In other words, on average a worker produces \$5 worth of output and earns a real wage of \$4. These dollar values are from a base period, so that our values are expressed in real terms. Let us assume that the labor force of 100 workers is fully employed. With these figures,

$$\begin{aligned} Y &= AL = 5 \times 100 = \$500 \\ C &= wL = 4 \times 100 = \$400 \end{aligned}$$

so that the economy is in full employment equilibrium if

$$I = \$100,$$

because then

$$AD = C + I = AS = \$500. \quad (6)$$

All these are our initial values. Now suppose productivity rises over time because of the positive level of investment and new technology or for some other reason such as good weather, etc. Let the new values be

$$A = \$10, \quad w = \$8, \quad \text{and} \quad \beta = 10/8 = 5/4$$

This is a case where the wage gap remains constant, because both productivity and the real wage have doubled. Let us see what the economy needs for our 100 workers to remain employed in spite of the rise in productivity, which often makes labor redundant. With these new figures

$$\begin{aligned} Y &= AL = 10 \times 100 = \$1,000 \\ C &= wL = 8 \times 100 = \$800 \end{aligned}$$

so that now if $I = \$200$, then $AD = AS = \$1,000$ and the economy remains in full-employment equilibrium.

Thus the doubling of productivity and wages will not lead to layoffs if investment also doubles. Let us assume that investment is proportional to consumer spending. This is a reasonable assumption, because if consumer spending rises, firms tend to expand their operations and add to their investment. So let

$$I = \alpha C \quad (8)$$

where α is the response of investment spending to consumer spending. For the time being, assume that α is constant, so that when consumer spending doubles, investment also doubles. Figures from the *Economic Report of the President* show that the investment to consumption ratio generally varied between 24% to 26% from 1960 to 2000. *This simple model illustrates that if the wage gap remains constant, there need be no layoffs and unemployment in spite of rising productivity.*

Let us now see what happens if the wage gap goes up. Suppose the new values are

$$A = \$10, \quad w = \$7, \quad \text{and} \quad \beta = 10/7 > 5/4$$

Here productivity doubles but the real wage rises by less, so that the wage gap goes up. Then

$$C = 7 \times 100 = \$700$$

so consumer spending is lower than before and AD tends to fall. But if

$$I = \$300$$

so that $AD = 700 + 300 = \$1000$, then AD continues to match AS. Again there are no layoffs, which occur only if $AD < AS$ and there is overproduction. *Thus if the wage gap rises the economy needs extra investment to avoid unemployment*, and this requirement does not change even if α is not constant, because α has a limit.

Is this possible? Can investment rise further if consumer spending falls from \$800 to \$700. The answer is no. This is because with the same level of investment of \$200, AD equals \$900, and with

companies producing \$1,000 worth of output, goods pile up on their shelves. Investment cannot rise further when some goods remain unsold; in fact investment falls when firms are unable to sell all they can produce. So now

$$I \leq \$200$$

Even if α is not constant, it is safe to assume that investment does not rise in the presence of unsold goods. Under these circumstances, firms will reduce their output to the level of aggregate demand, culminating in a recession and unemployment. *Hence when the wage gap rises, unemployment becomes inevitable. Furthermore, the greater the rise in the wage gap, the steeper the recession, and the bigger the jump in unemployment.* Note that investment equaling \$200 is the best-case scenario for the economy. If it falls below that level because of falling consumer demand then the recession is even deeper.

So far we have said nothing about the role of the price level. The model has been so designed that the price level only plays an implicit or secondary role. If goods pile up on their shelves, some firms are likely to lower their prices, but this is unlikely to cure the problem. This is because profits will fall, and some workers will be laid off any way. Furthermore, falling prices do not guarantee a rise in aggregate spending. Some goods have elastic demand and some have inelastic demand. So with a general price decline, spending will rise on elastic-demand goods and decline on others. But the economy as a whole cannot have elastic demand, so that, if there is general overproduction, the rise in spending on some goods falls short of the decline on others, as the world experienced so painfully during the Great Depression. Hence even if prices fall sufficiently, a rise in the wage gap will generate unemployment, which may even become worse if deflation becomes severe. In any case, there have been many recessions but no price decline since 1960.

However, history shows that a recession may not occur immediately after the rising wage gap. During the 1920s, after all, the wage gap climbed for a full decade, before the depression showed up in 1929. That is where consumer debt comes in. So far we have assumed that there is no debt in the economy, and all consumer spending is financed by wage income. But suppose for some reason consumers decide to go into debt to enhance their present consumption. Then in equilibrium

$$AS = C + I + \text{Consumer Borrowing}$$

so that if consumers borrow \$100 from financial institutions and spend them, then

$$AD = 700 + 200 + 100 = \$1,000 \quad (9)$$

and there is no recession and layoffs. Here consumer spending still equals \$800, 700 from wages and 100 from new debt. Something similar occurred in the 1920s, as shown in Table 2. The table shows that the consumer debt to GNP ratio more than doubled from 1919 to 1929. This is what sustained the economy even though the wage-gap rocketed during the 1920s; but, of course, consumer borrowing has its limits, which were reached by the end of 1929, when aggregate demand suddenly collapsed, culminating in a recession and later in a depression.

Year	CD/GNP
1919	3.1
1921	4.3
1923	4.4
1925	5.1

1927	5.6
1929	6.9
Source: <i>The Historical Statistics of the United States: Colonial Times to 1970</i> (Washington D. C., U. S. Department of Commerce, 1975), series D 685, D 727, D 802, F 32, and X 409.	

Keynesian Policies

So far we have assumed that there is no government spending or taxes in the economy. Let us now relax this assumption. Suppose C and I continue to be pre-tax spending levels by consumers and investors. Let G denote government spending and T denote tax revenue. An injection of G raises AD whereas taxation lowers it, so that the net effect equals

$$B = G - T,$$

where B is the budget deficit. So now

$$AD = C + I + B$$

This concept seems to differ from the textbook definition of aggregate demand where

$$AD = C + I + G$$

but the difference is more apparent than real, because in textbooks C and I are post-tax levels of spending, whereas in our model they are pre-tax values.^[4] *It has been demonstrated above that when the wage gap rises layoffs quickly follow, unless consumer debt rises sufficiently.* If the consumer debt fails to climb on its own, then the policy-maker has three choices. Either adopt policies that bring the real wage in line with productivity, or follow Keynesian remedies that raise AD artificially to the level of AS. The third choice is what the classical economists advocate, which is to do nothing. This choice may be ruled out altogether, because the politicians are interested in their re-election and do not wish to face an irate electorate. They hate unemployment almost as much their constituents.

We will discuss the wage-raising policies subsequently. For now, let us see how Keynesian measures affect our analysis. Let us recall our numerical values. When the wage gap went up, and I was at most \$200,

$$Y = \$1,000$$

but

$$C + I = \$900$$

In this case there was overproduction or unsold goods worth \$100, because

$$\text{unsold goods} = Y - (C + I) = 1,000 - 900 = \$100$$

Keynesian policies call for government intervention in the form of monetary or fiscal expansion. With fiscal expansion alone, the government raises its spending and/or cuts tax rates, thereby raising the budget deficit that must equal \$100 to avoid overproduction. With monetary expansion, the government increases money supply and lowers the rate of interest so as to induce consumers and investors to borrow more money and spend it. Thus, the purpose of both measures is to generate more debt and raise aggregate spending to the level of AS. This way

$$\text{Consumer borrowing} + \text{Budget Deficit} = \text{Overproduction} = \$100$$

We have argued above that the larger the wage gap, the greater the rise in unemployment. For instance, if

$$A = \$10 \text{ and } w = \$6,$$

then the wage gap rises further. Here $C = \$600$ and with $I = \$200$,

$$\text{Overproduction} = 1,000 - 800 = \$200$$

which is twice the level of overproduction that occurs when $w = \$7$, so that now the recession is deeper and more workers are fired. Fighting the recession through Keynesian policies then calls for a further dosage of monetary and fiscal expansion, so that now new debt equals \$200. *This way if the wage gap keeps rising over time, the politician moves the nation deeper and deeper into debt to avoid the specter of large scale unemployment.*

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An Open Economy

So far we have worked with a closed economy, but it should be clear that opening it to foreign commerce does not change our logic in any way, except that openness may raise a nation's wage gap even further and make matters worse. Let V stand for net imports or trade deficit, which is the excess of imports over exports. Let us suppose net imports are proportional to domestic private spending, i.e.,

$$V = \sigma(C + I)$$

so that a rise in private spending raises the trade deficit. σ , a positive fraction, may be constant or a function of other variables such as the exchange rate, foreign GDP growth, etc. If σ is constant our analysis retains its simplicity and does not change at all, because then

$$AD = C + I - V = (C + I)(1 - \sigma)$$

The equation for overproduction now becomes

$$\text{Overproduction} = Y - AD = Y - (C + I)(1 - \sigma)$$

So if C falls as a result of a rise in the wage gap and I does not rise, unsold goods increase and then borrowing by consumers and/or the government has to rise to generate demand supply equilibrium and avoid layoffs. Since $\sigma < 1$, the overproduction and hence the policy-induced increase in debt are smaller than those in the case of the closed economy. This is because a fall in private spending induces a fall in imports and mitigates the decline in AD. If σ is not constant, all that changes is the value of the new debt required to retain full employment equilibrium, because

$$\text{New Debt} = Y - (C + I)(1 - \sigma)$$

and a fractional change in σ only changes the value of new debt.

However, there is one significant way in which increased openness affects the outcome. This is because free trade tends to raise a nation's productivity, as demonstrated by Ricardo and many others, and it may also alter the real wage. If a country imports labor-intensive goods and exports capital-intensive products, then the Stolper-Samuelson theorem kicks in and free trade causes a fall in the real wage. This way the wage gap rises even if there is no new technology. But the wage gap

rises from the Stolper-Samuelson theorem regardless of what happens to a nation's output or productivity. We may write

$$Y = AL = wL + rK$$

where r is the return to capital and K is the stock of capital. In the Stolper-Samuelson model, L and K are fully employed and are constant. So if w falls and r rises because of increased openness, then

$$Y/wL = A/w = \beta$$

must rise regardless of what happens to Y . Thus, free trade raises the wage gap in a capital-abundant nation such as the United States, where imports are generally supposed to be labor-intensive relative to exports. The rising wage gap in turn requires an increase in consumer and/or government debt to maintain full employment equilibrium. *All this suggests that a part of the current US debt mountain is attributable to free trade.*

If the Stolper-Samuelson theorem is invalid, free trade may still raise the wage gap if the nation engages in large-scale outsourcing. Outsourcing reduces the use of domestic labor, because a part of home production is done by foreign-based labor. So while L falls, Y remains constant or may even rise, which leads to a rise in productivity. With lowered use of domestic labor, the real wage is likely to fall or at least not rise. Even if the real wage is not negatively affected, the wage gap goes up from increased productivity. *Thus, outsourcing is another reason why the US debt is at its all-time high, and is growing apace.*

Free trade may also lower the wage gap, especially if the nation imports capital-intensive goods, where increased openness tends to raise the real wage. Such a nation will then have a very low budget deficit and consumer debt, as is implied by the argument made above. This may partly explain why China, a labor-abundant country, is among the nations with the lowest level of debt.

The US Economy: 1960-2012

Let us now explore the behavior of the US economy between 1960 and 2012, and see if the wage-gap model explains it adequately. Take a look at Table 3 that presents information about consumer and federal debt as a percentage of GDP; it also displays the index of wage gap and the unemployment rate in selected years. Only figures for a few years have been presented in rounded values for ease of analysis and to indicate the trends. Column 2 furnishes consumer debt, column 3 details federal debt, and column 4 describes the sum of consumer and federal debt and is obtained by adding figures in columns 2 and 3. The aggregate debt measure is what matters for our analysis.

Table 3. Productivity and GDP Shares of Consumer and Federal Debt in the United States (in %): 1962 – 2012*

(1) Year	(2) Consumer Debt	(3) Federal Debt	(4) Con. + Fed. Debt	(5) Wage Gap	(6) Jobless Rate
1962	12	53	65	72	5%
1970	13	38	51	74	4.9
1980	13	33	46	77	7.1
1990	14	56	70	86	5.8
2000	17	57	74	88	4
2010	17	94	111	94	9.6
2012	16.6	105	122	95	8.1

Source: *The Economic Report of the President*, 2012, Council of Economic Advisers, Washington, D.C., B-1, B-42, B.77, B-79, and the Department of Commerce.

This table and also Table 1 show that during the 1960s the wage gap was more or less constant; our model argues that with a constant wage gap there need be no rise in aggregate debt to maintain full employment. In the United States, the natural rate of unemployment is supposed to be around 5 percent, so that full employment prevails so long as the official rate is no larger than the natural rate. Column 6 shows that full employment prevailed during the 1960s. In fact, the unemployment rate in 1969 (not shown) was a paltry 3.5 percent. Furthermore, there was no rise in consumer debt, and the federal debt actually fell during the 1960s so that the aggregate debt level also declined. This is because the government retired some of its debt accumulated in WWII, while consumers refrained from excessive borrowing. Clearly, because of the stable wage gap, full employment prevailed naturally and needed no rise in debt.

In Table 1 we discovered that even during the 1970s, the wage gap was fairly, though not completely, stable, and now Table 3 reveals that there was not much of a rise in consumer debt between 1962 to 1980, while the aggregate debt measure kept falling. However, from 1980 on the picture changed drastically. That is when the wage gap began a steady rise, and Keynesian debt-creating policies, which were used sparingly and mildly between 1960 and 1980, became a habit for politicians. Because of certain reasons discussed below, the wage gap grew apace, and then maintaining full employment required measures that constantly raised debt at the consumer as well as the governmental level. Both debt measures shot up. *We have argued that if the wage gap rises then either unemployment must rise or aggregate debt must rise.* Table 3 gives full vindication to this view. During the 1960s the wage gap was constant and so there was no need for the government to massively generate debt to maintain full employment. During the 1970s, the wage gap grew a little, but debt did not, and not surprisingly that decade experienced high jobless rates that routinely exceeded 7 percent. In 1975, the jobless rate (not shown) was 7.5 percent. Of course, another reason for multiple slumps in the 1970s was a quadrupling of the price of oil by the OPEC. But the growing wage gap made it worse.

During the 1980s and 1990s, the wage gap rose, but unemployment steadily fell. In fact, by 2000, the jobless rate was only 4 percent; but to achieve such a low rate the aggregate debt measure climbed steadily from 46 in 1980 to 74 in 2000. From 2000 to 2007, unemployment remained stable even as the wage gap rose further, and of course aggregate debt also climbed further.

The US Economy during The Great Recession

Let us now turn to the economy between 2007 and 2012. Table 4, which displays the same type of figures as Table 3, helps us in this regard. By 2007, the wage gap index, at 100, was the highest since 1962. So were consumer and federal debt. With debt measures so high, full employment still prevailed. But with the housing market in a bubble that was fueled by high consumer borrowing, and with the oil price breaking records in 2007, it was clear to some that the economy was on a shaky foundation, and it was just a matter of time, perhaps a few months, when the house of cards would collapse.

Table. 4. Wage Gap, Debt and Unemployment in the United States: 2007 – 2012

Year	Wage Gap	Con. Debt	Federal Debt	Jobless Rate	Real Consumer Borrowing*
2007	100	18	65	4.6	1.21
2008	102	17.9	70	5.8	1.19
2009	102	17.6	85	9.3	1.14
2010	106	16.6	94	9.6	1.10
2011	109	16.4	98	8.9	1.10
2012	109	NA	105	8.1	NA

*Trillions of dollars in 1984 prices

Source: *The Economic Report of the President*, 2012, Council of Economic Advisers, Washington, D.C., the Department of Commerce, series B-1, B-42, B-60, B-77, B-79.

The 1920s showed that consumer borrowing has its limits, because the banks, no matter how reckless their lending practices, do want some collateral, which is not unlimited. Once the consumer has used up his collateral, bank lending has to shrink. During the housing boom of the 2000s, people utilized their home equity to obtain low-interest loans, but apparently by 2007 this collateral was used up and financial lending began to decline. Since consumer borrowing has limits, an economy relying on it must come to a screeching halt someday and then not recover until the debt has been cleared. This was the experience of the 1930s. As Table 4 reveals, consumer debt peaked in 2007, and by the end of the year the recession had begun. Unemployment started to rise and kept rising in spite of rocketing federal debt, along with the sharpest fall in interest rates. The federal reserve cut the federal funds rate to near zero by 2009, but few Keynesian remedies worked, even though the price of oil collapsed from a high of \$147 per barrel in 2008 to just \$32 in early 2009. This is because the wage gap had been building up for years and aggregate demand had been propped up by Keynesian policies ever since 1980. The expensive oil was just a secondary factor, not the major reason for a sharp decline in aggregate demand in 2008 and 2009.

Real Consumer debt actually began to fall from 2007 as seen in the last column of the table. Nowadays, macro equilibrium requires that

$$AS = \text{Income-Based Demand} + \text{Consumer Borrowing} + \text{Budget Deficit}$$

Since consumer borrowing began to fall, the budget deficit had to climb even faster than before to maintain the economic balance; but even that was not enough to stop the hemorrhage for a while. The federal debt and deficit soared, but joblessness continued to climb. Unemployment peaked in 2010 at 9.6 percent, but even in 2012 it was above 8 percent. Keynesian remedies finally began to work, but at a disappointing pace. Since the wage gap continues to go up, it should be clear that the federal deficit will have to rise for years to come to bring down the jobless rate.

Globalization of the Recession

The recession started in the United States but quickly became global. Even though the US is no longer the overwhelmingly large economy in the world, the slump has been hard on most nations. This is because the wage gap has been rising all over the globe. Take a look at Japan in Table 5, where the wage-gap index was 86 in 1980 and soared to 130 by 2005. So the consequences were the same as in the United States. The official response was also the same. The government raised its spending sharply, stabilized the economy for a while, only to experience another slowdown in 2012. Japan's jobless rate exceeded its natural rate throughout the recession. Japan's experience shows how difficult it is to escape from stagnation once the wage gap has built up for a while. This is because as early as 1990 it suffered a serious recession, when its housing and stock market bubbles burst open. Ever since then the nation has followed ultra-expansionary monetary and fiscal policies, but, since its wage gap continued to rise, more than twenty years later it was still suffering from the same problems that began in 1990. Without addressing the affliction of the growing wage gap, the nation is likely to remain mired in stagnation.

Table 5. The Wage Gap Index in Japan

Year	Wage Gap
1980	86
1985	95
1990	100
1995	102

2000	124
2005	130

Source: *International Financial Statistics*, various issues, The International Monetary Fund, Washington, D. C.

Europe's experience during the Great Recession has been no different. Its unemployment rate kept rising and reached a high of 11 percent in September 2012. The budget deficit in the Eurozone area is no longer rising, and since its wage gap also continues to grow, it is likely to see a jump in unemployment for some years.^[5]

Reasons for the Rising Wage Gap

Why did the wage gap increase in the United States during the 1920s and after 1980? The following reasons apply.

1. Merger mania occurred in the 1920s and after 1980. This served to raise the degree of monopoly power and restrained the growth in wages.
2. Labor unions became weaker in both time periods.
3. The real minimum wage fell sharply after 1980.
4. The economy began more and more open following 1980.
5. The trade deficit went up sharply and the government did nothing about it.
6. Outsourcing thrived after 1990.
7. Finally, new technology tended to raise productivity sharply while making labor redundant, although it is worth mentioning that technical improvements also occurred during the 1960s, but the wage-gap remained stable. This suggests that government policy, rather than new technology, was the primary cause of the wage gap growth.

Thus government policy had a lot to do with the observed phenomenon of the rising wage gap. Had the government enforced anti-trust laws, increased industrial concentration could have been avoided, thereby restraining the degree of monopoly power. Similarly, if the real minimum wage had not been allowed to fall, or if the government had followed the policy of balanced trade, then foreign competition would not have decimated the unions, and the real wage could have kept up with constantly rising productivity, as it did during the 1950 and the 1960s. A tax on outsourcing could also have kept the wage gap under control. Needless to say, these are the measures that the United States now needs to stabilize the wage gap and raise employment. Otherwise, debt would have to rise endlessly to reduce joblessness and as, Japan's experience indicates, even that might not be enough.

Let us see how the suggested measures could eliminate American joblessness. In 2012 prices, the minimum wage in 1969 was around \$10 per hour compared to \$7.25 today. The unemployment rate was then 3.5% compared to over 8% today. It is well known that the minimum wage serves as a buffer for the wages of production workers who constitute about 80% of the labor force. An auto mechanic, for instance, is paid the minimum wage plus some skill premium. A rise in this minimum tends to raise the earnings of most, if not all, production workers.

Let us see numerically how some of the suggested measures could revive the US economy. Suppose the hourly nominal average wage is \$16, the minimum wage is \$7, productivity is \$25 and the labor force equals 120 but only 100 are employed. Given that $C = wL$, pre-tax consumer spending is then \$1600. If the trade deficit = \$50, and the budget deficit = \$650, then with pre-tax $I = \$300$,

$$AD = 1,600 + 300 + 650 - 50 = \$2,500$$

This means that equilibrium output also equals \$2,500. Since on average a worker produces \$25 worth of output,

$$\text{Employment} = 2500/25 = 100 \text{ and unemployment} = 20,$$

out of a labor force of 120. Suppose there is no new consumer borrowing, or the budget deficit cannot be raised, as in Europe, or because the nation's credit rating will be in danger, as in the United States.^[6] Then there are two ways to enhance employment. First, eliminate the trade deficit, say, through negotiation with trade surplus nations, or by imposing quotas. This will raise AD by \$50 and two more workers will be hired.

Second, raise the minimum wage gradually to \$10 so that the average wage rises by \$3 per hour. This will raise wage earnings by \$300, and hence AD, by the same amount. The output will then rise by another 300, and 12 more workers will be called back to work. Investment will also pick up and employment will increase further.

This numerical example uses fictional values, but makes it clear that *raising the minimum wage to catch up with hugely enhanced productivity over several decades is the only way to create full employment, when the economy can no longer generate more debt, or when extra debt is politically unfeasible.* Closing the trade gap will also help, but may be inadequate to recall all laid off workers.

You may wonder how profits will respond to these measures. Even if the minimum wage rises, there is enough left for profits, as the year 1969 demonstrates. In our example, the economy's

$$\text{Total Revenue (or GDP)} = \text{AD} = \text{Wages} + \text{Profit}$$

With wages equaling $19 \times 114 = 2,109$,

$$2,850 = 2,109 + \text{Profit}$$

Hence, profit = \$741.

Relaxing the Assumption

So far we have assumed that all wages go into consumption and savings come from non-labor income. This assumption is not crucial to our main conclusion that if productivity rises faster than the real wage, then either debt must rise or layoffs will follow. The reason is that *productivity is the main source of supply and wages are the main source of demand, and if the two are not in sync with each other, then the constantly rising productivity along with a trailing real wage creates overproduction, which can be postponed only through Keynesian debt-generating policies.* However, debt is not likely to grow forever, and a point comes when banks stop lending to debt-loaded consumers. That is when a serious slump or a depression follows. In fact, when overproduction occurs, all sources of income fall, and consumer spending may decline even faster, in which case the recession is even deeper.

Main Conclusion

Our main conclusion is that the rise in the wage-productivity gap because of government policy is the primary, if not the only, cause of recessions or unemployment.

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