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# Inflation Targets Reconsidered

Paul Krugman

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Over the course of the 1990s many of the world's central banks converged on an inflation target of 2 percent. Why 2 percent, rather than 1 or 3? The target wasn't arrived at via a particularly scientific process, but for a time 2 percent seemed to make both economic and political sense. On one side, it seemed high enough to render concerns about hitting the zero lower bound mostly moot; on the other, it was low enough to satisfy most of those worried about the distortionary effects of inflation. It was also low enough that those who wanted true price stability — zero inflation — could be deflected with the argument that official price statistics understated quality change, and that true inflation was in fact close to zero.

And as it was widely adopted, the 2 percent target also, of course, acquired the great advantage of conventionality: central bankers couldn't easily be accused of acting irresponsibly when they had the same inflation target as everyone else.

More recently, however, the 2 percent target has come under much more scrutiny. The main reason is the experience of the global financial crisis and its aftermath, which strongly suggests that advanced economies are far more likely to hit the zero lower bound than previously believed, and that the economic costs of that constraint on conventional monetary policy are much larger than the pre-crisis conventional wisdom. In response, a number of respected macroeconomists, notably Blanchard (2010) and, much more forcefully, Ball (2013), have argued for a sharply higher target, say 4 percent.

But do even these critics go far enough? In this paper I will argue that they don't — that the case for a higher inflation target is in fact even stronger than the critics have argued, for at least three reasons.

First, recent research and discussion of the possibilities of “secular stagnation” (Krugman 2013, Summers 2013) and/or secular downward trends in the natural real rate of interest (IMF 2014) suggests not just that the probability of zero-lower-bound episodes is higher than previously realized, but that it is growing; an inflation target that may have been defensible two decades ago is arguably much less defensible now.

Second, there are actually two zeroes that should be taken into account in setting an inflation target: downward nominal wage rigidity isn’t as hard a constraint as the interest rate ZLB, but there is now abundant evidence that cuts in nominal wages only take place under severe pressure, which means that real or relative wage adjustment becomes much harder at low inflation. Furthermore, we now have reason to believe that the need for large changes in relative wages occurs much more frequently than previously imagined, especially in an imperfectly integrated currency union like the euro area, and that such adjustments are much easier in a moderate-inflation environment than under deflation or low inflation.

Finally — and this is the main new element in this paper — there is growing evidence that economies entering a severe slump with low inflation can all too easily get stuck in an economic and political trap, in which there is a self-perpetuating feedback loop between economic weakness and low inflation. Escaping from this feedback loop appears to require more radical economic policies than are likely to be forthcoming. As a result, a relatively high inflation target in normal times can be regarded as a crucial form of insurance, a way of foreclosing the possibility of very bad outcomes.

This paper begins with a brief review of the standard arguments for a higher inflation target, then deals in turn with each of the further arguments I have just sketched out. I conclude with some speculation about the unwillingness of many central bankers to consider revising the

inflation target despite dramatic changes in our information about how modern economies behave.

### *1. The two zeroes*

If you polled the general public about what rate of inflation we should target, the answer would probably be zero — full price stability. Some economists and central bankers would agree: either they view any erosion of the purchasing power of money as illegitimate, in effect a form of expropriation, or they argue that even mild inflation degrades money's role as a unit of account. There is even a case for persistent deflation: Milton Friedman's optimal quantity of money paper famously argued that prices should fall at the rate of time preference, so that the private cost of holding cash to add liquidity matches its zero social cost.

In practice, however, the great majority of both economists and central bankers advocate modest positive inflation. Why? Because of the two zeroes.

The first zero is a hard one: nominal interest rates cannot fall below zero (except for trivial deviations involving transaction costs or the role of bills as collateral), because people always have the option of holding currency. This in turn sets a lower bound on the real interest rate, which can't fall below minus the expected rate of inflation.

Meanwhile, central banks are trying to stabilize their economies, which means trying to set policy interest rates at the Wicksellian natural rate, the rate consistent with more or less full employment. The problem is that the real natural rate of interest clearly fluctuates over time, rising during investment booms (whether these booms are well-grounded in fundamentals or

reflect bubbles), falling when economies face adverse shocks. If expected inflation is low, this raises the possibility that there will be periods in which the central bank cannot cut rates to the natural rate, leading to output below potential and excess unemployment.

A positive expected rate of inflation reduces the size of this problem, because it allows real interest rates to go negative; and the easiest way to ensure that expected inflation is positive is to pursue a monetary policy that keeps inflation stable at a modestly positive rate.

The question then becomes, how high does expected inflation have to be to make encounters with the zero lower bound rare and relatively harmless? Before the 2008 crisis, the general belief, bolstered by several statistical studies, was that 2 percent inflation was sufficient — that it would reduce the probability that the zero lower bound would be a constraint in any given year to 5 percent or less, and that even in such cases the likely damage from such episodes would be small.

Events have, however, rendered this optimism obsolete. Consider the case of the United States. The Fed effectively hit the zero lower bound with the fall of Lehman in fall 2008; at this point most members of the Federal Open Market Committee expect the first rise in the Fed funds rate off zero to take place in 2015. If we bear in mind that the United States entered an era of relatively low inflation in the mid-1980s, this will mean that for 7 out of 30 years — roughly a quarter of that time — the zero lower bound will in fact have been binding. Moreover, the U.S. economy appears to have experienced very large output gaps for most of this zero-rate era. A “maximum likelihood” assessment of the ZLB problem would therefore be that at 2 percent inflation it remains a quite common occurrence with major costs; overall, it’s at least an order of magnitude bigger than the consensus view that prevailed a decade ago.

The second zero is the extreme reluctance of employers to demand, or workers to accept, cuts in nominal wage rates. Yet the economy is always experiencing shocks, and in any given year the equilibrium real wage for at least some workers surely falls. As Akerlof, Dickens, and Perry (1996) pointed out long ago, this in turn implies that at low inflation the long-run Phillips curve isn't vertical, because some workers who "should" (in a market-clearing sense) be receiving reduced wages won't, leading to unemployment. However, when they investigated this effect in a simulation model calibrated to more or less match actual experience, they found only small effects as long as inflation was in the 2-3 percent range. In effect, their analysis provided an argument against seeking full price stability, rather than an argument for raising the inflation target above 2 percent.

Has experience in recent years suggested a change in this assessment, comparable to the changed assessment of the risk of ZLB events? In the United States, the answer is a definite maybe: Daly and Hobijn (2014) show a sharp increase in the number of U.S. workers receiving zero wage increase since the onset of the Great Recession, but it's not entirely clear whether this translates into a higher average unemployment rate. But as I will lay out at greater length later, downward nominal wage rigidity has become a very major problem within the euro area, an imperfectly integrated currency union that turns out to require much bigger adjustments in relative wages than anyone imagined pre-crisis.

The bottom line here is that the arguments used in the 1990s to argue for a positive inflation target rather than literal price stability now tell a significantly different quantitative story from what they used to suggest. Pre-2008, those arguments suggested that 2 percent inflation was probably enough to eliminate most of the damage caused by the two zeroes; that is no longer true.

But was the case for 2 percent wrong even in the 1990s, or has it become wrong thanks to structural changes in advanced economies? The answer, I would suggest, is both: even in the 90s we should have realized that ZLB episodes could be much worse than anything that had happened recently, and also that the euro project would create a situation in which DNWR was a much more important factor than it had been up to that point. But there are also good reasons to believe that the underlying situation has changed in a way that makes a higher inflation target more desirable now than it was a decade or two ago.

## *2. Secular changes in the real natural rate of interest*

The global financial crisis and its aftermath shows that ZLB episodes are both much more likely and much more damaging than the previous consensus view. But does this represent a change? And is this change likely to continue, so that such episodes will become still more common and damaging if we continue to have low inflation targets?

A number of economists have recently suggested that such a change is indeed happening. In the process they have revived Hansen's (1939) famous concept of secular stagnation — see, for example, Krugman (2013). The new secular stagnation hypothesis received a major boost in prominence when Larry Summers (2013) made an eloquent case for its relevance at the IMF's 2013 Annual Research Conference. It has also received a boost from IMF research (IMF 2014) suggesting a secular downward trend in real interest rates.

In evaluating the new secular stagnation hypothesis, it is helpful to distinguish between two propositions. First is the case Summers made — that even before the financial crisis struck, say during the 2001-2007 business cycle, advanced economies were depression-prone, that they were only able to achieve more or less full employment when asset and debt bubbles were

inflating. Second is the argument that changes since 2007, in particular slowing growth in the working-age population, have reduced the real natural rate of interest substantially below its previous level.

There is a good case for both propositions.

On the first proposition, consider Figure 1, which shows the ratio of US household debt to GDP. There has been a severe deleveraging shock since 2007, which was arguably both the principal driver of the Great Recession and a major reason for the slow recovery that has followed. What is immediately obvious, however, is that an end to deleveraging would not be sufficient to restore the status quo ante: while the Great Moderation may have been marked by relatively stable growth in GDP, underneath this surface stability lay an unsustainable growth in household debt, with an average annual increase of 3.9 percent of GDP over the course of the 2001-2007 business cycle. Yet this rise in debt was not accompanied by either rising inflation or high real interest rates. Figure 2 shows the Federal funds rate minus the rate of core inflation, and includes averages across the last three business cycles; this real rate was low on average during the 2001-2007 cycle, and negative during the first several years of that cycle, even though the 2001 recession was fairly mild.

Suppose, then, that deleveraging comes to an end but that we do not return to the rapid debt growth of the recent past. This would, other things equal, subtract close to 4 percent of GDP from aggregate demand, implying a substantially lower natural real interest rate on average — and therefore substantially negative real interest rates in the face of even moderate-sized negative shocks. In other words, the pre-2008 economy was arguably already prone to ZLB episodes, with this propensity masked by an unsustainable growth in household debt.



What about the case for a further decline in the real natural rate? Consider a simple accelerator model of investment, under which the desired stock of capital at any given real interest rate is proportional to real GDP. In that case, normal investment spending as a share of GDP at a given real interest rate will be equal to the capital-output ratio times the rate of growth of potential output. In 2007 the US capital-output ratio was approximately 3. Meanwhile, Figure 3 shows CBO estimates and projections of US potential growth; these projections call for a decline in potential growth of more than 1 percent from the growth rate during the 2001-2007 cycle, which implies a decline in investment demand of more than 3 percent of GDP.

Of course, projections of potential growth are highly uncertain, since they depend in part on projected rates of productivity growth. However, the main factor behind the CBO estimates is relatively solid: a sharp decline in the growth of the working age population, now that baby boomers have begun to retire en masse; Figure 4 shows projected growth in the US population aged 20-64. It's worth noting that concerns about the effect of slow population growth underlay Hansen's fears of secular stagnation — and this time it's really happening.

Suppose that we combine these two effects: 4 percent of GDP subtracted from demand because we won't return to an era of ever-growing leverage, plus another 3 percent subtracted due to the accelerator effects of slowing potential growth. This implies a hit to demand of 7 percent of GDP compared with the 2001-2007 business cycle, which was already marked by low average real rates and several years of negative real rates. If we apply typical estimates of the effect of budget deficits on real interest rates — e.g., Laubach (2003) estimates that a one percent of GDP rise in the budget deficit raises real rates by 20 to 40 basis points — this could easily reduce the natural real interest rate by 2 or more percentage points. The clear implication is that continuing with a 2 percent inflation target would leave the economy highly vulnerable to future ZLB episodes, to a much greater extent than in the past.

### 3. *Downward nominal wage rigidity, revisited*

Downward nominal wage rigidity — the extreme reluctance of employers to cut nominal wages, presumably rooted in turn in worker opposition to such cuts, and the adverse effects of such cuts on worker morale — is one of those propositions that is true in practice even if it is hard to justify in theory. The signature of DNWR is clear in micro data, which clearly show a spike in the distribution of wage changes at zero, with very few wage cuts. Moreover, not only is there a spike at zero, but the concentration of wage changes at zero rose substantially in the aftermath of the financial crisis.

Within the euro area the signature of DNWR is also clear in the macro data. The euro crisis, I would argue along with others, is best seen as a classic sudden stop: large capital flows to peripheral European nations that led to large real appreciation, then came to an abrupt halt, requiring that these nations achieve large internal devaluations, reducing their wages relative to core economies. Since internal devaluation takes time, however, the intermediate-run effect is to force current account adjustment through economic contraction and import compression.

What is striking, given this story, is how little of the adjustment has so far taken place via nominal wage cuts. Figure 5 shows nominal compensation in manufacturing in euro area debtor nations (I use manufacturing to limit the compositional effects that arise, for example, from the drastic decline in Spain's low-wage construction sector). With the exception of Greece, none of the debtor countries has seen a significant fall in compensation, despite extremely high unemployment rates. Nor is it easy to cast blame for this lack of adjustment on structural rigidities: Ireland, which was widely praised for its flexibility before the crisis, has been as resistant to wage cuts as Spain and Portugal. The same is true of other countries that have

been praised for their flexibility; Blanchard et al 2014 find essentially no decline in Latvian private-sector wages.

In the euro area context, then, downward nominal wage rigidity imposes costs by making the process of internal devaluation more difficult, prolonging the period of severely depressed output in debtor nations. This is a somewhat different mechanism from the one envisioned in Akerlof et al, although it's clearly related. The key point, however, is that it suggests that the supply-side costs of low inflation remain significant even at rates well above 2 percent.

To see why, let us approximate the process of euro area adjustment with the following model: there is an initial large fall in output in the peripheral nations, large enough to roughly balance their current accounts, followed by internal devaluation taking place entirely through rising wages in the core, and a gradual recovery in peripheral output. How long does this process take? It depends on the size of the required internal devaluation and the rate of increase in core wages, which in turn is linearly related to the currency area's inflation rate.

Consider a stylized but roughly realistic numerical example. Assume that the euro periphery is 1/3 of the area's GDP, and requires a 20 percent internal devaluation against the core. Assume also that inflation in the euro area is equal to the average wage increase minus one percent. Assume, finally, that the initial output loss in the periphery relative to potential, before internal devaluation can occur, is 12 percent of GDP, or 4 percent of the whole area's GDP. Then Table 1 shows how the time taken to adjust and the cumulative output loss, in point years of GDP, depend on the underlying inflation rate.

We can see, then, that a higher inflation rate smooths the path of adjustment. Furthermore, this effect is significant even as between 3 and 4 percent inflation.

Now, we don't know how often we should expect events like the current euro crisis and aftermath. Nonetheless, the example suggests that in an imperfectly integrated currency area — one that lacks the fiscal integration and high labor mobility that traditional theories of optimal currency areas call for — moderate inflation can be a crucial aid to the adjustment mechanism, and low inflation can impose significant losses.

#### *4. Low-inflation traps I: Economics*

Up to this point I have suggested that a 2 percent inflation rate may be too low, both because it may not leave enough room for interest rate cuts in the face of negative demand shocks, and because it may create supply-side difficulties because of downward wage rigidity. I have, however, written as if the central bank can be sure of maintaining 2 percent inflation if that is its target. In reality, this is far from clear. Core inflation has recently been running consistently below target in both the United States and the euro area, and Japan is still struggling to exit many years of slow deflation.

It's not hard to see why this happens. If historical inflation has been at 2 percent and the natural real rate falls below -2 percent, the central bank cannot cut rates sufficiently to prevent a sustained slump — and a sustained slump will, in general, further reduce the rate of inflation, and possibly even lead to deflation.

The obvious concern in such cases is that falling inflation will itself deepen the slump. That is, if an economy with low inflation experiences a severe negative demand shock, its central bank may find it difficult to avoid a self-reinforcing process that drives the economy into a low-inflation or deflation trap.

The most famous analysis of such a self-reinforcing process remains Irving Fisher's discussion of debt deflation, which was widely disregarded by the economics profession for several generations but has come back into its own since the global financial crisis. Recall Figure 1, showing how the crisis corresponds to a shift from rising leverage to deleveraging; deflation, or even lower-than-expected inflation, raises real debt levels relative to what they would have been with stable inflation, and can therefore create an economic drag that further reduces inflation.

Like the problem of downward nominal wage rigidity, this is an especially acute issue within the euro area, where the legacy of a debt bubble must be dealt with under conditions of imperfect integration. Figure 6 compares debt levels (public and private) with core inflation within the euro area. As you might expect, countries with high debt — the legacy of the housing and capital-flow bubble from 2000 to 2007 — are also countries experiencing low inflation or deflation, because they are being forced into internal devaluation. As a result, debt deflation within the euro area is a stronger force than one might realize looking only at Eurozone-wide inflation.

In addition to potentially causing Fisherian debt deflation, low inflation can become self-reinforcing through expectational effects: in an economy at the zero lower bound, falling inflation means rising real interest rates, which can depress the economy and reduce inflation still further. Until the coming of Abenomics, real interest rates in Japan were significantly higher than in the United States, even though both countries had zero nominal rates, simply because expectations of deflation were deeply embedded in the Japanese economy.

The point, then, is that inflation may well have a “stall speed” – if inflation is too low in good times, central banks may find themselves unable to prevent a tailspin when adverse shocks come along.

And the inherent economic difficulty of fighting such a tailspin is all too likely to be reinforced by what we might call the political economy of low inflation.

##### *5. Low inflation traps II: Political economy*

Much of the modern literature on both the zero lower bound and the risks of deflation has its origins in Japanese experience in the 1990s, which led a number of economists (notably Ben Bernanke, Lars Svensson, Michael Woodford, and myself) to worry that something similar could happen to advanced Western economies – which has in fact happened. One characteristic of that early literature was that it involved quite a lot of hectoring, in the sense of Western economists lambasting the Bank of Japan for its inadequate response to low growth and deflation. Bernanke memorably declared that the BoJ needed to start showing “Rooseveltian resolve.”

However, a funny thing happened a decade later: Western central banks also proved diffident in their response to poor economic performance. It seems that entering a slump with low inflation doesn't simply leave economies vulnerable to an economic trap; it also seems to set central

banks up for several kinds of political economy traps, in which officials who promised to act to maintain 2 percent inflation lose their resolve to act when inflation actually drops toward zero.

At the risk of possibly being too cute, let me characterize the various ways in which resolve fails as the complacency trap, the credibility trap, and the timidity trap.

*The complacency trap:* Central banks were extremely forceful when dealing with the “hot” period of the financial crisis, the roughly seven months following the fall of Lehman when the financial system was in evident danger of imploding. Later, the ECB proved willing to take strong action to stabilize European bond prices when the euro seemed at risk of collapse. Emergencies bring decisive action.

The problem of low and sliding inflation, however, doesn't manifest itself as an emergency.

Recent history has not involved any high-speed deflationary spirals like those of 1929-1933.

Even Japanese deflation has been a slow crawl rather than a rapid affair, and in most episodes of protracted economic weakness the slowing of inflation stops short of outright deflation.

This absence of catastrophe is, of course, a good thing – but it can also undermine the determination of policy officials to act. As long as prices remain stable, some officials will argue that monetary policy is doing its job, that any remaining economic difficulties must be addressed with structural reform – that is, by someone else. Long-time Japan watchers are familiar with the process of rationalization; first declarations that there's no problem because it's not really

deflation, then declarations that only the prices of goods with rapid technological progress are falling, etc.

And let's be blunt: there are already visible tendencies toward a similar loss of resolve in Europe – e.g., declarations by monetary officials that low inflation isn't really a problem because it's mainly driven by needed adjustments in debtor nations. (As I argued above, the concentration of deflationary pressure in the debtors actually reinforces the case that inflation is too low.)

One way of thinking about the complacency trap is that it's the mirror image of the "slippery slope" argument often made about higher inflation targets – the notion that if you accept 4 percent, it will be too easy to start accepting 6 percent, and so on. It's not at all clear that this really happens – but the slide from 2 percent targets to more or less passive acceptance of 1 percent or less, and maybe eventually -1 percent, is a very real phenomenon.

*The credibility trap:* The complacency trap I've just described doesn't just mean that central banks can lose their resolve to fight excessively low inflation. It also means that they will have a hard time convincing markets that they are in fact resolved to get inflation back up to target.

Long ago, analyzing the problems of Japan, I declared that to get traction in a liquidity trap a central bank needed to "credibly promise to be irresponsible" – that is, promise that it would in fact allow inflation to rise, not snatch away the punch bowl just as the party gets going. It's very



hard to credibly commit to inflationary policies in general; it's especially hard when a significant number of policy makers seem fairly comfortable with low inflation or even mild deflation.

*The timidity trap:* Finally, once an economy is both depressed and at the zero lower bound, getting it out may require more than a resolve by the central bank to get inflation back up to a 2 percent target. In fact, the target may have to be set higher to have any chance of working.

Why? Suppose that the economy is suffering from chronic shortages of demand, that fears of secular stagnation turn out to be justified. In that case, inflation targeting can only work if it successfully creates a self-fulfilling prophecy: investors expect inflation, which makes them willing to spend more, which pushes the economy to full employment, which then generates the inflation investors expected.

The trouble here is that this process won't work unless the expected inflation is in fact high enough to yield full employment; and we've already seen that 2 percent may well not be enough. If the target isn't high enough, then even if investors believe the central bank's promises for a while, actual economic developments will come up short, and the whole effort will sputter out.

This is a very real concern for Japan, where Abenomics represents a bold break with past policies – but the inflation target is still the conventional 2 percent, which is quite likely to prove insufficient.

The point is that even bold policies in principle can be undone if the inflation goal is too timid – and the continuing force of convention over 2 percent inflation makes such timidity hard to avoid.

#### 6. *Conclusion: We're all Japan*

I'm well aware that any proposal for a rise in the inflation target is greeted with extreme skepticism by central bankers – and this includes relatively dovish officials as well as inflation perma-hawks. The achievement of low inflation after the experience of the 1970s was hard-won, and officials fear that changing the now-conventional target would damage their credibility.

But this resistance is, in a sense, just a further illustration of why it's so important not to go into a prolonged slump with too low an inflation rate. The intense resistance of central bankers to regime change even after more than 5 years at the zero lower bound shows that the kind of policy stasis that afflicted Japan for almost two decades is a more or less universal phenomenon. In other words, escaping from a low-inflation trap is extremely hard.

This in turn tells us that we should take extra precautions to avoid getting into such a trap – and a higher inflation target in good times is the best precaution available.

Table 1

Inflation	Avg wage growth	Core wage growth	Years to adjust	GDP loss
1	2	3	6.7	13.3
2	3	4.5	4.2	8.4
3	4	6	3.3	6.6
4	5	7.5	2.7	5.4

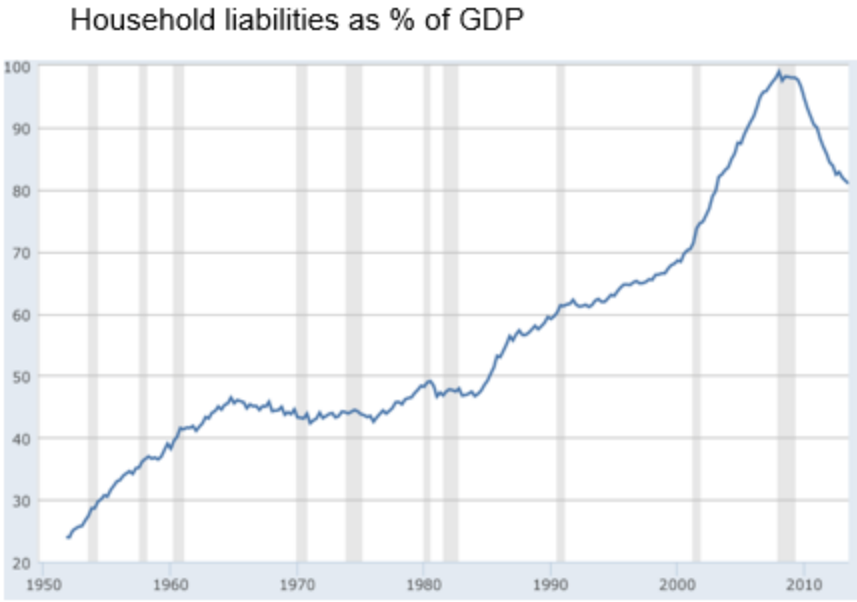


Figure 1

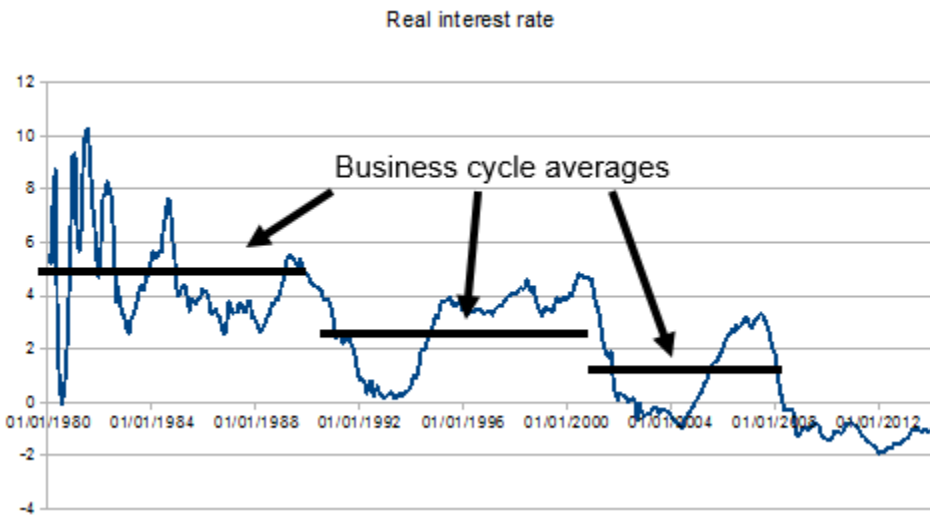


Figure 2

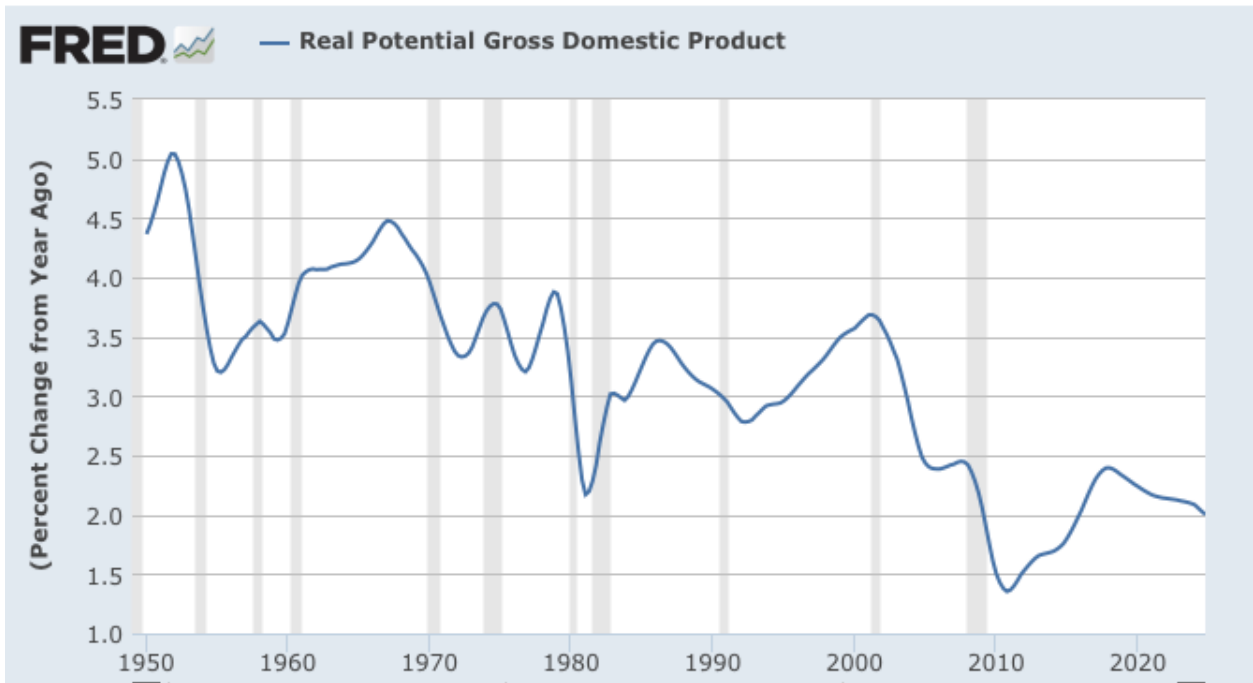


Figure 3

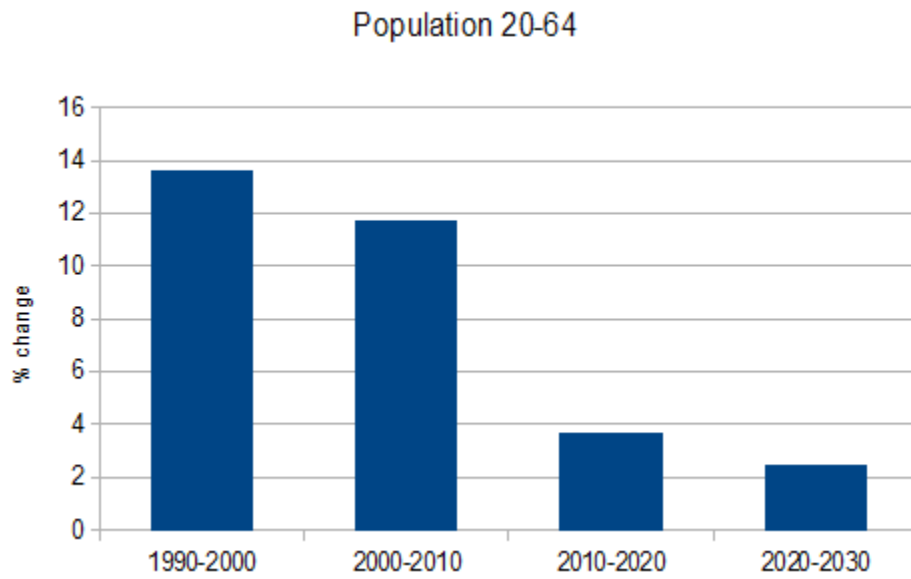


Figure 4

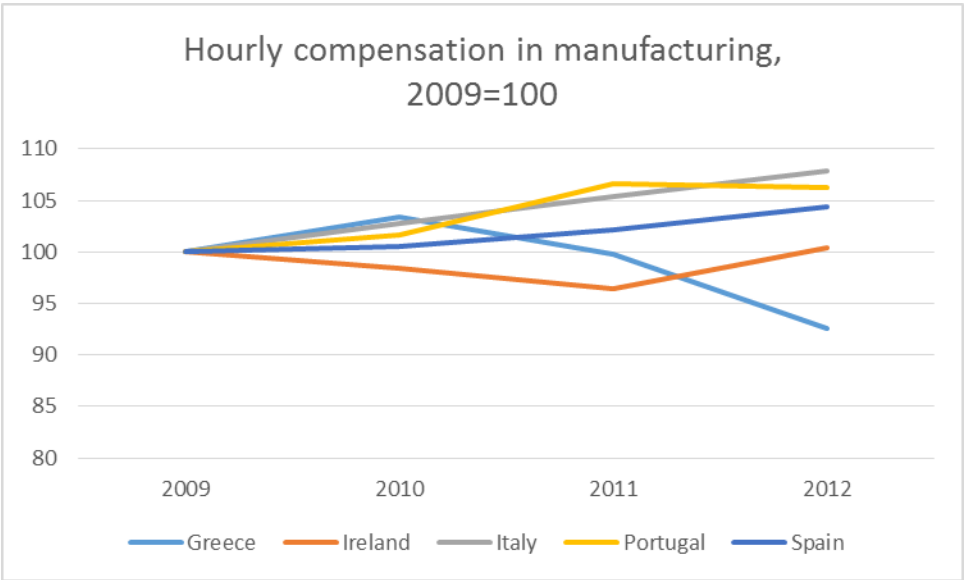


Figure 5

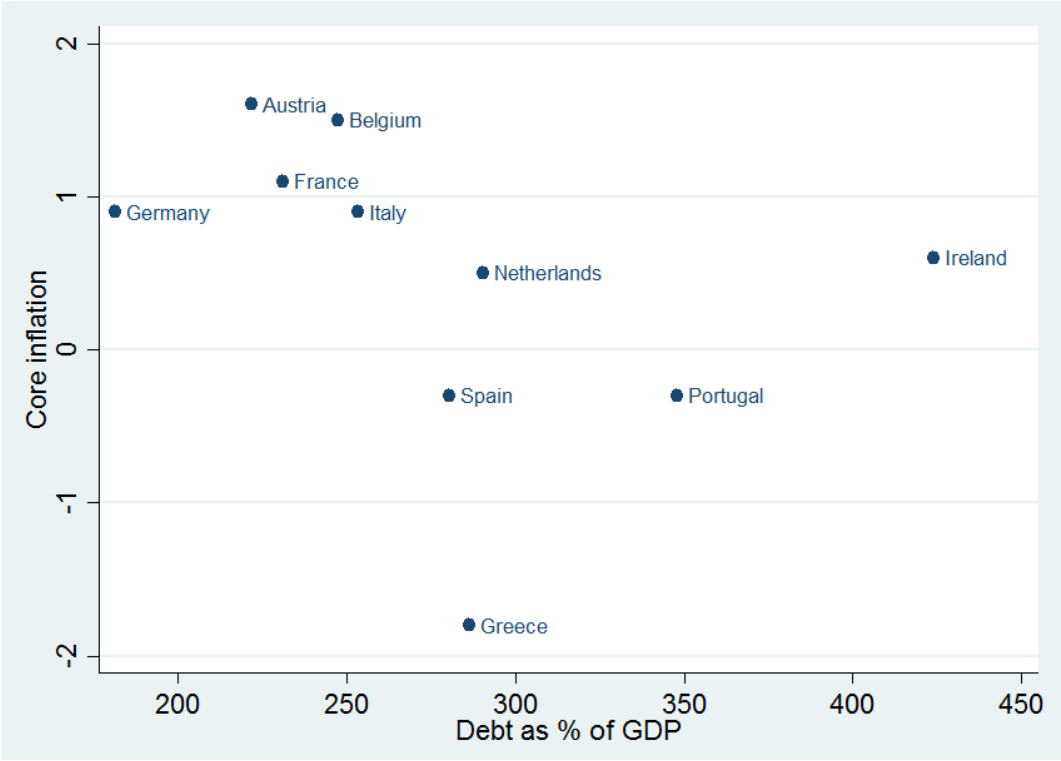


Figure 6

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