
A model of secular stagnation

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Japan's two-decade-long malaise and the Great Recession have renewed interest in the secular stagnation hypothesis, but until recently this theory has not been explicitly formalised. This chapter explains the core logic of a new model that does just that. In the model, an increase in inequality, a slowdown in population growth, and a tightening of borrowing limits all reduce the equilibrium real interest rate. Unlike in other recent models, a period of deleveraging puts even more downward pressure on the real interest rate so that it becomes permanently negative.

During the closing phase of the Great Depression in 1938, the President of the American Economic Association, Alvin Hansen, delivered a disturbing message in his Presidential Address to the Association (Hansen 1939). He suggested that the Great Depression might be the start of a new era of ongoing unemployment and economic stagnation without any natural force pushing the economy towards full employment. This idea was termed the 'secular stagnation' hypothesis. One of the main driving forces of secular stagnation, according to Hansen, was a decline in the birth rate and an oversupply of savings that was suppressing aggregate demand. Hansen's fears of secular stagnation turned out to be unwarranted. World War II led to a massive increase in government spending, ending any concern of insufficient demand. And the subsequent baby boom drastically changed the population dynamics in the US, erasing the problem of excess savings driven by an ageing population.

The return of the secular stagnation hypothesis

Recently, Hansen's secular stagnation hypothesis has gained renewed attention. One obvious motivation is the Japanese malaise that has by now lasted two decades and shares many of the same symptoms as the Great Depression in the US – namely, decreasing population growth, a nominal interest rate stuck at zero, and subpar GDP growth. Another reason for renewed interest is that, even if the financial panic of 2008 was contained, growth remains weak in the US and employment growth remains sluggish. Most prominently, Lawrence Summers raised the prospect that the crisis of 2008 may have ushered in the beginning of secular stagnation in the US in much the same way as suggested by Alvin Hansen in 1938. In the words of Summers, we may have found ourselves in a situation in which the natural rate of interest – the short-term real interest rate consistent with full employment – is permanently negative (Summers (2013)).

Lack of a formal model

Despite the prominence of Summers' discussion of the secular stagnation hypothesis and the flurry of commentary that followed it, there has not been an attempt to formally model this idea – to write down an explicit model in which unemployment is high for an indefinite amount of time due to a permanent drop in the natural rate of interest. Our recent work (Eggertsson and Mehrotra 2014, on which this chapter is based) seeks to fill this gap. It may seem somewhat surprising that the idea of secular stagnation has not already been studied in detail in the recent literature on the liquidity trap, which concerns itself with policy options once the central bank cannot lower the nominal interest rate beyond zero. This literature already invites the possibility that the zero bound on the nominal interest rate is binding for some period of time due to a drop in the natural rate of interest.

However, secular stagnation does not emerge naturally from the current vintage of models in use in the literature. Most analyses of zero lower bound episodes take

place within models with a representative agent (e.g. Krugman 1998, Eggertsson and Woodford 2003). In these models, the long-run real interest rate is directly determined by the discount factor of the representative agent, which is fixed. The natural rate of interest can then only temporarily deviate from this fixed state of affairs due to preference shocks or some similar alternatives. And changing the discount rate permanently (or assuming a permanent preference shock) is of no help either, since this leads the intertemporal budget constraint of the representative household to ‘blow up’ and the maximisation problem of the household to no longer be well defined. Moreover, even in models with some heterogeneity in borrowing and lending, it remains the case in most of those settings that a representative saver’s discount factor pins down a positive steady-state interest rate. But, as our paper shows, moving away from a representative savers framework to one in which households transition from borrowing to saving over their lifecycle will have a major effect on the steady-state interest rate and can open up the possibility of secular stagnation.

The logic of a secular stagnation model

In our work, we consider a simple overlapping generation (OLG) model (in the spirit of Samuelson 1958) where households go through three stages of life: young, middle aged and old. Income is largely concentrated within the middle generation. This gives rise to demand for borrowing by the young, and gives the middle aged an incentive to save part of their endowment for old age by lending it to the young. We assume that borrowing by the young is constrained by an exogenous debt limit. In this environment, we show that the steady-state real interest rate is no longer determined solely by households’ discount factor. Instead, it depends on the relative supply of savings and demand for loans, and the equilibrium real interest rate may easily be permanently negative. Forces that work in this direction include a slowdown in population growth, which increases the relative supply of savings, along with a tighter debt limit, which directly reduces demand for loans. An increase in income inequality, either across or within generations, may also generate a negative real interest rate. Interestingly enough, all three factors – an

increase in inequality, a slowdown in population growth, and a tightening of borrowing limits – have been at work in several economies that have experienced low interest rates and subpar growth in recent years. We also show that a fall in the relative price of investment works in the same direction.

Permanent deleveraging when there is no representative saver

One interesting result emerges when we consider a debt deleveraging shock of the kind common in the literature (e.g. Eggertsson and Krugman 2012 for a theoretical analysis). In that work, a deleveraging shock leads to a temporary reduction in the real interest rate as debtors pay down their debt. If prices are fully flexible, then this reduction in the real interest rate leads savers to increase their spending, fully compensating for the lower spending by borrowers. (This effect is complicated when prices are not fully flexible by a zero lower bound in nominal rates). Once the deleveraging process is complete (debt is back to a new debt limit), the economy returns to a steady state with a positive interest rate. In our model of secular stagnation, however, no such return to normal occurs. Instead, a period of deleveraging puts even more downward pressure on the real interest rate so that it becomes permanently negative. The key here is that households shift from borrowing to saving over their lifecycle. If a borrower takes on less debt today (due to the deleveraging shock), then tomorrow he has greater savings capacity since he has less debt to repay. This implies that deleveraging – rather than facilitating the transition to a new steady state with a positive interest rate – will instead reduce the real rate even further by increasing the supply of savings in the future.

Thinking about prices

Consider now how inflation behaves when the zero bound on the nominal rate is taken into account. A key result that emerges is that, under flexible prices, the zero bound on the nominal interest rate implies the existence of a lower bound on steady state

inflation, which can be no lower than the negative of the natural rate of interest. Thus, for example, if the natural rate of interest is -4% , then there is no equilibrium that is consistent with inflation below 4% in steady state. The secular stagnation hypothesis implies that long-run price stability is impossible when prices are flexible. We show that this has profound implications for an economy with realistic pricing frictions. If a central bank can force inflation below this ‘natural’ lower bound, it does so at the expense of generating a permanent recession.

To formalise a permanent recession explicitly, we assume in our model that wages are downwardly rigid (this particular theory of downward nominal rigidity is not central to our result, and other alternatives are very well possible). In this economy, we show that if the central bank is unwilling to tolerate high enough inflation, output falls permanently below the full-employment level. In line with the literature that emphasises deleveraging shocks that have short-term effects, we find that, in this economy, a long slump is one in which usual economic rules are stood on their head. The old Keynesian paradox of thrift is in full force, as well as the more recent ‘paradox of toil’ (Eggertsson 2010), where an increase in potential output decreases actual output, as well as the proposition that increasing wage flexibility only worsens the shortfall in output (Eggertsson and Krugman 2012).

Monetary and fiscal policy

Secular stagnation leaves important roles for both monetary and fiscal policy. We find that a high enough inflation target can – if credible – always do away with the slump altogether as it accommodates a negative natural interest rate. Importantly, however, an inflation target that is below what is required has no effect in this context. This result formalises what Krugman (2014) has referred to as the ‘timidity trap’ – an inflation target that is too low will have no effect in an economy experiencing secular stagnation. We show this trap explicitly in the context of our model, which only arises if the shock is permanent. Similarly, we illustrate that, in a secular stagnation environment, there are

strong limitations of forward guidance with nominal interest rates. Forward guidance relies on manipulating expectations after the zero lower bound shock has subsided; as the shock in our model is permanent, manipulating these types of expectations is of more limited value. Moving to fiscal policy, we show that either an increase in government spending or a redistribution of income from savers to borrowers can eliminate the output gap, although this latter result depends on the details of the distribution of income.

Takeaway

The main takeaway from our analysis is not a prediction that the world as we see it today will remain mired in a recession forever. Instead, the purpose is to establish conditions under which a permanent recession can take hold, or more to the point, provide a formalisation of the secular stagnation hypothesis. An important conclusion from our analysis is not just that a permanent recession is possible, but instead that a liquidity trap can be of arbitrary duration and last as long as the particular shocks that give rise to it (such as a deleveraging shock and/or a rise in inequality and/or population growth slowdown). This is particularly relevant when considering the Great Depression in the US (where the short-term interest rate started to drop in 1929, only to finally start rising again in 1947) or current-day Japan (where interest rates started falling in 1994 and remain at zero). It highlights that a passive attitude towards a recession of the kind experienced by the world today is not appropriate. Our model of secular stagnation instead provides, in our view, a strong case for aggressive policy interventions that are aimed at increasing aggregate demand.

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