

February 28, 2022

Mr. Mike Boerner
Chair, Life Actuarial (A) Task Force (LATF)
National Association of Insurance Commissioners

Re: Economic Scenario Generators

Dear Mr. Mike Boerner,

Please accept this comment on the NAIC LATF Economic Scenario Generator.

Sincerely yours,

Mark S. Tenney

The NAIC LATF is currently proposing to move forward with testing 2 versions of the 3 factor CIR model that impose some type of limit or reduction of negative rate severity. This is a negative rate on government debt. Their handling of non-government debt in this situation needs careful thought and clarification. Negative interest rates where non-government parties borrow are a strange looking glass world that requires more elaboration and analysis. In addition, negative interest rates and currency mechanism designs that make them possible go into what might be called political economy. This includes what might be proposed as part of such currency mechanism design, whether one personally agrees with it or not. The discussion is not too meaningful if it is restricted only to the mathematics of shadow rate models. This comment is a start to such a discussion.

The International Monetary Fund, IMF, and central banks have invented ways to get around paper money as a limit on deeper negative rates. Basically, paper money trades at an exchange rate to digital money. Each day, the index accumulates at whatever the central bank rate on reserves is. If a dollar of paper money is presented to a bank it is credited with the exchange rate as electronic money. This is called a dual currency. Paper money is a type of central bank reserve. Electronic central bank reserves are charged a fee and money subtracted to get a negative interest rate. Paper money receives a change to its exchange rate to digital money. In the dual currency approach, there is no arbitrage between central bank reserve money, whether it is paper, a Federal Reserve Note, or digital, a reserve balance of a bank at the Federal Reserve.

When central bank interest rates on reserve money are positive, the index goes up. This will be the usual case. So the normal situation is that a dollar of cash gets more than one dollar of digital money when presented at a bank. It is possible to make this a guarantee, so that cash money always has an exchange rate greater than one. Cash money never breaks the buck. This increases its popularity.

One mechanism to never break the buck is to start the index process when rates are positive, so the index builds up. The index could also be started above par. Finally, if the index hit par, the central bank could adjust the ratio up as a one time stimulus before continuing negative interest rates. So if the index hits 1, it might be reset to 1.25 to give up to approximately 5 years of negative 5 percent rates. Daily adjustments would result in a slightly shorter period. The index can only hit the buck during a period of negative rates. This is a time when more stimulus is wanted. This upward adjustment approach could be used to give extra juice to the stimulus. Those who are mostly dependent on cash tend to spend stimulus at a higher rate and so helping cash will tend to provide extra stimulus.

The exchange rate for cash being above par also creates additional possibilities for stimulus. Central bankers and the IMF can use these to help gain support for their new currency. Some of these have the effect of reducing inequality which they can also credibly say is part of getting the economy unstuck. Inequality may be part of why economies are stuck at zero interest rates for long. In addition to the stimulus effect, these mechanisms are also a way of gaining support for their currency mechanism design.

These IMF currency design stimulus and popularity enhancers could make over half the population winners from a dual currency system. These can be temporary stimulus during a crisis or permanent as a stabilizer. Or they could be a blend of the two, with a modest adjustment permanently, and the full amount during a crisis.

Stimulus and stabilizers include some of the following. Those receiving social security payments below a living income would be considered to get them in cash the moment before their bank account was credited. So their payment would be multiplied by the index, which is always above par. Other pension groups like military widows and orphans, teacher aides or part time teachers with small pensions, and so on might be included to further spread the stimulus and popularity.

Those with wages below the median wage or below the living wage could be required to be paid in cash at least notionally the moment before their bank account is credited. Other groups left out of prosperity over the last 50 years could also get some type of interpretation so that they are considered paid in cash momentarily before their bank account is credited. These groups are considered to have a greater tendency to spend stimulus, so these equity adjustments would also be stabilizers and add to stimulus during periods of negative rates.

Those with credit card debt would benefit from the IMF currency design by a reduction in rates during a crisis. That might be enough for them to get out of debt. Those with student debt might be allowed to pay off their existing debt by borrowing at negative rates. These groups might be helped by considering that their debt repayment was done with cash. This would then result in a powerful stimulus jolt because these two groups tend to spend what they get. Getting out of low for long then helps life insurance, the banks, and the bond market. So it is win win.

Some economists might propose the following to sell the dual currency mechanism. You can not get the bond market out of low for long without helping the people at the bottom. By many economic measures of living wages, rent cost burdened, and so forth, over half the population is on the bottom. Until half the people are lifted off the bottom, you can't raise the bond market off the zero rate bottom either. If the people are not lifted up, the bond market may sink further into negative rates for long. The fortunes of the life insurance industry may be tied to those on the bottom.

If the Federal Reserve thinks this, then it may be reality on two scores. They may see what is reality. They may act on what they believe. It appears in many ways that the Federal Reserve believes something like this already. They are pursuing low for long to the extent they are able. As long as they do, that is the world the life insurance industry will live in.

Economists at the Fed believe that to manage interest rates they have to get their hands dirty with the reality of the economy now. They believe that looking at a histogram of interest rates over the last 50 years is almost no guide at all to what interest rates should be now or for the next 50 years. They believe they have to have models that reflect the reality of work and capital in today's economy. They believe that is what their models are.

They believe their models based on the full economy's data tell them something very different than looking at charts of interest rates for the last 50 years. Their models are grounded on the same data used to create the national economic accounts that show over half the population struggling. So they have an interest rate policy oriented to the reality that the full set of national economic data shows, one of a population struggling to get by. This produces low for long and may produce negative for long.

This is why they are looking at tinkering with the currency so they can have deeper negative rates to give the economy a hard push. And this is why the elected officials may listen to them. The answers they seek are in models of the full set of economic data not in mathematical algorithms for shadow rate models of interest rates by themselves with no link to the full set of economic data.

Another approach to negative rates instead of a dual currency is to withdrawal paper currency and go to all digital currency. In this case, the digital currency can be charged a rate of interest through the digital currency mechanism. Digital currency of this type is another form of central bank reserve money and is paid or charged the common rate on central bank reserve money. In this case, digital cash has a par value, the index is pegged at one all the time.

Because periods of deep negative interest rates would be short, the ability to use commodities to arbitrage them would be limited. This still requires careful study to understand how much opportunity there might be in this.

The IMF and central banks see a dual currency of electronic and paper money as a possible solution to low for long by allowing brief periods of deeper negative rates. In their thinking, such periods would result in stimulating the economy rapidly and would not last for long periods. If this idea worked, it would benefit the life insurance industry as long as it can survive moderately long periods of negative rates up to -6 or so. In addition, if they added new business when rates were negative, it might become a continuing problem. They might want to limit that.

The negative rates currently considered too deep in LATF circle discussions are mostly within the range, up to -6, that economists want for counter-cyclical policy. Bernanke and others have discussed this in several papers. Bernanke's entire QE policy suite is a way to get around the zero lower bound. The IMF's dual currency solution is to allow deeper negative rates like -6 at least for loans where government is a party.

Although the original 3 factor CIR model is flawed, it does have the advantage that it is mathematically easy to deal with for bond yields. That level of math is within the capability of many actuaries.

In the Iraq war, we were told we have to fight with the army we have. That may be the situation the NAIC finds itself in now. Further delay in doing anything may be the worst choice.

Given the NAIC LATF mathematical methods to limit severity of negative rates in simulations are experimental mathematically, it should retain the option of using the original 3 factor CIR model. It should find the best case it can of that model that addresses the risk of low for long or of moderately negative for long. It should also test for deeper negative rates consistent with what economists at central banks are seeking to try. This sounds closer to the current parameters of the unfloored model.

A field test with the current unfloored model could also show what the life insurance industry needs to survive the new IMF medicine if it comes into play, and it could ask for that up front in exchange for its support of the IMF's new mechanism designs for dual electronic and paper currencies that can achieve deeper negative rates. The IMF and central banks may at some point decide to move forward with their approaches and get governments to consent to them.

The IMF only needs to find one country to try it and succeed in getting out of low for long. Once one country does it and succeeds, the leverage of the life insurance industry on planning it for the US will be minimal. If the life insurance industry is not proactive, it will not get any safeguards or assistance. Now is the time for it to get involved in planning the experiment.

At some of the IMF and World Bank meetings in DC, it was discussed that it might be better for some smaller countries to try the new experimental designs on currencies. That may be, but it will also mean leaving the US life insurance industry out of the planning stage.

The obvious assistance to negotiate when interest rates are negative 6 percent is to be able to borrow from the Fed at negative 6 percent. Alternatively, to get a guarantee so they can borrow from the private markets at a negative rate if that is possible. If they can borrow at a negative rate in a way that the principal is secure and can't be seized for some other debt, then that would seem to be sufficient to allow some borrowing if it is available. Borrowing at negative rates has less repayment difficulty than at positive rates if you have a way to use the principal that avoids having to pay a positive amount of interest. Where is the principal kept is the question. Principal is a hot potato. If you hold the principal in a place that pays negative interest, you don't get anywhere by borrowing at a negative rate, you only break even.

Insurance companies have some natural flow of liabilities coming due. They can borrow money to pay these and not cash in the long term bonds that were supporting them. So if a policy matures and requires a payment of 100, the life insurance company borrows 100 at -5 percent. They hold onto their

bond that was supporting the policy. That bond might pay 4 percent. So they now get an income of 9 percent. Their long bond covers their borrowing principal. But their only principal to invest is what is already in the long bond. They don't have an additional hot potato 100 of principal to invest at minus 5 percent. This type of cash management might provide some help. On the flip side, issuing new policies with guarantees might create an ongoing burden after the crisis with deep negative rates was over. NAIC LATF needs to study these to see if its solvency system is sufficient to manage them.

The situation of the capital markets with negative rates requires careful thinking. Can only governments borrow at negative rates? Or banks that borrow from the central bank? Is the government always a party to lending or borrowing at negative rates? Can private parties borrow at negative rates in the capital markets? Or would they be constrained by zero?

If this type of assistance or borrowing were available to life insurance companies, negative rates could be win win for life insurance. Negative rates help reduce low for long and they get to borrow at negative rates to a limited extent while it lasts. This would bring up determining how much they could borrow and what requirements were imposed.

The Fed might want companies to pass on the same rate to policyholder loans as a condition of additional borrowing beyond the amount of policyholder loans. It might want limits on executive bonuses, sales commission, and stock dividends. This might be needed if negative rates for private borrowers became or were feared to create a sort of unconstrained money machine. Or it was feared they could create bad incentives. Whether that could really happen with negative interest rate loans between private parties requires analysis. It may require additional regulations from the NAIC LATF to make it work.

Field tests involving negative rates should consider the case that negative rates only occur when government is a party. Cases when two non-government parties make a transaction should also be considered but should be separated so that these scenarios can be filtered out if desired.

Economist thinking on deeper negative interest rates has concentrated on allowing the central bank rate on reserves in their models to be negative. What happens between two non-government parties to a loan is not very clear to me at least. Their thinking is mostly in allowing rules like the Taylor rule to give a negative rate and then allow that as the central bank rate on reserves held by banks.

Any model involving negative rates has to think about the issue of cases of all non-government parties to a transaction. The life insurance industry has an incentive to think this through in case governments decide to try it out or if their own analysis shows they benefit. In the mean time, models with negative rates used by LATF or life companies should think about what it means for negative rates between non-government parties and whether life companies could borrow at a negative rate from the Federal Reserve or in some other fashion at least as part of cash management to help them during deeper negative rate periods.

In a model with government interest rates below zero, it should be considered whether borrowing rates of non-governments should be limited at zero. This may require double shadow rate models. One for government rates at a negative boundary such as -6 or even -10 with a dual currency or -1 or -1.5 without. Then another boundary for private parties at some level above the government boundary. This might be -4 with a dual currency or zero or perhaps slightly negative without.

It may be that with deeper negative rates, private parties will be able to borrow at some negative rate. This may require rethinking credit requirements in such circumstances. As long as the principal is not spent and is not earning negative interest, there is no limit to the borrowing that a borrower can repay. Where would the principal be kept? That's the rub. This tends to limit the opportunities. However,

there is an incentive to try to spend money sooner on replacement of equipment that is more energy efficient or provides some new feature. This is part of where the stimulus can come from for negative interest rates that are available to consumers and business.

This pop up of stimulus is why the IMF and central banks are so determined to get to deeper negative rates. They are working through whatever the difficulties are in mechanism design for negative rates. If they can implement deeply negative rates and private parties can borrow at them, it would create an avalanche of spending. This would pop the economy out of a ditch and get it moving again. Like a terminator, the IMF won't give up. Reducing the life insurance industry to term life is considered acceptable in IMF and central banking circles if they can get economies moving quickly in a recession.

The life insurance industry is the one that has to make it work for life insurance not just the general economy. While the IMF and central banks are thinking this out, they are looking for allies. One thing the life insurance industry has is the ability to pass on negative interest rate loans from the Federal Reserve to policyholders. At the formative stages, a large pot of money of this type may seem important help to the IMF, central banks and the labor economist at the top of the Treasury Department. So they would be willing to give favorable conditions to the life insurance industry to borrow at negative interest rates from the Federal Reserve. This bargaining chip is a fleeting opportunity for the life insurance industry to use.

Economists are fond of rules. So I will close with a couple of suggestions. No analysis of interest rates is over until it gets down to the dysfunctions of the economy at the time and what is on offer to fix them. Monetary solutions always sound the quickest and easiest. None of them may work, but some of them will be tried. The dual currency paper and digital money solution with deeper negative rates sounds like its time may be soon. If so, the life insurance industry should try to get in early to help structure it so that it survives and prospers. Analyzing how to negotiate and analyzing how to cope without negotiating go together, so one can support the other. Looking at it each way gives insights into the other way.

My thinking on this subject has jumped around erratically while drafting different versions of this comment. What is offered here is only a set of ideas fixed momentarily in time to stimulate discussion. Parts of this seem radical, but the IMF and central banks have moved to radical ideas to get out of low for long. Saving the life insurance industry may also be radical in a low for long or negative for long world. This particularly applies to saving all the smaller life insurance companies.