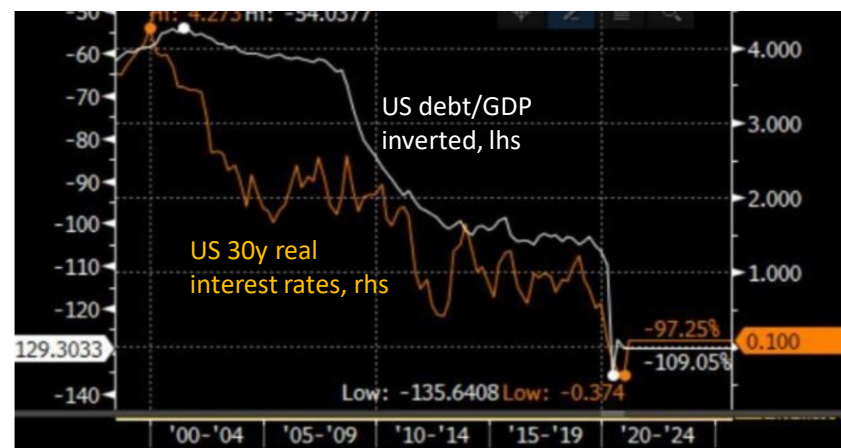


To facilitate more debt creation, we need lower real interest rates

$$d_t - d_{t-1} = \frac{r_t}{1+g_t} d_{t-1} - \frac{g_t}{1+g_t} d_{t-1} - p_t \quad (28)$$

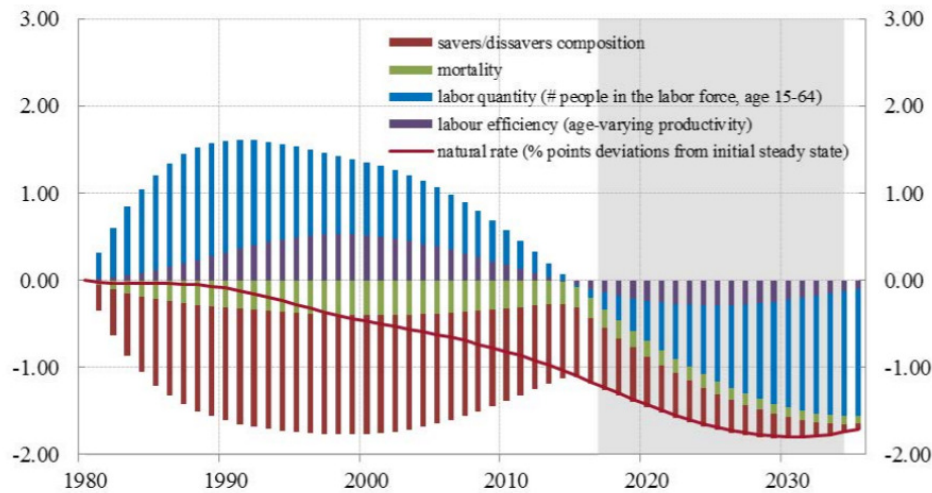
Notice that this equation can be alternatively derived from (4) and (5). Equation (28) shows that the evolution of the debt ratio depends only on the real interest rate, real growth, and fiscal adjustment. Hence, it shows that inflation has an impact on the debt ratio only to the extent that it lowers the real interest rate paid by the government. Otherwise, the higher nominal interest rates associated with higher inflation will fully offset the erosion in the real value of the debt due to inflation. Inflation lowers the real interest rate paid on debt, for example, if debt issued in the



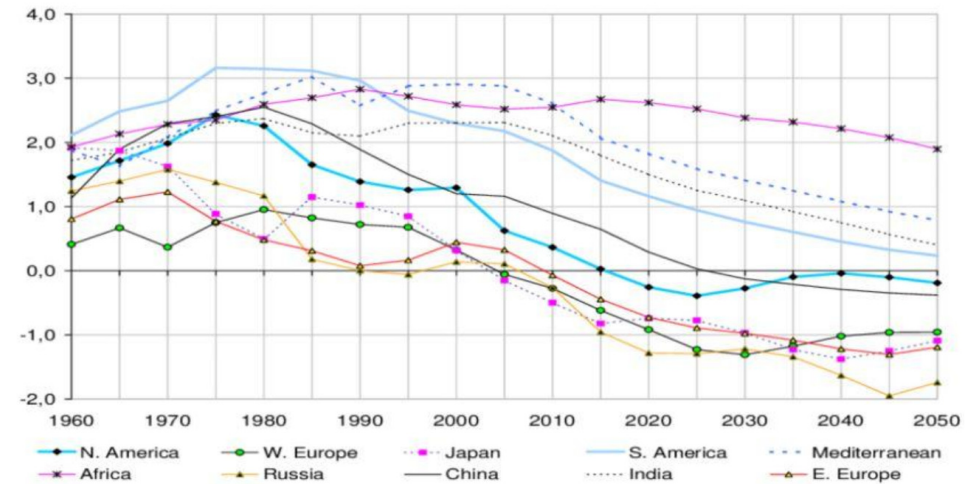
- Our monetary system is based on credit creation: we can expand and contract the money supply as we deem fit. Guess what, we expand it most of the times.
- The flip-side of credit creation is debt creation. We have to suppress real interest rates < potential real growth rates to facilitate this credit creation model.
- The graph above shows that as US debt/GDP increased (inverted in graph, hence when it decreased) over time, 30y real interest rate kept dropping.
- 30y US real interest rate are now at 0%. As we expand debt over time, we need real rates < r* (potential growth). So, what is the estimated level of real potential growth?

Potential growth is dropping, and it could get worse

ECB estimate of the long-run potential GDP growth r^*



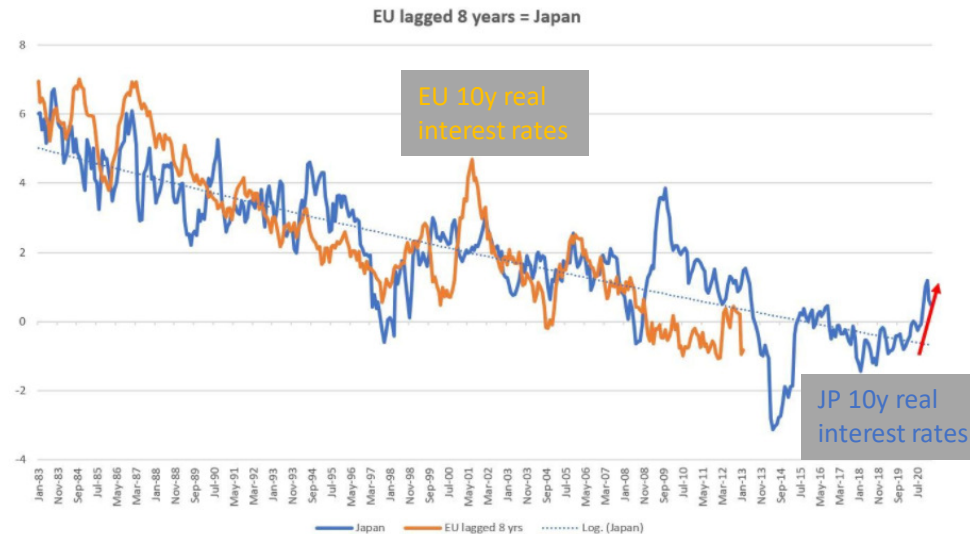
YoY labor supply growth estimates for different economies



- The potential, long-run real growth of an economy can be simplified as the sum of labor supply and productivity.
- The median r^* estimate from the ECB in 2018 was -1.2%. This means Europe is in a permanent, structural recession. Sharp drops in the YoY labor supply (blue stacks) are mostly responsible for this scary backdrop.

- Labor supply will shrink everywhere in the world over the next decade.
- YoY labor supply has already turned negative in the US and it's likely to turn into contraction territory even for China in 2025.

Market implications: lower real rates, but how far can they go?



- Japan shows the way: since the 80s, they kept adding more leverage to their economy and lowering real interest rates to ease the burden of servicing higher and higher debt levels.
- But since 2019, real rates in Japan have gone UP. This is because nominal yields reached a floor and inflation expectations have a hard time breaking upwards given the poor track record in producing any actual inflation.
- Europe lags Japan by about 8 years. 10y EU real rates are already around -1%, and to lower them further we need either lower nominal rates or higher (expected) inflation.