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# How Fast Can We Grow?

ARE THERE LIMITS TO GROWTH?

DAVID CHEREB

## Are Their Limits To Growth?

Of course there are limits. But too often the discussion about limits occurs after we've had a few years of slow growth. Then we start releasing opinions and research articles about why this is the new normal.

It's bunk; it's nothing more than an excuse so we don't have to make tough choices or make difficult changes. The U.S. and Europe used to grow at over 3%/yr. Now both regions grow at less than 2%/yr. Why aren't we growing at over 4%/yr.?

***"My God, it's full of stars!"***

Commander Bowman in movie 2001: A Space Odyssey

A short personal story. Many years ago I was giving a guest lecture about economic growth at a nearby college. During the question and answer period a student questioned whether we could keep growing; after all weren't we running out of resources and land? Because I was lucky enough to spend some time working with NASA and with space research engineers, I answered this way. "Tonight I want you to go outside and look up at the stars. We have plenty of room to grow." This seemed natural to me because we talked about space colonization all the time, but I realize now that the students probably thought I was just being odd.

### Limits To Growth

At the beginning of this article I wrote that yes there are limits. Most limits are time dependent. That is, if you have a fixed amount of resources, then there are many limits in the short run about how much you can produce. I grew up in a farm family so it's natural for me to use a farming analogy. If you have 100 acres of land and 1 million seeds, there is only so much you can produce that season. Even if you have 2 million seeds you won't be able to double production due to planting limits (i.e. each plant needs some soil and space around it to grow).

But what about over 20 years? If that is the time horizon it is possible that with new super seeds and fertilizer that same 100 acres will now yield more than double the crop harvest of 20 years ago.

Think of the various reasons for limits to growth just in the past 40 years.

Here are just some of the limits:

**Water**

**Land**

**Minerals**

**Energy**

**Pollution**

**Climate**

All of these are valid reasons restricting growth (in the short run).

And even though it is true that each one can impede growth, there are at least three reasons why none of them are true limits. One, we frequently find new sources of the resource that we didn't know existed. No matter how smart we think we are, in 20 years we always wonder how could we not have known about the new resource field. Two, when something is scarce its price goes up. If you had the last 1000 barrels of petroleum left in the world, would you sell it at \$100/barrel? When

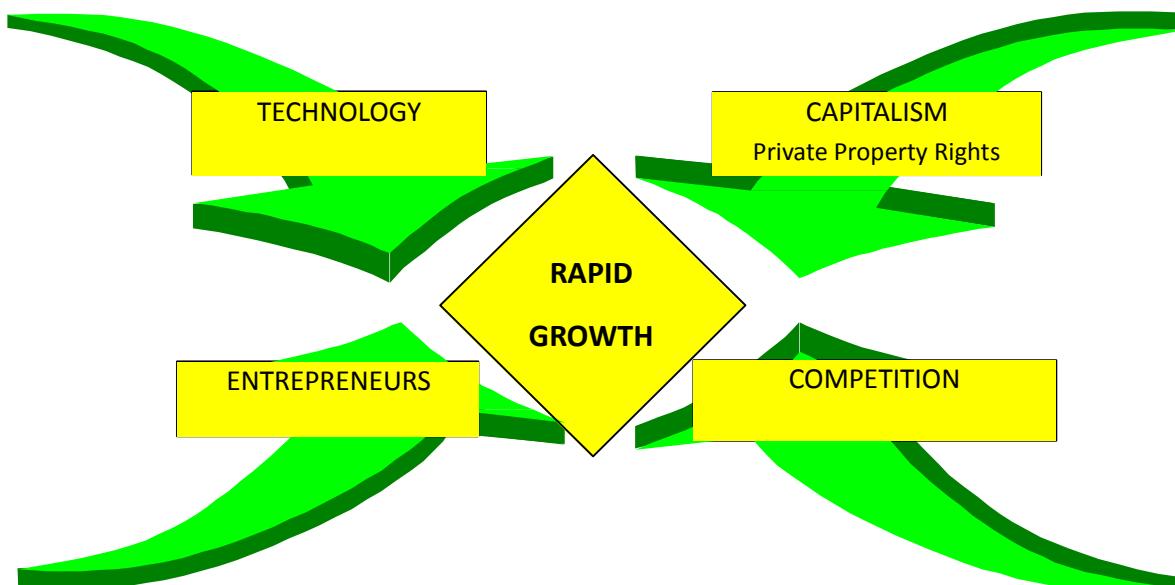
you get down to just 100 barrels left would you still sell it at \$100? By then someone is probably offering you 50x that price. As the price goes up, use goes down and the remaining inventory lasts longer. Three, and the most important reason, technology changes. Do any of you still use the original Mac? Today's computers are vastly faster and cheaper. Fifty years ago 5 of the top 10 companies on the Fortune 500 profit list were oil companies. Now only 2 of the top 10 are oil companies. Apple (#3) and Microsoft (#4) were not yet created.

As long as humans remain curious and innovate, we will adapt to and create new environments. We yearn to innovate.

### How Fast Can We Grow?

Production and growth occur by transforming inputs into more valuable outputs. Typical inputs are: labor, capital (equipment, buildings), land, energy, and knowledge. Adding more of any of these to production leads to more output. If all inputs double, then output doubles. Smart growth occurs when inputs are used in more productive ways; i.e. by innovating.

Rapid growth requires not only more labor, capital, etc. it also requires an environment that fosters growth. The chart shows some of the major environmental factors that make rapid growth likely. These factors work in a synergistic fashion. Combining capitalism with entrepreneurs and new technology results in a true multiplier. For instance, median household income increased 18% between 1984 and 2007, a period of relatively rapid growth. However, since then incomes have dropped by 8% per household showing the pain that slow growth causes. Even if my income hasn't increased many of the things I buy have dropped in price during that period: computers, TVs, cell phones, etc.



By the way notice anything missing? In potential growth equations and models there is no government; there is no QE3 or Federal Reserve. Why not? Because most government spending, deficits and monetary policy are short run tools that do not increase our innovation or our productive

capacity to grow. Growth is about producing more cars, computers, software, drugs, etc. more efficiently. Highly efficient and productive societies grow faster on average and become rich societies.

China had about 1.1 billion people 20 years ago but they produced only \$392/yr. on average (1990 GDP per capita, 2000 US\$). Now China produces about \$2425 per capita (as of 2010). That's over 9%/yr. in real terms and means their average income is six times higher. That's quite an achievement in 20 years when land hasn't grown and population is only modestly larger. In China's case they decided to adopt capitalism and their growth shot up to where many people think they will become the new number one economic power within the next twenty years. Capitalism for China means make as much money as you want but keep quiet about politics. So far it's working economically.

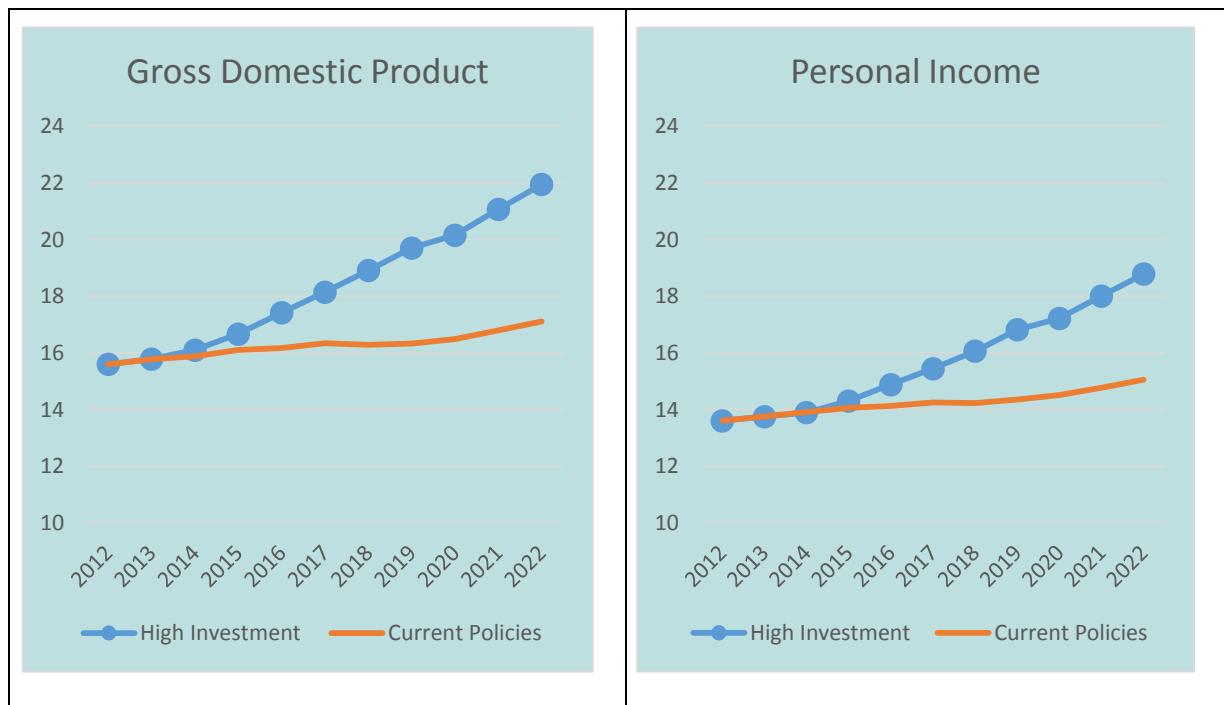
So if China can go from averaging less than 4%/yr. growth to over 9%/yr. growth why can't the U.S. grow at over 4%/yr.? We can but we don't want to.

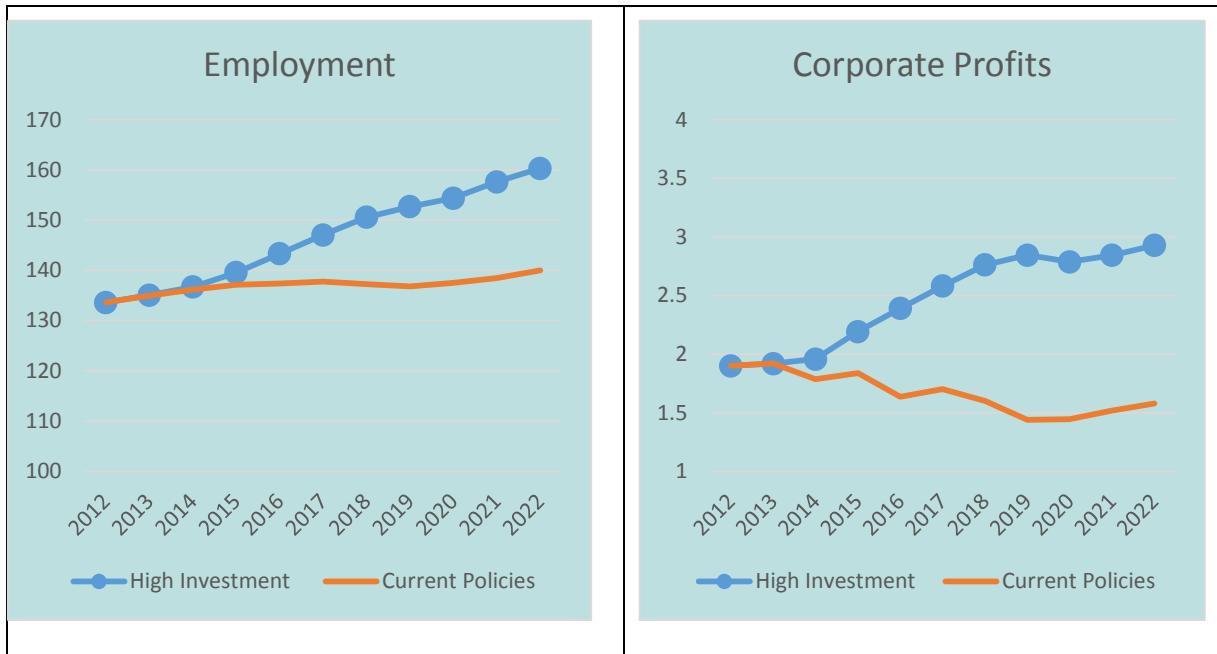
**"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard"** President Kennedy, Sept. 12, 1962.

Because we don't want to grow rapidly we make up excuses for why we can't grow rapidly—then we don't have to do the things it takes to get there. Similar to losing weight.

### Alternative Growth Paths: a High Investment Path vs. No Policy Changes (Baseline)

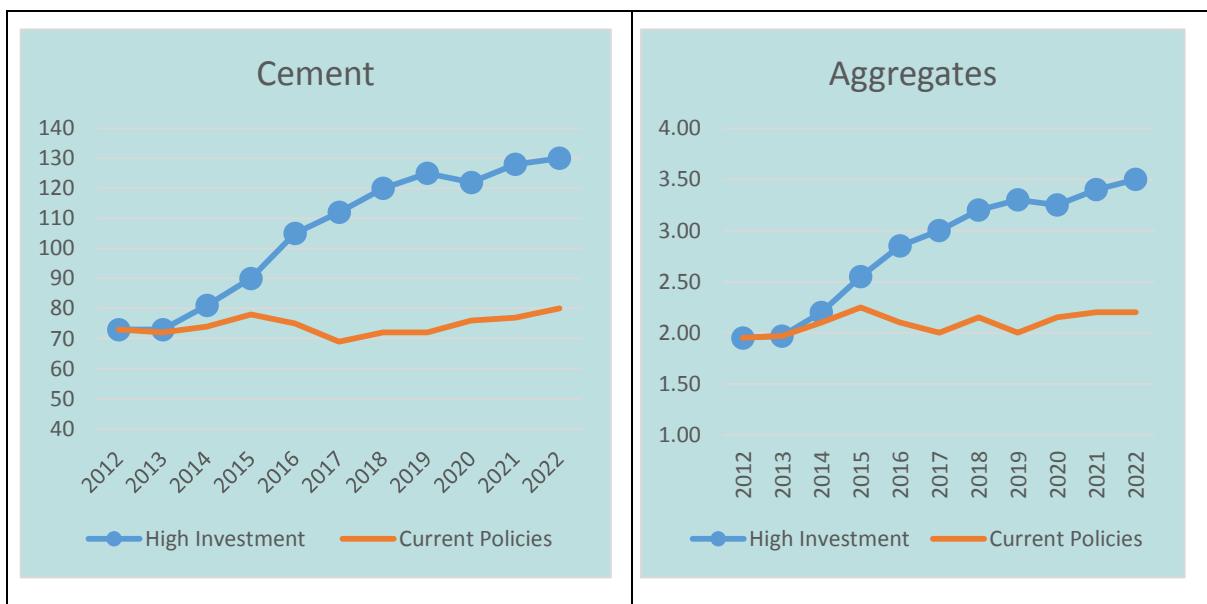
The charts show two very different paths—one we call the High Investment Path and the other a continuation of current policies. How we get to the High Investment Path is shown after the charts. It will require major changes to begin to move along the High Investment Path but over time there is a large payoff: higher employment, higher profits and higher personal income.





Source: All Forecasts: David Chereb; 2012 estimates-DCG extensions of Bureau of Economic Analysis, Bureau of Labor Statistics, USGS GDP and Personal Income in Trillions\$, Employment in Millions, Corporate Profits in Trillions\$.

The two growth paths we have shown have an even more dramatic impact on construction materials. Construction has a high beta, to use a stock term. Without rapid growth there just isn't much need for more construction.



Source: All Forecasts: David Chereb. Cement Millions of MTons, Aggregates-Billions of MTons

## How Do We Reach 4+% Growth?

History supports the conclusion that private investment out performs public investment-most of the time and for most things. Therefore to grow faster we need more private investment. Next are a few ways to get to 4+% GDP growth. This list is not exhaustive.

Reward Entrepreneurs	Apple, Google and others have produced innovative products that people want. They need to have the resources to continue to innovate.
Protect Private Property Rights	Intellectual and non-intellectual property must be protected from those who would confiscate it either through copyright violations or government control.
Invest in R&D	Protect patents and create incentives for private investment.
Protect Freedom	Creators need to have the freedom to innovate. Citizens need the freedom to innovate without asking for permission.
Eliminate Capital Gains Tax	Both Bill Clinton and Ronald Reagan reduced this tax. Both times capital gains tax receipts increased.
Eliminate Corporate Income Tax	Let people pay taxes not corporations. Corporations need to create value-added products and employee people.
Reduce Gov\$/GDP	The private sector is innovative and dynamic.

Rapid GDP growth is a winner for workers, owners and politicians. Faster GDP growth means higher demand for workers and higher profits for business. Faster GDP growth means higher tax receipts which can be spent on more government programs or given back to the people. The vast majority of stake holders win.

## Short Run vs. Long Run

Getting from under 2%/yr. in GDP growth to over 4%/yr. is difficult and won't happen in our current situation. There are just too many road blocks in our way; political, educational, financial and most importantly we don't have the mind set to try. Many people reading this don't think it's possible and therefore won't support the changes required to make it happen. We went to the moon in Apollo 11 because we worked very hard at it. It might have failed but it's for certain we wouldn't have gotten there if we didn't try. And we did all this in less than 10 years (1962-69).

An aggressive growth effort will get us to a 4+%/yr. in less than 10 years. Ten years is not that long. Sept. 11, 2001 was over ten years ago. Ten years ago Microsoft was worth about 30 times Apple. A lot can happen in ten years (Apple is now worth twice as much as Microsoft). Also, trying to accomplish something worthwhile is very satisfying.

## **Is It Wise To Grow?**

Maybe it's not worth it to make the changes necessary to grow rapidly. After all it means rewarding innovation and those who innovate. It means becoming business friendly. It means reducing the debt/GDP ratio. We are not headed in this direction now and to change course means new winners and losers in the short run even if almost everyone wins in the long run (i.e. within 10 years).

While a discounted cash flow model can show how the benefits are greater than the cost, it cannot decide voters' attitudes towards more growth, higher average incomes and continued income inequality. Even if the outcome is that 95% of the people gain, some may reject this path because 5% will be worse off. Those who favor rapid growth, such as me, cannot convince voters to enact these policies if a majority of voters will not accept any policy that makes one person worse off. That's why it is likely the U.S. will suffer slow growth for another decade. Rapid growth is a result of enacting rapid growth policies.

Capitalism produces rapid growth. Rapid growth produces wealth.