New Technology Can Improve Life for Most Americans
It's time to make that happen

By Ralph E. Gomory

Ralph Gomory is well-known for both his research and corporate leadership. For twenty years he led IBM's Research Division and then was President of the Alfred P. Sloan Foundation. He has been awarded the National Medal of Science and many other honors.

We live in a world that is being transformed by new technology. AI and robotics have shown, that separately or together, they can do much of the work that now requires humans. The chip technology that makes this possible is steadily becoming more powerful, so we must expect this ability to replace humans to steadily increase.

How will this new technology affect us? We must recognize that the effect on society is complex and to a considerable degree unpredictable. We can see both the complexity and the unpredictability if we look at a historical example: the impact that the arrival of the steam engine had on human lives.

From the early Middle Ages until the mid-19th Century, most people lived in small villages, and almost everything they needed was produced locally. Food was grown on small farms; clothing was made in the homes, even the horseshoes needed by the farm horses could be hammered out by the local blacksmith.

The arrival of the steam engine transformed this world, and people's everyday lives, in ways that were, at that time, mainly unpredictable.

What later became the steam engine first appeared around 1700 in very small-scale experiments. Over a century of improvements and limited uses followed. By about 1820 the steam engine had become practical, and as it continued to improve, it provided the power that, over roughly the next fifty years, completely changed daily life for most people.

Instead of working locally on farms, they began working for large corporations that, using steam power, could cheaply mass produce. This included most goods that previously were produced locally, for example clothing. But there was much more.

It was the steam engine that made possible the great freight trains that put the large growing areas of the Midwest into competition with the small rocky fields of New England. On the rivers and oceans, replacing sail with steam brought into closer contact regions and nations that had always been too far apart to matter much to each other. With the advent of steam, they could compete or cooperate, and it mattered which they chose.

We too live in a world that is being transformed by powerful new technology. Computing power increasingly makes it possible to automate much of what people do. It also makes it possible to do many things that simply could not be done before, such as running large complex factories with only a few people directing many machines, and having virtual meetings with people from many parts of the world,

How will this increasing capability affect human lives? For whom will it produce wealth, and for whom will it produce poverty?

One thing is clear. Using these new capabilities, we can produce enough to give every American a reasonable standard of living. Although giving everyone a reasonable standard of living has now become possible, that is not what we are doing. Instead, we are concentrating wealth in the hands of a few.

Our historical example shows the same effect. Concentration of wealth was also a part of what the steam engine revolution produced.

The productivity increase of the late 19th Century, based on the power of steam, gave rise to the so-called “Robber Barons”. This term was widely used to describe the powerful and often unscrupulous industrialists who amassed great power and wealth in the rise of mass production.

The Robber Barons met their match when Theodore Roosevelt became president in 1901. He understood and responded to ordinary American's concerns about this concentration of wealth and power. His leadership led to the passage of important antitrust laws and corporate anti-monopoly regulation at both federal and state levels.

Today's digital technology is like the steam engine; it is fueling productivity increases that may have positive effects but may also have negative effects on many people.

If your job can be done using some form of automation, your employer may prefer to have it automated, rather than having it done by you, a human being. After all, an automated job can run 24 hours a day and doesn't need to be paid wages.

Many see replacing humans with automation as inevitable for American corporations because, for many, their focus is on creating value for shareholders.

It is true that increasing shareholder value is the current focus of many of our corporations, but this outcome is the reverse of what was intended when corporations were first introduced. In our 2013 article, The American Corporation, Economic Historian Richard E. Sylla and I describe how corporations were originally given special privileges - such as limited liability - only if they could show that they were acting in the public interest. They were not given those privileges to focus mainly on enriching their shareholders.

As President Theodore Roosevelt stated in his 1901 message to Congress, "Great corporations exist only because they are created and safe-guarded by our institutions; and it is therefore our right and our duty to see that they work in harmony with those institutions."

It is time to remember this goal and once again require corporate employers to earn their privileges by better serving the public interest. There are many possible ways this can be done if there is a political will to act.

We routinely use tax incentives to induce corporations to invest in research; why not give tax incentives to share profits with employees? Tax incentives sound dull but in fact they can be made as strong as is needed to provide the effect that is desired. There are many ways to affect what our corporations do, some of which we spell out in our Daedalus article, but most worthwhile changes will need political support to make them happen. It was political support that made change possible in our historical steam engine example.

While these proposals are all intended to realign the interests of the corporation with those of the country, they do not take into consideration the new world we are entering where most work can be done without any human involvement.

The changes that are coming are profound. Given the complexity of our economy and the great range of human-to-human interactions that are now possible, no one can predict what the future will look like. Will marriage be less common or more common in a world where most people can live with little or no work? What about children? What new ways will people find to employ their leisure time?

It is likely that the economic and social structure of your life will change – just as it did in the steam engine era - but it is beyond our ability to predict how it will change.

We need to be open to rethinking and openly debating what we should do while the effect of our new technology evolves. It will change everything, from the structure of our society to our relations with each other.

While this is happening, we must exploit the fact that we are a democracy. We must vigorously and publicly discuss the many ways these new technologies can create a better life for most Americans.