

ECONOMICS U\$A  
PROGRAM #23  
PRODUCTIVITY: CAN WE GET MORE FOR LESS?

AUDIO PROGRAM TRANSCRIPT

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(MUSIC PLAYS)

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FRANK STASIO: This program was originally recorded in 1985. Though times have changed, the basic economic principles presented here remain as relevant today as they were when the series was produced. Also, please note that individuals interviewed on this program may no longer hold the same titles they held when this program was recorded.

(MUSIC PLAYS)

FRANK STASIO: Economics U\$A. One of a series of programs designed to explore twentieth-century micro and macroeconomic principles. The subject of this edition is Productivity. Our guest is John Kendrick, Professor of Economics at George Washington University and adjunct scholar at the American Enterprise Institute. I'm Frank Stasio.

JIMMY CARTER: "We've always believed in something called 'progress.' We've always had a faith that the days of our children would be better than our own. For the first time in the history of our country, a majority of our people believe that the next five years will be worse than the past five years.

FRANK STASIO: When Jimmy Carter made that troubling observation in 1976, he gave recognition to a trend that had begun almost a decade earlier. It is true that Americans had come to expect progress and continual improvement in their standard of living. Those expectations were founded on more than a hundred years of economic growth. The rate of growth varied, from decade to decade. But for most of the twentieth century, the U.S. economy grew faster than the rest of the industrialized world. United States per capita income grew to the fourth highest in the world in only its first seventy years as a

nation. By the turn of the century, the United States had taken the lead in per capita income. By most standards, America was the fastest growing country in the world. Key to this continued growth was the steady rise in one very important measure of economic progress, "productivity." John Kendrick is a Professor of Economics at George Washington University, and adjunct scholar at the American Enterprise Institute.

JOHN KENDRICK: "Productivity is the relationship of output, the goods and services that are produced, to the labor and other inputs used in the process of production. Often, a simple measure of productivity is used: output per worker, or per labor hour. However, even better is a broad measure that relates output to labor, capital, and natural resource inputs. Many people confuse production and productivity. GNP is total value of production, but productivity is a relationship between the quantity that is produced and the quantity of labor and other inputs required to produce it."

FRANK STASIO: Between 1871 and 1913, productivity per worker in the United States grew by two point two percent per year. That means that the output of goods and services for each hour worked grew by two and two tenths percent. Professor Kendrick explains how productivity is measured.

JOHN KENDRICK: "You can do it two ways. One is to measure the phys... physical volume of output, such as tons of steel, or, uh, barrels of oil, or bushels of wheat. And you, uh, you weight these together. You combine them, based on a measure of their relative importance, which is price, but price held constant as of a base period. So, that an aggregate, such as the real gross national product, or GNP, moves only as the physical volume of goods moves from one period to another, not because of price changes. The other way to do it is to deflate the GNP, in current prices or other measures of the value of output, by a price index. That is, you divide through the current values by prices to eliminate the effects of price change. So, you have movements in constant prices, as we say. Oh, and, then, of course, we measure the inputs in physical volume, labor, not in wages and salaries, but in labor hours worked, and the materials inputs in terms of the physical volume of materials, and the plant hours or machine hours in terms of the capital goods."

FRANK STASIO: But, simply dividing worker hours and capital into total output even after adjusting for inflation will not give a completely accurate picture of how much it takes to produce the goods and services we enjoy.

JOHN KENDRICK: "We do not adequately capture the improvement and quality of goods and services produced. We all know that TV sets are a lot better now, in terms of the picture, and, earlier on, radios were improved greatly, as static was eliminated, and fading, and so forth. So that durable goods gradually got improved, but we only pick up those improvements in our production measures to the extent that they are associated with increased costs. We, uh, we tend to measure the improvement in quality in terms of the...of the greater cost involved in the higher quality product. However, some innovations have given you higher quality at lower cost—and we miss those improvements, altogether."

FRANK STASIO: Productivity figures can also become distorted because they cannot account for certain improvements in our standard of living. This tends to keep the growth rate artificially low.

JOHN KENDRICK: "The GNP numbers and other production indices do not take account of improved quality of the environment, of air and water, nor of improved health and safety, nor is equity of an...an employment practice is reflected in output. However, the cost of complying with regulations do increase the inputs. That is, we have to spend more to, uh, to meet these requirements, and that increases the cost and the inputs. That has been estimated to have held down productivity growth also by about 10 percent."

FRANK STASIO: Is anybody, now, trying to...trying to redress that? Would it be valuable at all for us to find a way to put a value on improvements in health and safety standards?

JOHN KENDRICK: "It would, if we could. However, that's, uh, that's really difficult to measure, these highly qualitative aspects of the society, or of the environment. And I think it's better to recognize that our measures do exclude these qual...quality-of-life

factors, and address those separately, and more subjectively, and measure what we can measure, but not mix it up with soft estimates that lack precision.”

FRANK STASIO: The United States held the lead in productivity growth until the early 1970s. But, then, suddenly something changed. America’s productivity rate plunged from a high of three percent between 1948 and 1966, to less than one percent between 1973 and 1980. These numbers may sound small, but the effect of a two-point drop in productivity can be dramatic.

JOHN KENDRICK: “Due to the power of compound interest, three percent rate of increase means a doubling every twenty-four years. So, that it is important, and the three percent increase in productivity-defined as output per labor hour for this purpose-is somewhat greater than the increase in output per capita per person. That’s been about two percent, which means our planes of living, our standards of living double about every thirty-five years. So, these small numbers are...are quite important. Even point one is important. A tenth of a percent is important, in thinking about growth rates, because of the power of compounding.”

FRANK STASIO: What happened in the 1970s to put the brakes on America’s remarkable progress in productivity? First, it’s important to see that there were some immediate pressures that caused a worldwide slowdown in productivity growth.

JOHN KENDRICK: “About the time of the oil shock, when OPEC quadrupled the price of crude petroleum, the rate of productivity growth slowed down, not only in the United States, but also in most other industrialized countries, and in some of the less-developed countries, and, also, in the Communist bloc. So, it was virtually a worldwide slowdown in the growth of productivity, beginning around nineteen seventy-three. So, obviously people began to question why had this happened.”

FRANK STASIO: And what are some of the theories now about why it happened?

JOHN KENDRICK: “Well, one of the important things is that, with the quadrupling of the price of oil, that helped to set off an accelerating inflation, which continued to get worse throughout the seventies, because, later on, there was another doubling of oil prices

in 1979. And with the rising price levels and accelerating inflation, the value of profits declines. And, so, that led to some reduction of investment.”

FRANK STASIO: Kendrick says the drop in investment has an important effect on productivity because, as investment declines, the amount of capital per worker falls, in effect, leaving workers with fewer tools or less efficient equipment to do their jobs.

JOHN KENDRICK: “The quality of the capital goods is very important. In addition to the quantity of machinery and equipment per worker— and, obviously, if a worker has more tools to work with, he’s going to be able to do a more efficient job— but also, there’s the level of technique which is embodied in the equipment, so that technological advance embodied in capital goods is very important. The most recent models of machinery and equipment, and of plants, tend to be more efficient. So, the increase in investment is quite important in giving us newer and better capital goods, I would say. The fact that total investment was dropping somewhat, for the reasons that I mentioned, the fact that profits, purchasing, prof...profits was not as good. Because of that, the average age of plant and equipment no longer was declining. Prior to 1973, the average age of equipment was falling, which means it was becoming more efficient. It’s the opposite of...of people beyond some point. You become less efficient as you got older. But, with equipment, the younger it is, the more recent technology is embodied in it. And that was going on until ‘73, but after that, actually, the age began increasing somewhat, which is negative on productivity.”

FRANK STASIO: After World War II, and until 1973, investment was high, leading to annual growth and the ratio of capital-to-labor of three percent a year. After 1973, the ratio of capital-to-hours worked dropped by almost a full percentage point. The drop in the capital-to-labor ratio accounted for nearly one fifth of the total drop in growth of productivity in the nineteen seventies. And as capital equipment declined, the workforce, it grew. The sudden huge influx of new workers into the economy also held down the growth of productivity.

JOHN KENDRICK: “The Baby Boom generation began coming into the labor force in the mid-sixties. Actually, the United States’ productivity growth was already slowing

down somewhat by the latter '60s, but, even more after 1973. Those young workers have less experience. Their average wage rate and the value they add to product is less than that of prime-age workers. So, that, uh, bulge in the labor force, probably accounted for about ten percent of the slowdown in productivity."

MALE VOICE: "Ignition sequence.... Six, five, four, three, two, one, zero, all engine running. Liftoff. We have a liftoff. Tower clear."

FRANK STASIO: Research into new technology can have a dramatic impact on the growth of productivity. America's Space Program in the sixties is a good example of the kind of progress that can be made when investment is poured into technological advances. Spending on research and development, by private industry and government, increased steadily between 1953 and 1969. But, then, in the early '70s, when adjusted for inflation, the total actually fell. After the initial dip, R&D spending began to rise again, but at a much slower pace than in the previous two decades.

JOHN KENDRICK: "R&D as a percent of GNP, the gross national product, dropped from about three percent in the mid-'60s down to only two point two percent in 1977. Since then, it has been gradually increasing and is now back up to about two point seven percent, which is one reason why I'm somewhat optimistic that productivity will be more back on track in the '80s than it was in the '70s."

FRANK STASIO: What was R&D like, the investment in R&D like, before the '70s?

JOHN KENDRICK: "Well, the trend had been steadily up from only about one tenth of one percent of GNP in nineteen twenty, up steadily, through World War I, and on up to this three percent number that I mentioned, with now, hundreds of thousands of scientists and engineers involved, just in the research and development function. However, after we phased out of Vietnam, there was a drop in the government funding of R&D and the leveling out of private funding, with increasing unemployment of scientists and engineers in the early '70s, which really was a tragic waste of our most valuable human resources at that time."

FRANK STASIO: Research is divided into two categories, basic and applied. Basic research is scientific investigation that is pursued without a particular economic application in mind. This is sometimes called “pure research.” “Applied research” takes the findings of basic research and tries to put them to work in the economy. Does productivity growth change with changes in the ratio of basic and applied research?

JOHN KENDRICK: “I don’t think we can see that in...in the productivity numbers, but basic research comprises about 10 percent of total R&D. Most scientists think that that is extremely important, that there be enough basic, because the more practical kinds of research projects draw on that advancing knowledge that basic gives us, without regard to its immediate applications, but usually it does have application. So that, enough basic is important, and it has increased somewhat in...in recent years. But the more immediate cause of new inventions is the applied R&D, of course, and the invention, once it’s translated into commercial application, becomes an innovation. That’s when it affects productivity.”

FRANK STASIO: Is there a difference in the kind of, in who does the research? Is it more productive for private industry to do it? Or, is increase in government R&D, uh, lead to greater productivity?

JOHN KENDRICK: “Well, generally, we think that it’s the privately performed R&D that has more productivity impact. However, remember that industry performs much more R&D than it finances. It finances a little over half of the research and development. The rest is largely financed by government, although nonprofit institutions are also a source of...of funding. But industry performs the greatest part of R&D, even though some of it is funded by government. The government-funded R&B... R&D tends to be concentrated more in the space and defense area. We do know that much of the space research has civilian application; probably less of the military R&D would have civilian applications that would help to increase productivity.”

FRANK STASIO: In some industries, such as chemicals, the marginal rate of return on investment in research and development is as high as fifty percent. The importance of

R&D spending was not lost on the Carter Administration. Jordan Baruch is a technology expert, and former Commerce Department official.

JORDAN BARUCH: “The President saw a report by the National Science Foundation that showed a decline in industrial research and development. And the first question that was asked by the policy office of the White House was, ‘why the decline?’ And that question was then modified to, ‘what can we do about the decline in industrial research and development?’ But as we all realized that research and development was only a little part of the innovation process, we finally got to the question, well, what should the federal government do to encourage industrial innovation?”

JIMMY CARTER: “The actions that I’m announcing today meet this goal.”

FRANK STASIO: In 1978, the Carter Administration launched a domestic policy review on industrial innovation, which offered suggestions for improving growth and productivity.

JIMMY CARTER: “First of all, they will loosen some of the stifling restraints that have been placed upon innovation by government. Secondly, they represent a first major step toward forging a public and private partnership, which will rally cooperative efforts to spur industrial growth.”

FRANK STASIO: The domestic policy review stressed over and over again the damping effects of government regulation on technological innovation. As we’ve already pointed out, the cost of health and safety regulations can artificially lower productivity figures because the benefits cannot accurately be measured. The policymakers found it difficult to ignore the growing cost of compliance with federal standards, while productivity growth declined. Some politicians also cast a suspicious eye on regulated industry, such as trucking and airlines. For some time, many economists had been saying that government regulation of some industries discourages competition, which can promote bad business practices, and lead to less productivity. A process of deregulation and relaxing government standards began under the Carter Administration and continued

through the Reagan years. Another popular target for slow growth and productivity was the effective taxes on investment.

RONALD REAGAN: “We have the highest percentage of outmoded industrial plant and equipment of any of the industrial nations. I stood in Ohio, in a great, empty shell of a building that was once a steel plant. The weeds are beginning to grow up. Closed, because they could not afford to modernize, and punitive taxes and those excessive regulations mandating additional costs on them had been responsible.”

FRANK STASIO: In 1979, Ronald Reagan waged his first presidential campaign on the promise of restoring America’s growth rate by freeing the marketplace from government interference. He would get the government off the backs of the people. Reagan’s popular political theme was embodied in an academic theory called “supply-side economics.” John Kendrick.

JOHN KENDRICK: “Those economists felt that, uh, that the government influenced incentives to work and to save and to invest. And if we reduced marginal tax rates on wages and salaries, people would have an incentive to work more. If we reduced taxes on income, then people would have more sa... incentive to save and to invest, and these would increase the supply of goods and services.”

FRANK STASIO: The supply-side theory was buttressed by the research of Arthur Laffer, whose Laffer Curve implied a relationship between taxes and productivity. Arthur Laffer.

ARTHUR LAFFER: “People don’t work to pay taxes. People work to get what they can, after taxes. People don’t increase the productivity of their capital or their labor or their production process, to give the money away to the government. They do it to make more profits themselves. And when you cut the taxes, you increase their incentives for doing that activity, and you’ll increase productivity output and employment. Who cares about productivity when you don’t get any benefits from it? And, frankly, people don’t work for nothing. They work to get paid, and when you increase the amount they get after tax, you’ll find them doing more of it.”

RONALD REAGAN: "We move on to the individual, you and me, and my proposal is for a ten-percent cut in the income tax across the board, not a special cut for someone, while someone else, you know, rob Peter and pay Paul. We're all named Peter, today. We, (Applause) Ten percent, a ten percent in 1982, and another ten percent in 1983 a thirty-percent cut over a three-year period."

FRANK STASIO: Armed with the Laffer Curve, and overwhelming popular support, Ronald Reagan pushed through a seven hundred fifty billion dollar tax cut in 1981. The tax package offered incentives, not only to workers, but it was also designed to encourage businesses to increase investment. Barber Conable was a congressman from New York at the time. He added a provision to the tax bill that would allow firms to write off their capital investments more quickly.

BARBER CONABLE: "The basic Reagan idea was to have a simple proposal of two parts: rate cuts, and cuts for business that would be given in such a way that would encourage investment and, therefore, improve productivity. And the ACRS, "ten, five-three," Jones-Conable bill was the second half of the proposal. I felt it was very necessary, in short, to encourage productivity growth, to encourage savings. I am not a Keynesian. I don't believe that you can handle economic policy, solely by taking those steps that will stimulate consumption. I think you've got to...to give some incentive to savings, too."

FRANK STASIO: Productivity growth did speed up some in the eighties, and supply-siders were quick to take the credit.

BARBER CONABLE: "It not...not only led to better productivity, it also led to an increase in produc..., in employment. See, to increase output in employment and production in the system, there are two ways of doing it. One is productivity, which means you get more for each worker, and the other one is, to increase the number of workers. And what you found happening is that both went up. We not only got a lot more employment, we also got a lot more productivity per employee, which is just the perfect combination."

FRANK STASIO: But other economists argued that, what appeared to be supply-side effects were in fact, driven by Keynesian demand theories.

JOHN KENDRICK: "The stimulus of investment helps to increase demand, and through a multiplier, has a ripple effect on the economy. So, that the demand side tax cut of...of President...Presidents Kennedy and Johnson, when Walter Heller was Chairman of the Council of Economic Advisors, from the demand side, the tax cuts were seen as good at that time. And, now, from the supply side, the tax cuts are seen...seen as good because, in both cases, investment was stimulated."

BARBER CONABLE: "You can call it anything you want. The question is, it works. Now, those of us in sort of the academic garb who like to get into the footnotes and argue their, sure, you can say, well, was it a demand shift, or was it a supply shift? Who cares? Production output, employment, increased enormously. Now, I think it was a supply shift."

FRANK STASIO: Kendrick points out that, when policymakers design tax cuts, they should be aware of their effect on the allocation of resources.

JOHN KENDRICK: "In the Tax Act of 1981, sometimes called ERTA, Economic Recovery Tax Act, there were accelerated depreciation allowances permitted, the so-called Accelerated Cost Recovery System. Those tended to affect different industries differently, particularly the industries that had a lot of long-lived equipment, like steel and autos, were benefited more than the industries with less capital goods and with equipment of shorter lives, such as the high-tech kinds of production. So that, even though I don't think the framers of that legislation meant it, the impact was uneven, and that causes some distortion in the allocation of resources in the economy."

FRANK STASIO: Let's recap some of the key points in our discussion on productivity. Productivity is: the relationship between the amount of goods and services that are produced and inputs, including labor, that are used in the process of production. For most of this century, the United States led the world in improvements in productivity. This was largely due to better education and training, technological growth, capital

investment, and abundant natural resources. But, beginning in the late 1960s, the U.S. suffered a slowdown in the rate of productivity growth. Economists attribute the slow rate of growth and productivity in the late '60s and throughout the '70s to the large number of young people and women who entered the workforce during that period, increased government regulation, oil shocks, a decline in the proportion of national output dedicated to research and development, and a falling rate of growth in the capital-to-labor ratio, that is, the proportion of plant and equipment per worker. The government attempted to improve the capital-to-labor ratio by passing a tax package, in 1981, that offered incentives to firms to invest in new equipment. This action was supported by a theory called "supply-side economics" that proposed to stimulate economic growth and productivity by removing government disincentives to invest and produce. Deregulation of certain industries in the late nineteen seventies and early eighties was another attempt to improve productivity. Economists and policymakers felt that government interference in those industries increased production costs and discouraged competition, promoting poor business practices, and reducing productivity. Changes in the growth of productivity are measured in tiny amounts, but even small percentages of decline in the growth rate can have dramatic effects on the nation's standard of living over the course of a generation.

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FRANK STASIO: You've been listening to Economics U\$A, one of a series of programs on micro and macroeconomic principles. Our guest has been John Kendrick, Professor of Economics at George Washington University and adjunct scholar at the American Enterprise Institute. Economics U\$A has been produced by the Educational Film Center. I'm Frank Stasio.

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Announcer: Funding for this program was provided by Annenberg Learner.