ECONOMICS U$A
21st Century Edition

PROGRAM #12

ECONOMIC GROWTH: CAN WE KEEP UP THE PACE?

AIRSCRIPT

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NARRATOR: FUNDING FOR THIS PROGRAM IS PROVIDED BY ANNENBERG LEARNER

DAVID SCHOUMACHER: 1914. From one man in one factory in Michigan came a global revolution. What did Henry Ford to that sparked productivity and economic growth? Some say the days of our economic growth are numbered…that soon there just won't be enough basic raw materials to go around. Are the prophets of doom correct? The revolution today is coming from something we call the world wide web. But can we count on it to drive economic growth?

DAVID SCHOUMACHER: This has been America's century. Giant steps of economic growth have taken us from the buggies of the Auto Age to the enormous galaxy of the internet revolution. Our real gross domestic product has increased tenfold. Our real income per person has more than tripled. Economic Growth: Can We Keep Up The Pace? With the help of economic analysts Richard Gill and Nariman Behravesh we'll examine that question on this 21st Edition of Economics U$A. I'm David Schoumacher.

(MUSIC PLAYS - SERIES OPENING TITLES)

PART I

DAVID SCHOUMACHER: The improvement in our standard of living can be directly tied to the dramatic growth of our economy since the turn of the century. Three times as many goods are now enjoyed by the average American worker. All of this is because of a continuing increase in what economists call "productivity"…the engine of growth. Seventy years ago in the auto industry a productivity revolution took off. How did it begin? And why was it successful? Turn of the century autos were elegant playthings of

the rich. Their purpose, however, was not wholly clear. Perhaps they were best in static pose. Certainly auto industry growth was static. Dozens and dozens of models all designed and produced differently…the culmination of 19th-century craftsmanship. But with the buyers, like Astors, Vanderbilts, Whitneys and Winthrops setting the fashion, $5,000 a car, $50,000 in today's dollars seemed nothing extraordinary. In a Michigan machine shop there was another idea. Could you get a car on the road for under $1,000? In 1905, most of these cars were in the $2,000 range. Henry Ford, a junior partner in the firm, proposed a less expensive Model "N." His senior partners argued for the more expensive Model "K." Alexander Malcolmson and friends lost when Ford bought them out with borrowed money. Thereafter, the Ford would be self-financing, with Henry Ford totally in control. First, he designed the right car…the Model "T." Made for farmers, they would lurch through mud, ford streams, plow through the snow. But there were still only 200,000 cars in a country of 89,000,000 people. If Ford could get the price down to $600, he knew he could tap that vast market. But how to do it…how to improve productivity? Auto industry historian, Steven Meyer…

STEPHEN MEYER III: "Labor…labor turnover…approached 370%. The quit rate was 370% of the workforce. This meant that to maintain a workforce of 13,000, he had to hire something like 54,000 workers over the course of the year. And here is where we get the $5.00 day…a nearly doubling of the unskilled workers' wages to provide the financial incentive for the worker to produce at much more faster rates and much more faster pace."

DAVID SCHOUMACHER: Ford got a grip on labor by doubling his workers' wages, but he had to cut costs radically elsewhere. No longer would cars be built in one place from bottom up, with workers wandering in and out bringing parts. And the product and each of its parts would have to be standardized. Ford said he wanted to make automobiles come through the factory all alike, just like one pin is like another pin when it comes from the pin factory.

STEPHEN MEYER III: "The Model "T" Ford was a very, very complicated product. It had something like 5,000 parts in it. To produce that part, in large numbers especially, you could do it very, very cheaply if those parts never changed. So that once you accept the principle of a standard and unchanging model of an automobile, along with large runs of that automobile, then

you can sit down and say, 'OK, when I build my factory, I'm going to build the factory so that it can produce those parts over and over again.' This is particularly important in terms of machine tools and equipment."

DAVID SCHOUMACHER: By 1914, Henry Ford had completed his plan. Highland Park cost almost 4 million dollars, with an additional investment of 3 million for equipment and tools. The moving assembly line was the ultimate revolution. The line needed conveyor belts, with over-head drive shafts moving materials past the now stationary workers. For moving the chassis, there were endless chains and overhead cranes. And for final assembly, there were gravity slides and rollways. Today, it might look chaotic, Jeri-built, but what was the bottom line? The productivity shot up and was carefully noted by Ford managers.

STEPHEN MEYER III: "They discovered enormous increases throughout the entire plant. For example, the time for the production of the chassis…the main assembly line decreased from about 12 and a half hours to 1 and a half hours. The time for engine assembly also decreased from about 8 and a half hours down to approximately 2 hours. Throughout the plant they discovered that there were increases of 200 all the way up to 800% in the productivity at the Ford Highland Park plant."

DAVID SCHOUMACHER: Each worker now had more equipment around him. And though wages had doubled, output increased much more. In two years, production of the Model "T" rose from 78,000 to 500,000 and the price came down to $600 a car…then in 1916 to $360 a car. Here indeed was more than the farmers' car…truly a car for every man. And the Ford revolution had massive impact beyond the Model "T."

STEPHEN MEYER III: "What happens is that the Ford methods very rapidly diffused through Detroit. Then they moved from industry to industry. It becomes a national and in fact an international movement. There's Fordisimus in Germany, Fordizotzia in the Soviet Union…Everybody is trying to copy this system of production that Ford had built."

DAVID SCHOUMACHER: It might not look like much, this Tin Lizzie, but its meaning extended far beyond Detroit, far beyond the Auto Age. It will not be forgotten. Henry Ford supplied more than the Model "T"…He gave us a model of economic growth for the century. We asked economic analyst Richard Gill to discuss those factors that contribute to increased productivity in a growing society.

ECONOMICS U$A LOGO

(MUSIC PLAYS COMMENT AND ANALYSIS I)

RICHARD GILL: All of us have heard the advertising slogan: "There's a Ford in your future." Certainly there was a prominent Ford in the American past. Henry Ford, in the first half of this century, gave us a textbook lesson on the factors that make for economic growth. In the first place, he showed us that, in many industries, bigger can be better. He took advantage of the large and rapidly growing American market to exploit what economists call economies of scale. As he increased his production runs, he found that his average costs per car fell. This enabled him to lower the price and expand production further. Secondly, he also increased labor productivity by expanding the amount of machinery, plant and equipment each laborer had to work with. This was an increase in the capital/labor ratio. It was exemplified in the Ford factory by all those cranes, chains, drilling machines and the like that his workers used. Thirdly, he did everything in new ways. He paid his workers more. He designed a basically different product. He introduced to the automobile industry a novel method of production: the assembly line. He was, in the terms of the great Austro-American economist, Joseph Schumpeter, an entrepreneur and an innovator. It has sometimes been said that "Yankee know-how" was what made this country great. Henry Ford was clearly one Yankee who did know how!

PART II

DAVID SCHOUMACHER: Growth. In many parts of the world growth means growth of population…growth in poverty…growth in the scarcity of resources. Today, in America, we

take economic growth and our standard of living for granted. But what about the future? What if basic raw materials ran out? What if world population growth and pollution get out of hand? In 1972, a group of experts known as the Club of Rome issued a report called The Limits to Growth. It makes for gloomy reading. What did these growth-busters predict…and could they be right? On population…if current rates of growth continue, the number of people in the world will double by the year 2000. By the time our grandchildren are old the population will have doubled again. Consequent pressure on land and supplies of food would be tremendous. Wide-spread famine and malnutrition would be all pervasive. On industry…the report concluded that if minerals and metals were consumed at the American rate, global supplies would be exhausted in a few decades. They were called "The Club of Rome" only because they met there. In fact, the writers of The Limits to Growth book came from MIT. Professor Jay Forrester, a consultant to the group, summarized their conclusions.

JAY FORRESTER: "The message was that the forces are like an onion. You can peel off one layer and there will be another limit. You can peel off that layer and there will be another limit…that ultimately, there will be a combination of forces that make it impossible for the high growth rate of industrialization and the high growth rate of population to continue through as much as the next century."

DAVID SCHOUMACHER: Population…Jay Forrester recounts their most dire predictions on the forces that will halt population growth.

JAY FORRESTER: "Those forces can be social perception that smaller families are necessary to long term high quality of life. Or it will come about by the sheer pressures of starvation…or the social instabilities that will precipitate an atomic war."

HENRY C. WALLICH : "I thought, then, that there was a large scare element in it…"

DAVID SCHOUMACHER: While a professor at Yale, Henry Wallich began to confront the doomsayers point by point…On population

HENRY C. WALLICH: "Some years ago, I guess ten years ago, there were projections up to thirty billion people…I think they've gradually come down because population growth has diminished and has yielded to the effect of higher standards of living…"

DAVID SCHOUMACHER: With higher standards of living and government persuasion, population growth can level off. Disaster need not strike. On the matter of pollution, political considerations are also as important as economic ones. Anti-pollution technologies are available and the cost of cutting back emissions and cleaning up can be passed along to consumers who'd be willing to bear them. Another major subject in the limits to growth thesis involves basic resources…minerals and oil. "Shortages were imminent," said the growth-busters and in the early '70s they got an immediate boost for their cause.

HENRY C. WALLICH: "One of the most striking things for the Club of Rome was…almost immediately after the book came out, the price of oil jumped up four times. So people said, 'They're right.' Then, five or six years later, it jumped up several times more. So that seemed to be pretty good evidence. Well, now the price of oil is going down…People are not concerned about the basic shortages to the long distant future…The cartel is breaking apart…"

DAVID SCHOUMACHER: Surely, however, oil will run out in a few decades. Not so, say oilmen. As long as there is a profit to be made, new exploration technology will be developed to keep supplies flowing. Dr. Ed David is President of Exxon Research Corporation and a White House Science Advisor.

EDWARD E. DAVID: "With respect to discovering more, geologists today believe that you can use tomographic techniques, which are similar to what was used in the cat scanner for diagnosing disease, for searching in the earth for new deposits of material. And there are all kinds of new exploration tools such as satellites."

DAVID SCHOUMACHER: The impending exhaustion of energy and mineral supplies had been predicted many times before…in 1908, 1944, 1952…By now many minerals should be extinct.

None is. A major survival factor has been substitution between metals and between alternative forms of energy. Such conservation will continue to prevent long run shortages. And, besides, the earth's crust is thirty miles thick and we've barely scratched the surface. No wonder the doomsayers have been proved wrong decade after decade. In all it seems unlikely that economic growth will be stopped dead because of too many people, too much pollution, too few resources. Yet worldwide, there are vast differences between standards of living, and in the next century lower rates of economic growth may come to be accepted in America as the rest of the world catches up.

HENRY C. WALLICH: "Even though we've come to a slowdown, this is nothing fatal…not a collapse…as limits suggest. Low growth rate is not as good as a high one but it's certainly better than stagnation."

EDWARD E. DAVID: "The real point of these models, I think, is that man can learn to control his own future. And I think that's the important point to make. We do have an influence on our future…We can think about what we want it to be and push it in the directions that we think are profitable for our own activities and that will result in a world which is livable."

DAVID SCHOUMACHER: Public prophesy about economic conditions fifty or one hundred years in the future is obviously difficult. Many experts believe that new technologies and the motivations of the marketplace are likely to overcome the doom and gloom predictions of groups like the Club of Rome. We asked analyst Richard Gill what our economic past may imply about the future for our children and grandchildren.

(MUSIC PLAYS - COMMENT AND ANALYSIS II)

RICHARD GILL: At the time of her industrial revolution, Great Britain was running out of forests and timber. She responded by shifting to a coal technology, and production increased many times over. That has actually been the characteristic story of modern economic growth and we see it again today in the case of metals, like copper, and even energy sources, like oil. This

scenario isn't accidental; it is built into the way the market mechanism works. We have first a growing shortage of some resource. The price of this scarce resource goes up. This sets in motion a series of responses. First it becomes profitable to try to find more of this scarce resource. We get added supply. It also becomes advisable to use as little of this now expensive resource as possible. We get conservation. Thirdly, it becomes desirable to focus our scientific and technological attention on developing new products and means of production that use other more plentiful resources. We get Alternative technologies. The results? Well, historically, there is little doubt about the matter. These responses have not only met the resource shortage problem but usually have overshot the mark by a great margin, leading to vast increases in our productive potentialities. In the cases of population growth and pollution, it is difficult to be quite so clear cut. In the matter of pollution, for example, as I've noted in earlier programs, the price system can't be counted on to solve the problem by itself. Here, active preventative steps will have to be taken. Still, even in the case of pollution, new technology is likely to help us out considerably as time goes on. My personal conclusion: We may eventually choose to abandon a growth-oriented society. I doubt that we'll be forced to, certainly not in the years immediately ahead.

PART III

ROB ATKINSON "The Internet is the major economic engine today… Because of the Internet, the world economy is 1.5 trillion times larger in dollars annually than it would have been otherwise…This is about fundamental innovations that then go and transform an entire economy… The newest smart phones are 20,000 times more powerful than the original supercomputers used to design the Internet."

DAVID SCHOUMACHER: The electronic age heralded by the Internet is upon us. Computers and smart phones are pervasive. Could this new technology be the next engine of economic growth? And what, from its inception, triggered the astonishing growth of the Internet?

ROB ATKINSON: "It was interesting at the beginning, the big companies; the established companies, didn't jump in…It was these upstarts, Steve Case at AOL for example, or Jerry Yang at

Yahoo…Jeff Bezos at Amazon, had this idea, he basically said, 'I think this Internet is something real. What could I sell? I think it's books. I think that's probably the best thing.' "

DAVID SCHOUMACHER: Amazon, Yahoo, Google, Facebook - companies started by risk taking innovators whose business plan included the Internet as their primary source for marketing and revenue - all exploded into economic and societal prominence in the late 1990s and early 2000s. The ability to shop online has attracted serious attention from major players in the credit card and retail business. Major banks have modified their services to meet the new demands of its customers. Businesses nationwide have incorporated Internet innovations to grow their business and increase productivity.

MARGARET: "NAPA has an online store. And we have online registration for all of our meetings. Every conference that we have, we deliver the content via webinars…"

PATTI: "We have a Facebook account, a Twitter account."

DAVE: "Many, many websites… You don't want to know how many, a bunch."

KAREN: "We exhibit at a lot of trade shows…This morning I was trying to figure out how much electricity I'd need for that booth because we've got these two big TV monitors that we're going to use that we've never done before. So I went to Google and typed in "how many amps does it take to run a 50" TV? Figured that out to determine how much power I was going to need to order for the show."

DAVE: "I don't know what we don't do through the Internet. Just about everything…"

JON ZEITLER: "Zipcar is a child of the information economy in a very real way."

DAVID SCHOUMACHER: "From top to bottom, Zipcar is a product of the Internet."

JON ZEITLER: "The technology, obviously, is what makes all of this go. If you don't know what it is is really, as we like to say, it's car ownership one hour at a time… You join. You get a membership card…You can pull up our iPhone application and it will show you all the Zipcar locations near you. You'll see what cars are available. You'll be able to click on that car to get some information about it. Reserve it… And then we have the keys in the car once you're in it."

SUZANNE GOLTER: "Hi. I'm Suzanne Golter and this is my company, Happy Hound."

MATT MILLER: "Well, I'm Matt Miller and this is my house in Cedar Rapids, Iowa where I started Mobile Demand."

DAVID SCHOUMACHER: Both Suzanne Golter and Matt Miller built their business around their passion.

SUZANNE GOLTER: "I'm an animal lover. My passion is dogs."

MATT MILLER: "And this is my baby, my rugged tablet PC."

DAVID SCHOUMACHER: Mobile Demand provides complete rugged handheld computer systems for a variety of industries and applications. Happy Hounds is a boutique-style daycare and boarding facility for canines in Oakland, California.

SUZANNE GOLTER: "For the first day or two, I walked into my warehouse at seven o'clock in the morning and I realized I was alone…So at the moment when I was standing in the warehouse with no dogs, I realized that I needed to find ways to market myself…So I sat at my computer and I found Google Adwords…I never in my wildest dreams ever imagined myself owning a business with thirty plus employees, with a hundred and twenty plus dogs a day and thinking of opening more facilities."

DAVID SCHOUMACHER: Quality of life trumps ideal business location at Mobile Demand.

TONI HOGAN: "Most of our customers are located somewhere else worldwide. So we need Google Adwords to help find those customers."

MATT MILLER: "We definitely do targeting in our Adwords campaigns and in our marketing campaigns to certain industries."

TONI HOGAN: "We are doing a lot of business in the agricultural market. And prior to that we were not."

MATT MILLER: "We're gaining a lot of attention from Fortune 50, Fortune 100 companies… We've grown 400% in the last three years. And it's all based on the foundation of our Internet marketing."

ROB ATKINSON: "This is what economists call general-purpose technology. That's what the Internet is. And a general-purpose technology is a technology that powers growth, powers transformation, and it becomes used in everything in an economy and in society."

DAVID SCHOUMACHER: How integral and necessary to our economic growth were the technological changes introduced by the Internet? We asked economic analyst, Nariman Behravesh.

MUSIC PLAYS - COMMENT AND ANALYSIS III)

NARIMAN BEHRAVESH : For millennia living standards were stagnant. However, since 1800—and the beginning of the Industrial Revolution—they have increased by 20 to 30 times in countries such as the United States. Successive waves of new technologies have not only delivered greater productivity and higher levels of material well being, but longer life spans, better health and education, lower levels of poverty, and greater time for leisure.

The Internet is simply the latest—though far from the last—wave of technological change. It has transformed both businesses and the lives of ordinary people. Businesses have used the Internet to improve the ways in which they do business with their suppliers and customers—in many in-

stances reducing the need for intermediaries. It has allowed small companies and start-ups to compete with larger corporations and become large in the process—think Google and Yahoo! It has also fostered the creation of many new companies doing things that had never been done before—think YouTube, Facebook, Twitter and Zipcar.

The Internet has also transformed the lives of ordinary people—allowing them, for example, to comparison shop on line, to make travel arrangements without having to go through a travel agent and to get college credits from home.

Technology has accounted for one-third to one-half of the more rapid growth of the past two centuries—the Internet is no exception.

DAVID SCHOUMACHER: The recipe for economic growth? Henry Ford knew its ingredients. So do today's businessmen and entrepreneurs. And what has been true for autos and digital communications will be true far into the future as we strive to maintain and even increase reasonable levels of growth on Planet Earth. There must be technology and investment in it, balanced by a concern for protecting the environment…Then productivity can be sufficiently increased to supply the growing demand of all our people. For this 21st Century edition of Economics U$A, I'm David Schoumacher.

MUSIC & ECONOMICS U$A CREDITS

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