

An hourglass with a wooden frame and glass bulbs. The top bulb is filled with gold coins. The bottom bulb is empty. The hourglass is set against a background of US dollar bills, with the words "THE UNITED STATES OF AMERICA" and "FEDERAL RESERVE NOTE" visible. The lighting is dramatic, with strong highlights and deep shadows.

Time Well Spent

The Declining *Real* Cost of
Living in America

1997 Annual Report
Federal Reserve Bank of Dallas



*Time is money, they say.
But money,
rather than time,
is how we usually keep score.*

We use money to value our work and the things we buy. When we say we have trouble keeping up with the Joneses, we're talking about money, not time. That's why whenever we get close to the Joneses, they refinance.

While money has become a more nearly constant measure of value in recent years, it remains imperfect. Inflation makes money an elastic standard over time, like a rubber yardstick. That's why this year's annual report essay looks behind money to time as a measure of our economic progress. Our progress is best gauged by the shrinking work time it

takes to pay for the necessities and luxuries of life. Work time enables us to compare our productivity and standard of living over the long haul.

What such comparisons show is that our free enterprise system drives down real prices so goods and services once within the reach of only the most wealthy become affordable by the rest of us. For example, once upon a time only Peter, Paul and Mary could afford to leave on a jet plane. Now I can, too, if I buy my ticket two weeks in advance and stay over a Saturday night. The essay cites other results of our great productivity machine.

Our essay, "Time Well Spent: The Declining *Real* Cost of Living in America," continues the Dallas Fed's recent series of optimistic looks at our dynamic free enterprise system, the

world's greatest engine of growth and prosperity and its greatest welfare program. In 1997 the Dallas Fed's exploration of market-based solutions to public policy problems included conferences on education reform, the potential for markets to allocate water in Texas efficiently, the economic impact of immigration, market-driven health care, privatization of local government services, and microlending as a means of helping low-income individuals own their own business. Our economic research also dealt with a wide range of public policy issues, beyond the traditional focus on monetary theory and policy.

Our optimism about the American economy was well placed last year. Real GDP grew almost 4 percent, employment was up 3.2 million, unemployment fell to 4.7 percent and the Consumer Price Index increased only 1.7 percent. The best performance in years in both unemployment and inflation left many less optimistic souls scratching their heads. We, however, expect more of the same in 1998.

Most good things about the national economy in 1997 were even better in the Eleventh Federal Reserve District. Employment growth, particularly in Texas, continues to outpace the national average. District banks are sharing in the prosperity; they are sound, liquid and well capitalized. Texas bankers finally succeeded in getting antiquated restrictions on home-equity lending partially removed, which should unlock capital for the state's homeowners. That plus the refinancing boom triggered by low mortgage rates should give the Texas economy an extra kick in 1998. Keep it between the ditches, boys and girls. No more "goin' and blowin'" this time around.

Bob McTeer

Robert D. McTeer, Jr.
President and Chief Executive Officer

Time Well Spent

The Declining *Real* Cost of Living in America

By W. Michael Cox and Richard Alm

Queen Elizabeth owned silk stockings. The capitalist achievement does not typically consist in providing more silk stockings for queens but in bringing them within the reach of factory girls in return for steadily decreasing amounts of effort.

Joseph Schumpeter

Capitalism, Socialism, and Democracy

As America exits the 20th century, we'd be hard-pressed to find a five and dime store. Penny candy now goes for a nickel. Five cents no longer buys a good cigar. Dime novels can't be found. Even a 3¢ stamp costs 32¢. Over the century, prices have gone up. The buying power of a dollar is down. We know this from statistical measures of inflation. We know it also from Grandpa's stories about paying 15¢ for a ticket to *Gone With the Wind* or 19¢ for a gallon of gasoline. Even a casual observer of the U.S. economy can see that the prices of milk, bread, houses, clothes, cars, and many other goods and services rise from year to year.

The cost of living is indeed going up—in money terms. What really matters, though, isn't what something costs in money; it's what it costs in time. Making money takes time, so when we shop, we're really spending time. The real cost of living isn't measured in dollars and cents but in the hours and minutes we must work to live. American essayist Henry David Thoreau (1817–62) noted

this in his famous book, *Walden*: “The cost of a thing is the amount of . . . life which is required to be exchanged for it, immediately or in the long run.”

The shortcoming of money prices is that they mean little apart from money wages. A pair of stockings cost just 25¢ a century ago. This sounds wonderful until we learn that a worker of the era earned only 14.8¢ an hour. So paying for the stockings took 1 hour 41 minutes of work. Today a better pair requires only about 18 minutes of work. Put another way, stockings cost an 1897 worker today's equivalent of \$22, whereas now a worker pays only about \$4. If modern Americans had to work as hard as their forebears did for everyday products, they'd be in a continual state of sticker shock—\$67 scissors, \$913 baby carriages, \$2,222 bicycles, \$1,202 telephones. (See *Exhibit 1: The High Cost of Living, 1897 Style*.)¹

The best way to measure the cost of goods and services is in terms of a standard that doesn't change—time at work, or real prices.² There's a regular pattern to real prices in our dynamic economy.



When a product first comes onto the market, it's typically very expensive, affordable for only society's wealthiest. Soon thereafter, though, its price falls quickly and the product spreads throughout society. Once the good or service becomes commonplace, its price usually continues to fall, but at a slower rate. This tendency shows up in such everyday purchases as housing, food, clothing, gasoline, electricity and long-distance telephone service. It also applies to manufactured goods—automobiles, home appliances and the modern age's myriad electronic marvels. And year after year it takes less of our work time to buy entertainment and services—movies, haircuts, airline tickets, dry cleaning and the like. In a very real sense, the cost of living in America keeps getting cheaper. By harnessing the natural power of income distribution, free markets have routinely brought the great mass of Americans products once beyond even the reach of kings.³

EXHIBIT 1: *The High Cost of Living, 1897 Style*

Item	1897 Sears catalog price	1997 work-equivalent price*
1 lb. box of baking soda	\$.06	\$ 5.34
100 lb. 16d nails	1.70	151.39
Garden hoe	.28	24.94
26" carpenter's saw	.50	44.53
13" nail hammer	.42	37.40
9" steel scissors	.75	66.79
Aluminum bread pan	.37	32.95
Ironing board	.60	53.43
Telephone	13.50	1,202.23
Men's cowboy boots	3.50	311.69
Pair men's socks	.13	11.58
Pair ladies' hose	.25	22.26
200 yd. spool of cotton thread	.02	1.78
Webster's dictionary	.70	62.34
One dozen pencils	.14	12.47
250 manila envelopes	.35	31.17
1 carat diamond ring	74.00	6,590.00
Upright piano	125.00	11,131.76
Bicycle	24.95	2,221.90
Baby carriage	10.25	912.80

* Prices are in terms of how much a manufacturing employee would earn today working the same number of hours required to afford the product in 1897. For example, a 1-pound box of baking soda sold for 6¢ in 1897. At an average hourly wage of 14.8¢ the typical manufacturing worker would have had to labor 24 minutes to earn enough to buy the box of soda. Today, 24 minutes earns that worker \$5.34.

AFFORDING THE BASICS

Americans come in all shapes and sizes. We differ in height and weight, gender, race and age. We vary in talents, skills, education, experience, determination and luck. Quite naturally, our paychecks differ, too. Some of us scrape by at minimum wage, while movie stars, corporate chieftains and athletes sometimes make millions of dollars a year.

In appraising the nation's cost of living, it's what the average American can afford that matters. Calculations of the work time needed to buy goods and services use the average hourly wage for production and nonsupervisory workers in manufacturing.⁴ A century ago this figure was less than 15¢ an hour. By 1997 it had hit a record \$13.18, a livable wage but nothing worthy of *Lifestyles of the Rich and Famous*. What's most important about this wage is that it represents what's earned by the great bulk of American society. (See *Exhibit 2: Average Hourly Wages, 1897–1997*.)

In calculating our cost of living, a good place to start is with the basics—food, shelter and clothing. In terms of time on the job, the cost of a half-gallon of milk fell from 39 minutes in 1919 to 16 minutes in 1950, 10 minutes in 1975 and 7 minutes in 1997. A pound of ground beef steadily declined from 30 minutes in 1919 to 23 minutes in 1950, 11 minutes in 1975 and 6 minutes in 1997. Paying for a dozen oranges required 1 hour 8 minutes of work in 1919. Now it takes less than 10 minutes, half what it did in 1950. The money price of a 3-pound fryer chicken rose from \$1.23 in 1919 to \$3.15 in 1997, but its cost in work time fell from 2 hours 37 minutes to just 14 minutes. A sample of a dozen food staples—a market basket broad enough to provide three squares a day—shows that what required 9.5 hours to buy in 1919 and 3.5 hours in 1950 now takes only 1.6 hours. (See *Exhibit 3: Our Daily Bread*.)

EXHIBIT 2:

Average Hourly Wages, 1897–1997

It's hard to fathom, but turn-of-the-century factory workers earned barely 15¢ an hour for their efforts. Manufacturing wages, shown here, were then among the best in the nation but today are roughly equal to averages in other sectors.

Average Weekly Wages by Industry, 1897

Automobile	\$ 7.37
Blast furnace	10.62
Brick	7.44
Cotton goods	6.72
Foundry	8.41
Leather	7.96
Lumber	7.68
Marble	8.97
Paper	8.92
Petroleum	10.74
Rope	8.40
Shipbuilding	9.90
Slaughtering	9.24
Soap	9.60
Tobacco	7.74
All Industry	8.88

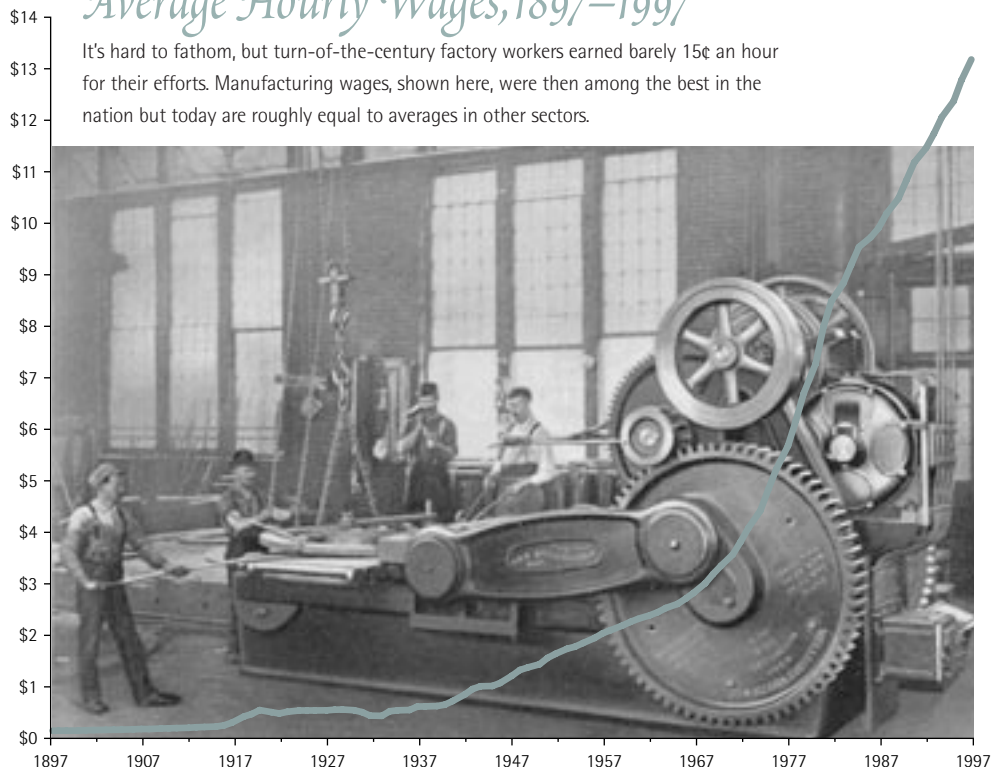




EXHIBIT 3:
Our Daily Bread



**FOOD ITEMS,
IN MINUTES OF WORK**

	1919	1997
Tomatoes, 3 lb.	101	18
Eggs, 1 dozen	80	5
Sugar, 5 lb.	72	10
Bacon, 1 lb.	70	12
Oranges, 1 dozen	68	9
Coffee, 1 lb.	55	17
Milk, half-gallon	39	7
Ground beef, 1 lb.	30	6
Lettuce, 1 lb.	17	3
Beans, 1 lb.	16	3
Bread, 1 lb.	13	4
Onions, 1 lb.	9	2

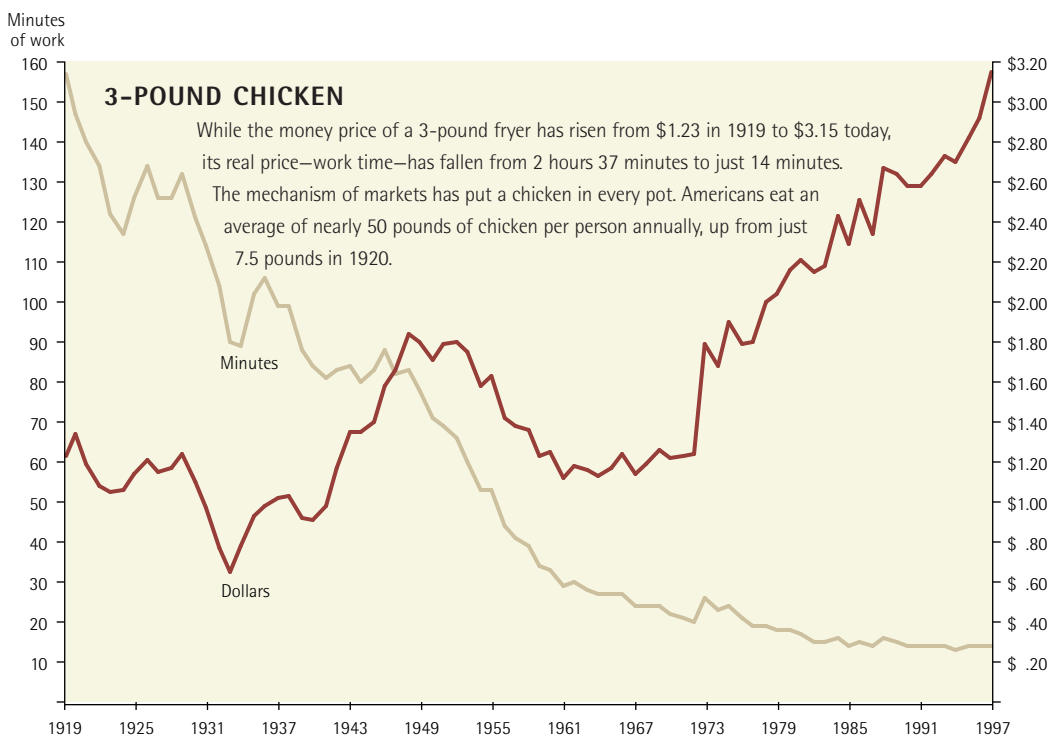


EXHIBIT 4: *Gimme Shelter*



1920

\$4,700

7.8 hr. per sq. ft.

1956

\$14,500

6.5 hr. per sq. ft.

1996

\$140,000

5.6 hr. per sq. ft.

The price of a new home has gone up over the century, but the homes—and our paychecks—have gotten bigger, too. Adjusting for the additional square footage and higher wages, the price per square foot of new housing is lower today than in 1920 and 1956. Plus, today's homes come equipped with many more amenities—from central heat and air-conditioning to a full range of kitchen appliances.

AMENITIES

Percentage of new houses equipped with...

1956

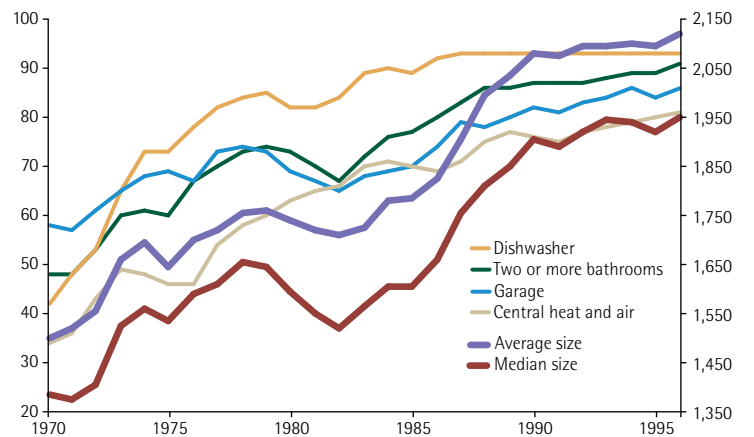
1996

Garage	50	86
Three or more bedrooms	78	87
Two or more bathrooms	28	91
One or more fireplaces	35	62
Two stories or more	6	47
Insulation in the walls	33	93
Storm windows	8	68
Central heat and air	6	81
Range	1	94
Dishwasher	11	93
Refrigerator	5	18
Microwave	0	85
Garbage disposal	34	90
Garage door opener	<1	78
Median price	\$14,500	\$140,000
Median square footage	1,150	1,950
Median price per sq. ft.	\$ 12.61	\$ 71.79
Average hourly wage	\$ 1.95	\$ 12.78
Hours of work per sq. ft.	6.5	5.6

Percentage equipped with

FEATURES OF NEW HOMES

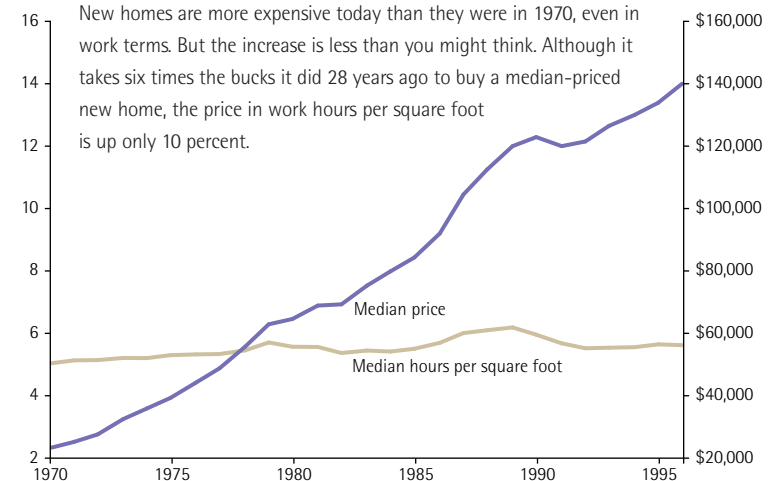
Square feet



Hours of work per square foot

COST OF A NEW HOME

New homes are more expensive today than they were in 1970, even in work terms. But the increase is less than you might think. Although it takes six times the bucks it did 28 years ago to buy a median-priced new home, the price in work hours per square foot is up only 10 percent.



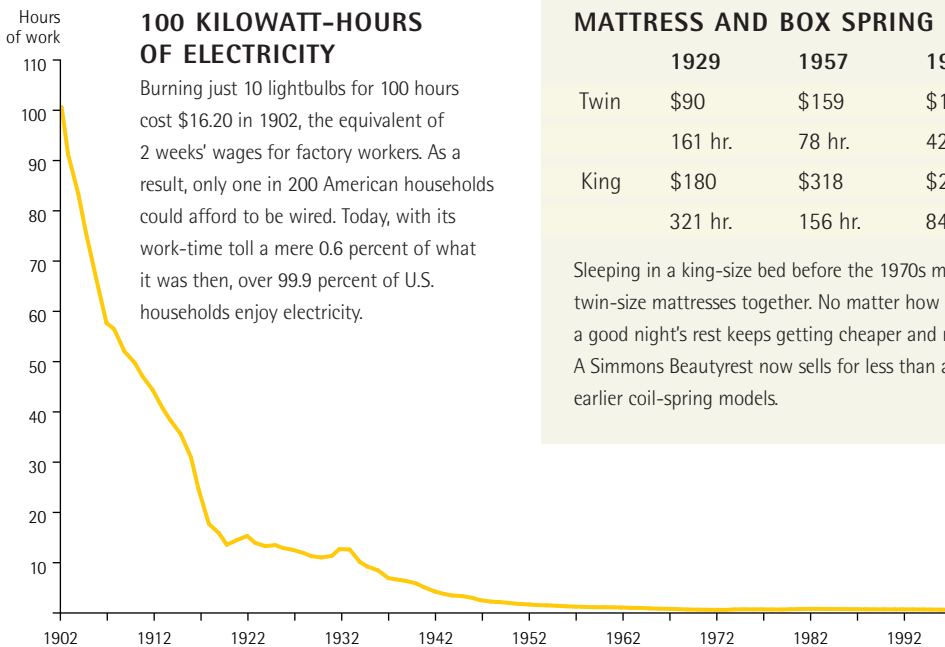
Americans' homes sell for a lot more than they once did. In 1920, the median price of a new house was \$4,700. Forty years ago, as America moved to the suburbs, a typical family paid \$14,500 for a new house. Today, the median price is up to \$140,000. Housing inflation has outstripped the rise in wages, so the comfort of a roof overhead must be getting more expensive, right? Not really. Today's homes are more expensive, but they're also a lot bigger, so for comparison purposes their price must be expressed in cost per square foot.⁵ By that measure, the work-time cost of new homes fell from 7.8 hours in 1920 to 6.5 hours in 1956 and 5 hours in 1970, but then rose to 5.6 hours in 1996. (See *Exhibit 4: Gimme Shelter.*)

It's true that from 1970 to 1996 the work-time cost of a square foot of housing rose just over half an hour. It's a mis-

take, however, to jump to the conclusion that the trend toward greater value in housing ended a generation ago. These days we're getting more home for our money. Today's new homes are more likely to come with central heat and air-conditioning, major kitchen appliances, a garage, an extra bathroom or two, ample insulation, storm windows and many other extras. The basic price of today's new homes includes these amenities, so it's impossible to calculate exactly what's happened to the real cost of housing. But it's a safe bet that the added features more than offset the extra 10 percent of work time. And families have continued to get smaller over the past quarter century. Taking into account the shrinkage in average household size, an individual's housing cost, expressed in work time, is actually 6 percent cheaper today than in 1970. Two-thirds of Americans

now own their own home—the highest percentage in history and up from 45 percent in 1920.

Much of what's in our homes is getting cheaper, too. Over just the past 27 years, consumers have benefited from work-time declines of 60 percent for dishwashers, 56 percent for vacuum cleaners, 40 percent for refrigerators and 39 percent for lawn mowers. (See *Exhibit 5: Domestic Servants.*) The cost of a twin mattress and box spring fell from 161 hours in 1929 to 78 hours in 1957, 42 hours in 1970 and 24 hours in 1997. A room air-conditioner now costs less than 4 hours of work for each 1,000 BTUs, down from 7.5 hours in 1970 and more than 40 hours when first introduced in 1952. Since entering the market, portable radio prices have declined from more than 13 hours to less than 1 hour of work.



MATTRESS AND BOX SPRING

	1929	1957	1970	1997
Twin	\$90	\$159	\$140	\$320
	161 hr.	78 hr.	42 hr.	24 hr.
King	\$180	\$318	\$280	\$799
	321 hr.	156 hr.	84 hr.	61 hr.

Sleeping in a king-size bed before the 1970s meant pushing two twin-size mattresses together. No matter how much room you prefer, a good night's rest keeps getting cheaper and more comfortable. A Simmons Beautyrest now sells for less than a fifth of the company's earlier coil-spring models.

AIR-CONDITIONER

	1952	1970	1997
	\$350	\$150	\$299
	213 hr.	45 hr.	23 hr.

Since sweltering Southerners first stuck air-conditioners in their open windows, the units' work-time cost has been slashed by 90 percent.

EXHIBIT 5: *Domestic Servants***RANGE**

1910	1950	1970	1997
\$67	\$420	\$380	\$288
345 hr.	292 hr.	113 hr.	22 hr.

Hughes Electric's three-burner stove listed for \$40 in 1910 (a separate oven cost \$27), the equivalent of about 5 weeks' wages for middle-income Americans. General Electric's midline models today sell for around \$288, less than one-tenth the work-time cost of comparable models offered in the 1950s.

DISHWASHER

1913	1954	1970	1997
\$100	\$250	\$230	\$370
463 hr.	140 hr.	69 hr.	28 hr.

Walker Brothers electrified its manual dishwashing appliance in 1913, creating the first "automatic" dishwasher. Owning one would have been an expensive proposition for the common laborer, requiring more than 2 months' wages, not including the cost of replacing all the broken dishes. Today's \$370 units require about 4 days' wages, approximately 40 percent of that in the 1970s.

REFRIGERATOR

1916	1958	1970	1997
\$800	\$700	\$375	\$900
3,162 hr.	333 hr.	112 hr.	68 hr.

The Guardian electric refrigerator was first manufactured in an old Detroit organ factory in 1916. Units were insulated with seaweed and boasted 9 cubic feet of storage. At \$800 each, only the city's wealthy could afford one, and the company sold just 40. Today's 20-cubic-foot Frigidaire units come with ice makers, frost-free freezers and more. Yet they're available for just a fifth of the work-time cost of even 1950s models.

CLOTHES WASHER

1911	1956	1970	1997
\$110	\$270	\$240	\$338
553 hr.	138 hr.	72 hr.	26 hr.

The Thor, made by Hurley Machine Co., was one of the first electric clothes washers. It was chain driven and a hazard to long skirts of the day. Today's models have more features, require less repair and are more energy efficient, yet sell for about a third the work-time cost of 1970 models.

CLOTHES DRYER

1940	1956	1970	1997
\$130	\$230	\$190	\$340
198 hr.	118 hr.	57 hr.	26 hr.

Introduced in 1940, General Electric's AD-3 clothes dryer used 220 volts of electricity, handled 7 pounds of wet clothes and cost about 5 weeks' factory wages. Fifty years later, GE's dryers are bigger, use a fraction of the energy and include moisture sensors and other features, but they cost just an eighth of the job time they once did.



There are bargains in the closet as well. After aviator Charles Lindbergh became the toast of two continents by flying solo from New York to Paris in 1927, he toured the United States in a Hart Schaffner & Marx suit that cost \$42.95. It would have taken an Average Joe 79 hours to buy that outfit. Today the same company sells comparable suits for \$525, the equivalent of 40 hours of work. Over the past century, the work-time cost of a pair of Levi's jeans has fallen by nearly 7 hours, to 3 hours 24 minutes.⁶

With basics such as these costing less, more of our budgets can go toward other products. In 1901, the average family spent three-quarters of its income on food, shelter and clothing. Almost a century later, it's little more than a third.



DRY-CLEANING A DRESS

1946	1970	1997
\$1.25	\$1.70	\$6.50
70 min.	30 min.	30 min.

Although dry-cleaning a dress costs less than half what it did 50 years ago, its price in work time hasn't declined since 1970. Today's machines use a microprocessor to monitor temperature so clothes don't get overdried, and they're equipped with environmentally friendly condensers that recover cleaning solution.



LEVI'S

Levi Strauss sold his first pair of jeans—made from tent canvas—to California gold miners in 1853. Jeans have since undergone numerous improvements, including today's popular presoftened treatment. Still, work-time prices are only about a third what they were at the turn of the century.



MAN'S SUIT

1927	1970	1997
\$42.95	\$165	\$525
79 hr.	49 hr.	40 hr.

Seventy years after Charles Lindbergh toured America in a \$42.95 suit provided by Hart Schaffner & Marx, the company's suits go for roughly \$525. Their work-time cost, though, is just half what it was back then.

THE COST OF LIVING HIGH

When people talk about the high cost of living, they're usually talking about the cost of living high. But moving beyond the basics, in the currency of work time almost everything else we buy is getting cheaper, too. Take transportation.

If any invention has made its mark on American culture, it's the automobile. We consider it our birthright to own a car—often two or three. Within a few years, the United States will likely become the first country to have more vehicles than people.⁷ In 1908 a typical factory worker had to toil more than 2 years to buy Ford's Model T, one of the nation's first affordable cars.⁸ A 1997 Ford Taurus costs today's worker just 8 months. Of course, few of us would pay even \$850 for a Model T today, at least not for everyday transportation. Today's cars are just so much better. Going back only one generation, we can see an enormous improvement in the quality of cars and trucks. Today's vehicles last longer. They require less maintenance, with some 1997 models traveling 100,000 miles before their first tune-up. They're more comfortable because of air-conditioning, power seats and adjustable steering columns. They often include such extras as power windows, sunroofs, tinted glass, cruise

control and compact disc players. They're safer with the addition of air bags and antilock brakes, which have contributed to the decline in traffic fatalities from 7.6 per 100 million miles traveled in 1950 to 1.9 today. As with housing, part of the increase in auto prices stems from better quality. So although buyers are shelling out more money than they once did, cars have never been such good values. (See *Exhibit 6: Kings of the Road.*)

Drivers may grumble when they pull into a service station, but a gallon of gasoline required just 5.4 minutes of work in 1997, compared with 6.6 minutes in 1970, three years before the Arab oil embargo caused prices to surge. If we consider the 60 percent increase in average miles per gallon since 1970, the work time to drive a typical car 100 miles has been nearly halved over the past quarter century—from 49 minutes in 1970 to 28 minutes today. The price of an automobile tire has risen from \$13 in the mid-1930s to about \$75 today. However, today's steel-belted radials last more than 42,000 miles, a big increase from the 16,000 miles for the nylon tires of the 1950s or the 2,000 miles for the 3½-inch, cotton-lined tires of the early 1920s. Based on work time per 1,000 miles, tires are now cheaper than ever.

THE SHARE FOR FOOD, CLOTHING AND SHELTER

	1901	1995
Food	46.4%	14.0%
Clothing	14.7%	5.3%
Shelter	15.1%	18.4%
Total	76.2%	37.7%

Even working a shorter week than at the turn of the century, Americans today don't have to spend as much of their income on the basics. With the gains in what our work time buys, expenditures for food, clothing and shelter consume only 38 percent of a typical household's budget, not the 76 percent they once did.

EXHIBIT 6: *Kings of the Road*



1908



1955



1997

\$850

\$3,030

\$17,995

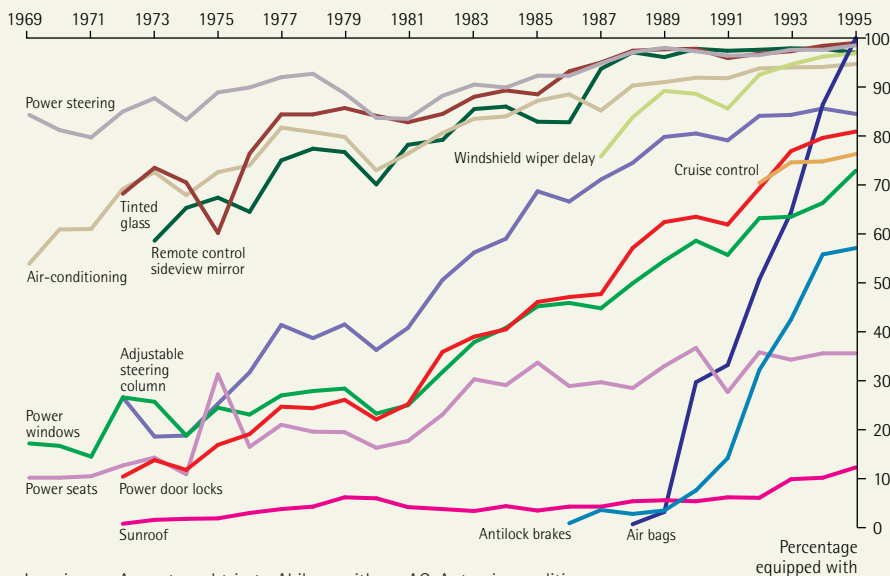
4,696 hr.

1,638 hr.

1,365 hr.

FEATURES OF NEW CARS

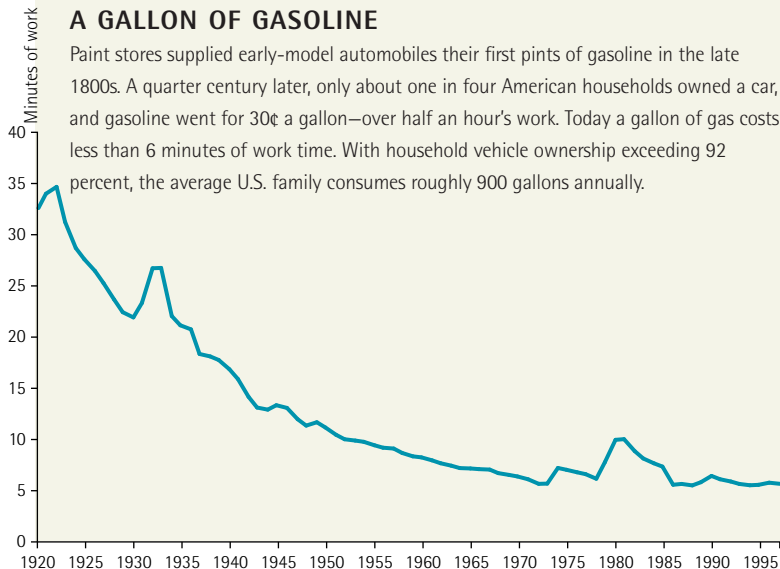
In the currency of work time, today's Ford Taurus costs about 17 percent less than the celebrated 1955 Fairlane and more than 70 percent less than the first Model T, introduced in 1908. And that's without any adjustment for quality. Early cars rarely had an enclosed body, tires couldn't be removed from rims and buyers had to purchase a separate anti-kickback device to prevent broken arms. Today's models embody literally hundreds of standard features—from air-conditioning and antilock brakes to computer-controlled carburetors and CD players—making driving safer, more economical and more fun.



Imagine an August road trip to Abilene with no AC. Auto air-conditioners were introduced in the mid-1950s, but as late as 1969 only half of new cars had them. Dozens more standard features have been added over the past two decades.

A GALLON OF GASOLINE

Paint stores supplied early-model automobiles their first pints of gasoline in the late 1800s. A quarter century later, only about one in four American households owned a car, and gasoline went for 30¢ a gallon—over half an hour's work. Today a gallon of gas costs less than 6 minutes of work time. With household vehicle ownership exceeding 92 percent, the average U.S. family consumes roughly 900 gallons annually.



AUTO RENTAL

1970 1997

\$99 \$247

30 hr. 19 hr.

Renting a Ford sedan from Hertz for a week in 1970 cost roughly 60 percent more work time than renting a Ford Taurus does today.

Much of today's consumption centers on leisure. What helps make the good times good is the declining real cost of life's pleasures—little and big. The price of a movie declined from 28 work minutes in 1970 to 19 minutes in 1997. Compared with a generation ago, each 1,000 miles of air travel now requires 6½ hours less work. A seven-day Caribbean cruise slipped from 51 hours in 1972 to 45 hours in 1997.

It's even getting cheaper to look our best: work time for dry-cleaning a dress is half what it was in 1946, and a woman's haircut is down 27 percent since 1950. Soft contact lenses have plummeted from more than 95 hours' wages in 1971 to less than 4 today—and the latest versions can be worn longer.



WOMAN'S HAIRCUT

1920	1950	1997
\$.25	\$1.50	\$10
27 min.	63 min.	46 min.

There's no accounting for taste and style, but there is for expense. Today's woman's haircut costs less in work time than in 1950 but more than in 1920.

SOFT CONTACTS

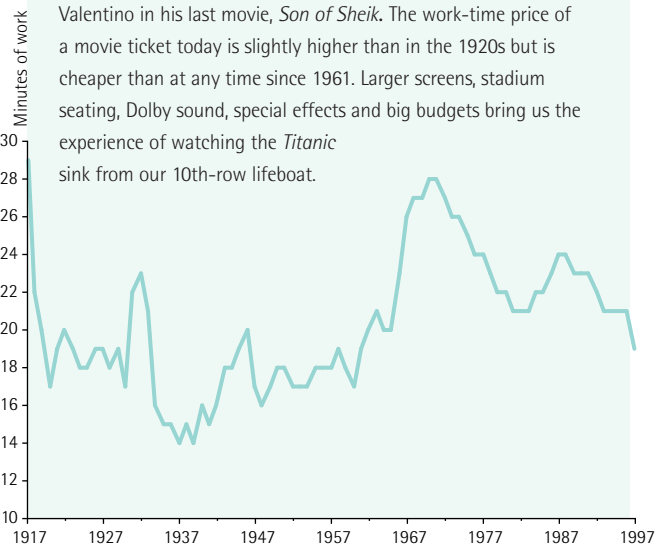
1971	1997
\$340	\$50
95 hr.	4 hr.

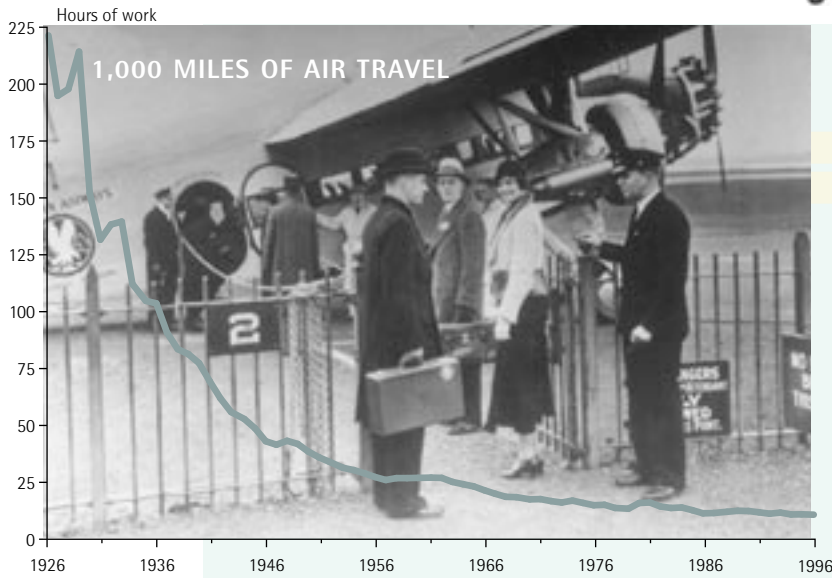
Before soft contact lenses became available in 1971, half of contact wearers eventually abandoned the struggle and went back to eyeglasses. Even at \$340 a pair—the equivalent of more than 2 weeks' work—the first soft contacts were a good buy. Today's safer lenses can be worn longer and in terms of work time cost about 4 percent of the 1971 price.

MOVIE TICKET

1926	1954	1970	1997
\$.17	\$.49	\$1.55	\$4.25
19 min.	17 min.	28 min.	19 min.

Moviegoers paid 17¢ in 1926 to watch silent film star Rudolph Valentino in his last movie, *Son of Sheik*. The work-time price of a movie ticket today is slightly higher than in the 1920s but is cheaper than at any time since 1961. Larger screens, stadium seating, Dolby sound, special effects and big budgets bring us the experience of watching the *Titanic* sink from our 10th-row lifeboat.





COAST-TO-COAST FLIGHT

1930	1951	1997
\$200	\$110	\$209
366 hr.	71 hr.	16 hr.

American Airways' Ford Tri-Motor had a top speed of 120 mph, carried 12 passengers and bumped along 2,000 feet up for the first coast-to-coast plane trip in 1930. The trip included 10 stops, one of them overnight. Passengers carried all their luggage on board, plugged their ears with cotton wool and were warned not to throw anything out the plane's windows. Cabins were not heated, air-conditioned or pressurized. The 36-hour trip cost \$200—nearly 2 months' work for the typical factory hand—so passenger rosters read like the invitation list to a royal ball. The tab for today's 5-hour trip runs about 2 days' wages, just 4 percent of 1930's work price and less than a fourth of 1951's toll. Americans of virtually all income classes travel, racking up a per capita average of more than 1,000 air miles annually.

7-DAY CARIBBEAN CRUISE

1972	1997
\$195	\$599
51 hr.	45 hr.

When it entered the market in 1972, Carnival Cruise Lines helped pioneer the contemporary cruise—lower priced, shorter, more affordable excursions for the average American rather than an elite, elderly few. Designed to be unstuffy and unintimidating, modern cruises offer passengers fine dining, pools, spas, cocktail parties, casinos, orchestras, first-run movies and more. The number of Americans taking cruises is up from just half a million in 1970 to 4.5 million today.

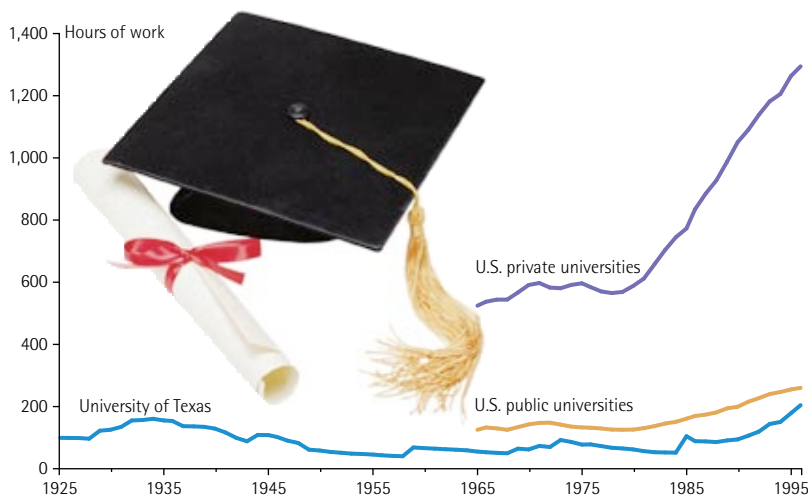


We're a nation on the go, grabbing fast food and snacks. Americans may be eating more of these foods because they're getting cheaper. Buying a large pepperoni pizza costs an eighth less work time than in 1958—and today we can get it delivered to our door. A 6.5-ounce bottle of Coca-Cola has declined from 5.5 minutes in 1920 to 3.5 minutes in 1970 to 1.5 minutes today. In 1940 Californians paid 30¢—nearly half an hour's wages—for the McDonald brothers' first burger—a one-eighth pounder. Today's one-fifth-pound Big Mac costs \$1.89, the equivalent of just 8.6 minutes' work. The price of a Hershey's chocolate bar has risen from 10¢ to 45¢ over the past 23 years; still, its price in work time is a mere 2 minutes, a tenth of what it cost at the turn of the century. A five-stick pack of Wrigley's chewing gum has jumped

from a nickel to a quarter since 1964, but its work cost has ebbed by 24 seconds. (See *Exhibit 7: Food on the Go.*)

Americans do, of course, have to work longer to buy some goods and services. Paying for higher education and medical care requires more hours of work than it used to. Tuition and fees at public colleges, for example, have doubled in terms of work time since the mid-1970s. Inflation has been even steeper at America's private institutions.⁹ But such higher prices are rarely without justification. In many cases the quality of what we're getting for our money has improved.

Few of us would deny that medical care is better than it used to be. After all, the past quarter century has brought a wealth of new diagnostic tools and drugs to treat ailments that range from cancer to depression. But, given the general public's disenchantment with American education, the notion that what colleges provide students today may actually be worth more might raise eyebrows. An accurate measure of the cost of education would require extensive information about its quality, much of it subjective. One objective measure, however, is the value the economy puts on a sheepskin. Workers with a bachelor's degree earn an average of \$16,504 a year more than high school graduates today, up from \$10,488 more in 1979.



UNIVERSITY EDUCATION

The cost of higher education is up—about double the work hours required in 1979. Today's college graduates, however, make an average of \$16,504 a year more than high school graduates, up from \$10,488 back then. The extra \$6,016 earned annually, over a 40-year work life, amounts to almost \$250,000 more in lifetime income than in 1979—more than enough to cover the higher tuition and fees. Moreover, students may emerge from college better educated. (Income figures are in 1996 dollars.)

EXHIBIT 7: *Food on the Go*

BIG MAC

1940	1997
\$.30	\$1.89
27 min.	9 min.

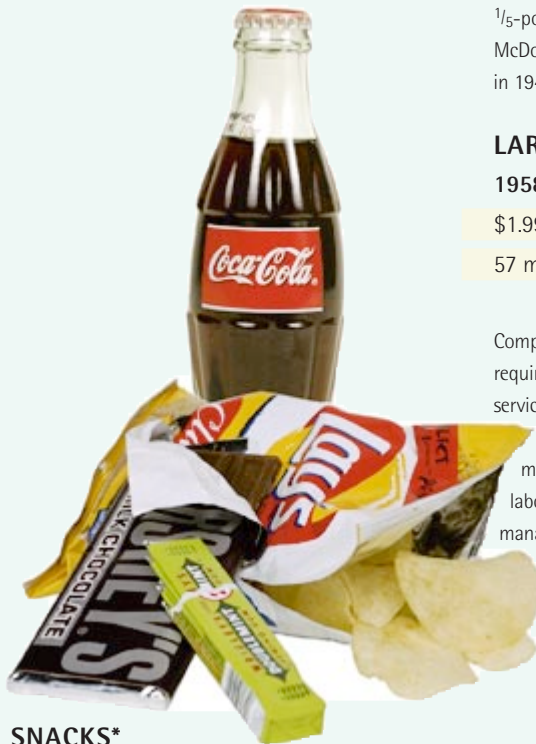
In the currency of work time, today's 1/5-pound Big Mac costs a third of the McDonald brothers' 1/8-pound burgers in 1940.



LARGE PEPPERONI PIZZA

1958	1970	1980	1997
\$1.99	\$3.99	\$7.99	\$10.99
57 min.	71 min.	66 min.	50 min.

Compared with the huge initial investment required to start, say, long-distance phone service, the outlay for setting up a pizza shop is relatively small. Even with mostly recurring costs—ingredients, labor, rent and so on—Pizza Hut has managed to cut the work-time tab for its large pepperoni pizza from 57 minutes in 1958 to just 50 today.



SNACKS*

	1900	1910	1920	1930	1940	1950	1964	1974	1984	1997
Soft drink	5¢	5¢	5¢	5¢	5¢	7¢	16¢	22¢	28¢	33¢
minutes	19.9	15.5	5.5	5.5	4.6	2.8	3.8	3.0	1.8	1.5
Candy bar	5¢	5¢	5¢	5¢	5¢	5¢	5¢	10¢	30¢	45¢
minutes	19.9	15.5	5.5	5.5	4.6	2.1	1.2	1.4	2.0	2.0
Gum	5¢	5¢	5¢	5¢	5¢	5¢	5¢	11¢	18¢	25¢
minutes	19.9	15.5	5.5	5.5	4.6	2.1	1.2	1.5	1.2	1.1
Chips	—	—	—	—	—	—	15¢	25¢	35¢	50¢
minutes	—	—	—	—	—	—	3.6	3.4	2.3	2.3

A Coke, a Hershey bar and a pack of Wrigley's gum were each just a nickel for decades. Today average prices range from 25¢ to 45¢, but the work-time cost is a mere tenth or less of its 1900 level.

*Units are a 6.5-ounce bottle, a 1.55-ounce bar, a 5-stick pack and a 1-ounce bag.

FALLING FASTER AT FIRST

In looking at the work-hour cost of living, it's clear that most of the good news comes as products permeate the marketplace. In minutes of work, orange prices fell 63 percent from 1919 to 1938. It took another 60 years to match that decline. The work time required to buy a pack of Wrigley's chewing gum fell an average of 7 percent a year in the first two decades of the 20th century but less than 2 percent a year after 1920. The real price of a gallon of gasoline halved in the 21 years from 1920 to 1941; it took another 45 years to equal that. Still, it's encouraging that the real cost of most of these products has continued to drift lower.

Americans are always buying goods and services that are in the early stages

of their product cycle. Often, money prices fall fast at first. A handheld calculator too bulky to fit easily into a pocket or purse sold for \$120 in 1972.¹⁰ A mere quarter century later, true pocket calculators sell for \$10—cheaper than a slide rule was in 1952. A 25-inch color television with remote control went for as little as \$299 in 1997, compared with \$620 in 1971 and more than \$1,000 for early color sets in the mid-1950s.¹¹ Videocassette recorders entered the mainstream market at \$985 in 1978. Twenty years later, VCRs offering surer picture tracking, on-screen programming and other features cost less than \$200. Cellular phones sold for \$4,195 in 1984; they're available for \$120 or less today. Better



COLOR TELEVISION

1954	1971	1997
\$1,000	\$620	\$299
562 hr.	174 hr.	23 hr.

While early color televisions had only 9- to 12-inch screens and required frequent repairs, today's sets are bigger, rarely go on the blink and come with a host of convenience features—from remote control to closed caption. Today's 25-inch RCA TVs are only about 15 percent the work cost they were in 1971.



VCR

1972	1978	1984	1990	1997
\$1,395	\$985	\$499	\$329	\$199
365 hr.	160 hr.	54 hr.	30 hr.	15 hr.

Video recorders that used cassettes and would both play and record crept into the market in 1972 at prices ranging from \$1,395 to \$1,850. Better models today sell for just 4 percent of the 1972 work-time price.

HOME MOVIE CAMERA

1960	1977	1997
\$129	\$351	\$549
57 hr.	62 hr.	42 hr.

Bell & Howell's 8mm movie camera offered no sound and required a projector, screen and processor to develop the film (not included in price shown). The next-generation home video cameras cost more but incorporated sound and eliminated film processing. Today's RCA camcorder allows users to pop videocassettes out of the cameras for play in home VCRs. Yet in work hours they're cheaper than even 1960s-vintage technology.



yet, the phones are often free for the price of monthly service, which itself has fallen to about half what it was a decade ago. These aren't isolated examples. Over the past generation, the sticker prices for microwave ovens, camcorders and many other items have fallen.

Combining falling prices with rising wages yields even more bounty for consumers. When prices are converted from dollars and cents into hours and minutes of work, many of the modern age's signature products become spectacular bargains. In terms of time on the job, the calculator's price plummeted from 31 hours in 1972 to 46 minutes today, less time than it takes for lunch. The color tele-

vision that required over 3 months' work to buy in 1954 was down to 1 month by 1971; today the work-time cost is just 3 days. VCRs sell for 15 work hours, or almost 90 percent less than in 1978. Over the past 13 years, the work time required to buy a cell phone has declined 98 percent. It took an average worker more than 176 hours on the job to buy a microwave oven in 1967; now it's 15 hours. Dad had to work 57 hours in 1960 to buy a camera to take home movies—a Bell & Howell model that used Kodak film and required a separate projector. Today, 42 hours of work will buy a camcorder that preserves our memories on a handy cassette that slips into the family's VCR.



CALCULATING DEVICES

1916	1952	1972	1996
\$125	\$15	\$120	\$10
494 hr.	9 hr.	31 hr.	46 min.

The adding machine and slide rule were a welcome advance over the abacus. None of these, however, could match the ease, accuracy, convenience and capability of Texas Instruments' TI-2500 pocket calculator, introduced in 1972. Today, TI's calculators are far more powerful and less expensive.

MICROWAVE OVEN

1947	1967	1975	1997
\$3,000	\$495	\$470	\$199
2,467 hr.	176 hr.	97 hr.	15 hr.

The price tag on Amana's first microwave was about \$3,000, the equivalent of \$32,515 in wages today for equal hours of work. Sales were confined to commercial enterprises and a few wealthy households. Beloved by restaurants, college students and busy parents, today's microwaves command less than 10 percent of the work time they did when \$495 consumer models first appeared in 1967.



CELLULAR PHONE

1984	1997
\$4,195	\$120
456 hr.	9 hr.

Motorola introduced the DynaTAC 8000X cellular phone in late 1984 with a suggested retail price range of \$3,995-\$4,395. Better equipped Motorola models today sell for \$120 or less, and monthly service fees are half what they were 13 years ago. The number of cellular subscribers has grown from only one—on the streets of downtown Chicago—to nearly 55 million as the work-time cost of a phone has fallen to under 2 percent of what it was in 1984.

Computing power provides perhaps the most vivid example of something getting cheaper as it becomes an everyday product. A circa 1970 IBM mainframe, capable of 12.5 million calculations a second, sold for almost \$4.7 million. Today, we can pay less than \$1,000 for a personal computer capable of operating 13 times faster. In average work time, the cost of today's computing is down to 27 minutes for each 1 million calculations per second—a price likely to continue falling.¹² With the IBM mainframe of the 1970s, owning enough computing power to plow through that many calculations per second would have taken more than a lifetime of work.¹³

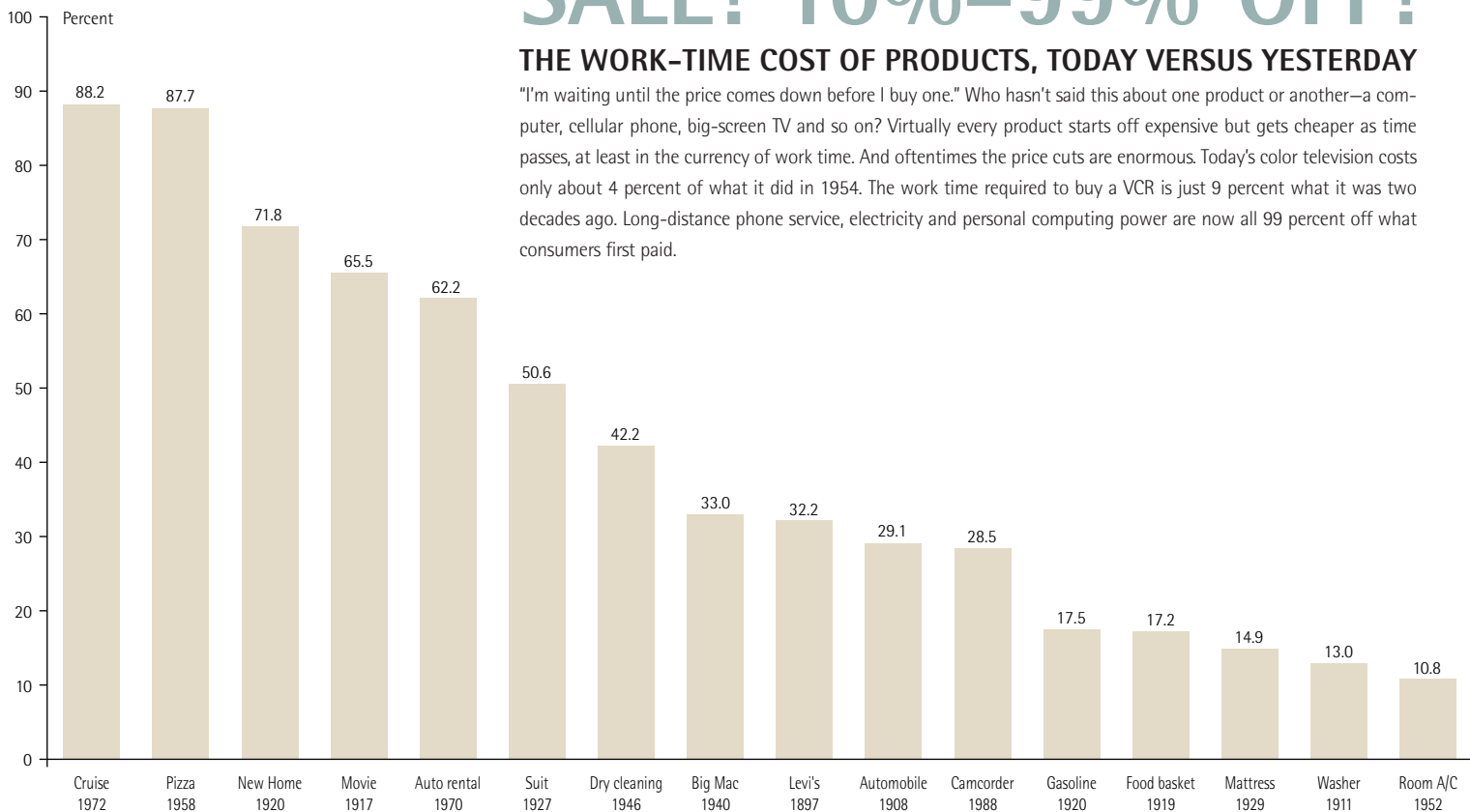
Whether it's calculators or computers,

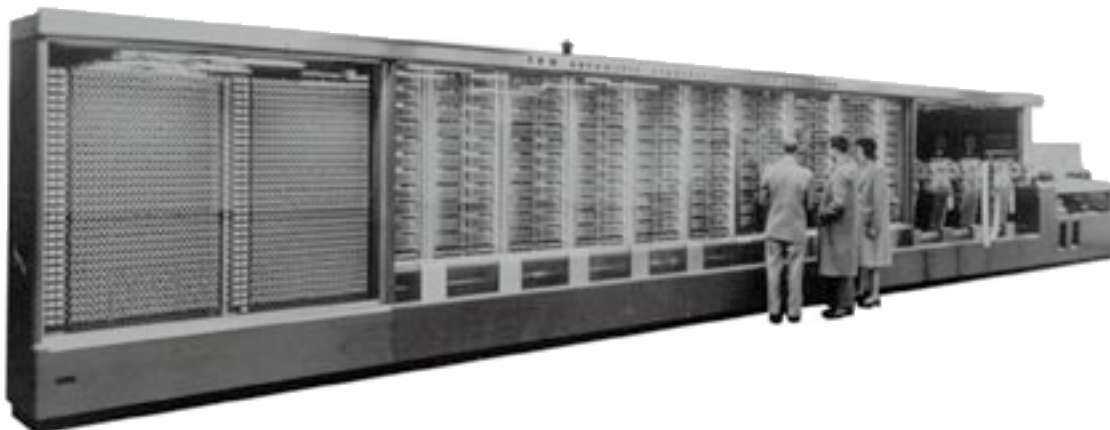
Americans today get the best of all worlds—better products for less effort. Common-place consumer goods aren't likely to post spectacular price declines down the road, but the future will bring a new generation of products that will repeat the pattern of falling prices. Later this year, manufacturers will begin offering high-definition television, a technology that promises to deliver crystal-clear images into American living rooms. When HDTV sets hit the market, they will cost as much as a used car—about \$5,000 to \$10,000. Within a few years, the televisions will doubtlessly sell for a quarter or even a tenth of that. The hours of work required to own one, of course, will fall even faster.

SALE! 10%–99% OFF!

THE WORK-TIME COST OF PRODUCTS, TODAY VERSUS YESTERDAY

"I'm waiting until the price comes down before I buy one." Who hasn't said this about one product or another—a computer, cellular phone, big-screen TV and so on? Virtually every product starts off expensive but gets cheaper as time passes, at least in the currency of work time. And oftentimes the price cuts are enormous. Today's color television costs only about 4 percent of what it did in 1954. The work time required to buy a VCR is just 9 percent what it was two decades ago. Long-distance phone service, electricity and personal computing power are now all 99 percent off what consumers first paid.





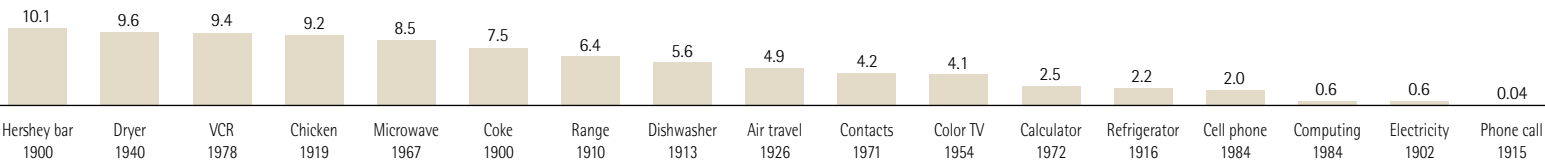
**COMPUTER
1944**

\$200,000
197,824 hr.
.000003 MIPS
\$65,941,300,000 per MIPS
732,681 lifetimes per MIPS



1970	1984	1997
\$4,674,160	\$3,995	\$999
1,395,272 hr.	435 hr.	76 hr.
12.5 MIPS	8.3 MIPS	166 MIPS
\$373,933 per MIPS	\$479 per MIPS	\$6 per MIPS
1.24 lifetimes per MIPS	52 hr. per MIPS	27 min. per MIPS

IBM spent \$200,000 building the Mark I computer in 1944. A huge advance in technology, it could do 3 calculations per second. Today's personal computers ramp up to 400 million instructions per second (MIPS) and sell for only a tiny fraction of what they did only a decade ago. Comparisons with early mainframes boggle the mind.



THE ECONOMICS OF CHEAPER AND BETTER



The phenomenon of so many products becoming more and more affordable can't be simply dumb luck. To the contrary, we owe the prosperity of our times to the routine workings of our free enterprise system. In the labor market, the system spurs the increases in productivity that pull up wages. In the product market, it provides the incentive to innovate and the discipline to become more efficient. The benefits flow to American consumers in the form of better values—more for our money and more money for our time.

Just about all new goods and services go through a cycle of falling prices and improving quality as companies ratchet up to large-scale production, as markets expand, as competition arrives in the marketplace and as goods and services move from luxuries to everyday conveniences. Virtually every new product requires an up-front investment, often sizable, to cover the cost of getting started. Whether innovation springs from startups or established companies, it requires money for research and development as well as the physical plant, machinery, equipment and labor needed to launch production. The cost of reaching just the first customer ranges from a few thousand dollars for a mom-and-

pop enterprise to billions of dollars for Fortune 500 companies.

New markets are initially small, so the fixed costs of introducing products are spread over relatively few consumers at first. Prices start out high. As markets increase in size, these fixed costs are spread over more and more sales. Larger production runs mean lower per-unit costs and economies of scale take hold. Success attracts competitors, kicking off a race to see which company can offer the best product at the lowest cost. Companies must slash prices to stay in business. As markets mature, it becomes more difficult to wring new efficiencies out of the production process, and producers aren't able to cut prices as much. The biggest declines in money prices and work-hour costs come in the early stages of a product's life cycle.

The United States had more than 360 automobile manufacturers in 1920, all sensing a fast-growing industry, all vying in a race that had no clear winners. Auto prices ranged from \$200 for a Briggs & Stratton to \$7,250 for a Pierce-Arrow. The companies that emerged from the fracas were those offering the highest quality at the lowest price. Hundreds dropped out of the market, but their loss didn't go to waste. Good ideas endured—the automatic transmission, the speedometer, four-wheel brakes—and were embodied in the products offered by industry survivors.

A relatively small number of consumers—typically the wealthy—are the first to acquire hot new products. In effect, they nurture infant industries and product lines by paying most of the fixed costs. For the rest of us, prices reflect only companies' added cost of producing what we want. The dichotomy helps explain why some sectors of the econ-



omy show steep price reductions while others go through the process more gradually. Big declines usually occur when fixed costs are high. It's true for computers. And electronics. And pharmaceuticals. And for many other products. When fixed costs aren't overwhelming, companies start out charging prices closer to marginal cost—a pattern that fits food and personal services.

Capitalism's critics often fret about the wealthy having too much, but uneven income distribution plays a role in developing markets. New products are usually very expensive—outside the reach of all but society's wealthiest. Henry Ford sold his first Model T for \$850 in 1908. At the equivalent of more than 2 years' wages for ordinary factory workers, only 2,500 cars were sold. By 1920 Ford had incorporated numerous improvements into his sedan—including an electric starter, demountable rims and an enclosed body—yet cut its work-hour price by nearly two-thirds. Even with its extensive list of standard features, today's Taurus sells for less work time than either the Model T sedan or the 1955 Fairlane. And Ford has soundly answered critics' claims that the car is just a "rich man's toy." More than 92 percent of U.S. households own an auto; 62 percent own two or more. (See *Exhibit 8: The Bounty of Time Well Spent.*)

One more example helps prove the point. A 3-minute phone call from New York to San Francisco, for example, cost \$20.70 when first available in 1915. Earning an average hourly wage of less than 23¢, the working stiff of that day would have had to labor more than 90 hours to afford a call. Yet long-distance telephone service did take root in the marketplace—and it grew. Somebody had



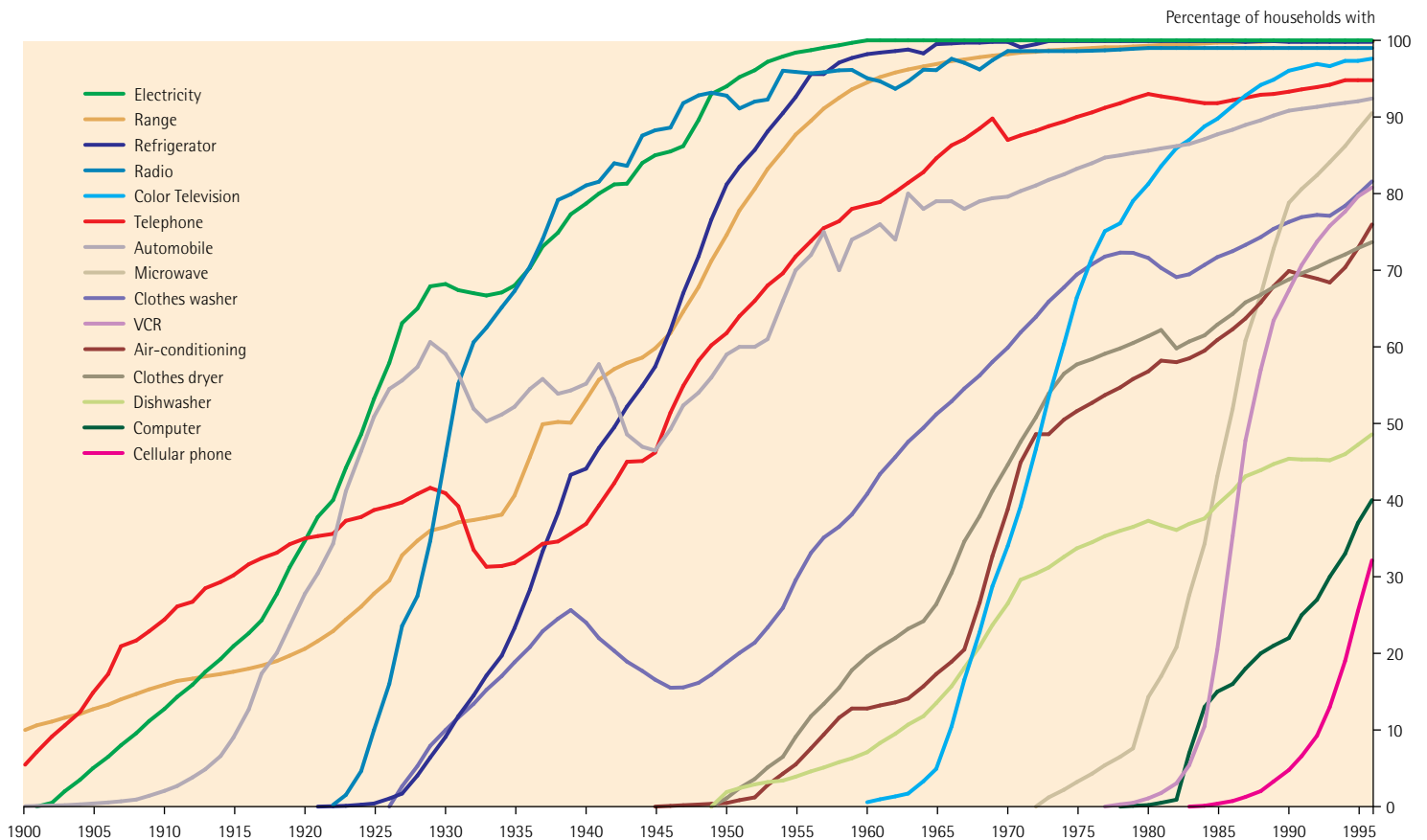
3-MINUTE COAST-TO-COAST PHONE CALL

Although the telephone was invented in 1876, coast-to-coast calls weren't possible until 40 years later. Lines were strung along poles adjacent to railroad tracks, and men dangled high above the ground every few miles to ensure the calls went through. AT&T's investment was enormous, and the first 3-minute calls cost \$20.70—2 weeks' work for the typical factory hand. In the currency of work time, today's long-distance toll is just 1/2,500 of what it was at the service's inception and an eighth what it was as recently as 1970. All told, Americans make nearly 95 billion long-distance calls annually.

to pay the high price, or the service would have been just another failed entrepreneurial gamble. In footing the initially high bill, the rich paid the fixed cost of bringing long-distance service to the masses in America. Today, of course, nearly all of us are "rich" enough to afford long-distance calls. A 3-minute coast-to-coast connection costs less than 50¢, or a scant 2 minutes of work.

Without society's wealthy, fewer new goods and services would find their way to the rest of us. Indeed, the wealthy's free spending spurs a democracy of consumption because it starts the process of lowering prices. As a result, today's average Americans have what only a few could once enjoy. The system harnesses the spending of a relative few and puts it to work delivering goods to the masses.¹⁴ Far from being a blight on society, unequal income distribution is instrumental in driving society forward. It's a natural resource.

EXHIBIT 8: *The Bounty of Time Well Spent—
Household Ownership and Use of Products*



The past 100 years have brought a virtual explosion in the array of goods Americans routinely enjoy. At the turn of the century, nobody—not even society's wealthiest—could travel by air, wear comfortable tennis shoes or even take an aspirin, yet the majority of modern-day Americans regularly do so. From cars to computers to cell phones, our ancestors would gawk at the products we take for granted.

THE MECHANISM OF MARKETS

The true test of an economic system is how productive it is with people's time. The majority of us aren't born with big bank accounts, but we are born with time. Time is the real currency of life, and the value of our time—what we can acquire for its exchange—is our most important asset. Like a good steward, America's free enterprise system has consistently raised the value of our hours and minutes, making most goods and services affordable

for the average worker. The result is a democracy of consumption.

In 1928, Herbert Hoover's presidential campaign promised Americans "a chicken in every pot . . . and a car in every backyard, to boot." Today, we have all that and much, much more—not by the grace of government but by the mechanism of markets.

When common labor supports the good life, it's truly time well spent.

NOTES

- 1 Whenever possible, this report uses specific product models rather than broad product categories to make price comparisons. As Federal Reserve Chairman Alan Greenspan noted recently, "It is the measurement of individual prices, not the aggregation of those prices, that is so difficult conceptually...[While] the prices of a ton of cold rolled steel, or of a linear meter of cotton broad woven fabric, can be reasonably compared over a period of years...when the characteristics of products and services are changing rapidly, defining the unit of output...can be conceptually difficult." Although some generality may be sacrificed, it is easier to accurately compare, say, a 1908 Model T with a 1997 Ford Taurus than "cars" with "cars."
- 2 An hour of work isn't without its vagaries if we try to measure the effort and discomfort involved in doing our jobs. The majority of today's workers—sitting at computers in well-lighted, air-conditioned offices—are sacrificing less of their energy and well-being than yesterday's cotton picker, coal miner or barge hand.
- 3 For a discussion of other aspects of income distribution and mobility, see "By Our Own Bootstraps: Economic Opportunity and the Dynamics of Income Distribution," 1995 Annual Report of the Federal Reserve Bank of Dallas.
- 4 This is the only statistical series on wages that goes back far enough to make comparisons over a century. It covers a large number of workers but by no means all of them. Pay in manufacturing was above the average for wage and salary workers for most of this century, but in recent years the gap has all but disappeared. A smaller portion of today's workforce, moreover, holds factory jobs. At the turn of the century the United States was still predominantly an agricultural nation. Weekly wages for farm labor averaged roughly \$4.75, about half that of factory workers. So if anything, the use of manufacturing wages biases the research in this report against measuring the full extent of the decline in real living costs. All wage statistics fail to account for income and payroll taxes, which have grown from 5 percent of wages in the early 1950s to about 21 percent today (for year-round, full-time workers in manufacturing). Balancing that out, however, is the omission of nonmonetary employee benefits, which are 44 percent of wages today, up from 19 percent in 1953.
- 5 Looking at averages, a new home in 1996 had 2,120 square feet, bigger by two 12- by 15-foot rooms than in 1970. A 1956 new house had 1,230 square feet; in 1920 the mean was 1,100 square feet.
- 6 The low point in the cost of jeans came in 1971, when it took 2 hours 16 minutes to buy a pair. The subsequently higher prices reflect changes in the garment's quality. Most of today's jeans are designed for fashion wear, not manual labor, with special processes that improve fit and comfort.
- 7 Already, cars and trucks nearly outnumber Americans old enough to drive. In 1995, when the population age 16 and over totaled 201.2 million, the country had 193.4 million vehicles.
- 8 The average workweek for manufacturing employees in the 1920s was roughly 50 hours, whereas today it is about 40. For consistency of comparison, all monthly and weekly figures in this report are based on a 40-hour workweek.
- 9 In 1966 average annual tuition at a private college required 537 hours of work; 30 years later it was up to 1,295 hours. Public universities went from 133 hours to 260 hours.
- 10 In 1971 Texas Instruments and Canon jointly introduced a model selling for \$390. Breakthroughs at TI helped slash the price by 70 percent in just a year.
- 11 Technology also allowed television screens to get a lot bigger. Today families can buy 36-inch models for less work time than a 19-inch set in 1971.
- 12 In January 1998 IBM cut the price of its 233-MHz MMX Aptiva to \$999, lowering the cost to under 20 minutes per MIPS.
- 13 This calculation assumes an average work life of 90,000 hours, at 40 hours a week, 50 weeks a year, for 45 years.
- 14 While even socialist economies may eventually get the goods (with a very long lag), they rarely do so without the delivery system of markets elsewhere. To put it bluntly, they free ride on the accomplishments of their capitalist neighbors.

ACKNOWLEDGMENTS

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Domestic Servants

Range

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Dishwasher

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Clothes Washer

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Clothes Dryer

1940 GE model AD-3: Friday Historical Business Archives. 1956 GE model and 1970 GE model DDE8100L: *Life*, June 26, 1970. 1997 GE model DWXR473 E/G: Dallas-area retailer.

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Dry-Cleaning a Dress

Base price for dry-cleaning a plain dress (no pleats): International Fabricare Institute.

Man's Suit

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Levi's

Levi Strauss & Co.; Dallas-area retailers.

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The Share for Food, Clothing and Shelter

U.S. Department of Labor ("How Family Spending Has Changed in the U.S."; *Consumer Expenditure Survey*).

Page 11

Kings of the Road

Dallas Ford dealers; Lichty 1995; *Ward's Automotive Reports*, various issues.

Auto Rental

One week, unlimited mileage, return to same city. 1970 Ford sedan: *Life*, July 24, 1970. 1997 Ford Taurus: Hertz Corporation.

A Gallon of Gasoline

American Petroleum Institute 1995.

Page 12

Movie Ticket

Motion Picture Association of America; U.S. Bureau of the Census (*Historical Statistics of the United States, Colonial Times to 1970*).

Woman's Haircut

Museum of Cosmetology Arts and Sciences, St. Louis, Mo.

Soft Contacts

1971: *Consumer Reports*, May 1972. 1997: Lens Express, Inc.

Page 13

1,000 Miles of Air Travel

Air travel is 1,000 miles domestic average price. Air Transport Association of America; U.S. Bureau of the Census (*Historical Statistics of the United States, Colonial Times to 1970*; *Statistical Abstract of the United States*, various issues).

Coast-to-Coast Flight

One-way, New York to Los Angeles. Cherington 1958, American Airlines.

7-Day Caribbean Cruise

Miami port-of-origin, excluding airfare: Carnival Cruise Lines.

Page 14

University Education

University of Texas at Austin, full-time undergraduate tuition and fees for a state resident for academic year: UT-Austin, Office of Institutional Studies. U.S. public and private institution full-time undergraduate average tuition and fees for academic year at 4-year universities (state resident, where applicable): U.S. Department of Education, National Center for Education Statistics.

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Food on the Go

Snacks

Coca-Cola Company, Frito-Lay, Inc.,

Hershey Foods Corporation, Wm. Wrigley Jr. Company.

Big Mac

McDonald's Corporation.

Large Pepperoni Pizza

Pizza Hut Totally New Pizzas. Prices are estimates.

Page 16

Color Television

1954 RCA 12-inch model LT-100 and 1971 RCA 25-inch model FQ545: Friday Historical Business Archives. 1997 RCA 25-inch model F25209WT: Dallas-area retailer.

VCR

1972: *Radio Electronics*, July 1972. 1978: *Consumer Reports*, September 1978. 1984: Sears Catalog. 1990: Sears Catalog average. 1997: J. C. Penney Catalog average.

Home Movie Camera

1960 Bell & Howell Electric Eye Family Camera: Ritz Collectibles. 1977 RCA BW002: Friday Historical Business Archives. 1997 RCA Pro 854: Thomson Consumer Electronics, Inc.

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Calculating Devices

1916 Burroughs Class Three adding machine: Charles Babbage Institute. 1952 Frederick Post Co. Versalog slide rule: Sphere Research Corp. 1972 TI-2500 calculator and 1996 TI-1795 calculator: Texas Instruments.

Microwave Oven

1997 model is Amana model FBG623T: Amana Appliances.

Cellular Phone

1984 Motorola DynaTAC 8000X portable phone and 1997 Motorola StarTAC 6000: Motorola, Inc.

Pages 18 and 19

Sale! 10%-90% Off!

The Work-Time Cost of Products,

Today Versus Yesterday

Early camcorder is Realistic model 150 Compact MovieCorder. Mattress is twin-size. Computing comparisons are based on minutes per MIPS, 1997 versus 1984. Phone call is 3-minute coast-to-coast call.

Page 19

Computer

1944 IBM Mark I, 1970 IBM System/370 model 165, 1984 IBM PC AT and 1997 IBM Aptiva model E24: International Business Machines Corporation.

Page 21

3-Minute Coast-to-Coast Phone Call

Daytime, New York to San Francisco. AT&T Corporate Archives; U.S. Bureau of the Census (*Historical Statistics of the United States, Colonial Times to 1970*; *Statistical Abstract of the United States*).

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The Bounty of Time Well Spent: Household Ownership and Use of Products

American Association of Home Appliance Manufacturers; Cellular Telephone Industry Association; *Electrical Merchandising*, various issues; *Information Please Almanac*; Public Roads Administration; Television Bureau of Advertising; U.S. Bureau of the Census (*Census of Housing; Current Population Reports; Historical Statistics of the United States, Colonial Times to 1970*; *Statistical Abstract of the United States*); U.S. Department of Energy; U.S. Department of Transportation.

PHOTO CREDITS

See Exhibit Notes and Data Sources for product details.

Page 4, 1904 Westinghouse factory, Library of Congress, Motion Picture, Broadcasting, and Recorded Sound Division.

Page 6, 1920 house, Library of Congress, Prints and Photographs Division.

Page 8, 1910 range, 1913 dishwasher and 1940 clothes dryer, Friday Historical Business Archives, Louisville, Ky.; 1916 refrigerator, Frigidaire Home Products; 1911 clothes washer, Ron Lutz, Lee Maxwell Washing Machine Museum, Eaton, Colo.

Page 11, all cars, courtesy of Ford Motor Company.

Page 12, 1954 movie theater, Sony Loews Theatres; 1920 woman's haircut, Museum of Cosmetology Arts and Sciences, St. Louis, Mo.

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