How New Technology and Ideas Could Have Led to
Shorter Work Days for Low Income Earners

The time period from 1890-1991 saw a huge shift in the length of work day vs. wage for workers in the United States (Costa, 2000). In 1890, low income earners worked longer days than high income workers and by 1991, these two groups had switched positions. Costa presents several arguments for this phenomenon, including increased coordination of work activities within and across firms and a labor supply response in which workers take a shorter workday because income effects were larger than substitution effects. In this paper, I will look at one reason why this labor supply response was higher for people earning lower incomes than it was for people with high incomes.

Over the last century, the ways in which Americans spend their leisure time has changed drastically. Most of this change is technological based change that has been a result of mass produced consumer goods. Some of it comes from new ideas such as new sports, music, and dances. These consumer goods have been widely available to people across all incomes. This paper is based on the assumption that in 1890, the leisure available required more money and therefore was biased more towards high income people.

We see the trend of more widely available leisure in the graph in figure 1. Between 1900 and 1970, the share of income spent on non-necessities in the US increased from 20% to 50%. This increase was likely a result of the combination of
increasing overall incomes and a decrease of prices of necessities compared to non-necessities.

To understand how the changing prices of consumer goods can affect labor supply, we look at a simple labor supply model. Consider a model where consumption is based on total income

\[ c = wI + i \]

where \( c \) is consumption, \( w \) is wage, \( I \) is hours worked, and \( i \) is income not associated with labor. Plugging this boundary condition into the Slutsky equation, we get:

\[ \frac{\partial I}{\partial w} = \frac{\partial I}{\partial w} \bigg|_{U=U_0} + I \frac{\partial I}{\partial n} \]

The left side of the equation is the change in work hours with a change in wage. The first term on the right is the change in work hours with a change in wage holding utility constant. This is the substitution effect. The second term on the right side of the equation is the change in work hours given a change in non labor income. This is the income effect. As wage goes up, working hours go up in the substitution effect and as non labor income goes up, working hours go down in the income effect. Thus the substitution effect is positive and the income effect is negative.

We will consider a change in the availability and price of consumption goods equivalent to an increase in non labor income. Consumers feel richer, but not as a direct result of increased wage or longer work hours. According to this equation, if non-labor income increases, the number of hours worked will decrease. Thus we expect that if the price of consumption goods drops, people will end up working less and spend more time on leisure. However, if wage alone increases, then we would expect in to see workers work more hours. The increase in wage and decrease in working hours over the last
hundred years therefore points to an income effect dominated the substitution effect in
the Slutsky equation.

The Morris County Library provides data on different the prices of different
recreation and amusement goods from 1900 to 2009. We can assume that most
recreational goods advertised for in a newspaper are goods that are supposed to appeal to
the mass public. In 1900, the advertised recreation and amusements are camera products
and a meal ticket at a restaurant. It is difficult to imagine someone running home from
work to use his camera. In 1920, we see that there are more amusements available to the
general public, including movies, dancing, and music. Going through the century, we see
that more and more consumer goods become available, including televisions, sports, and
most recently, video games, ipods, and sophisticated home entertainment.

1900
Recreation & amusements
Camera plate, Eastman, 4"X5", .44/doz
Camera tripod, 1.00-1.75/each
Restaurant, Louisa Vismara, 2.50/meal ticket
Toning solution (camera film developing), .25/8 oz bottle

1920
Recreation & amusements
Belgian hares (rabbits), 10.00/each
Bicycle, girl's, 10.00
Business supper, YMCA, .60/ticket
Cigars, Ms. J. Noltz, .10-.15/each
Concert, Enrico Caruso & others, 10.00/ticket
Dance, Elks Entertainment, 1.00-3.00/ticket, includes war tax
Horse show, Far Hills, .50/admission
Movies, Liberty Theatre, .17/matinee; .22/evening
Piano, 50.00
Scarf pins, 10.50/each
Steeplechase & pony races, Whillany River Club, 2.00/admission
1940

**Recreation & amusements**

Barn dance, Mt. Kemble Fire Dept., .40/admission

Book, *How to Win Friends and Influence People*, Dale Carnegie, Pocketbook paperback, .25/each

Bus trip, New York World's Fair, Flushing Queens, 1.50/roundtrip ticket

Card party, New Vernon Unit First Aid Squad, .25/admission

Dance lessons, square and modern, .44/lesson

Movie Camera, Cine-Kodak Eight, 97.50/each

Movies, New Palace Theatre [Morristown], .15-.20/matinee ticket; .20-.25/evening ticket

Radio, Emerson, tabletop model, 9.95/each

Sunday Dinner, Master's Drug Store [Morristown], .45/person

Turkey Supper, Brookside Engine Company No. 1, Mendham Twp., .50/child; 1.00/adult

1960

**Recreation & amusements**

Christmas tree, flameproof vinyl, 6', 4.99-10.00/each

Golf clubs, set of 7, 14.99-55.00/set

Halloween costumes, .99-2.69/each

Hi-fi stereo console, Motorola, 4 speakers, 99.95/each

Movies, Drive in, 1.00/car

Piano, grand, 395.00/each

Radio, transistor, 19.95/each

Television, Mahogany cabinet, 21", 119.95/each

Train set, Lionel, "Santa Fe," 5 car with diesel engine, 24.66/est

1980

**Recreation & amusements**

Basketball, 9.99/each

Basketball backboard, 29.99/each

Bicycle, Saxon Gemini, 10 speed, 26", 69.88/each

Breakfast, IHOP, .99-1.95/person

Dinner, Larison's Turkey Farm, 3.75/children under 8; 7.50/adult

Game, Milton Bradley, Hangman, 6.97/each

Movies, Rockaway 6, 1.25/ticket

Record album (music), 4.49/each

Television, color, 19", 379.95/each

Toy, Etch-a-Sketch, 4.97/each

Toy, Lego, Duplo Village, 17.43-21.79/set

Toy, Rubick's Cube puzzle, 9.99/each

Toy, Tonka truck, "Mighty Dump," 10.38-12.97/each

2000

**Recreation & amusements**

Camcorder, Sharp, 249.00/each

Coin display unit, "50 States Quarters," 10.00
The conclusion that more widely available leisure goods led to lower income earners working fewer hours than higher income earners is based on the assumption that in 1900, most leisure goods were only available to the rich and therefore were not advertised in the newspaper. These leisure goods could have included activities such as
hunting, horseback riding, and human chess sets, activities that required a lot of capital and also took up time (preventing the rich from working more). It must be noted that the conclusions reached in this paper do not necessarily provide a causal relationship between working hours and the availability of consumption goods. To find such a relationship, more rigorous consumption data and statistical analysis would be necessary.