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ECONOMIC WELL-BEING AND CHILD LABOR: THE INTERACTION OF FAMILY AND INDUSTRY

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ABSTRACT

How did industrialization in the nineteenth century affect the well-being of children among American working class families? Two revealing surveys from 1890 and 1907 are used to examine the implications of child labor on schooling decisions and on possible offsetting intrafamily transfers, in the form of current "retained" earnings or future asset transfers. Both issues are analyzed within the context of a formal model of family labor supply, in which returns to schooling accrue after the youth has left the household and thus the interests of the parents and the child need not coincide. Parents working in the industries examined did not, it appears, compensate their children for the reduced future earnings implied by child labor, in either the current or in future time periods. But, in addition, the migration of families in which parental altruism was weak may have eliminated much of the apparent increase in family income due to higher child earnings. We end with a note reconciling our findings with the long term trend away from child labor.

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> Insofar as machinery dispenses with muscular power, it becomes a means of employing laborers of slight muscular strength, and those whose bodily development is incomplete, but whose limbs are all the more supple....The value of labour-power was determined, not only by the labour-time necessary to maintain the individual adult laborer, but also by that necessary to maintain his family. Machinery, by throwing every member of that family on the labor market, spreads the value of the man's labour-power over his whole family.....In order that the family of four may live, four people must now, not only labour, but expend surplus-labour for the capitalist....Previously, the workman sold his own labour power, which he disposed of nominally as a free agent. Now he sells wife and child. He has become a slave dealer.
>
> Karl Marx, Capital
> (1906, pp. 431-32; Orig. Pub. 1867)

1.0. Introduction

The process of industrialization altered radically the types of work activities demanded of the labor force. As Marx noted in the quotation above, industries developed in which sheer physical strength was relatively less valuable and nimbleness and dexterity relatively more productive than in the agricultural economy within which industrialization occurred. As a result the ratios of the wages of young people and of females of all ages to that of adult males rose substantially in the transition from agriculture to industry (Goldin and Sokoloff, 1980). The increase in the demand for female and teenage labor had important social consequences that have been intensively studied since the time of Marx. In this paper we explore both theoretically and empirically the effect of this increased demand on the well-being of the family, particularly of the young, and on intra-family relations.

The two data sets we employ for this study are derived from surveys undertaken in the U.S. around 1900. Both surveys were bases for seminal studies of working-class or industrial families, living mainly (although

not wholly) in nonurban areas. Our empirical analysis therefore should be useful in understanding the impact of industrialization on intrafamily relations during much of the nineteenth century, when industry evolved outside the large commercial centers.

In the early stages of mechanization in the U.S., the percentage of the industrial labor force that was young and/or female was extremely high, but it began a secular decline as early as 1840 (Goldin and Sokoloff, 1980). By 1900 the simple generalization proposed by Marx, that mechanization enhanced the usefulness of child labor, is not completely supported by evidence for the U.S. A cross-state analysis of 1900 Census of Population data indicates that the labor force participation rate of males 10 to 15 years old was not significantly higher in the manufacturing and mining sectors than in agriculture, although the rate for females 10 to 15 years was higher in manufacturing.[1] Certain industries, for example textiles, boots and shoes, paper, and clothing, did employ substantially more young labor, particularly female labor, than did others, such as iron and steel and mining.

The data in Table 1 make clear that the location of working-class families in 1890 was a prime determinant of the employment of their children. The likelihood that a boy of age 11 to 13 would be in the labor force if the father was in textiles was just over 40 percent; if the father's industrial employment was <u>not</u> in textiles, only 11 percent. For females, the likelihood that a daughter of a textile worker was in the labor force rose from 34.5 percent for those 11 to 13 to 97.7 percent for those 16-17, the rise for daughters from nontextile families only from 1.4 percent to 21.8 percent. These dramatic differences are not simply a reflection of differences in parental income. Even among textile families with father's

TABLE 1

THE EMPLOYMENT PROBABILITY OF CHILD BY AGE, SEX, INDUSTRY, AND FATHER'S EARNINGS, c. 1890[a]

Sex/Age	Total		Low Earnings[b]		High Earnings[c]	
	(1) Textile	(2) Nontextile	(3) Textile	(4) Nontextile	(5) Textile	(6) Nontextile
Child						
5-10	0.064	0.020	0.104	0.020	0.036	0.023
Male						
11-13	0.411	0.110	0.546	0.258	0.130	0.067
14-15	0.846	0.543	0.919	0.796	0.646	0.411
16-17	0.930	0.757	0.813	0.836	1.008[d]	0.694
18+	0.773	0.814	0.716	0.782	0.852	0.800
Female						
11-13	0.345	0.014	0.480	-0.006[d]	0.131	0.021
14-15	0.734	0.141	0.798	0.215	0.525	0.130
16-17	0.977	0.218	0.985	0.412	0.642	0.146
18+	0.850	0.234	0.845	0.518	0.645	0.137

[a]Source: Derived from a regression analysis based on the Wright 1890 study (see text, 1.0). The full estimating equation is available from the authors.

[b]Father's earnings less than or equal to $400 (1890$).

[c]Father's earnings more than $400 (1890$).

[d]The estimating procedure yields probabilities outside the 0-1 interval.

earnings above the mean for textile workers (approximately $400, 1890$), almost two-thirds (64.2 percent) of the young women 16-17 worked.

What were the consequences for the family and for the young of this "opportunity" for child labor that the textile industry offered? The effect on current family income was substantial. Average earnings per child were approximately $50 per year higher for males 14 to 17 in textiles than elsewhere (Table 2, columns 1 and 2); average adult male earnings in the sample were only slightly more than $500 per year. For females 14 to 17, the difference in earnings was more than $100 per year between sectors.

The cost to family members of the increased child earnings, however, was also real. Schooling was the principal alternative time use for children. Among males 11 to 13, those in textile families were only half as likely to be attending school as those in nontextile families, 41.3 percent and 75.6 percent respectively (see below, Table 4). The same wide disparity existed for female offspring. The likelihood that a daughter 11-13 was in school was 48.8 percent in textile families, 86.3 percent in nontextile families. This attenuated schooling must surely have reduced the future earning capacity of the children of textile workers.

Section 2.0 develops more formally a model of family labor supply with emphasis on the schooling-work decision of children and young adults. In Section 3.0 industry effects on the future economic well-being of offspring in the U.S. at the turn of the century are estimated. In particular the implications of child labor for schooling and subsequent earnings are more carefully assessed. Since the returns to schooling accrue largely after the youth has left the household, the interests of the parents (the presumed decision-makers) and the interests of the young are not necessarily identical.[2] Interests coincide only to the extent parents perceive the

TABLE 2

MEAN INCOME (1890$) PER CHILD BY AGE, SEX, INDUSTRY, AND FATHER'S EARNINGS, c. 1890[a]

Sex/Age	Total		Low Earnings[b]		High Earnings[c]	
	(1) Textile	(2) Nontextile	(3) Textile	(4) Nontextile	(5) Textile	(6) Nontextile
Child						
5-10	$ 3.79	$ 2.45	$ 2.06	$ 1.44	$ 5.25	$ 3.03
Male						
11-13	22.86	10.01	24.18	24.37	16.62	5.80
14-15	109.56	65.97	123.78	89.00	80.90	53.45
16-17	188.34	120.50	184.48	139.11	186.90	107.88
18+	211.55	235.45	201.08	231.01	236.23	236.09
Female						
11-13	21.39	4.19	24.43	9.15	15.38	2.42
14-15	113.59	13.26	131.05	20.76	76.00	11.89
16-17	147.93	35.04	149.46	58.46	120.76	25.53
18+	188.50	32.99	191.25	45.66	157.81	29.59

Source: Wright 1890 Study (see text 1.0).

[a]See Table 1 for estimation technique. Note that these estimates are per child, not per working child.

[b]Father's earnings less than or equal to $400 (1890$).

[c]Father's earnings more than $400 (1890$).

future wealth of their offspring as an increase in their own well-being. Parental altruism therefore is obviously critical.

The possibility of offsetting intra-family physical asset transfers for the reduced earnings capacity of those with less schooling is also considered, since parents may have compensated children for reduced schooling with larger physical wealth transfers. Such does not appear to be the case. The results indicate that parents working in industrial sectors where the demand for child labor was high did not compensate their children for the reduced schooling and future earnings capacity implied by the child labor. Any compensation to the child apparently came from the additional current consumption that the family as a whole may have enjoyed.

We also show that the increased earnings of the children need not even be translated into an equivalent increase in family consumption if parental altruism is weak. Competition among families in the labor market may have eliminated much of the apparent increase in family income due to higher child earnings. Many manufacturing centers in nineteenth century America were oriented around a single industry because of natural resource requirements (e.g. water power, coal, iron ore). The geographical isolation of these industries made labor supply mainly a product of family migration. If enough parents were unconcerned about the sacrificed future earnings of their offspring, the equilibrium wage of a father in textiles would be lower dollar for dollar for each dollar of earnings of their working children. But to the extent that reduced schooling and implicitly reduced future income of the child were valued by the parents, equilibrium adult wages would not fall dollar for dollar with the earnings gained by increased child labor.

In Section 4.0 we explore this interaction between child labor opportunities and adult (male) wages to determine the extent to which adult wages

were reduced by the potential for child labor. The brief conclusion, Section 5.0, reviews and interprets our findings in light of the remarkable expansion in educational attainment during the second decade of this century.

The principal data source we have used in this paper is derived from the Sixth and Seventh Annual Reports of the Commissioner of Labor, namely Carroll Wright, a pioneer in modern labor statistics. This detailed survey of 6,800 industrial families in 1889-90 was undertaken to provide information for the McKinley Tariff of 1890.[3] But it was also the first extensive national survey of family budgets, a precurser to our modern cost of living surveys. We will refer to this report as the Wright 1890 Study. A second data source has been employed which gives information on the fraction of earnings working children retained for their own use. It is the extensive 19 Volume Senate Report on the Condition of Woman and Child Wage Earners conducted in 1907 and will be referred to as the 1907 Report.

2.0. Child Labor and Child Economic Well-being: A Model

The evidence presented in the introduction, on the unusually high employment of child labor in the textile industry and the correspondingly low level of schooling attainment, raises the issue posed by Marx and others: Was child well-being reduced by industrialization? Certainly no theorem on the operation of the market system guarantees that technological advances will improve the economic well-being of all groups, particularly the young. The market "guarantees" little to children whose well-being is principally dependent on the altruism of the parents. As discussed at length in Ishikawa (1975) and Parsons (1977), the dependence of child well-being on parental altruism is particularly important in the child labor decision

since the principal cost of child labor is the foregone schooling and future (adult) income of the child. The mortality of the parents and, more importantly, the absence of enforceable long run human service contracts make the evaluation of the long run benefits of schooling critically dependent on the altruism (or lack thereof) of the parents. The current earnings of the child are, within limits, the parents to allocate; the child's future earnings are not.

Child labor need not imply a complete absence of parental concern nor need it reflect family economic desparation. Even a wealth maximizing individual (or purely altruistic parent) will be sensitive to current as well as future income prospects. The higher the wage rate of children, ceteris paribus, the less valuable (net) is a given schooling investment. Rational parents who intend to transfer wealth to their offspring will presumably transfer wealth to the child in human investment form until the returns decline to the level of the rate of return on physical assets. Beyond that point, all transfers will be in the form of physical assets.[4] A rise in current child earning power may therefore only signal that it is optimal to reallocate intergenerational transfers from human to physical form.

A simple model will illustrate the family decision process and will provide the basis for the discussion of the family labor market in Section 4.0.[5] Imagine a parent-child world in which the parent has complete authority to allocate resources, including the child's time. Assume moreover that the parent's utility (U) is a function of current family consumption and future child wealth, to be concrete the geometric mean with weights α and β respectively,

1) $U = C^{\alpha}W^{\beta}$,

where $C \equiv$ current family consumption and $W \equiv$ future child wealth.[6]

The parent must make two interdependent decisions: (1) choose the amount of total family earning capacity to allocate to current family consumption and to future child wealth, and (2) choose the composition of transfers to the child, consisting of both schooling and physical assets. Family income in the current period will be the sum of parent and child earnings or

2) $I = E + E_0 = E + (H-S)w_0$

where $I \equiv$ family income,

$E \equiv$ parent earnings,

$E_0 \equiv$ current child earnings,

$w_0 \equiv$ wage rate of child,

$H \equiv$ total time of the offspring under the control of the parent,

and

$S \equiv$ child time spent in school, $S \leq H$.

The future wealth of the child, ignoring for simplicity the discount factor, is the sum of physical wealth transfers and future child earnings, or

3) $W = T + E_1$,

where $T \equiv$ physical wealth transfers from the parent to child and $E_1 \equiv$ future child earnings. Since we assume that parents have no control over the child's income in the second period, the transfers must be nonnegative ($T \geq 0$).[7] Child earnings in adult life are assumed to be a function of schooling investment as a child, specifically

4) $E_1 = \phi S^{\gamma}, \quad \phi > 0, \quad 0 < \gamma < 1$

where ϕ and γ are parameters of the wage function. The parameter γ is the schooling elasticity of earnings.

The parental decision problem, then, is to choose levels of current consumption (C), physical transfers to the child (T), and schooling (S) that will maximize parental utility, equation (1), subject to the parental income constraint $[C + T = E + w_0(H - S)]$ and the inequality constraint on transfers $(T \geq 0)$. Forming the Lagrangian,[8]

$$5) \quad L = C^{\alpha}W^{\beta} - \lambda[C + T - E - w_0(H - S)],$$

the necessary conditions for a maximum are:

$$6) \quad \frac{\partial L}{\partial C} = \alpha \frac{U}{C} - \lambda = 0 ,$$

$$7) \quad \frac{\partial L}{\partial S} = \beta \frac{U}{W} \phi\gamma S^{\gamma-1} - \lambda w_0 = 0,$$

$$8) \quad \frac{\partial L}{\partial T} = \beta \frac{U}{W} - \lambda \leq 0,$$

$$9) \quad \frac{\partial L}{\partial \lambda} = - [C + T - E - w_0(H - S)] = 0 .$$

If physical transfers to the youth are positive, so that equation (8) holds as an equality, then it is easy to derive the behavioral function for schooling from equations (7) and (8), since these reduce to the simple wealth maximizing rule that schooling will be undertaken until the increment in future earnings is just offset by the foregone current earnings $(\phi\gamma S^{\gamma-1} - w_0)$. Therefore

$$10) \quad S^* = \left(\frac{\phi\gamma}{w_0}\right)^{1/1-\gamma}$$

where the asterisk denotes the optimizing level of S. Optimal schooling increases with γ, the elasticity of earnings with respect to schooling, and decreases with w_0, current wage levels. Total family income affects total child future wealth, but not schooling levels when optimal physical transfers are positive. The optimal schooling is undertaken and the remainder transferred in physical asset form.

In the simple utility function assumed here, the optimal family consumption and child wealth levels can be derived as follows:

11) $$W = \frac{\beta}{\alpha + \beta} F$$

and

12) $$C = \frac{\alpha}{\alpha + \beta} F$$

where

$$F = E + w_0(H - S^*) + \phi S^{*\gamma} = E + E_0 + E_1.$$

Clearly F is total family wealth, including the future earnings of the child. Family consumption and child wealth increase proportionately with F, where the proportions are $\alpha/(\alpha + \beta)$ and $\beta/(\alpha + \beta)$ respectively. The elasticity of parental utility with respect to child wealth (β) could be considered a measure of parental altruism.

Physical transfers (T) are the residual of child wealth less human capital transfers ($\phi S^{*\gamma}$), or

13) $$T = W - E_1 = \frac{\beta}{\alpha + \beta} F - \phi S^{*\gamma}.$$

Clearly if family wealth (F) or family altruism (β) are sufficiently low, the total transfers that the parents choose to make to the child are less than the child's future earnings alone. Since we assume that parents cannot capture

the child's future earnings (or borrow on them), they can increase current family consumption only by having the child work more (undertake less schooling) than a simple wealth maximizing rule would indicate. In this case (T = 0),

$$14) \quad S^* = \frac{\beta\gamma}{\alpha + \beta\gamma} \left(\frac{E + w_0 H}{w_0}\right).$$

In this constrained environment, optimal schooling will increase linearly with earnings of the male head (E) and decline with the child's wage (w_0).

In the next section we explore these family decisions empirically. In particular we estimate the effect of child labor on schooling and on subsequent earnings capacity and then attempt to determine the extent to which this reduction in future earnings is offset by physical asset transfers to the child made possible by the family's higher current earnings.

3.0. The Future Well-being of Children: Empirical Estimates

The future wealth position of one's offspring will depend on two types of transfers, earning capacity (schooling and other forms of skill acquisition) and physical assets (gifts and bequests). In this section we explore the effect of child labor on these two types of transfers to the child in the U.S. around 1900. In Section 3.1 we consider the effect of child labor on schooling attainment and on future earnings. Sections 3.21 and 3.22 explore the issue of whether working children are compensated within the family by gifts (principally "retained" earnings) and by bequests later in life, controlling for parental income.

3.1. Child Schooling and Future Earnings

Most children of industrial workers in the Wright 1890 Study were engaged either in work or in school by the age of eleven (see Table 3). Thus it is almost definitional that child labor reduced the amount of schooling and perhaps the ultimate earning capacity of the child. The data on the fraction in school by age in Table 3 are indirect estimates obtained by regressing the number of children per family in school on the age-sex composition of the family, since the observation units are the family and not the individual members.[9] The probability that a male child 11-13 was in school, 0.60, is the coefficient of number of male children 11-13 in a "number of children in school" regression. The sum of the estimated work and schooling probabilities is tolerably close to one, even for females, which makes us confident in the results from this procedure. Furthermore, the schooling probabilities for industries other than textiles (see Table 4) are strikingly similar to those for youths in the entire U.S. in 1890.[10]

Schooling probability estimates by industry (textile, nontextile) are reported in Table 4. The frequency of child labor among textile families is clearly reflected in the probability that a child of a given age was in school. The probability that a male child between the ages of 11 and 13 would be in school was 41.3 percent in textile families and 75.6 percent in nontextile industrial families. By 14 to 15, only 13.1 percent of male youths in textiles were in school, while 36.5 percent of males of this age were in school in nontextile industries. The differentials in schooling attendance are even larger for females in these age intervals.

TABLE 3

THE EMPLOYMENT AND SCHOOLING PROBABILITY OF CHILDREN IN INDUSTRIAL FAMILIES, U.S., c. 1890[a]

	(1) At Work	(2) At School	(3) Work or School
Child			
5-10	0.02	0.53	0.55
Male			
11-13	0.24	0.60	0.84
14-15	0.69	0.25	0.94
16-17	0.86	0.05	0.91
18+	0.78	0.01	0.79
Female			
11-13	0.21	0.65	0.86
14-15	0.49	0.39	0.88
16-17	0.72	0.04	0.76
18+	0.74	-0.02[b]	0.72

Source: Wright 1890 study.

[a]See Table 1 for estimation techniques.

[b]The estimating procedure does not constrain the estimates to the 0-1 interval.

TABLE 4

THE PROBABILITY OF CHILD IN SCHOOL BY AGE, SEX, INDUSTRY, AND FATHER'S EARNINGS, c. 1890[a]

Sex/Age	Total		Low Earnings[b]		High Earnings[c]	
	(1) Textile	(2) Nontextile	(3) Textile	(4) Nontextile	(5) Textile	(6) Nontextile
Child						
5-10	0.466	0.569	0.356	0.435	0.554	0.606
Male						
11-13	0.413	0.756	0.277	0.505	0.722	0.843
14-15	0.131	0.365	0.073	0.288	0.359	0.432
16-17	0.057	0.078	0.136	-0.100[d]	0.161	0.246
18+	0.030	-0.006	0.132	0.095	-0.164[d]	-0.043[d]
Female						
11-13	0.488	0.863	0.299	0.780	0.794	0.897
14-15	0.203	0.662	0.165	0.680	0.408	0.636
16-17	-0.058[d]	0.302	-0.017[d]	0.108	0.249	0.399
18+	-0.031[d]	0.159	0.014	0.057	0.039	0.179

Source: Wright 1890 study.

[a]See Table 1 for estimation technique.

[b]Father's earnings less than or equal to $400 (1890$).

[c]Father's earnings greater than $400 (1890$).

[d]The estimating procedure admits values outside the zero-one interval.

Separating the sample by father's income less than or equal to $400 (1890$) and greater than $400 (Table 4, columns 3-6),[11] reveals that both industry and parental income had powerful effects on the likelihood that the child was in school. Among low wage families in textiles 27.7 percent of males 11-13 were in school, in nontextiles 50.5 percent. Among high wage families, the corresponding percentages are 72.2 percent and 84.3 percent.

A more precise estimate of the industry effects on median schooling, controlling for father's income, can be obtained by estimating separately (by industry) the number of children in school per family, including interaction terms between father's earnings and the sex-age composition of the household. Ordinary least squares estimates are reported in Table 5. It is clear that father's earnings strongly and significantly increased the likelihood that a child of either sex was in school at any particular age.

With these estimates (Table 5), it is possible to compute the industry effect on median schooling or, more precisely, to estimate the median age of schooling departure, controlling for differences in income. Using male offspring of textile workers as an example, the estimates in Table 5, column 2 give the probability that a male child will be in school as:

15) $$\text{Prob(male in school; textiles)} = 0.689 - 0.044\ \text{Age} + 0.00049\ \text{Father's Earnings}.$$

Substituting mean father's earnings in the full sample ($517.68) into the equation, permits us to calculate the age at which the probability of being in school is 0.5, namely 10.1 years of age. Similar calculations can be made for females and for children of both sexes in nontextile families. These are reported in Table 6. The median age of school departure is 3.1

TABLE 5

NUMBER OF CHILDREN IN SCHOOL, INDUSTRIAL FAMILIES IN THE U.S., c. 1890[a]

	Textiles		Nontextiles	
	(1)	(2)	(3)	(4)
Constant	0.056	0.068	-0.016	-0.011
	(2.34)	(3.11)	(0.82)	(0.60)
Children 5-10[b]	0.536	0.444	0.642	0.565
	(33.43)	(28.35)	(45.96)	(42.70)
Males 11+[c]	0.158	0.689	0.306	1.688
	(9.05)	(6.20)	(17.97)	(15.73)
Males * Age[d]		-0.044		-0.104
		(6.38)		(15.67)
Males * Father's Earnings		0.00049		0.00041
		(7.64)		(9.99)
Females 11+	0.107	0.775	0.481	1.909
	(7.33)	(7.71)	(26.86)	(18.01)
Females * Age		-0.052		-0.101
		(8.80)		(15.41)
Females * Father's Earnings		0.00069		0.00023
		(12.53)		(5.85)
$\bar{R}^2$[e]	0.33	0.44	0.55	0.62
Sample Size	3043	3043	3766	3766

Source: Wright 1890 study.

[a]The absolute values of the t-ratios are reported in parentheses.

[b]Number of children in family between five and ten years old.

[c]Number of male children eleven years of age or older.

[d]Cumulative ages of all males 11 years of age or older.

[e]Adjusted R^2.

years less among males in textiles, 2.9 years among females, than it is among nontextile families, controlling for parental income.

TABLE 6

MEDIAN AGE OF LEAVING SCHOOL

	Textiles	Nontextiles
Males	10.1	13.4
Females	12.3	15.2

Source: Table 5 and text.

Most estimates of the pecuniary return to education (e.g. Becker, 1975, Hansen, 1963) pertain to a relatively modern period in the evolution of the American economy, but many have asserted that returns to education were even higher at the turn of this century than at its midpoint. The individuals we have been analyzing lived just prior to a great watershed in schooling attainment in the U.S.; median years schooling increased by over one-third during the brief period from about 1915 to 1930.[12] This rapid expansion of more educated workers is reflected in the substantial drop in the skilled to unskilled wage ratio throughout the first half of this century and particularly during the period of most rapid advance in educational attainment.[13]

Education clearly augmented mean earnings for individuals of the schooling vintage we have been analyzing. This was true, if less pronounced even for females. The 1907 Report, briefly described in Section 1.0, contains information on months schooling and literacy for young,

unmarried female workers. Log earnings equation (16) indicates that schooling increased earnings for females about 2 percent per year around the mean, controlling for experience, age, and region. Equation (17) shows that literacy, by itself, augmented earnings by over 13 percent.

16) Log Annual Earnings = $\Sigma\alpha_i X_i$ + $\underset{(4.90)}{0.034}$ S - $\underset{(2.71)}{0.0017}$ S^2

R^2 for entire equation = 0.810

17) Log Annual Earnings = $\Sigma\gamma_i X_i$ + $\underset{(6.94)}{0.134}$ L

R^2 for entire equation = 0.810

X_i ≡ experience, experience squared, log days worked, age at which work began, regional or state dummies.

S ≡ (months of schooling/8).

L ≡ literacy, i.e. can read or write.

Source: 1907 Report, number of observations = 2515.

Although education may have enhanced a young woman's home productivity and may have led to a more lucrative marriage, the eventual penalty from reduced schooling was probably not as great as it was for a young man, whose labor force experience continued far beyond his unmarried years.[14] The penalty of not continuing schooling to high school for young men at this time must have been on the order of 10 to 15 percent of their future yearly earnings.

3.20. Physical Wealth Transfers to Offspring

The question obviously arises whether the reduced schooling for children of textile workers reflected a shift in the composition of asset

transfers to the offspring rather than a reduction in total asset transfers. Parents may simply have been optimally reallocating between human and physical capital in response to higher youth earning prospects. In this section we explore the effect of child labor on parental gifts and bequests.

3.21. Earnings Retained by the Child

Among the most important of parental gifts was the amount of earnings the child was permitted to retain for its own use.[15] Although it would be preferable to have data on actual consumption, such data do not exist and would in any event be difficult to measure since there were many public goods within the household. The concept of "retained earnings" was frequently used in budget studies during this time period, and although its definition is clear there is some ambiguity in its interpretation. Retained earnings was that part of earnings a child kept for its own discretionary use. It is not known, however, the degree to which it substituted for in-kind transfers. Thus families that allowed their working children no retained earnings may have compensated them with goods such as clothing. It is our reading of secular trends in the data and of the literature that in-kind transfers were poor substitutes for retained earnings and that retained earnings are a good measure of wealth transfers to a child while it labored for pay.[16]

Two unique data sets collected in 1907 as part of extensive Senate hearings into the conditions of female and child labor permit us to explore retained earnings and its determinants. One set of data consists of information on individual unmarried working women living at home with their parents and gives data on earnings, retained earnings, and age,

but not, unfortunately, any information on the youth's household. A second data set consists of information about the families of working children of both sexes in textiles and the clothing industry. The second set of data contains a figure for retained earnings by all children in the family over 15 years old, but no information on retained earnings by individual child. Thus the first set of data will enable the study of retained earnings by age for females and the second the determinants of retained earnings by family and individual characteristics.[17]

Age profiles of weekly earnings and of the percentage of daughters who retained some earnings from the first data set are reported in Figure 1. Weekly earnings (the dotted lines) rise continuously to age 30, from approximately $4 (1907$) per week at age 15 to $8-9 per week at age 30. Average earnings are somewhat higher for daughters who retained positive earnings. Of greater interest, the percentage of daughters who retained some earnings never exceeded 50 percent. The percentage approached 50 percent only when the young women were in their late twenties. At age 21, the percentage was closer to 15 percent. The average percentage of earnings that were retained by those who retained any earnings at all was substantial, 51.7 percent, and was relatively invariant with respect to age.[18] Of weekly earnings of roughly $7, approximately 50 cents was retained by the average 21 year old working daughter ($7 x .5 x .15 = $0.53), that is, 7.5 percent of her earnings, although an average of $3.62 was retained by those for whom retained earnings was positive.

These data have two deficiencies in terms of providing empirical content for our model: they deal only with females and they do not have information on the youth's household, and therefore cannot be used to measure the impact of father's income, number of siblings, and other

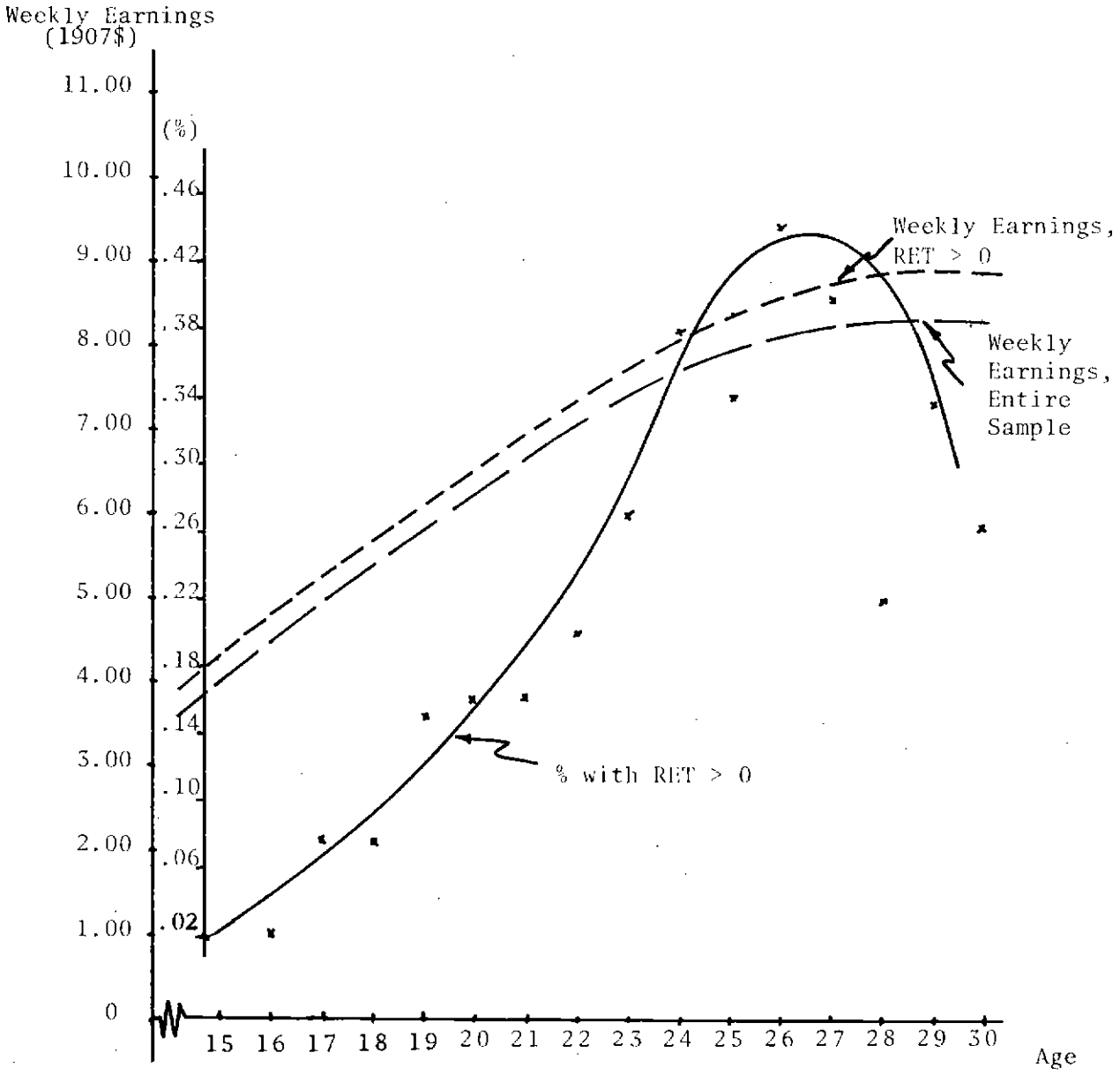

Figure 1: Earnings and Retained Earnings of Unmarried Women Living at Home and Working in Factories and Stores in N.Y.C. in 1907. (1319 observations)

Source: 1907 Report (see text).

continued . . .

Notes to Figure 1: (RET = retained earnings)

(1) Weekly Earnings, given RET >0 = $-11.123 + \underset{(0.455)}{1.403}\ \text{Age} - \underset{(0.0097)}{0.0250}\ \text{Age}^2$

$R^2 = 0.186$
N = 186; standard errors in parentheses.

(2) Weekly Earnings, for the entire sample =

$$-16.168 + \underset{(0.276)}{2.114}\text{Age} - \underset{(0.0082)}{0.0592}\ \text{Age}^2 + \underset{(0.00009)}{0.000529}\ \text{Age}^3$$

$R^2 = 0.290$
N = 1319; standard errors in parentheses.

(3) % with RET > 0
Means at each age are given by ×'s.

variables. A related data set for 1907 does contain information on the family characteristics of children working in the clothing and cotton textiles industries as well as information on the value of earnings retained by all children over 15 years in each family. We have estimated the following relationship over all households having a child older than 15 years:

$$18) \quad RET = \beta_0 + \beta_1 CHY + \beta_2 POPY + \beta_3 KIDS + \beta_4 SIBS + \beta_5 POP + \beta_6 MOM + \beta_7 HOME + \beta_i R_i$$

where

RET ≡ retained earnings of all children > 15 years

CHY ≡ the earnings of all children > 15 years old in the family

POPY ≡ the father's income

KIDS ≡ the number of siblings ≤ 15 years old

SIBS ≡ the number of siblings > 15 years old

POP ≡ the presence of the father

MOM ≡ the presence of the mother

HOME ≡ 1, if the family owned their home, zero otherwise

and

R_i's ≡ a set of state and city dummies.

The model of Section 2.0 has suggested the importance and the signs of most of these variables, particularly CHY, the earnings of children, and POPY, the earnings of the father. The presence of younger siblings should be equivalent in effect to a decrease in family income; the presence of older siblings may reduce RET by decreasing the bargaining strength of other adolescents. The ownership of a home might indicate more public goods or an environment that would be fairly expensive for a youth to duplicate in the housing market, and thus it should decrease RET.

How the presence or absence of the mother affects RET is an interesting empirical question.

Because RET can take on a zero value, and does with considerable frequency (in 77.5 percent of the families), estimation of equation (18) was performed using a TOBIT procedure. The results are given in Table 7. There are two ways of interpreting the coefficients and related elasticities from this estimation, and this issue is related to that raised above on the meaning of retained earnings. It is possible that RET might not have been reported by families that rewarded children with in-kind transfers rather than with cash. If this were the case, interest should center on the coefficients and the elasticities of the index (I), that is on the values conditional on RET > 0. However, if zero values are indeed meaningful, as we believe they are, the elasticity of the expected value of RET, E(Y), would be of interest.[19]

Increases in father's income increase RET, and for E(Y) the elasticity of POPY is 0.184. The change in E(Y) is considerably larger for changes in CHY than it is for changes in POPY, and the amount of earnings retained by these children rose considerably with increases in their earnings.[20] The coefficient on the child's earnings is 0.62, greater than the value of 0.52 obtained from the previous sample restricted to females. Because the data analyzed here are for both males and females, this indicates that males must have retained a greater percentage of their income. Younger siblings reduced RET, and so did older ones, but not with statistical significance. The ownership of a home substantially reduced RET, as one might expect if children "paid" for the amenity value of such ownership.[21] Finally, the presence of a mother had a profoundly philanthropic affect on her children.

TABLE 7

DETERMINANTS OF RETAINED EARNINGS (RET):
TOBIT ESTIMATION

Dependent Variable = Retained Earnings (RET)

Variable	Coefficient (β_i)	T-Statistic[a]	Elasticity of Index (I)[b]	Elasticity of E(Y)[c]	Variable Means
CHY	0.624	15.32	5.795	1.932	675.6
POPY	0.156	2.82	0.551	0.184	256.9
KIDS	-39.54	-6.20	-1.429	-0.476	2.63
SIBS	-17.84	-1.17	-0.579	-0.193	2.36
POP	41.56	1.29	0.422	0.141	0.740
MOM	117.75	2.45	1.517	0.506	0.938
HOME	-112.92	-3.48	-0.271	-0.090	0.175
State or City Dummies[d]					
MASSACHUSETTS	-110.32	-3.02	-0.355	-0.118	0.234
NORTH CAROLINA	434.38	12.85	1.555	0.518	0.261
CHICAGO	121.69	3.44	0.429	0.143	0.257
Constant	-913.15	-14.55			

Number of Observations = 2686

Observed frequency of Y > 0 = 0.225

Predicted frequency of Y> 0, given average X_i's = 0.186

Source: 1907 Report (see text).

[a] Asymptotically 't'.

[b] Index = I = $X\beta$.

[c] $E(Y) = P(X\beta/\sigma) + \sigma f(X\beta/\sigma)$, and $[X_i/E(Y)]\cdot[\partial E(Y)/\partial X_i] = P\beta_i\cdot[X_i/E(Y)]$. P = Prob(Y>0)

[d] Omitted dummy = New York City.

Therefore although children retained a greater percentage of their earnings as their earnings rose and as their parents' earnings rose, the fraction who received such transfers and the amounts they received were small relative to the earnings that were implicitly foregone in the process.

3.2. Family Assets (Potential Bequests)

That on average such a small fraction of earnings was retained by these children may have reflected more the timing than the nature of the asset transfer to the child. It is possible, for example, that the family simply held the child's earning in trust and intended to bestow the assets on the child at a later time, perhaps through bequests.

The Wright 1890 Study provides evidence on the likelihood that such a process occurred. Although the survey did not secure estimates of net family assets (assets minus liabilities), it did include a question concerning the household's financial status, whether it was "in debt," held a "surplus," or had "accounts balance."[22] A probit analysis of the likelihood that the household held a surplus can indicate whether the savings rate out of child income was indeed higher than that out of other family income sources.

The probit estimates are reported in Table 8. Family income was divided into three components: father's earnings, children's earnings, and other income.[23] All three had powerful positive impacts on the likelihood that a family reported positive net family assets. But of more interest from the current perspective is that the estimated coefficient on children's earnings is <u>less</u>, not more, than the coefficient on father's earnings. The hypothesis that children's income was simply accumulated by

TABLE 8

PROBIT ESTIMATES OF THE PROBABILITY OF POSITIVE NET FAMILY ASSETS, INDUSTRIAL WORKERS IN THE U.S., c. 1890[a]

Constant	-1.060
	(2.63)
Family Income	
Father's Earnings	0.00313
	(17.91)
Children's Earnings	0.00241
	(6.71)
Other Income	0.00217
	(6.42)
Demographic	
Father's Age	-0.00259
	(0.13)
Father's Age Squared	0.00012
	(0.51)
Children 0-10[b]	-0.106
	(5.24)
Males 11-15	-0.190
	(3.49)
Males > 15	-0.165
	(1.94)
Females 11-15	-0.291
	(5.32)
Females > 15	-0.338
	(5.32)
Log of Likelihood Function =	-1366
Sample Size	2489

[a]Data Source: Wright 1890 study. The dependent variable equals one if financial status is "surplus," zero if "in debt" or "accounts balance." Absolute value of asymptotic t-ratio in parentheses.

[b]Number of children in the family between the ages of zero and ten.

the parents for later transmission to the offspring is not supported in this sample. Future wealth was apparently lower for children who worked.

4.0. Child Labor and the Wages of Adults

The heavy demand for child labor in the textile industry apparently induced a major reallocation of family resources from the future wealth of the offspring to the family's current consumption. As discussed in Section 1.0, these gains to current family income were apparently substantial. In the Wright 1890 Study the average family in textiles reported $173 (1890$) per year in child earnings, the average family in non-textiles only $51 or $122 less. By comparison the average earnings of the male household head in the sample was $518. The differential child earnings corresponded to one quarter of the male head's earnings, clearly suggesting a major difference in current family economic well-being.

This higher current family income may have been illusory. The U.S., even at the turn of this century, was primarily agricultural and the industrial work force had to be attracted largely from the agriculture sector. The attractiveness of job offers would involve the family's assessment of various characteristics of the location, including the father's earnings and the possibility of child work.[24]

To the extent families viewed the gain in child labor income as a simple increase in family income, it is likely they would have migrated to areas where the demand for child labor was plentiful. Such migration would have put downward pressure on adult wage rates in industries with high child labor demands. Such a downward adjustment in adult wages is consistent, for instance, with the earnings of unskilled labor in the Wright 1890 Study. In textiles, child earnings per family averaged $199,

in nontextiles, $57. The annual earnings of the father, however, were $293 in textiles and $447 in nontextile industries. (The endogeneity of the labor force participation of children will be accounted for in the empirical analysis below.)

Indeed if parents felt no concern for the future well-being of their offspring, family incomes from all sources would presumably have been equalized dollar for dollar in the long run. Any gain in family income due to child labor opportunities would have been completely offset by a lower wage to the household head. If, however, parental concern for the child's future welfare were more substantial, the father's earnings would have dropped less in industries with a high potential for child labor. The future earnings reductions of the child would partly or totally offset the gain in child earnings in the evaluation of the family's compensation bundle.

The process suggested can be formalized using the model developed in Section 2.0. To attract labor to an industrial location, the firms in the industry must offer a compensation package equal to or exceeding that of other firms in the economy. The labor market establishes an equilibrium compensation level (say V in utility units) and the industry must offer a rate of adult wages and child labor opportunities that permit the family to achieve that level. Presumably the equilibrium compensation package offered workers depends on their skill, age, and other "quality" attributes so equilibrium requires[25]

19) $C^{\alpha}W^{\beta} = V$ (Skill, Region, etc.)

or

20) $(E + E_0)^{\alpha} (E_1)^{\beta} = V.$

The schooling relationship, eq. (4), defines the tradeoffs possible between E_0 and E_1, namely

21) $$E_1 = \phi S^{\gamma} = \phi(H - \frac{E_0}{w_0})^{\gamma}$$

since $E_0 = w_0(H-S)$. From 20) and 21), it is easy to compute the adult earnings/child earnings gradient:

22) $$E = -E_0 + \frac{1}{\phi^{\delta/\alpha}} S^{\frac{-\gamma\beta}{\alpha}} V^{\frac{1}{\alpha}}.$$

Assuming a fixed child wage rate (w_0), variations in child earnings will induce variations in adult wages according to

23) $$dE = [-1 + \frac{\gamma\beta}{\alpha} (\frac{1}{w_0 \phi^{\delta/\alpha}}) S^{\frac{-\gamma\beta}{\alpha} - 1} V^{\frac{1}{\alpha}}] dE_0.$$

Adult earnings will fall dollar for dollar with child earnings if either the elasticity of future income with respect to schooling (γ) is zero, that is schooling has no investment value, or the parents place zero value on the child's future well-being ($\delta = 0$).

The extent of adult earnings reductions, then, reduces to an empirical issue. Equation (22) would suggest estimating an adult earnings function dependent on child earnings and the arguments in V, namely, skill, age, regional wage levels, etc. Since the child work constraint may not be binding, particularly for high income families, it is not reasonable to treat child work (and therefore earnings) as exogenous. In particular, the earnings of the father may influence child work hours and earnings. Indeed simple evidence of such an effect was presented in Section 3.0.

It is necessary, therefore, to estimate a simultaneous model of father's earnings (E) and children earnings (E_0) of the form

$E = f[E_0$, skill, age, regional wage levels, demographic structure of children].

$E_0 = g[E$, demographic structure of children (age, sex), regional wage levels, industry].

Estimates of a linear approximation to this model are presented in Table 9. The simultaneous structure was estimated using two stage least squares.

The most interesting coefficient from our viewpoint is the estimate of the effect of child earnings on father's earnings, -0.714. Controlling for skill, age, regional wage levels, and nativity, we find a powerfully significant negative impact of children's earnings on adult wages. Indeed the annual earnings of the male household head was reduced $0.71 for every $1.00 increase in children's earnings. Apparently the greater part of the family's current income gains from child work was offset by the reduced earnings of the father. From a behavioral perspective, it would appear that the family did not require a substantial increase in total family earnings to sacrifice a reasonably large amount of schooling opportunity for their children.

Briefly reviewing the other estimated coefficients, adult male wages do increase appreciably with skill level (particularly in the highly craft-oriented glass industry). Industrial wages are also powerfully correlated with the labor income of agricultural workers in the state of residence. Adult earnings reduce children's work effort as well as the reverse (column 2). Children's earnings are also influenced by wage levels in the state, but much less so than adult wages are. The textile effect is strongest for female offspring and young (age 11-15) males.

TABLE 9

A SIMULTANEOUS MODEL OF FATHER'S EARNINGS AND CHILDREN'S EARNINGS, U.S. INDUSTRIAL WORKERS, c. 1890[a]

	(1) Father's Earnings	(2) Children's Earnings
Father's Earnings	-	-0.0418
		(3.92)
Children's Earnings	-0.714	-
	(13.22)	
Constant	-66.60	5.884
	(1.40)	(0.78)
Human Capital-Father		
Skilled	79.20	-
	(9.91)	
Semi-skilled	109.7	-
	(11.76)	
Unskilled	-	-
Other	-3.81	-
	(2.65)	
Skilled * glass	216.5	-
	(10.92)	
Semi-skilled * glass	316.0	-
	(25.84)	
State Agricultural Service Income[b]	0.497	0.0738
	(9.21)	(2.97)
Demographic		
Father's Age	20.08	-
	(8.95)	
Father's Age Squared	-0.249	-
	(9.65)	
Native Born	-3.989	-16.46
	(0.57)	(5.51)
Children 0-10	9.625	3.935
	(2.84)	(2.14)

TABLE 9 (continued)

	(1) Father's Earnings	(2) Children's Earnings
Males $\leq$ 15	18.99	29.30
	(3.04)	(8.77)
Males > 15	109.0	188.6
	(8.77)	(51.55)
Females $\leq$ 15	18.59	4.92
	(3.01)	(1.41)
Females > 15	70.77	41.14
	(7.72)	(11.31)
CHO-10 * TEX[c]	-	-4.81
		(1.86)
M $\leq$ 15 * TEX	-	24.94
		(5.09)
M > 15 * TEX	-	13.33
		(2.60)
F $\leq$ 15 * TEX	-	54.87
		(11.13)
F > 15 * TEX	-	131.1
		(28.49)

Source: Wright 1890 study.

[a]The absolute value of t-ratios are reported in parentheses. The sample size is 6610 families, largely in import-competing industries (textiles, iron and steel, glass, etc.).

[b]State averages of service (or labor) income per agricultural worker.

[c]Number of children in the family up to the age of ten, times a dummy equal to one of father's industry is cotton or woolen textiles, zero otherwise.

5.0 Conclusion

The structure of industry and the social relationships among family members have had powerful interactive effects. In the U.S. at the turn of this century not only did child labor have an almost definitional, negative effect on schooling, but in addition families provided little in the way of physical asset transfers (gifts or bequests) to compensate children for the lost schooling and future earnings. Thus the presence of industries with a high demand for child labor reduced the future wealth position of the offspring. The increased family income was apparently absorbed in higher current family consumption.

But even that economic gain was largely offset by the effect of child labor possibilities on adult wage rates. Any lack of concern by parents for lost schooling and future earnings of their children would, in equilibrium, be reflected in lower adult earnings, as families migrated to areas where child labor was prevalent. If enough parents were totally uncaring, families would continue to migrate to regions of high child labor until their own wages were forced down precisely to offset the higher earnings of their children. The estimates presented show that in the U.S. in 1890 each $1.00 increase in "child" earnings reduced the earnings of the male head of the household by $0.71, implying a willingness of some parents to "sell" the future income of their offspring for current consumption.

We have concentrated on aspects of intrafamily relations among working class families in the late nineteenth century. Yet, how do our results illuminate change over time in child labor, schooling, and retained earnings? Long term trends in all three suggest that parents exhibited substantial concern for the present and future well-being of their offspring. Our results do

yield positive income elasticities for both schooling and retained earnings. But our sample contains only working class families,and had we one including families not employed in these industries the impact of income would have been greater and more applicable to long run analysis. More importantly, we believe, many changes over time cannot be encompassed in cross sectional analysis. Industries which were previously in the hinterland, became part of urban America, as electrification diffused. And as industrial families left their rural heritages and became urbanized, the perceived costs and benefits of schooling may have been radically altered. Furthermore, increases in the skilled-unskilled wage ratio and the rise of the non-domestic service sector encouraged parents to keep their children in school longer, as did the legal incentives of school attendance laws. Alternatively the substantial increase in schooling over time may have been the result of simple good fortune, that most advanced industrial technologies place little value on the unskilled labor of children.

Footnotes

[1]A cross section (48 states) analysis of youth labor force participation for 1900 yields:

% 10-15 year olds in labor force ('t' statistics in parentheses):

Males: $42.95 - \underset{(8.74)}{0.019}\ \text{Income} + \underset{(1.61)}{0.397}\ \%\ \text{Black} + \underset{(5.89)}{0.091}\ \text{Mfg.} - \underset{(0.86)}{0.117}\ \text{Mining} - \underset{(0.47)}{0.527}\ \text{Service}$ $\underset{(2.63)}{}$

$R^2 = 0.81$

Females: $10.17 + \underset{(3.23)}{0.010}\ \text{Income} + \underset{(1.37)}{0.367}\ \%\ \text{Blacks} + \underset{(8.50)}{0.270}\ \text{Mfg.} - \underset{(4.01)}{0.265}\ \text{Mining} - \underset{(1.66)}{0.420}\ \text{Service}$ $\underset{(3.28)}{}$

$R^2 = 0.78$

Service includes wholesale and retail trades, finance, transportation, etc. Agriculture is the omitted sector. Source: Census of Population, 1900.

[2]Economic implications of the lack of identity of interests between parents and children have been developed in Ishikawa (1975), Parsons (1975, 1977), and Blinder (1976).

[3]Families in several other industrial countries were also included in the sample but were excluded from the current analysis. Michael Haines kindly provided us with the data set. It should be noted that the families were not a random sample. See Haines (1979) Chapter 5 for a more detailed discussion of it.

[4]Schooling investment models of this form are discussed in Becker (1967), Ishikawa (1975), Parsons (1975), and Blinder (1976).

[5]Implicit in this model is the assumption that parents have authority over minor children and can, in fact, direct their activities and secure for their own use as much or as little of the child's earnings as they feel is appropriate. We believe this captures the essence of the child labor process. Among young adults living in the household of origin, a more explicit exchange system might be appropriate. See, for example, Horney and McElroy (1978) and Manser and Brown (1980) for applications of bargaining models to family processes. We raise some of these issues in Goldin and Parsons (1980) in relation to the age at which children exit from the household.

[6]One might assume that consumption within the household is distributed in fixed proportions among family members; a higher living standard for the parents implies a higher living standard for others in the household as well. We ignore leisure in this model.

[7]Data from the 1907 Report indicate that transfers from unmarried young women to their parents drop off considerably once they leave home but continue to work.

[8]The child wealth and wage/schooling relationships are treated (implicitly) by substitution although they obviously could be treated symmetrically with the family income constraint. The potential upper bound on schooling time in the parental household ($H \geq S$) is ignored here, an internal solution is assumed.

[9]In the Wright 1890 Study the family reported the number of children in school and the age and sex composition of the family, with the sex of the children reported only for those eleven years of age or older.

[10]The population percentages in school by age, sex, and nativity are:

Males Age	Native Born Parents Native Born	Foreign Born Parents	Foreign Born Parents	Females Age	Native Born Parents Native Born	Foreign Born Parents	Foreign Born Parents
5≤9	0.509	0.594	0.6000	5≤9	0.508	0.586	0.589
10≤14	0.839	0.876	0.755	10≤14	0.849	0.873	0.747
15≤19	0.434	0.285	0.128	15≤19	0.396	0.258	0.096

Source: Census of Population 1890.

[11]The $400 (1890$) figure is the mean of father's earnings in the textile industry.

[12]The cohort of women born from 1893 to 1902 reported, when they were 45-54 years old, that they completed 8.8 years of schooling, but the cohort born between 1908 to 1917 reported, when they were 45-54 years old, that they completed 12.0 years. The data for women are 8.6 and 11.3 years schooling respectively. The source used is Series P-20 Current Population Reports, 1947 and 1962.

[13]See, for example, on general wage ratios Keat (1960) and on wage ratios for occupational groupings of women Goldin (1980).

[14]On the role of education in enhancing nonmarket productivity, see Benham (1974) and Leibowitz (1974).

[15]Obviously children also consume goods and services in the household. This is true of children who do not work, however, as well as those who do. We know of no evidence that suggests that working children consume a relatively greater share of family expenditures on goods and services than do nonworking children (for given total family expenditures and family size and composition).

[16]Although some percentage of children who live at home with their parents continue to work for pay, the income they regularly give over to their parents seems to have declined considerably since the early twentieth century. Women's Bureau Report No. 183 (1940),which surveyed Cleveland, indicated that only 32.8 percent of all daughters under 21 years living at home and working gave their parents all their earnings. For those 21 years old to under 30, the percentage was only 18.1. Thus there was a substantial decrease in the contributions of children to the family from 1907 to 1940.

[17]The first sample consists of (1319) young women in manufacturing and store work in New York City, and the second sample included (2686) children working in the clothing industry (Chicago and New York) and in cotton textiles (Massachusetts and North Carolina).

[18]The regression of % Retained (conditional on RET > 0) on Age and Age^2 has an $R^2 = 0.003$.

[19]The difference between the two slopes is the Probability $(Y>0|X_i's)$. That is, $\partial E(Y)/\partial X_i = \beta_i \cdot Prob(Y>0|X_i's)$, while $\partial I/\partial X_i = \beta_i$.

[20]The elasticity of retained earnings with respect to earnings (for RET > 0) was about 1 in the sample of working females, that is the percentage retained was independent of earnings. The difference in the two samples with respect to this elasticity results from the characteristics of the children each includes. Observations in the sample of Table 7 are for all children over 15 years old in a family. Thus even though one child retained earnings, all may not have.

[21]We are avoiding the issue of bequests here. Children may have accepted less current wealth in the form of retained earnings to avoid conflict where the expected value of a bequest was large.

[22]The response rate to this question was less than one half that for questions on family income and other family characteristics. The results should, therefore, be viewed with correspondingly greater caution.

[23]The analysis also includes various demographic characteristics of the family, including age of the father and age and sex of the children.

[24]For recent work on the economics of family migration see the work by Sandell (1977) and Mincer (1978).

[25]In this discussion we assume that incomes are sufficiently low that all transfers to the child are in the form of schooling ($T = 0$).

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