DOCUMENT RESUME

ED 175 048 CS 205 111

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TITLE The Financial Affairs of 1860 Wisconsin Newspapers: An Analysis of the Manuscript Products of Industry Returns from the U.S. Census of 1860.
PUB DATE Aug 79
NOTE 42p.; Paper presented at the Annual Meeting of the Association for Education in Journalism (62nd, Houston, Texas, August 5-8, 1979)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Business; Comparative Analysis; *Economic Factors; *Journalism; *Media Research; *Newspapers; Publishing Industry; United States History
IDENTIFIERS Wisconsin

ABSTRACT

A study was undertaken to describe the financial affairs of 49 Wisconsin newspapers enumerated in the 1860 United States Census of Products of Industry schedules. Specific information was sought concerning the cost of establishing a newspaper, the cost of materials and supplies, the number of employees and their pay, the value of the newspaper and job printing work produced, and the financial returns of the newspaper-publishing business. The data were then compared with similar data on all businesses in Wisconsin in 1860. The results revealed that the newspaper establishment was smaller than other businesses in all input and output measures except the number of employees. Newspaper publication and job printing done in association with publication were labor-intensive businesses; therefore, the payroll was the larger proportion of the total actual costs of operation. As production increased, however, the value of raw materials increased more than did payroll. The operating costs for doing newspaper publication and job work were greater than initial investment, and the costs of newspaper production increased per unit of total output at a greater rate than did job printing costs, indicating that newspaper production was relatively more expensive to do than job work. (FL)

THE FINANCIAL AFFAIRS OF 1860 WISCONSIN NEWSPAPERS:

An Analysis of the Manuscript Products of Industry Returns from the U.S. Census of 1860

by

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For Presentation to the History Division, Association for Education in Journalism, Houston, Texas August, 1979.

Primary source material on the economic history of the mass media has been found to be more scarce than on any other topic in journalism history.[1] Archival records and published reminiscences range from vague implications about financing to the whimsically specific, with a scattering of revealing and suggestive letters and documents in between.[2] One source that has not been used by journalism historians is the U.S. Census Products of Industry schedule for the years 1850 to 1880 for which county, state and national aggregates have been published and manuscript schedules, including entries on individual newspaper publishing firms, are available.[3]

The purpose of this paper is to describe the financial affairs of Wisconsin newspapers enumerated in the 1860 products of industry schedules.[4] The questions to be considered are: What did it cost to establish a newspaper? What was the cost of materials and supplies? How many employees were used and what was their pay? What was the value of newspaper and job-printing work produced? How profitable was the newspaper-publishing business?

As these census data have not been used before to examine the financial situation of newspapers, there are no findings about the business in other states with which to compare the Wisconsin findings. The only comparison possible is a comparison between the business of newspaper publishing with all other forms of business in Wisconsin in 1860.[5] Although the comparisons of the newspaper business with all other forms of business are in many respects comparisons of unequals, they permit a guage of where the newspaper establishment fit into the state's economy. The perspective provided is helpful in assessing the size and significance of the newspaper business in this period. This comparison will,

therefore, be used as a backdrop against which the analysis of data from the newspapers will be displayed.

THE DATA, THEIR MEASUREMENT, AND COMPARISONS OF NEWSPAPERS WITH ALL INDUSTRIES

In 1860, 49 newspaper establishments were enumerated in the industrial census. This number amounted to only 38 per cent of the 130 newspapers that were counted by census enumerators on another schedule, the periodical schedule.[6] These 49 newspaper establishments included 42 independent weeklies, one independent semiweekly, and six urban combinations publishing daily and weekly editions. Some combinations also published semiweekly editions. Independent weeklies and the semiweekly are defined as newspaper establishments that published only one edition, while combinations published more than one edition. Among the papers enumerated in the industrial census, the ratio of independent weeklies to combinations was about the same as the ratio among newspapers in the periodical census--about 87 per cent of the total being independent weeklies. And the mean weekly circulation of all independent weeklies and independent weeklies in the industrial census were close--632 for all independent weeklies and 659 for those in the industrial census. The combinations were an inadequate sample of their group. For most of the discussion, the independent weeklies will be the focus. Only nine, or 23 per cent of the 1850 newspaper establishments in Wisconsin were enumerated in the industrial census.[7] Discussion of these papers will be limited as they appear to be an unrepresentative sample.

The industrial census data provide a summary picture of the investment, raw materials, and labor that went into the production of newspapers and job printing for each establishment enumerated. From these values it was possible to construct others representing profitability and productivity.

Table I compares the available data on all Wisconsin businesses counted in the industrial censuses of 1850 and 1860 with data on newspaper establishments.[8]

Table I

Summary of Data on Newspaper Establishments and All Businesses Reported in the Products of Industry Schedules of the 1850 and 1860 U.S. Censuses in Wisconsin

	1850				1860			
	All Businesses	Newspapers	NP % of all	OR Index	All Businesses	Newspapers	NP % of all	OR Index
Number of establishments	1,286[1]	9	.007	--	3,173	49	.015	--
Capital investment	$3,421,680	$15,900	.005	.7[2]	$17,167,500	$139,500	.008	.5[2]
Value of materials	$5,186,563[3]	$7,885	.002	.3	$17,272,709	$92,874	.005	.3
Value of product	$8,984,533	$23,598	.003	.4	$28,596,726	$219,793	.008	.5
Value added by manufacture	$3,797,970	$15,713	.004	.6	$11,323,017	$126,919	.011	.7
Number of employees	6,232	53	.009	1.3	17,266	279	.016	1.1
Mean investment per establishment	$2,660	$1,767	.664	---	$5,410	$2,847	.526	---
Mean value of materials	$4,033	$876	.217	---	$5,444	$1,895	.348	---
Mean value of product	$6,986	$2,622	.375	---	$9,013	$4,486	.498	---
Mean value added by manufacture	$2,953	$1,746	.591	---	$3,569	$2,590	.726	---
Mean number of of employees	4.8	5.8	1.208	---	5.4	5.7	1.056	---
Mean value added per employee	$609	$296	.486	---	$656	$420	.640	---

Sources: Manuscript products of industry schedules for the State of Wisconsin, 1850, 1860; Walsh, 18, 22, 25-6, 228-9.

[1] Calculated from Walsh, 228-9.

[2] Overrepresentation index relates the percentage newspaper establishments' portion of all capital investment, for example, to newspaper establishments' portion of all businesses reported in the product of industry schedule.

[3] Calculated from Walsh data, 227 and 228.

The means summarize data on one-man shops and large establishments in which labor was significantly divided. The data show that in both years newspapers had smaller capital investments, consumed raw materials of smaller value, and turned out products worth less than other businesses in the state.

The output measures--value of product, value added by manufacture, and value added per employee--need explanation and qualification with reference to Table I and the subsequent discussion. Value of product, which was reported in the census, represents the gross output of an establishment before costs of production are subtracted. Comparisons of the value of product from industry to industry do not account for the differing amounts and values of raw materials used.[9] The processing industries, such as lumber and flour milling, could trar form large amounts of raw materials into finished products with relatively small amounts of mechanized labor.[10] In contrast, the craft industries, such as blacksmithing or shoemaking might use relatively small amounts of raw materials, apply relatively large amounts of labor, and produce small amounts of product. Furthe., while newspapers did have some economic value comparable to that of milled flour or shoes, they also had an intangible value that defies direct comparison with other manufactured products.

The construct value added by manufacture corrects the output for differing amounts of raw materials used.[11] Value added by manufacture, or value added, is computed by subtracting the value of raw materials from the value of total product. It has been described as the most useful single measure for determining the contribution of an industry to the economy.[12] Value added may be compared across industries that use vastly different quantities and values of raw materials. The construct represents the utility, or money value, derived from the manufacturing process on the raw materials. A large part of value added is the money paid in wages to employees.

The third measure of output in Table I, value added per employee, is often used as an indicator of the scale of an operation and, at least indirectly, of the amount of mechanization and division of labor. The higher the value added per employee, the larger, more technologically advanced a business usually is.[13]

Newspaper establishments employed relatively more persons than other businesses in the state. Most of the work done in a newspaper office was not amenable to mechanization in this period. Gathering information, writing editorial matter, clipping exchanges, and setting type all took manpower and time that did not change with the amount of output or number of copies published or with division of labor. These first-copy costs could not be reduced substantially by increasing output but they could be spread over larger output to some extent.[14] Labor costs constituted 67 per cent of the cost of production for independent weeklies in 1860. Only the printing could be mechanized through the use of power presses, but only six of the 49 establishments in the 1860 industrial census had power presses. Apparently because of the proportion of labor that did not actually "produce" finished newspaper copies, newspaper employees were less productive than employees in other industries in these years.

The comparisons show that newspaper establishments were relatively small operations. They were generally less productive than other businesses, and the productivity of individual workers was lower for newspaper establishments than for other businesses, probably because they could not be significantly mechanized. It required less capital to start a newspaper establi hment than many other businesses. Comparing the ratios of value added to capital investment for newspapers and other businesses, it was found that newspapers were more profitable than other businesses in 1860.[15] Since overhead expenses, such as rent, interest on borrowed money, and distribution costs, were not included in the census reports, the productivity values are all inflated by whatever those values would have been.

THE FINANCIAL AFFAIRS OF NEWSPAPER ESTABLISHMENTS

Data for all newspapers in the products of industry schedule have been compared with data on all businesses because both include small establishments in their means. But the means for all newspapers obscure large differences between the economic condition of the independent weeklies and that of the large combination papers in Milwaukee and Madison.[16] Where there were real differences in volume or dollar values between weeklies and combinations the differences were very large. These differences ranged from about six times as many employees to the expenditure of 20 times as much for printing paper for the combinations as compared to the weeklies. The variations in size and volumes among weeklies were relatively small.[17] For a few variables, such as monthly pay per employee and value added per employee, the mean values for weeklies and combinations were nearly identical.[18] These similarities and differences will be discussed below.

Table II compares the mean values for independent weeklies with those for combination papers and includes the values for all newspapers, including one triweekly, among 1860 newspapers and means for the nine independent weeklies counted in the 1850 manufacturing census. Table II also includes additional variables available only for newspaper establishments, some reported in the manufacturing censuses, some constructed from manufacturing census data, weekly circulation figures from periodical censuses, and longevity data computed from various sources.[19] The discussion of these data on the financial affairs of newspapers will be divided into two sections; one on the input or cost-of-production measures and the other on the output measures.

Table II

Summary of Mean Values for Financial Reports on Wisconsin Newspapers in 1850 and 1860

	1860 Industrial Papers						1850 Industrial Papers
	Weeklies			Combos	All Papers		
	Mean	Std. Dev	C/V[1]	Mean	Mean	Std. Dev.	Mean
Investment	$1,517	$943	.622	$12,500	$2,847	$5,248	$1,766
Reams of paper	121	163	1.347	2,146	412	1,114	217
Value of paper	$464	$349	.817	$9,922	$1,699	$5,131	$922
Cost per ream of paper	$4.06	$1.13	.342	$4.21	$4.05	$1.31	$4.04
Value of other raw materials	$220	$389	1.768	$1,294	$404	$642	$55
Value of all raw materials	$596	$503	.844	$11,216	$1,895	$5,325	$876
Number of employees[2]	3.7	1.4	.378	20.2	5.7	6.5	5.9
Annual payroll	$1,099	$551	.501	$7,814	$1,926	$2,774	$1,352
Individual monthly pay	$24.99	$5.91	.257	$29.29	$25.58	$6.41	$19.64
Total costs of production	$1,695	$957	.565	$19,030	$3,821	$7,797	$2,228
Per-copy production costs[3]	$0.031	$0.014	.452	$0.026	$0.030	$0.014	$0.030

Table II (Continued)

	1860 Industrial Papers						1850 Industrial Papers
	Weeklies			Combos	All Papers		
	Mean	Std. Dev.	C/V[1]	Mean	Mean	Std. Dev.	Mean
Weekly circulation	659	302	.458	1,967	830	753	805
Number of copies printed	34,986	18,545	.530	307,225	70,974	108,674	35,425
Value of newspapers printed	$1,054	$580	.550	$8,249	$2,061	$3,432	$1,100
Per-copy value[4]	$0.033	$0.015	.454	$0.025	$0.031	$0.014	$0.032
Value of job printing	$907	$890	.981	$14,107	$2,916	$9,013	$2,267
Value of all production	$2,009	$1,141	.568	$22,354	$4,486	$10,050	$2,622
Newspaper per cent of total product	.629	.220	.350	.688	.625	.231	.520
Value added by manufacture[5]	$1,413	$1,005	.711	$11,138	$2,590	$5,169	$1,746
Value added per employee	$414	$290	.700	$503	$420	$309	$364
Return[6]	$314	$1,038	3.306	$3,416	$664	$3,457	$392

Table II (Continued)

	1860 Industrial Papers						1850 Industrial Papers
	Weeklies			Combos	All Papers		
	Mean	Std. Dev.	C/V[1]	Mean	Mean	Std. Dev.	Mean
Return on investment dollar	$0.31	$0.86	2.770	$0.23	$0.22	$0.88	$0.23
Longevity (in years)	4.2	3.3	.786	8.2	4.5	3.6	2.8

Sources: Manuscript industrial and periodical schedules for the State of Wisconsin, 1850 and 1860; Oehlerts, Griswold; county histories.

[1]Coefficient of variation. Calculated by dividing the standard deviation by the mean, it permits the comparison of the relative homogeneity of groups with different means. It ranges from 0.0 up. See Blalock, 88.

[2]Male employees only in 1850 and for 1860 combinations; male and female for 1860 weeklies and all newspapers.

[3]Estimated by formula: Newspaper per cent of total product X (value of all raw materials + annual payroll) / number of copies printed.

[4]Copy value = value of newspapers printed/ number of copies printed.

[5]Value added = value of all production - value of all raw materials.

[6]Return = value of all production - value of all raw materials and annual payroll.

Investment, Raw Materials, and Labor Force

The mean capital investment of real and personal property in a newspaper establishment in Wisconsin in 1860 was $1,517 for independent weeklies and $12,500 for combination papers. Investment would have included the costs for one or more presses, several fonts of type and their periodic replacement, office furniture, and possibly real property to house the newspaper office. The $1,517 mean corresponds with anecdotal evidence about newspaper start-up costs for the whole antebellum period. The establishments that reported more than $2,000 in investment in 1860 had large circulations and/or large volumes of job printing, and most reported having two hand presses or power presses. The higher investment mean for 1850 ($1,767) is probably an artifact of the rather limited sample of newspapers, including some rather large weeklies, in the industrial census in that year.

For independent weeklies, investment in 1860 was most strongly related to other input or cost-of-production values, including the value of raw materials, the number of employees, and their payroll.[20] These relationships, measured by Pearsonian correlations, were stronger than relationships of any of these input values with the size of the business, measured as total weekly circulation, number of copies printed, the value of newspapers printed, value of job printing, or value of total production. These findings suggest that the scale of operation for independent weeklies, including how much one invested at the outset and over time and the amount one spent on raw materials and payroll, were possibly more strongly related to how much one could raise or afford to spend than to the need, represented by the circulation or volume of job printing. A newspaper operator could make do with an older press, smaller and cheaper paper, fewer fonts of type and less frequent replacements, and fewer or less experienced and expensive employees and still manage to publish the number of pages necessary to meet subscription and job printing demand.

Based on expenditures reported, one could publish a weekly with a circulation of 500 with a capital investment of about $1,300, raw materials costing $450, and an annual payroll of $850.[21] Larger circulation would have required more equipment at a capital investment cost of $1.55 per unit of circulation, or weekly subscription, raw materials costing .98 cents, and .002 more employees, earning 77 cents annually.[22]

Investment was related significantly with the value of both newspapers and job printing, the relation with newspaper value being slightly higher.[23] The stronger relationship between newspaper value and investment than between job value and investment and a larger investment cost per additional dollar in newspaper output indicate that the investment in newspaper publishing was less productive than in job printing.[24] Since job printing was often done during slack time on a newspaper press, and/or contracted with a newspaper publisher because he had a press, it would be expected that little additional investment--for more type faces and sizes--would have been needed to produce job work. Stated another way, job printing produced income supplementary to that from newspaper publication.[25] Among weeklies, investment also increased with longevity of the newspaper at the rate of $151 per year.[26] This added investment was probably for new type.

Reported raw material costs amounted to 33 per cent of the annual cost of operating weeklies, 50 per cent for operating combinations. The census reports on the volume and value of raw materials used in production, though governed by quite precise rules, were generally not comparable. And values were reported specifically for few of the materials used by the 49 newspaper establishments in 1860.[27] The only material for which it was possible to determine with reasonable confidence the average unit price was printing paper. It has been assumed that this paper was newsprint because it was listed first among raw materials in all

reports.[28] The mean quantities purchased and mean price per unit of each raw material reported are shown in Table IIN. All of the Ns in the table are small except those for printing paper, and some of the materials had to be divided because two different units of measure were reported. In the analysis the values of all raw materials other than printing paper have been grouped into one category of "other" materials. The aggregate raw material reports may be distorted as a result of improper enumeration.[29] Thus the unit prices and volumes for materials are at best indicators of the general value and amount of raw materials used by newspapers.

Expenditures for printing paper amounted to 82 per cent of the reported expenditures for all raw materials for both weeklies and all papers in 1860. But the mean was probably distorted by the reports of 12 operators that they used no raw materials other than paper. When those 12 were removed from the calculations, paper amounted to 74 and 75 per cent of the dollar value of all raw materials for weeklies and all papers, respectively, in 1860. Whether the paper was used for both newspaper publishing and job printing is not clear.[30]

The <u>amount</u> of paper used did not vary significantly with either weekly circulation or total number of copies printed by independent weeklies. But the <u>value</u> of paper did vary significantly with both measures of newspaper size.[31] When the combinations, which published many more newspapers, were included, the amount of paper used and its value both varied with weekly circulation and total number of copies printed.[32]

Although other raw material expenses included those for ink and fuel, which would have been used for both newspaper and job printing, most of the specified other costs were for job printing supplies. Among independent weeklies, other raw material expenses varied more strongly with the value of job printing than with most other variables and did not vary significantly with either the

Table V

Mean Amounts of Raw Materials Used by Newspaper Establishments in Wisconsin in 1860 and Unit Costs

Material	Establishment	Mean Volume	Mean Unit Cost	Number of Establishments
Printing paper	weeklies	121 reams	$4.06	35[1]
	combos	2,146 reams	4.21	7
Other paper	weeklies	50 reams	2.50	2
	weeklies	41 bundles	7.26	2
Job paper	weeklies	168 reams	3.03	2
Blanks	weekly	40 reams	3.00	1
Cardboard	weeklies	2,942 sheets	0.04	5
	combo	2 tons	150.00	1
Ink	weeklies	2.7 kegs	8.55	3
	weeklies	75 pounds	0.32	2[2]
	combos	900 pounds	0.21	2
Wood	weekly	30 cords	2.00	1
	combos	175 cords	3.08	4
Coke, coal	combc	600 bushels	0.17	1
	combos	8 tons	5.84	2
Goatskins	weekly	36 skins	2.78	1
Sheepskins	weekly	24 skins	0.50	1
Type	combo	600 pounds	0.33	1

Sources: Manuscript products of industry and periodical schedules for the State of Wisconsin, 1850 and 1860.

[1]1850, six weeklies used a mean of 217 reams of printing paper that cost $4.04 per ream.

[2]1850, three weeklies used a mean of 117 pounds of ink that cost $2.44 a pound.

number or value of newspapers printed.[33] When the combinations were included, other raw material costs did vary with both job and newspaper production values.

The relationship between the value of all raw materials--paper plus other--and newspaper value was stronger than that between all raw materials value and job value among weeklies.[34] With combinations included, however, the relationship between the value of all raw materials and the value of job printing was the stronger of the two.[35] For the 32 weeklies reporting the values of both newspaper publication and job printing, the cost of all raw materials increased 50 cents for every dollar increase in newspaper value, 17 cents for every dollar increase in job value, and 20 cents for every dollar increase in total output.[36] As with investment, these figures indicate that after initial outlays, newspaper publishing was more costly than job printing.

The price paid for printing paper, assumed to be newsprint varied little from newspaper to newspaper or from 1850 to 1860, as the data in Table III show. And the price paid per ream did not decline at a significant rate with the increased consumption as one would expect. The relationship of these prices for newsprint to general prices in the country in either year could not be determined.[37]

Despite the relatively small number of employees on 1860 Wisconsin newspapers, their payroll made up the larger share of annual costs of operation. Among independent weeklies, the payroll constituted 67 per cent of the reported annual costs, and among combination papers, 50 per cent. The number of employees per establishment varied more with investment and raw material values than with output values, but the relationship between the number of employees and weekly circulation was among the stronger relationships.[38] Newspaper establishments employed about two persons at a minimum and the number of employees increased about one person for every additional 500 in weekly circulation.[39] With combinations included, the number of employees increased one for every 16,667 copies, the equivalent of a five-day daily circulation of 64.[40]

Comparing the employment and payroll values for newspaper publication and job printing among the 32 weeklies reporting the value of both kinds of production, one finds that an additional employee was required for each additional $1,124 of newspaper production, $2,000 of job production or about $2,000 of total production.[41] The payroll increased 36 cents for each additional dollar in newspaper production, 17 cents for each additional dollar in job production, and 18 cents for both.[42] Payroll amounted to the larger share of annual costs, as stated above, but was a smaller proportion of the cost of producing an additional dollar's worth of output: 41 per cent of added costs for newspapers, 50 per cent for job work, and 46 per cent for both.[43]

The monthly pay per employee varied little among either weeklies or all newspapers.[44] For weeklies, where the mean pay was $25 a month, individual pay varied significantly only with total monthly payroll.[45] Several alternative conclusions might be drawn from this observation, and evidence is not available to select one. Since individual pay increased with increases in total payroll, it might be concluded that an employer who could afford more employees could also afford to pay each one more. Alternatively, it is possible that those establishments that had larger numbers of employees used them for specialized jobs, driving up their value and/or demands for pay. Editorial employees, for example, might have earned more than press operators.

The addition of the total cost of raw materials and the annual payroll of a newspaper establishment approximates the cost of operation. The figure does not include rent or its equivalent, interest on borrowed money or equipment bought on time, or delivery costs.[46] Thus the mean costs of all production--$1,691 for independent weeklies and $19,030 for combinations in 1860--are rough estimates. The total cost of an additional dollar of newspaper output was 87 cents, for job output, 34 cents, and for both, 39 cents.[47]

Since operating costs were not divided between newspaper and job production in the census, an estimate of the cost of producing one copy of a newspaper was developed by dividing costs according to the ratio of newspaper value to the value of total product. It was found that the mean cost per copy of weeklies was 3.1 cents and for combinations, 2.6 cents. The copy cost did decline with increased production by independent weeklies but not for all papers.[48] Total costs increased at the rate of 2.1 cents a copy for weeklies.[49] For all newspapers, costs increased at the rate of 2.4 cents a copy.[50] These means and costs per additional copy obscure a pattern that indicated limits on the economies of scale possible or desirable in newspaper production. When the independent weeklies were divided into groups according to the number of copies produced, it was the middle group that had the lowest per-copy costs rather than the group with the largest weekly newspaper production. The copy costs for nine groups of weeklies are shown in Table IV. When combinations were included in the breakdown, the pattern was less clear.[51]

The copy-cost figures are crude estimates that include the cost of printing, which was directly related to the number of copies produced, as well as editorial costs not related to volume of production. But the apparent pattern in per-copy costs among independent weeklies corresponds to findings on twentieth-century newspaper costs. That is, first-copy costs on the larger weekly papers were not relatively the lowest.[52] The reasons for the patterns may be different, however. For contemporary newspapers the lack of a continued per-copy cost reduction as circulation increases apparently occurs because economies in editorial product would mean a reduction in quality and quantity of content that would presumably reduce demand for newspapers. For the 1860 Wisconsin weeklies, however, it is likely that larger circulation would have required the hiring of additional employees and purchase of additional equipment. It was the average independent weekly, with a circulation between 577 and 673, that had the lowest per-copy cost.

Table IV

Estimated Cost of Producing One Newspaper Copy

Among Groups of Independent Weeklies in Wisconsin in 1860

Circulation[1]	Mean Copy Cost[2]		Number of Establishments
250- 308	$0.045		4
385- 400	0.040		5
404- 481	0.040		5
500	0.025		4
577- 673	0.017	lowest per-copy cost	4
681- 700	0.026		4
750- 869	0.020		3
904- 962	0.030		4
1,000-2,031	0.023		3
250-2,031	0.031		36

Sources: manuscript periodical and products of industry schedules for the State of Wisconsin, 1860

[1]Circulation estimated by dividing number of copies printed by 52 weeks.

[2]Copy cost estimated by dividing all costs according to the proportion of all output represented by newspaper publishing.

To publish newspapers and do some job work, the operator of an independent weekly in 1860 needed an average of $1,500 in capital investment and $1,700 for one year's operating expenses. The operating expenses included about $600 for raw materials, most of that amount being spent for paper, and about $1,100 for the annual payroll for an average of 3.7 employees who earned an average of $25 each a month. The newspaper production portion of the expenses alone, including the cost of raw materials and payroll, increased at the rate of 2.1 cents a copy. The payroll for independent weeklies was the largest annual operating expense, amounting to 67 per cent of the annual cost of operation, but the payroll constituted the smaller portion of the cost of producing each additional copy.

Combination papers in 1860 operated on a much larger scale than weeklies. The ratios were different, but unit costs found among independent weeklies were similar to those for the combinations. The annual payroll constituted 50 per cent of the annual operating costs. The monthly pay for just over 20 employees was about $30 each, only slightly higher than the pay on weeklies. The cost of paper made up the majority of the total cost of raw materials for combinations.

Production, Productivity, and Profit

The production of newspaper establishments enumerated in the industrial census will be discussed in terms of the value and volume of products. Production values will be related to cost-of-production values to produce rough measures of productivity and profitability--value added by manufacture, return, and return on investment. The value-added constructs are produced by subtracting the costs of raw materials from the value of finished product. The return constructs involve the subtraction of both annual payroll and costs of raw materials from the value of finished products.

Most of the newspaper establishments counted in the industrial censuses produced both newspapers and job work.[53] Newspaper production accounted for

62 per cent of the total value of products for weeklies and 69 per cent for the combinations in 1860. In 1850, 52 per cent of the reported output value came from newspaper publishing. Although newspaper publishing made up the larger share of the value of all production, newspaper publishing was the less productive and profitable portion of the newspaper establishment's business, because after the start-up expenses,as indicated earlier, it was the more costly to do. The relationships between the value of job work and the value of total output and the productivity and profitibility measures were all considerably higher than relationships between the value of newspapers and the other output measures.[54] These findings indicate that output and profitibility increased more regularly with the value of job work than with newspaper publishing. Neither weekly circulation nor number of copies printed varied significantly with any of the profitibility measures, and their correlations were weaker with the value of total product than those for newspaper value or job value.[55]

The relatively high cost and low productivity and profitability of newspaper production is most clearly evident in a consideration of the values that occurred with increases in the percentage of total output contributed by newspaper production among all weeklies. The value of total product, value-added by manufacture, and return all declined with each one per cent increase in newspaper production's portion of the total output value. Because total output was made up of only newspaper and job production, the declining output occurring with increases in newspaper production means that output, value added by manufacture, and return increased with each percentage increase in the proportion of total output represented by job work. With each increase of one per cent in newspaper production's portion of total output value came a decrease of about $25 in the value of total product, $20 in value added, and $18 in return.[56] These findings indicate that job printing may have been necessary to the survival of newspapers in Wisconsin

in 1860. The seemingly constant effort of newspaper operators in antebellum Wisconsin to win the local, state, and federal printing contracts would appear, in light of these findings, to have represented the real need for income supplementary to that from newspaper printing and general job printing rather than greed.[57]

For all independent weeklies, the value of total output increased about four cents with the production of an additional newspaper copy, part of that being the value of newspaper production and part being the value of job work accompanying newspaper production.[58] Value added increased about 2.3 cents and return about one cent for each copy.[59]

Return or profit values are confused by the fact that the calculated return values--the subtraction of the value of raw materials and annual payroll from the value of product--were negative for one-third of the independent weeklies. These negative values could mean that the establishments were operating at actual losses. The brief period of publication for many papers in antebellum Wisconsin may reflect this situation. One would expect, however, that the return would be smallest for papers in operation the briefest length of time, and therefore that some of the operators of such newspapers, unable to finance further losses, discontinued their papers. But the relationship between return and longevity was negative, indicating that the longer a newspaper establishment had been in operation the lower was its return.[60]

Possible errors in reporting data and artifacts of the timing of the enumeration could explain this result.[61] Or it may have represented reality. The brief lives of newspapers then might be explained by the fact that despite increased circulation an production, return didn't improve, and after a few years of successively greater losses, newspaper operators eventually discontinued their publications.

These findings on return suggest that growth in the newspaper business may have been more costly than profitable, because some growth required additional

employees and equipment. None of the independent weeklies was large enough to have made the use of large, power presses profitable. The copy-cost breakdowns in Table IV indicate that it was the average weekly, with circulation of about 600, that was apparently most economically efficient, benefiting from economies of scale that were lost with growth.

Return was more strongly related to job production than newspaper production values and increased at a greater rate for job production than for each additional dollar of newspaper production.[62] Return increased 82 cents for each added dollar of job production and only 56 cents for each added dollar's worth of newspaper production.[63] Return increased at the rate of 61 cents for each dollar increase in total production.[64] It would have taken total production worth $1,427 for one of these weeklies to break even, given the data here.[65]

The mean return of $314 for independent weeklies seems rather small, being little more than the average annual pay of about $300 per employee. It is not clear whether the operator of a newspaper in 1860 counted wages for himself in his payroll. If he did not, his return seems to have earned him little for the problems and responsibilities of operating his publication. No mention is made in the Wisconsin industrial census reports of the value of advertising.[66] It might have been included in the value of newspapers printed or it may have been considered clear profit which would have augmented the return figures calculated here.

The construct return on investment, being calculated by the subtraction of costs from output and division of the remainder by investment is subject to the numerous distortions discussed pertinent to each of the factors influencing the final construct--value of paper, value of other raw materials, annual payroll, value of newspapers, value of job work, and investment. The means of 31 per cent or 31 cents on a dollar of investment for independent weeklies and 23 per cent for combinations in 1860 and for the 1850 newspaper establishments seem

high. The figures probably reflect the fact that rent, interest, and distribution costs were not reported as costs and have not been subtracted from return.

The relationship between return on investment and job value was higher than that between return on investment and newspaper value.[67] The increase for return on investment for each additional dollar of newspaper production was slightly higher than that for job work.[68] Return on investment decreased with increases in the value of newpaper production as a proportion of total product value.[69]

Newspaper publication made up 63 per cent of the value of all production by independent weeklies and 69 per cent among combinations, job work accounting for the remaining production. But newspaper publication was less productive and profitable than job work because it was more costly. As the newspaper portion of total production increased, total product value, value added, and return declined. Newspaper publication generated increases in value added at the rate of 92 cents for every dollar of newspaper value, while job work generated 99 cents. Newspaper publication generated 56 cents return for every dollar of newspaper value, while job work generated 82 cents return for every dollar of job value. Return, the best measure available for profits, averaged $314 among independent weeklies and $3,416 among combinations. Return on investment was 31 per cent for weeklies and 22 per cent for combinations.

SUMMARY

The newspaper establishment in Wisconsin in 1850 and 1860 was smaller than other businesses in all input and output measures except the number of employees. Newspaper publication and job printing done in association with publication were labor-intensive businesses. The editorial tasks and typesetting necessary before any output could be produced could not be mechanized in this period and mechanized printing was not practical for small papers. The payroll, therefore, was the

larger proportion of the total actual costs of operation. As production increased, however, the value of raw materials increased more than did payroll. Employees apparently were expected to accommodate to some increased production work.

The operating costs for doing newspaper publication and job work in 1860 were greater than initial investment. In the first year, a newspaper operator needed both investment capital and reserves enough to buy materials and pay employees for some time because of lax collection procedures and the notorious tardiness of subscribers and advertisers in paying for products and services received. The relationships were highest between cost-of-production values and other cost-of-production values and between production or output measures and other production measures. Thus it appears that an operator invested and spent on supplies and payroll what he could afford rather than an amount dictated entirely by the amount of production, at least at the outset. The value of raw materials did not increase significantly with increases in weekly circulation, but the number of employees did.

The costs of newspaper production increased per unit of total output at a greater rate than did job printing costs, indicating that newspaper production was relatively more expensive to do than job work. Although per-copy costs did decline with increases in the value of newspaper production, the decline had an apparent limit as possible economies of scale were limited. Among weeklies, the average establishment with a circulation of about 600 had the lowest per-copy costs. Beyond that circulation, the need for additional employees and equipment pushed up the costs of production and reduced economies of scale. Among all papers, including the combinations, it was the largest establishments that had the lowest per-copy costs, but a middle group also had low costs.

Newspaper production constituted about two-thirds of the product value of newspaper establishments, but because of greater costs of production, newspaper

publishing was the less productive and profitable. The productivity measure, value added by manufacture, and the profitability measures--return and return on investment--increased more with increases in the value of job work than with increases in newspaper production. In fact, productivity and profit decreased with increases in the proportion of total output made up by newspaper production. Conversely, productivity and profit increased with increases in the proportion of total output made up by job work.

The absolute return, inflated by failure to subtract rent, interest on borrowed money and materials bought on credit, and delivery costs seems low, being not much more than the annual wages for one employee. But related to investment, return seems higher than contemporary returns on investment in the newspaper business. The inflated returns on investment were more than 30 per cent for independent weeklies and more than 20 per cent for all establishments, including combinations.

The greater profitability of job work than newspaper publication indicates that job work was a necessity to newspaper operators hoping to make profits on their capital and labor investments. The data on Wisconsin newspapers in 1860 indicate that newspaper publication alone was not a profitable business, and that job printing was actively sought to increase the potential of an establishment to earn a profit.

NOTES

[1]Unpublished report of the Association for Education in Journalism History Division Bibliography Committee for 1968-9, cited in William E. Ames and Dwight L. Teeter, "Politics, Economics and the Mass Media," in Ronald T. Farrar and John D. Stevens, Mass Media and the National Experience (New York, 1971), 40.

[2]Some examples from this research: A letter from a publisher to the Wisconsin Editorial Association saying he moved to Fond du Lac to publish a paper, "large inducements being made" (Samuel Ryan, Jr., WEA Proceedings, Vols. 1-3, 77). Another publisher described the scavenger's approach to outfitting an office, at a total cost of $175 (J.A. Hadley in WEA Proceedings, Vols. 1-3, 37-9). A description of the credit market faced by a publisher and the cost of equiping the Milwaukee Sentinel in 1836 is described in a letter from Philo White to Delegate G.W. Jones, 8 April 1838, in John Peter Bloom, ed., Territorial Papers of the United States: Vol. 27, The Territory of Wisconsin Executive Journal 1836-1848, Papers 1836-1839 (Washington, 1969) 973-976. For other examples, see Carolyn Stewart Dyer, "The Business History of the Antebellum Wisconsin Newspaper, 1833-1860: A Study of Concentration of Ownership and Diversity of Views" (Ph.D., University of Wisconsin-Madison, 1978) Chapter VII.

[3]The only use of local data from this source found in research for this study was in William H. Lyon, The Pioneer Editor in Missouri 1808-1860 (Columbia, Mo., 1965) 23. Lyon used aggregate county data on capital investment and number of employees. The most extensive use of the national aggregates is in Alfred McClung Lee, The Daily Newspaper in America (New York, 1937) 716-20, 725-6, 728-30, 732-45, 748-500. Bruce M. Owen also used aggregate census data in Economics and Freedom of Expression (Cambridge, Mass., 1975) 64-5, 69-70, 72-4, 79. Many of Owen's tables were based on Lee's use of the census data. All surviving state manuscripts for these censuses are available on microfilm.

[4]1860 was chosen because the data were used as part of a larger study on Wisconsin newspapers from 1833-1860. (See reference to Dyer, 1978, note 2 above.) Only nine firms were included in the 1850 Wisconsin censuses. Those data are mentioned here where appropriate. Also used here were data on circulation from the periodical schedule of the same censuses. Problems in using these data and an evaluation of their probable accuracy are discussed in Dyer, op. cit., Appendix B.

[5]Comparisons are made with findings of Margaret Walsh, The Manufacturing Frontier (Madison, 1972), a study of the same manuscript industrial data. Walsh did not include newspaper publishing among the industries she examined closely because the industry was so small. Newspapers, however, were included in her aggregates on businesses.

[6]Although all firms earning $500 or more in the year preceding the census were to be counted, it appears that many fitting that criterion were ignored. The basis for exclusion is not known. See discussion in Dyer, op. cit., 565-7.

[7]All of the newspapers in the 1850 industrial census were independent weeklies and they accounted for 85 per cent of the independent weeklies. None of the Milwaukee papers, including six combinations, were enumerated.

[8]The data on all Wisconsin businesses in the products of industry schedules are derived from the work of Walsh. She reported aggregate values. The means have been calculated from her data.

[9]E.B. Alderfer and H.E. Michl, Economics of American Industry (New York, 1957) 405.

[10]Walsh found, however, that in these and other processing industries, there were both large, highly mechanized units and small, less mechanized units.

[11]Alderfer and Michl, loc. cit.

[12]Ibid.

[13]Walsh, 23-5.

[14]See discussion of first-copy costs in Owen, op. cit., 36.

[15]Other businesses produced 66 cents in value added per investment dollar in 1860, and newspapers produced 91 cents. The other-business figure was calculated from Walsh, op. cit., 18, 228. The 1850 newspaper data are too limited to be considered reliable for this type of calculation..

[16]All the English-language papers in Milwaukee were combinations, and three of four German-language papers were combinations. The only semiweekly, the German Phoenix, was in the industrial census. In Madison, the German and Norwegian newspapers, all of which were in the industrial census, were independent weeklies.

[17]Variation as discussed here is determined by the coefficient of variation, which is derived by dividing the standard deviation by the mean. The coefficient of variation permits comparison of the relative homogeneity of several groups when the groups have very different means. Here the discussion involves the same groups, plus or minus a few individual establishments because of missing data. But the values of the variables and the means are quite different. If every establishment had the same value for a variable, the coefficient of variation would be 0.0. The coefficient may range up from 0.0. See Hubert M. Blalock, Jr., Social Statistics, 2nd ed. (New York, 1972), 88, on the coefficient of variation.

[18]See Table II. Monthly pay per employee was $24.99 for weeklies, $29.29 for combinations. Value added per employee was $414 for weeklies, $503 for combinations, in 1860.

[19]For a discussion of the reliability of circulation data, see Dyer, op. cit., 557-63. From a test of the consistency of circulation data with industrial schedule data on the number of copies printed, it was concluded that the circulation data was probably quite accurate, contrary to other conclusions about nineteenth-century circulation data.

[20]A correlation matrix for independent weeklies is presented as Appendix A to this paper, for persons interested in these findings. Correlation coefficients will not be discussed specifically in the text, and an understanding of correlation statistics is not needed. References in the text to strong and weak relationships that are significant or not significant are based on the correlation matrix data, as are statements that values did or did nor vary together. Where correlations were not significant, the matrix in Appendix A is blank and no specific reference will be made to it.

[21]These values are derived from a series of simple regression equations summarized in a table presented as Appendix B. The general reader will not need to understand these statistics or refer to the appendix. Where they are used in the following discussion, the equation numbers in the table will be cited in footnotes. Equations 16-18 were used here. For a discussion of the use of the regression equation for this purpose, see Dyer, op. cit., note 34, p. 277.

[22]Appendix B, equations, 16-19.

[23]Appendix A, Part II.

[24]For 32 weeklies reporting the value of both newspapers and job printing, an additional investment of 84 cents was required for an additional dollar in newspaper value and 40 cents for an additional dollar in job value. Derived from Appendix B, equations 1 and 7.

[25]Although there are reports that newspapers were established to win public printing contracts, most of those contracts involved publishing delinquent tax lists in newspapers rather than printing materials for government use. Thus the newspaper was an integral part of the printing contract, not an appendage. Only one establishment has been found that began as a job-printing office. That was the firm that was counted in the industrial census as a job-printing firm and began publication of the Fond du Lac Saturday Reporter shortly after the June 1, 1860, census date. It has not been included in this analysis.

[26]Appendix B, equation 30.

[27]The instructions are reprinted in Carroll D. Wright, History and Growth of the United States Census (Washington, 1900), 312-14. The instructions provided for the order in which materials should be listed, the number of materials that should be identified specifically, and even the units of measure to be used, with paper in reams being used as one of the examples.

[28]The most important raw material was to be listed first.

[29]While some reports were broken down into components, others were not. Some included the value of paper only. And some appear to have included two years' supplies of raw materials. Thus the unit prices and volumes for materials are at best indicators of the general value and amount of raw materials used by newspaper operators.

[30]The printing of proceedings and other official reports could well have been done on newspaper stock. Some legislative proceedings and documents used in this study seem to have been printed on finer, thinner paper than the newsprint commonly used. But few of the newspapers used in this study have been examined in their original form.

[31]Knowing that newspapers varied in page size, it had been assumed that reams of paper would have varied in size, value, and possibly count as well. But there was little variation (the coefficient of variation was .342) in the cost per ream of printing paper. For correlation coefficients, see Appendix A, Part II.

[32]These coefficients are not in Appendix A. The Pearsonian correlation coefficients were: amount of paper/weekly circulation = .889; amount of paper/ number of copies printed = .745. All were significant at the .001 level.

[33]See Appendix A, Part II.

[34]Ibid.

[35]These coefficients are not in Appendix A. They were: value of all raw materials/ value of job printing = .947; value of all raw materials/ value of newspapers printed = .624. Both were significant at the .001 level.

[36]See Appendix B, equations 2, 9, 15.

[37]The units used in the census were not the same as those in other reports on the cost of paper, and neither the weight nor dimensions of a ream was reported. Therefore, these findings couldn't be compared with others.

[38]See Appendix A, Parts I and II.

[39]Appendix B, equation 22. The minimum figure is also derived from the regression equation. It is the a value to the left of the + sign. The a is the point at which regression curve intercepts the y axis.

[40]Appendix B, equation 32.

[41]Appendix B, equations 3, 10, 16.

[42]Appendix B, equations 4, 11, 17.

[43]Calculated from Appendix B, equations 2, 4, and 5. For newspaper value, the calculation was 36¢/87¢; for job work, 17¢/34¢; for all production, 18¢/39¢.

[44]The coefficient of variation, from Table II, was .257.

[45]See Appendix A, Part I.

[46]The census instructions specifically excluded costs of distribution from the value of products (Wright, 314). For urban papers, 50 cents was often added to the subscription price for local delivery. Published subscription rates do not mention payment of postage, which would have cost the newspaper operator 26 cents a year for a weekly if he paid the postage in advance of mailing. The cost would have been 52 cents if the subscriber paid the postage quarterly.

[47]Appendix B, equations 5, 12, 18.

[48]See Appendix A, Part II.

[49]Appendix B, equation 27.

[50]Appendix B, equation 33.

[51]The seven largest newspaper establishments, in a five-group breakdown, had the lowest per-copy costs--2.2 cents. This group included all the combination papers and one independent weekly.

[52]Owen, op. cit., 36.

[53]In 1850, 88 per cent of the establishments in the industrial census reported doing both newspaper publishing and job printing; in 1860, 76 per cent reported doing both.

[54]See Appendix A, Part III.

[55]Ibid.

[56]See Appendix B, equations 28, 29, 30.

[57]Letters, newspapers, and public records are replete with mentions of competition for public printing contracts and the need for the income it represented. A number of newspapers were reported to have been started in order to win a printing contract--usually to publish the delinquent tax lists in newspapers--or to have terminated shortly after the loss of a contract. The evidence seems to indicate that job printing was sought and done as a necessary supplement to newspaper publication rather than the reverse.

[58]Appendix B, equation 24.

[59]Appendix B, equations 24, 25.

[60]The Pearsonian correlations were negative whether negative return values were included or not. With the negative values included, r = -.360, significance = .016.

[61]As stated earlier, it appeared that some establishments reported more than one year's supplies of raw materials, perhaps because of the timing of the enumeration. And it was speculated that some capital expenditures, such as replacement of type, may have been included in raw material expenses. Both of these factors would have increased raw material costs and thereby reduced value added and return. Where replacement of capital goods was included, the costs would be expected to be higher the longer a newspaper had been in operation, and the return would be lower. Although businessmen were to report the average number of employees and average monthly payroll, it is possible that operators were asked simply how many employees they had and what their monthly payroll was. Thus the addition of employees at any time during the year prior to census time, and the calculation here of annual payroll costs for a full year based on the inflated report would mean that the calculated total labor costs were higher than they actually were. This possible distortion would also increase costs and reduce return. To the extent that more established newspapers would need more employees, the exaggeration of costs would be greater for the papers in operation for longer periods.

[62]See Appendix A, Part III.

[63]Appendix B, equations 6, 13, 19.

[64]Appendix B, equation 19.

[65]Ibid.

[66]In the Iowa returns for 1860, two firms listed a value for newspapers published "valued in subscriptions and advertising." Five others reported separate values for newspapers, job work, and advertising. In these latter reports, it is not clear whether the advertising represented income for ads in newspapers or separate ad work in the form of handbills, for example.

[67]See Appendix A, Part III.

[68]Appendix B, equations 7, 14.

[69]See Appendix A, Part III.

Appendix A

Correlation Matrix for Independent Weeklies in Wisconsin in 1860

Part I: INPUT MEASURES

	Investment	Reams of paper	Value of paper	Cost per ream of paper	Value of other raw materials	Value of all raw materials	Number of employees	Annual Payroll	Individual monthly pay	Total costs of production	Newspaper production costs
Reams of paper	.518[1]										
Value of paper	.614[1]	.780[1]									
Cost per ream of paper	----	----	----								
Value of other raw materials	.842[1]	----	----	----							
Value of all raw materials	.873[1]	.707[1]	.757[1]	----	.896[1]						
Number of employees	.706[1]	----	.412[2]	----	.596[1]	.595[1]					
Annual Payroll	.735[1]	----	.428[2]	.829[1]	.489[2]	.598[1]	.829[1]				
Individual monthly pay	.366[3]	----	----	----	----	----	----	.519[1]			
Total costs of production	.896[1]	.461[2]	.649[1]	.377[3]	.743[1]	.883[1]	.803[1]	.904[1]	.372[3]		
Newspaper production costs	.638[1]	.314[2]	.405[1]	.376[3]	----	.610[1]	.578[1]	.667[1]	----	.741[1]	
Per-copy production costs	----	----	----	----	-.389[4]	----	----	.305[1]	----	----	.418[2]

[1]Significance, p = .001. [2]p = .005. [3]p = .01. [4]p = .05. Significance levels rounded to nearest value.

	Investment	Reams of paper	Value of paper	Cost per ream of paper	Value of other raw materials	Value of all raw materials	Number of employees	Annual Payroll	Individual monthly pay	Total costs of production	Newspaper production costs	Per-copy production costs
Weekly circulation	.486[1]	----	.681[1]	----	----	.576[1]	.503[1]	.490[1]	----	.591[1]	.698[1]	.290[1]
Number of copies printed	.482[2]	----	.704[1]	----	----	.589[1]	.425[2]	.439[1]	----	.567[1]	.682[1]	-.309[2]
Value of newspapers printed	.487[1]	----	.580[1]	----	----	.528[1]	----	----	----	.451[2]	.542[1]	----
Per-copy value	----	----	----	----	----	----	----	----	----	----	----	----
Value of job printing	.450[2]	----	----	----	.542[2]	.374[1]	.342[4]	.303[4]	----	.388[3]	----	-.464[2]
Value of all production	.491[1]	----	.445[1]	----	.341[4]	.474[1]	.449[1]	.452[1]	----	.517[1]	----	-.500[1]
Newspaper % of all production	----	----	----	----	-.488[3]	----	----	----	----	----	.452[2]	.544[1]
Value added by manufacture	----	----	----	----	----	----	----	----	----	----	----	-.531[1]
Value added per employee	----	----	----	----	----	----	-.265[4]	----	----	----	-.337[3]	-.631[1]
Return	-.273[4]	----	----	----	----	-.280[4]	----	-.324[3]	----	-.339[3]	-.446[2]	-.649[1]
Return on investment	----	----	----	----	----	----	----	----	----	----	-.381[3]	-.670[1]
Longevity	.529[1]	----	----	----	.714[1]	.524[1]	.494[1]	.829[1]	----	.557[1]	----	----

[1] p = .001. [2] p = .005. [3] p = .01. [4] p = .05.

	Weekly circulation	Number of copies printed	Value of newspapers printed	Per-copy value	Value of job printing	Value of all production	Newspaper % of all production	Value added by manufacture	Value added per employee	Return	Return on investment
Number of copies printed	.978[1]										
Value of newspapers printed	.769[1]	.785[1]									
Per-copy value	----	----	.476[1]								
Value of job printing	----	----	----	----							
Value of all production	.591[1]	.602[1]	.636[1]	----	.889[1]						
Newspaper % of all production	----	----	.314[4]	----	-.775[1]	-.479[1]					
Value added by manufacture	.385[3]	.391[2]	.539[1]	.324[4]	.911[1]	.898[1]	-.471[1]				
Value added per employee	----	----	.501[1]	.421[2]	.696[1]	----	-.298[4]	.816[1]			
Return	----	----	.399[3]	.383[3]	.775[1]	-.630[1]	-.411[3]	.855[1]	.888[1]		
Return on investment	----	----	.400[3]	.345[3]	.583[1]	.613[1]	-.316[4]	.756[1]	.873[1]	.842[1]	
Longevity	----	----	----	----	----	----	----	----	----	-.360[3]	----

[1] $p = .001$. [2] $p = .005$. [3] $p = .01$. [4] $p = .05$.

Appendix B

Summary of Regression Equations for Financial Data Reported by Newspaper Establishments in the 1860 Products of Industry Schedule of the U.S. Census for Wisconsin

32 Establishments with Job and Newspaper Values

When X =	and Y =	Y = a + bX =
1 Value of newspapers printed	Investment	$604* + $0.84*X
2 Value of newspapers printed	Value of all raw materials	$97[a] + $0.050X
3 Value of newspapers printed	Number of employees	2.5* + .0009***X
4 Value of newspapers printed	Annual payroll	$650* + $0.36***X
5 Value of newspapers printed	Total costs of production	$747* + $0.87*X
6 Value of newspapers printed	Return	-$273[b] + $0.56****X
7 Value of newspapers printed	Return on investment dollar	-$0.24[c] + $0.00048****X
8 Value of job printing	Investment	$1,095* + $0.40**X
9 Value of job printing	Value of all raw materials	$451* + $0.17***X
10 Value of job printing	Number of employees	3* + .0005****X
11 Value of job printing	Annual payroll	$865* + $0.17****X
12 Value of job printing	Total costs of production	$1,317* + $0.34***X

*Significance = .001. **Significance = .005. ***Significance = .01. ****Significance = .05. Significance levels rounded to the nearest value.

[a]Significance = .196. [b]Significance = .215. [c]Significance = .221.

Appendix B (continued)

	When X =	and Y =	Y = a + bX =
32 Establishments	13 Value of job printi	Return	-$452** + $0.82*X
	14 Value of job printing	Return on investment dollar	-$0.25[d] + $0.00056*X
	15 Value of all production	Value of all raw materials	$199**** + $0.21*X
	16 Value of all production	Number of employees	2.5* + .0005**X
	17 Value of all production	Annual payroll	$672* + $0.18***X
	18 Value of all production	Total costs of production	$871* + $0.39*X
	19 Value of all production	Return	-$871* + $0.61*X
Independent Weeklies	20 Weekly circulation	Investment	$511[e] + $1.55*X
	21 Weekly circulation	Value of all raw materials	-$37[f] + $0.98*X
	22 Weekly circulation	Number of employees	2.06* + .002*X
	23 Weekly circulation	Annual payroll	$487[g] + $0.91[g]X
	24 Number of copies printed	Value of all production	$583**** + $0.04*X
	25 Number of copies printed	Value added by manufacture	$587** + $0.23**X
	26 Number of copies printed	Return	-$1**** + $0.01*X

*Significance = .001. **Significance = .005. ***Significance = .01. ****Significance = .05. Significance levels rounded to nearest value.

[d]Significance = .081. [e]Significance = .063. [f]Significance = .410.

[g]Significance level not available.

Appendix B (continued)

	When X =	and Y =	Y = a + bX =
Independent Weeklies	27 Number of copies printed	Cost of newspaper production	$266[g] + $0.02[g]X
	28 Newspaper per cent of total product	Value of all production	$3,409* + (-$25*)X
	29 Newspaper per cent of total product	Value added by manufacture	$2,564* + (-$20*)X
	30 Newspaper per cent of total product	Return	$1,399* + (-$18**)X
	31 Longevity	Investment	$888* + $151*X
All	32 Number of copies printed	Number of employees	1.6* = .00006*X

*Significance = .001. **Significance = .005. Significance levels rounded to nearest value.

[g]Significance level not available.