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From Quasi-Private to Quasi-Public: The Development of Local Libraries in the United States, 1870-1930

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ABSTRACT: The period 1870-1930 witnessed the emergence of the local public library as a widespread and enduring American institution. During these years, access to free community-based library services spread to a much larger share of the U.S. population, while the institutional structure of local libraries underwent a transition from largely quasi-private, voluntary associations to the tax-supported public institutions familiar today. In this paper we describe this transition, and document the expansion of public libraries and library services in the United States over these years, using data drawn from library surveys conducted by the federal Bureau of Education. We then review some causal accounts for that expansion. Exploiting cross-state and temporal variation in the data, we estimate cross-section and panel regressions to assess plausible demand and supply factors affecting the pace of library development. We consider a number of the social and economic variables that have been found to correlate with the development of secondary educational institutions, which expanded during roughly the same historical period: these include, when available, income or wealth, urbanization, ethnic composition, and in some specifications average levels of education and literacy. We also examine the effect of legal and political factors that were specific to public libraries, such as state library commissions and associations.

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Introduction

Public libraries in the modern sense—local or municipal institutions offering free library services to the general public and supported by tax money—date back at least to 1833 in the United States when Peterborough, New Hampshire, established its public library. The first large public library in a major city was established in Boston over the period 1848-54. In 1849 New Hampshire became the first state to pass comprehensive enabling legislation, facilitating the process for localities to establish public libraries. But the public library movement grew only slowly in the decades after these New England firsts (McMullen 2000, p. 31). During the 1890s, however, the growth of libraries accelerated, as can be seen in Figures 1 and 2, which plot public libraries and volumes held in public libraries on a per capita basis for the period 1875-1929. The underlying data are derived from Bureau of Education library survey reports (discussed below), for different thresholds of library size.[2]

Although public libraries have come to fill a variety of roles, recreational as well as educational, they were originally conceived as part of the nation's broader educational movement, and it was their educational function that provided the principal justification for public support. Thus it is instructive to place the timing of public library expansion within the broader context of two other important changes in the educational apparatus of the United States: primary and secondary education. The free and compulsory elementary school movement championed by Horace Mann was already almost 50 years old by the time the library movement got rolling. By the late 19th century most children in the country were enrolled in primary school, and many states were approaching nearly universal primary education. The high school movement, on the other hand, gained momentum slowly in the 1890s and took off after 1910 (Goldin 1998). Figure 3 plots a measure of public library penetration—library volumes per capita—along with secondary school enrolment rates. By these measures, the public library movement appears to have begun its acceleration somewhat in advance of the major uptick in high-school enrolments.[3]

[2] The survey years included here are 1875, 1884, 1895, 1900, 1903, 1913, 1923, and 1929. Data on public libraries with at least 1000 volumes were available only through 1903; data on libraries with at least 3000 volumes were unavailable for 1913, so the plots interpolate a straight line between 1903 and 1923 for those series.

[3] Although it might be natural to view high-school education as a precursor to demand for library services, the timing suggests that library development was coincident or perhaps even prior to the spread of secondary education. Indeed, a case could be made for a causal role of libraries in the high school movement. Andrew Carnegie's library philanthropy, for example, quite plausibly extended the reach of the public high school movement. Jones [1995, 94] observed that: "In many towns, Carnegie libraries were the only large public buildings, and they became hubs of

There has been little if any statistical analysis of the factors influencing the establishment of public libraries. Many researchers in the field of library history have devoted attention to the emergence and growth of the public library movement (Learned 1924; Thompson 1950; Green 1972; Colson 1973; Sturges 1994; Martin 1998; McMullen 2000). Some of them have made use of the comprehensive library censuses conducted periodically by the United States Bureau of Education and its successor departments. But no study seems to have connected the library statistics with census and other data sources and then used statistical techniques to weigh the importance of various causal factors.

This paper aims to fill the statistical gap by exploring the impact of various factors that have been adduced to explain the growth of public libraries. The next section discusses the library survey data we employ and summarizes the growth path of the public library movement, highlighting the period of expansion after 1895 and geographical variation in the extent and timing of library development. We then review some of the salient theories that purport to explain the trends in library development. Finally, we provide some largely descriptive county cross-section and time-state panel estimates of the correlates of public library development.

Measuring the growth of public libraries in the United States after 1870

Early momentum to establish public libraries was slow. In his exhaustive study of American libraries prior to 1876, McMullen (2000, pp. 123-25) was able to identify only 484 free public libraries as having existed at any point in time in the United States during the period before 1876. More than half (253) were located in New England. One-sixth (81) were the last remnants of an ill-fated experiment by the states of Michigan and Indiana, which passed state laws mandating the creation of so-called township libraries. In all, 1,559 of these township libraries were created in these two states during the 1840s and 1850s, but the vast majority were very short-lived, and so were not included by McMullen in his 484 total. The southern states lagged in the early development of public libraries, as they did in the development of educational institutions more generally, with only 12 free public libraries identified through the entire first century of the country's existence. Thus a region that accounted for nearly a third

social activities like concerts, lectures, and meetings and did double duty as museums and community storehouses." It is not unimaginable that they also served as catalysts for high schools.

of the country's total population and a quarter of its white population in 1870 had produced only about 3 percent of its public libraries.

To track and analyze the spread of public libraries after 1870, we have assembled and coded data on individual libraries from special reports on libraries issued intermittently by the U.S. Bureau of Education.[4] These reports included extensive tables of information on individual libraries gathered from surveys conducted by the Bureau. The surveys covered in our data set were conducted in 1875, 1884, 1891, 1895, 1903, 1913, 1923, and 1929. The first of these reports, which appeared in 1876, notes that planning for the survey began with a list of every town "the population of which was sufficient to seem to justify the belief that it possessed a public library of some sort" (U.S. Bureau of Education 1876, p. xviii). Letters of inquiry were then sent, generally to the local postmaster, soliciting the names of any public libraries. In larger towns and in cities, the superintendent of public schools was also contacted, and in the larger cities "persons were selected to make special investigations" (xviii). Previous listings of libraries, city directories, gazetteers, offices of institutions societies, clergy, public officials, etc., were also consulted. Direct inquiries were then sent the libraries identified: "This preliminary work involved the writing of some 10,000 letters, to which the responses have generally been most prompt and gratifying" (xix). Statistics of libraries with at least 300 volumes were tabulated in chapter 37 of the special report. Subsequent reports appear to have used similar methods.

The statistics reported in the published tables typically included the name and location of the library, some classification as to type of library, whether services were free or by subscription, and number of volumes in collection; in some years they included financial statistics, year of founding, and/or name of librarian. Unfortunately, reports for different years use different minimum size thresholds for publishing individual library data. The reports for 1875 and 1884 list all libraries with 300 or more volumes; the reports of 1891, 1895, and 1903 use a threshold of 1,000 volumes; 1923 and 1929 a threshold of 3,000 volumes; and 1913 a threshold of 5,000 volumes. Consistency across years obviously requires restricting our attention to consistent size thresholds.

[4] Details of the data will be made available in a data appendix from the authors.

Our interest here is in public libraries as community-based institutions providing access to books and other reading materials that were free and open to the public. Eventually these would largely be truly public institutions, in the sense that they were owned, operated, and financed by local governments. But especially in the early years of public library development, many free community libraries were run by non-governmental voluntary associations. Such libraries were usually termed *social libraries*, and for present purposes we classify these as public. The library surveys also reached a much wider range of libraries, such as those run by private associations (e.g. fraternal organizations) for their own membership, schools, and other sorts of institutions. The classification schemes used in the reports are inconsistent across years and often unsatisfactory for our purposes. In this paper, we classify libraries as public only if they offered free library use and were run by local governments or voluntary associations, as identified using the survey classifications or the library name (e.g., "XX Public Library" or "YY City Library"). In subsequent work we intend to examine the implications of using a broader definition that includes quasi-public social or association libraries.

Counts of total libraries and total volumes by minimum size threshold are presented in Table 1. We calculated two basic measures of the penetration of public libraries by state and year of survey: libraries per capita, and library volumes per capita. In this paper we focus on the latter (volumes) for two reasons: first, volumes seem like a natural measure for actual library services; and second, the volumes measure is less sensitive to truncation problems introduced by varying thresholds of library size in the reports. Figures 1 and 2 illustrate the effect on per capita measures of varying the threshold number of volumes for inclusion in the data. Excluding smaller libraries leads to a fairly significant undercount of libraries (Figure 1), but the impact on the volumes count is much more modest (Figure 2).[5] Larger libraries get more weight in the volume count, so excluding the lower tail has less impact. In the volume count, we have also topcoded the number of volumes in any single library at 50,000. This procedure prevents a very small number of huge libraries (such as the New York Public Library) from dominating

[5] Indeed, the apparent differential between the 3000 and 5000 volume lines in Figures 1 and 2 is exaggerated, because data for the 3000 count are missing in 1913, so the plot draws a spuriously straight line between 1903 and 1923. Presumably the plot for the 5000 threshold, with its acceleration after 1913, is more indicative of the actual pace of library development.

our statistics. Volume counts for such "libraries of record" are probably not indicative of the access of the general public to library books.

Figure 4 plots volumes per capita by region (using the 5000 threshold for consistency). As in the case of secondary education (Goldin 1998), the Northeast led the way early on, but by the late 1920s the West had assumed the lead with the highest per capita penetration of library services. In the South, public libraries continued to be all but nonexistent before 1903, and even after that the region's library development lagged far behind the rest of the country. A question we can address with the statistical analysis is whether the South's retardation in library development can be explained by other regional differences, such as lower rates of urbanization, income, or general education in the South.

Explaining the growth of public libraries

Shera (1973, 39) reviews early work by historians of the public library movement, and suggests that Borden's (1931) essay in the first volume of *Library Quarterly* was a "harbinger of a new phase in library historiography." Borden adduced several factors behind the rise of public libraries, which he (prematurely) dated as occurring between 1850 and 1890. First was the role of the federal government, second was the largesse of philanthropists, and third was the demand for educational activities resulting from the rise of an affluent middle and working class with more time for leisure and more capable of influencing public spending through suffrage. Borden seems to have been the first historian to begin cataloguing the set of supply and demand factors and institutional innovations that were likely responsible for the growth of public libraries in villages, towns, cities, and counties across the United States.

The remainder of this section follows his lead, reviewing many factors discussed by Borden's successors (Leigh and Social Science Research Council 1950; Steig 1952; Shera 1973). While our list has a bit of the "what to buy at the store" quality, it is abbreviated compared with Spencer's (1943) colossal dissertation on the establishment of the Chicago Public Library in 1872. She concludes her work with a list of 94 causes that led to the establishment of the library at that particular moment in history. We divide our discussion into the following four kinds of factors, though obviously there is much overlap: (1)

institutional precedents for public libraries; (2) institutional innovations that enabled the establishment of public libraries; (3) supply-side factors; and (4) demand-side factors.

Institutional precedents

The public libraries that marched across the American landscape after 1895 evolved from a number of antecedent institutions, most notably so-called social libraries and school district libraries. Social libraries were typically corporations formed by voluntary associations and funded by subscription or issuance of shares. McMullen (2000, p. 59) identifies 3,296 social libraries in existence at some point in time before 1876. Many of these social libraries were ultimately transformed into public libraries (Joeckel 1935; Shera 1973). As McMullen (2000, p. 123) notes, "When the members of a library society lost interest in their collection, they often turned it over to the town government, which converted it to a public library by supporting it financially and opening it to the citizens of the town." In some communities, publicly supported libraries competed with social libraries for a time. In Otsego, Michigan, for example, the Ladies' Library Association developed its own collection of books beginning in 1868, despite the presence of a Township Library founded in 1844. Eventually, however, expansion of the Township Library collection in the 1880s drew members away from the Association: according to Helms (1964, p. 115): "Free service, supported by taxes, was much more attractive than membership in an organization of somewhat limited service." The two institutions ultimately merged when the Ladies' Association sold their building and books to the township in 1905.

Social libraries commonly shared the same basic organizational form as free public libraries, being governed by a board of trustees whose membership often constituted a local citizens' "who's who." In a number of communities, free public libraries would continue to be non-governmental legal entities and provided their services under contract to local governments. As late as the early 1930s, according to Joeckel (1935, p. 79), one-sixth of public libraries in cities of more than 30,000 people were owned or controlled by associations or corporations legally independent of the city government. In this sense, boards of trustees of the social libraries agreed to turn over the 'private' social libraries for public use in return for steady funding from municipalities. The existence of a large supply of these social libraries

available for conversion must be taken into account when explaining the growth of public libraries. Joeckel (1935, p. 24) estimates that, "[O]f the first twenty-five free libraries established in Massachusetts… seventeen absorbed one or more preceding social libraries in various ways, some as outright gifts, some by purchase, and some as more or less permanent loans." Of course, taking account of the role of social libraries as a precursor of truly public institutions merely pushes the question of causal factors back a step.

The school district library was another important precursor to the modern free public library. Libraries run by local school districts were often intended to make reading materials available not only to school children but to adults as well. In 1835 the state of New York passed the nation's first school district library law, permitting school districts to tax for the purpose of providing free library service to pupils and the public (Bobinski 1969, p. 4). Similar laws would be passed in 14 other states by 1855. Such libraries were quite numerous by mid-century: the Census of 1850 reported a total of just over 12,000 nationwide (McMullen 2000, p. 156). The scheme of providing library services to the general public through libraries administered by local school districts eventually gave way to the public library run by towns or cities. Joeckel (1935) and Thompson (1950) suggest that the school district library movement was ill-fated in all but a few places, having been imposed top-down from the state level and generally creating libraries that were too small to be viable community institutions: "Beginning with much promise in most states, [the school district library movement] either died out completely or became solely a school library movement…" (Joeckel 1935, pp. 13-14). Nevertheless, school district libraries set important precedents, establishing the legitimacy of taxation in support of free public library service, and linking libraries and public education (in this case, adult education) in the mind of the public.

Institutional innovations

Localities desirous of public libraries could not just establish them willy-nilly. Before the New Hampshire enabling legislation of 1849 spread to other states, a locality had no convenient legal basis for taxing local property to fund a library. To the extent that local library services were a local public good subject to free riding, library enabling legislation was a potentially critical legal innovation permitting the

state's coercive power to be applied to library funding. Enabling legislation that authorized localities to use tax funds to support public libraries evolved from the precedent of local funding of public schools via the school district library movement, mentioned above. Legislation during the period after 1870 was much more expansive in giving municipalities authority to establish tax-supported public libraries. In some states, residents had to vote on measures to authorize taxation for libraries (Colson 1973), while in other states town councils could enact the necessary legislation on their own (Kilpela 1964).

The state constitutions of Indiana and Michigan included provisions essentially mandating township libraries during the period 1830-1860. Consequently, of 1659 free public libraries that McMullen was able to identify in the Midwest states between 1786 and 1876, some 1559 of them were township libraries in either Michigan or Indiana. Thus during this period, for seemingly exogenous reasons, Michigan and Indiana had more public libraries than similar states nearby, such as Wisconsin, Illinois, or Ohio. For reasons not entirely understood, most of the township libraries established in Michigan and Indiana during the mid-1800s were small and did not survive many years. By the beginning of the period under consideration in this paper (1875) Michigan and Indiana did have more public libraries per capita than their neighbors Illinois and Ohio, but not more library volumes per capita.

Also important in enabling public libraries were state library commissions and state library associations, which acted as full-time advocates and guides for the creation of new libraries in townships and counties in the state. Established by legislation, library commissions were state entities, typically with small budgets, consisting of a few professional and full-time employees charged with helping localities establish libraries. These officials traveled the state explaining library legislation and helping establish libraries. They also explained procedures for obtaining Carnegie grants for public library buildings. Writing about Alabama, White (1997, p. 38) opined that, "Without an effective state library program in place and lacking public support, communities experienced great difficulty in gathering information necessary for participation in the Carnegie program." Associations were voluntary organizations with a similar mission, having as members the librarians of existing public libraries. The American Library Association was founded in 1890, and state library associations followed.

The timing of the great expansion of public libraries coincides closely with the formation of state library associations and commissions. Figure 5 details the diffusion of commissions and associations across states after 1890.[6] Of course, to some extent these entities were endogenous outgrowths of the spread of local public libraries and allied interest groups.

Students of local and national public library history note that the library movement was inextricably tied to the growth of women's organizations and eventual attaining of suffrage. The last quarter of the nineteenth century witnessed a proliferation of women's literary and cultural clubs in American cities and towns (Blair 1980). The clubwomen's ideology of "Domestic Feminism" emphasized the role of women in education and cultural uplift, and libraries became a key component of their civic reform efforts (Blair 1980, p. 100; see also McCauley 1971; Mussman 1982). A frequent claim in the library historiography is that by the 1930s, "75 percent of the public libraries in this country owed their origins to women's clubs" (Gere 1997). Although the original source and the veracity of this figure are uncertain, it seems to be of a plausible magnitude. Watson (1996, p. 162) cites documentary evidence from a number of states to back up the general claim. As of 1937, for example, 70 percent of Oklahoma public libraries "owe[d] their existence to women's clubs." Women's organizations also founded the large majority of public libraries in such states as Kansas, Virginia, Florida, and North Dakota during the period under consideration, and they often were the driving force behind soliciting funds from philanthropic sources such as Andrew Carnegie. In Iowa, the Iowa Federation of Women's Clubs was a prime mover in pressing the state legislature for the establishment of a state library commission to promote local library development and librarian training (Goldstein 2003).

On the supply side

The philanthropy of Andrew Carnegie played an important role in the spread of public libraries. Carnegie grants, for example, helped establish about 85% of the larger public libraries in California existing in 1919 (Kortun 1990, p. 1). Almost 1700 communities received grants to establish, improve or replace library buildings. A common refrain is that Carnegie (Akst 2005) "transformed the American

[6] Data on commission and association founding dates were derived from a variety of sources, including Bureau of Education reports, association and commission websites and correspondence (see data appendix).

library landscape." Figure 6 plots cumulative Carnegie library grants along with the total number of public libraries of at least 5000 volumes enumerated in the library surveys for the period 1890-1923. Because Carnegie grants did not always establish new libraries, and because some percentage of Carnegie libraries presumably fell below the 5000-volume threshold to be counted in the survey data, the two series are not strictly comparable, but the plot nonetheless suggests that Carnegie libraries constituted a significant share of public libraries built prior to World War I. Carnegie attached only a few conditions to the grants: the municipality had to donate the land and had to agree to dedicate for the library annual tax revenue equivalent to 10% of the building grant; and building plans were reviewed by Carnegie's secretary, James Bertram, before funds were delivered.

Carnegie was not the only library philanthropist, and across the country major benefactors either funded libraries during their lifetime or left bequests for public libraries. To our knowledge, no one has compiled a set of comprehensive numbers to estimate the sum of this other private philanthropy, but casual observation of the histories of hundreds of local libraries suggests it was substantial. Green (1972) is a contemporary account reminiscing on the author's involvement with many of the philanthropic and volunteer efforts of the period. Wellard (1937) also gives prominence to philanthropy.

Local governments were obviously the other principal source of funding for public libraries, and the fiscal capacity of local governments seems to have grown substantially during this period. Wallis (2000, p. 69) refers to the period 1842-1933 as "the era of property finance and local government." Between 1890 and 1922, corresponding roughly to the period of rapid public library expansion, local government revenues increased from under 3 percent of GDP to over 5 percent. The share of local government in total government revenues at all levels reached its historical peak on the eve of World War I, at about 56% (figures derived from Wallis 2000, p. 65). The predominant source of local tax revenues was property taxes. Increased property taxation was politically feasible to the extent that it funded benefits that increased local property values, such as schools, public utilities, local infrastructure, and perhaps library services (Wallis 2000). Although libraries probably remained a small and fairly stable

fraction of local budgets, the general expansion of local governments over this period shifted the budget constraint for all forms of local spending.[7]

Demand factors

To the extent that public libraries are viewed as an aspect of a broader movement toward increased public provision of education, some of the same demand factors associated with the rise of mass schooling in the 19th and early 20th centuries should be relevant for libraries as well. Recent research suggests that economic growth and consequent rising average income and wealth, well underway in the United States at the turn of the century, played an important role in the increase in school enrolments at both the primary and secondary levels (Lindert 1994; Goldin 1998). But rising income can only be part of the story. As Goldin and Katz (1997) note, high school attendance rates in England lagged far behind those in the United States during the first half of the mid-20th Century, in spite of similar per-capita incomes.

Rising levels of literacy and educational attainment themselves must have increased demand for library services, although the reverse causation may have occurred as well. A perennial debate in the history of education and literacy in the United States is the importance of legislative mandates. In explaining high school enrolment rates, attention has been paid to compulsory schooling and child labor laws. Recent work suggests that compulsory schooling laws had a quite modest causal impact on school enrolments (Goldin and Katz 2003). But to the extent that these laws were effective, they bolstered the demand for libraries, under the weak assumption that libraries and schooling were seen as complements rather than substitutes (Steig 1952, p. 265). For a timeline of compulsory education laws see, Steinhilber and Sokolowsi (1966).

The size of the local market for library services, as proxied by place size or population density, should have affected library development, at least in small communities. Library services are presumably subject to indivisibilities, in the sense that to be useful to readers a library collection must be of some

[7] Joeckel (1935, p. 29) notes that the share of library operating expenses out of total municipal expenditures in American cities remained steady at about 1.3% between 1905 and 1930.

minimum scale. As such, local libraries were unlikely to emerge until a local community reached a threshold population size or density.

Many authors have suggested that libraries were demanded by established citizens as a way to assimilate or control immigrant groups. But the presence of large numbers of immigrants may also have worked against the demand for public libraries to the extent that ethnic heterogeneity was associated with greater heterogeneity in preferences for public goods (Alesina et al 1999), or lower levels of civic engagement, as suggested for example by Goldin and Katz in their work on the high school movement. Kahn and Costa (2003) summarize a range of empirical work by economists using both current and historical data that shows lower civic engagement in communities with greater ethnic or economic heterogeneity, where civic engagement is measured by rates of volunteering, membership in organizations, state spending on public goods or redistribution, self-reported levels of trust, etc.

Finally, shifts in preferences and ideology were probably important, if difficult to measure. Such shifts were actively pursued by early library promoters, who were often referred to as missionaries. Martin (1998) suggests that the ideology of the public library movement was an amalgam of four conceptions of the role of libraries: as democratic institutions promoting good citizenship (see Ditzion 1947); as educational institutions complementing public schools--early on intended for continuing adult education and self-education, but by the 1920s increasingly serving children as their main educational function; (3) as a source of recreational reading material; and as serving a humanitarian mission, offering an alternative to the saloon, elevating youth, and controlling the masses. Swetman (1991) carefully reviews public discourse surrounding drives to establish public libraries in twenty communities of Utah and Washington at the turn of the century. In the booming Inland Empire communities of Washington, libraries were seen as markers of economic progress and enticements to settlers to take up residence in progressive “can-do” kinds of towns. In Utah, by contrast, public discourse treated libraries as places where the morals of wayward youth might be improved. Swetman draws attention in particular to libraries as an amenity and signal of prosperity used in the competition between towns to attract new residents, even in cases where current residents did not place much value on library services.

Data analysis

Quantitative measures of many of the causal factors that loom large in library historiography, such as the women's movement, philanthropy, and local voluntarism, are elusive. But the impact of some basic economic and demographic influences can be assessed, along the lines of Goldin and Katz's (1997) work on cross-state variation in the high-school movement. To assess the potential importance of some of these factors in the spread of public libraries, we present preliminary empirical results based on county-level cross-section regressions and some state-level panel regressions. These regressions must be considered essentially reduced-form and descriptive, but the results are nonetheless suggestive of factors at play in library development, and point to some similarities as well as contrasts with the case of secondary education.

County-level cross sections

For this paper we have analyzed county-level data for three benchmark years of the library surveys: 1875, 1895, and 1929. None of the library surveys identified counties, but each arranged the responses by state and indicated the town or community in which each library was located. These place names were matched to counties using several different sources of concordance. Only unique place-county assignments were included in the county data set; we were typically able to match well over 90 percent of place names to counties. Independent variables were drawn from ICPSR decadal census data for the 1870, 1890, and 1929 census years respectively.

In a large fraction of counties, no communities reported public libraries to the library survey, especially in the early years. This requires that we deal with a large number of zeroes on the left-hand side in our county regressions. We therefore estimate a probit, with the dependent variable a dummy for the presence of at least one public library above the threshold volume count in the county, as well as a tobit on the number of volumes per capita held in public libraries. In most cases the probit and tobit yield qualitatively similar results.

Table 2 provides summary statistics for the dependent and explanatory variables. The first three lines show that very few of the 2316 counties in the sample reported the presence of a public library in

1875: fewer than 6 percent of counties had even a very small public library (300 or more volumes). The figure for larger (3000+ volumes) libraries exhibits the dramatic spread of public libraries across counties between 1895 and 1929. Volumes per capita show a similar pattern.

Our core regressors are in the spirit of the variables used in Goldin and Katz's (1997) state-level regressions on secondary education. Basic demographic controls include proportion of the population female, proportion black, and proportion foreign-born. As Goldin and Katz argue, ethnicity variables may serve as proxies for community solidarity or homogeneity (or its absence), which could have been important in decisions over the provision of a public good such as libraries. In their results, a measure of ethnic heterogeneity (percent Catholic) is negatively related to secondary education rates. Consistent measures of the age structure are not readily available at the county level for most years, so we are unable to follow Goldin and Katz's suggested use of proportion elderly as a proxy for community stability and solidarity, except in 1929.

Measures of income or wealth are not available in most years. Variables for manufacturing employment per capita as well as urbanization must serve as our proxies for the county's level of economic development. We use two urbanization variables, both of which measure the proportion of the population residing in "urban" areas: the first employs the conventional census urban population threshold of 2500, and the second a larger urban threshold of 25,000. Place size would matter if library services were subject to local scale economies. Including the larger threshold allows for the possibility that rather few towns with populations as small as 2500 would have been able to support their own libraries; Carnegie, for example, gave the large majority of his grants to towns with populations in excess of 2500. Under the assumption of some minimum population threshold, library penetration in a state might also have depended not only on the proportion of the population urban but on the actual *number* of such places per capita. We experimented with including as regressors the ratio of the number of urban places to population, at the same urban population thresholds, but these variables are highly collinear with the standard urbanization variables and are not presented here. We do include county population density as another measure of market "thickness."

For selected years, we are able to include additional variables of interest, including measures of

wealth and local taxes per capita (1875), illiteracy (1875 and 1929), school enrolment (different measures available each year), and churches or church attendance per capita. Literacy and educational attainment may in principle be endogenous to library development, so interpretation requires caution.

In Table 3 we present results for probits, using as the dependent variable the presence in the county of a public library holding at least 1000 volumes. This variable is available for 1875 and 1895. Coefficients are presented as marginal effects on the probability. Columns (1) and (3) are for a comparable specification, while (2) and (4) add variables only available in that year. The results suggest that, ceteris paribus, public libraries were more likely in counties with a larger proportion female, more manufacturing activity, and greater urbanization. The effects are reasonably large in magnitude. In 1895, for example, about 12 percent of counties nationwide reported a public library of at least 1000 volumes. A one-standard deviation increase in proportion female, manufacturing per capita, or small-scale urbanization would increase the probability by about 3, 2, and 4 percentage points respectively. The manufacturing and urbanization results are broadly consistent with the prediction that library development was associated with economic development and the size of the local market. The interpretation of the effect of proportion female is less obvious; perhaps it is a proxy for more settled areas, as the gender balance tended to swing toward males in frontier regions. In these regressions, the presence of foreign-born is not significantly related to public libraries.

The coefficient on the dummy for southern states is negative and significant in three of the four specifications. Even after controlling for urbanization and industrialization, southern counties were much less likely to have public libraries, by about 10 percentage points. This result is of course fully consistent with findings for other measures of educational development, such as high school enrolments.

Table 4 presents the tobit results for volumes per capita corresponding to the Table 3 probits. These results largely echo the probit findings, with two interesting differences. First, the coefficient on larger-scale urbanization (proportion in a city of at least 25,000) is now significantly negative in the 1895 regressions. The apparent non-monotonicity in the effect of city size suggests that volumes per capita may be dominated by a threshold effect in counties with smaller towns, with scale economies in larger cities that permit serving a larger population with fewer holdings per capita. Second, the alternative measures of

school enrolment rates have similarly positive and significant coefficients.

Tables 5 and 6 are similar to 3 and 4 but use the 3000-volume threshold, allowing us to analyze the 1929 survey. The 1875 regressions are included here, but it is worth bearing in mind that only a tiny fraction of counties (about 3 percent) reported public libraries of this size in that survey year. The 1875 and 1895 results are largely quite similar to those presented in Tables 3 and 4. Focusing on the tobit results for 1929, the coefficients on manufacturing employment and both urbanization measures show a pattern qualitatively quite similar to the earlier survey years. Not surprisingly, local school enrolment rates tend to be positively associated with library development, as does the proportion age 65 or older. The latter result is consistent with the Goldin and Katz findings for secondary education. On the other hand, in contrast with the findings of Alesina et al, Goldin and Katz, and others that ethnic heterogeneity suppressed provision of local public goods, we find here that if anything the presence of more ethnic minorities (immigrants and blacks) is associated with increased volumes per capita in 1929, once we control for education and age structure. With the exception of 1875, for which the sample is very thin, we find no evidence of a significant relationship in either direction between the religious variables and library development, contrary to Goldin and Katz's work on high schools.[8]

State-time panels

A second approach we take to analyzing the library survey is to arrange all our survey years into a panel. We use volumes in public libraries per capita as the dependent variable, for libraries with at least 5000 volumes to provide consistency across all years in the sample. We aggregate to the state level, which permits us to employ some variables that are not available at the county level, including some that we generate from IPUMS microsamples of the U.S. Census, and allows for a more direct comparison with the Goldin and Katz state-level regressions on secondary education. Using the panel we can also control for state fixed effects. By doing so we may capture the effect of unobserved heterogeneity in preferences for libraries across states, or idiosyncratic institutional features correlated with observed characteristics. For example, states with a strong tradition of social libraries, or states such as Indiana that

[8] One anomaly in the 1929 results is the reversal of the sign on proportion female.

established township libraries by state law from an early date, may have followed different paths of library development.

Table 7 provides summary statistics for the dependent and explanatory variables used here, combining all years. Census-based variables are linearly interpolated to the year of the library survey. Real property tax revenue per capita serves as a proxy for both local fiscal capacity on the supply side and per-capita wealth on the demand side. State-level estimates of per-capita income, which are available for some years in our sample period, are positively correlated with our property tax variable and yield similar results in regressions not reported here. We also include the manufacturing variable from the cross section regressions. Basic demographic controls include proportion of the population 60 and over and proportion under 18, proportion female, proportion black, and proportion foreign-born. We again use urbanization measures for two population thresholds. In each regression we also include a separate dummy variable for survey year. The coefficients on the year dummies capture any time trend in public library development not explained by movements in our other dependent variables.

In an alternative specification we add three variables that are of considerable interest but might be endogenous to library development. These include the literacy rate and two proxy variables for statewide institutions in support of library development: state library commissions and associations. Using the founding dates of each association and commission, we calculate the number of years in existence at the time of each library survey. These variables measure the length of exposure to any library-boosting activities undertaken by such institutions.

Table 8 reports the results for the entire sample and separate South and non-South samples, using fixed effects. Random-effects estimates (not reported here) are qualitatively similar to the fixed-effects for most variables; a standard Hausman test rejects the random-effects specification in each case. Focusing on the fixed-effects results for the simpler specification (first column), the coefficients on per capita tax revenue, proportion foreign-born, proportion under 18, and proportion black are all significantly positive. The effect of tax revenue, whether a proxy for general wealth or the fiscal resources of local government, is substantial: an increase of per-capita tax levies of $5, which is fairly close to one standard deviation across states in 1903, would have increased per-capita library volumes by about 0.075,

compared with a cross-state standard deviation that year of 0.16. The impact of nativity is also substantial, and the reverse of the effect of ethnic heterogeneity that Goldin and Katz find for secondary schooling. Changes in the immigrant population may be proxying for unobserved changes in the social or economic structure; or perhaps, as some library historians have argued, the ideology of Americanization played a relatively more important role in the demand for public libraries than did social homogeneity or solidarity. In the second column, the library commission variable has a significantly positive coefficient, as expected, although it is modest in magnitude. Anomalously, the literacy coefficient is negative.

Given the dramatic regional differences in the pace of public library development between the South and the rest of the United States, we have estimated the panel regressions separately by region. This is of course equivalent to interacting all the independent variables with a South dummy. The results show that the impact of property taxes per capita holds up within the South but not within the non-South, while the substantial positive coefficient on foreign-born is only significant within the non-South. Strikingly, the estimated coefficient on proportion black, which is positive in the full sample, is now insignificant within the South and large and negative outside the South. The first 30 years of the twentieth century witnessed the first major wave of northward migration of African-Americans. The fixed-effects coefficient on proportion black in the northern sample suggests that the states that received large numbers of black migrants lagged substantially in library development. Whether this constitutes confirmation after all of the adverse impact of ethnic heterogeneity on local public goods provision, or merely the impact of some unobserved correlates of black migration, remains to be seen.

The year dummies in the third column (relative to the excluded category 1875) indicate a significant, large, and steadily positive time trend in library development outside the South, even after controlling for the variables included here. By contrast, within the South, the trend is positive, but the year coefficients do not reach statistical significance until 1923. The gap between the year dummies grows each year, confirming the relative retardation of public library development in the South, even with controls for wealth trends, industrialization, and demographics.[9]

From Table 1 it is apparent that the 5000-volume threshold for inclusion in the data misses a

[9] The widening regional gap is also robust to controlling for literacy.

large number of small public libraries, particularly in the earlier years of our sample. To check the robustness of our results to this truncation, we ran the panel regressions for the period 1875-1903, for which we can include all libraries with at least 1000 volumes. The basic results (not reported here) are very similar whether the 1000- or 5000-volume threshold is used.

Conclusions

Public libraries are an enduring institutional legacy of the Progressive era in the United States. Using data from detailed library surveys conducted by the U.S. Bureau of Education, we have documented the acceleration of public library development after 1890. In cross-section regressions using country data, we find that library services were more prevalent in industrialized areas, areas with more small-scale urbanization, and areas with more children attending school. We find little evidence, in cross section or panel regressions, that ethnic heterogeneity, in the form of a larger immigrant presence, impeded library development, with the possible exception of northern states with growing black populations during the early twentieth century. Our state-year panels show that the overall time trend in library services cannot be explained by changing local real tax revenues, rising literacy, or changes in standard demographic variables. Furthermore, the factors captured by our regressors do not explain the significant lag in library development in the South relative to the rest of the country. It may be that accounting for more subtle institutional, legal, cultural, or even philanthropic (Carnegie) factors are required to understand the “geography of reading.” Incorporating these into our story constitutes our future research agenda.

References

Akst, D. (2005). "Do Libraries Still Matter?" Carnegie Reporter **3**(2).

Alesina, A., Reza Baqir, and William Easterly (1999). "Public Goods and Ethnic Divisions," Quarterly Journal of Economics 114(4): 1243-1284.

Association of Religion Data Archives (ARDA). www.TheARDA.com

Blair, K. J. (1980). The Clubwoman as Feminist: True Womanhood Redefined, 1868-1914. New York, Holmes and Meier Publishers.

Bobinski, G. S. (1969). Carnegie libraries; their history and impact on American public library development. Chicago, American Library Association.

Borden, A. (1931). "The Sociological Beginnings of the Library Movement in America." Library Quarterly **1**: 278-82.

Colson, J. (1973). The Public Library Movement in Wisconsin. Graduate Library School, University of Chicago.

Constantine, R. (1970). The Role of Libraries in the Cultural History of Indiana, Indiana University Graduate Library School.

Ditzion, S. (1947). Arsenals of a Democratic Culture. Chicago, American Library Association.

Gere, A. R. (1997). Intimate practices : literacy and cultural work in U.S. women's clubs, 1880-1920. Urbana, University of Illinois Press.

Goldin and Katz (2003). , NBER #10075.

Goldin, C. (1998). J. of Ec.Hist **58**: 345-374.

Goldin, C. and L. F. Katz (1997). "Why the United States led in education: lessons from secondary school expansion, 1910 to 1940." National Bureau of Economic Research. Working Paper Series **No. 6144**.

Goldstein (2003). Libraries & Culture **38**(3): 214-35.

Green, S. S. (1972). The public library movement in the United States, 1853-1893. From 1876, reminiscences of the writer. Boston,, Gregg Press,.

Haines, Michael R., and the Inter-university Consortium for Political and Social Research (2004). HISTORICAL, DEMOGRAPHIC, ECONOMIC, AND SOCIAL DATA: THE UNITED STATES, 1790-2000 [Computer file]. ICPSR02896-v2. Hamilton, NY: Colgate University/Ann Arbor: MI: Inter-university Consortium for Political and Social Research [producers], 2004. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2005-04-29.

Helms, C. (1964). The Development of Library Services in Allegan County, Michigan. Contributions to Mid-west Library History. T. Eaton. Champaign, Illini Union Bookstore**:** 106-29.

Joeckel, C. (1935). Government of the American Public Library. Chicago, University of Chicago Press.

Kahn and Costa (2003). Perspectives on Politics **1**: 103-111.

Kilpela, R. (1964). "A Historical-Legalist Review Of Indiana Library Legislation." Library Occurent: 160.

Kortun, L. D. (1990). Carnegie Library Development in California and the Architecture It Produced, Sonoma State University.

Learned, W. S. (1924). The American Public Library and the Diffusion of Knowledge. New York, Harcourt, Brace & Co.

Leigh, R. D. and Social Science Research Council (U.S.). Public Library Inquiry. (1950). The public library in the United States; the general report of the Public Library Inquiry. New York,, Columbia University Press.

Lindert, P. (1994). Explorations in Economic History **31**: 1-37.

Martin, L. A. (1998). Enrichment : a history of the public library in the United States in the twentieth century. Lanham, Md. :, Scarecrow Press,.

McCauley, E. (1971). The New England Mill Girls: Feminine Influence in the Development of Public Libraries in New England. New York, Columbia University.

McMullen, H. (2000). American libraries before 1876. Westport, Conn., Greenwood Press.

Mussman, V. (1982). Women and the Founding of Social Libraries in California, 1859-1910, University of Southern California.

Steven Ruggles, Steven, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander (2004). *Integrated Public Use Microdata Series: Version 3.0* [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2004. http://usa.ipums.org/usa/

Shera, J. H. (1973). Knowing books and men; knowing computers, too. Littleton, Colo.,, Libraries Unlimited.

Spencer, G. (1943). The Chicago Public Library: Origins and Background. Chicago, University of Chicago Press.

Steig, L. (1952). "Notes on the Origins of Public Libraries in California, 1850-1900." **22**: 263-9.

Steinhilber, A. W. and C. J. Sokolowski (1966). State law on compulsory attendance. [Washington], U. S. Dept. of Health Education and Welfare Office of Education; [for sale by the Superintendent of Documents U.S.Govt.Print.Off.

Sturges, P. (1994). The Public Library and Reading by the masses: Historical Perspectives on the USA and Britain 1850 1900, 60th IFLA General Conference - Conference Proceedings.

Swetman, S. H. (1991). "Pro-Carnegie library arguments and contemporary concerns in the intermountain west." Journal of the west **30**(3): 63-68.

Thompson, C. S. (1950). Evolution of the American Public Library, 1653-1876. Washington, D.C., Scarecrow Press.

United States (1876). Public libraries in U.S., their history, condition, and management, special report ... [microform]. Washington, D.C. :, U.S. G.P.O.,.

United States Bureau of Education (1897). Report of the Commissioner of Education for then Year 1895-96. Vol. 1. Washington, GPO.

United States Dept. of the Interior Office of Education (1931). Statistics of Public, Society and School Libraries 1929. Washington, GPO.

Wallis, J. J. (2000). "American Government Finance in the Long Run: 1790 to 1990." J. of Economic Perspectives **14**(1): 61-82.

Watson, P. (1996). Libraries & Culture **31**(1): 159-196.

Wellard, J. (1937). Book Selection: Its Principles and Practice. London, Grafton & Co.

White, S. D. (1997). The Development of the Statewide Tax-Supported Library System in Alabama : 1901 - 1974, University of South Carolina.

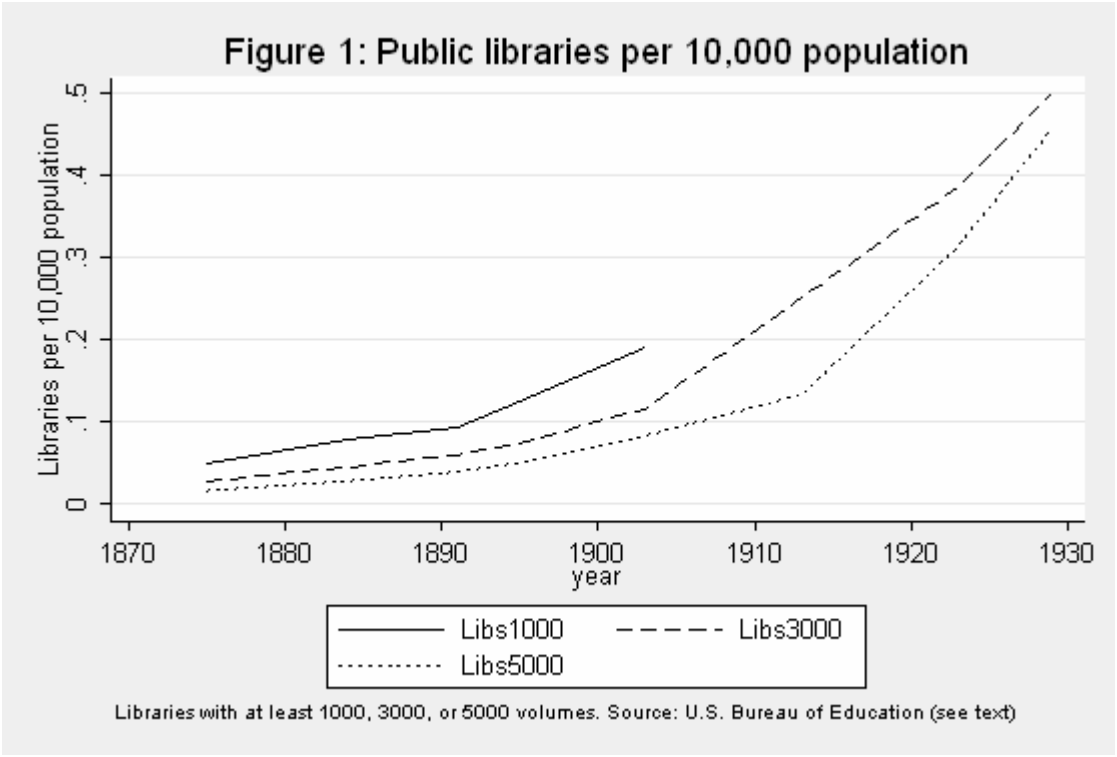
Figure 1: Public libraries per 10,000 population
Libraries per 10,000 population
0
.1
.2
.3
.4
.5
1870
1880
1890
1900
1910
1920
1930
year
Libs1000
Libs3000
Libs5000
Libraries with at least 1000, 3000, or 5000 volumes. Source: U.S. Bureau of Education (see text)

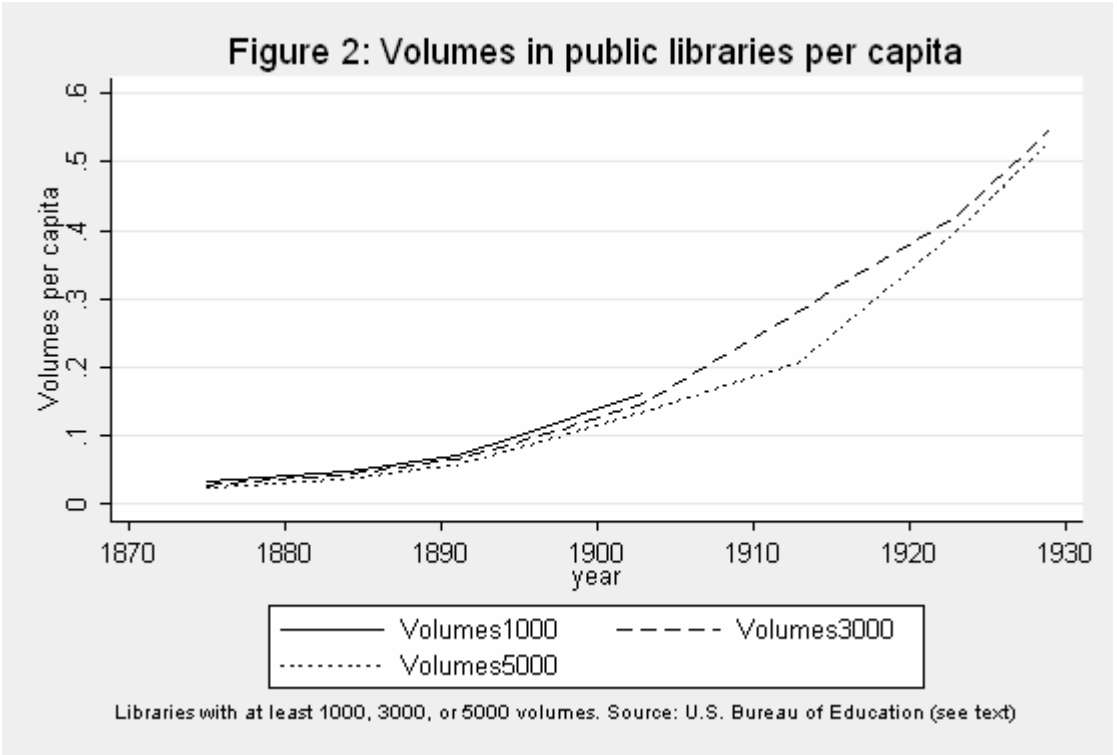
Figure 2: Volumes in public libraries per capita
Volumes per capita
0
.1
.2
.3
.4
.5
.6
1870
1880
1890
1900
1910
1920
1930
year
Volumes1000
Volumes3000
Volumes5000
Libraries with at least 1000, 3000, or 5000 volumes. Source: U.S. Bureau of Education (see text)

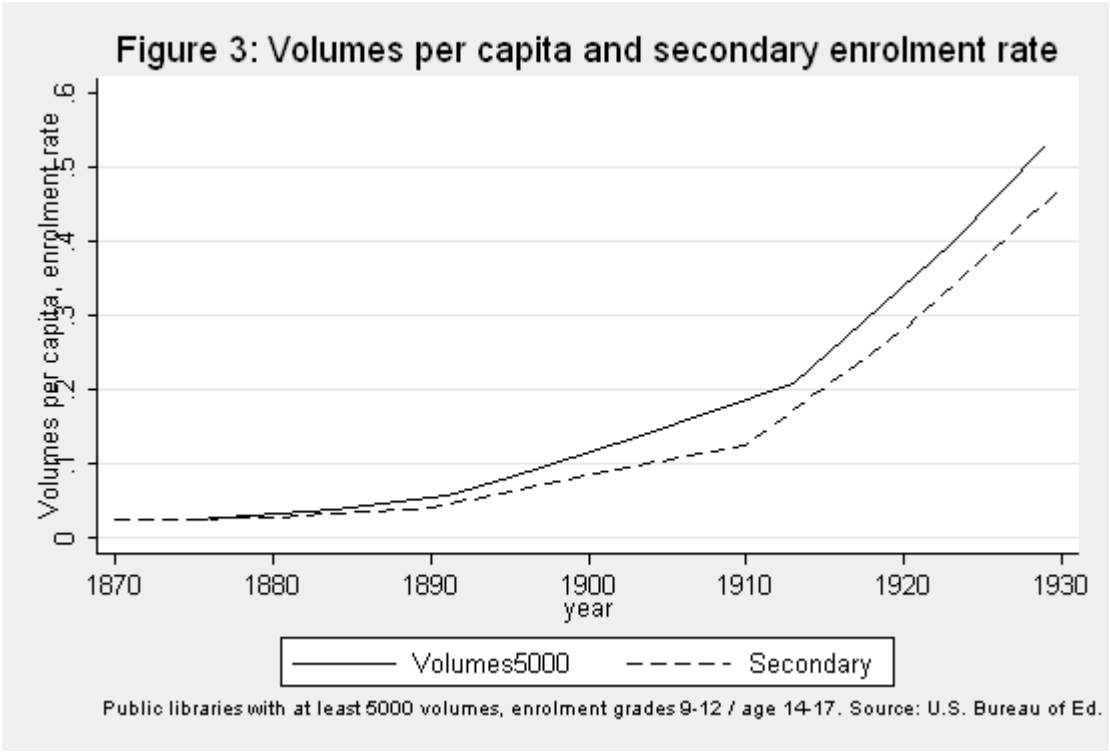
Figure 3: Volumes per capita and secondary enrolment rate
Volumes per capita, enrolment rate
0
.1
.2
.3
.4
.5
.6
1870
1880
1890
1900
1910
1920
1930
year
Volumes5000
Secondary
Public libraries with at least 5000 volumes, enrolment grades 9-12 / age 14-17. Source: U.S. Bureau of Ed.

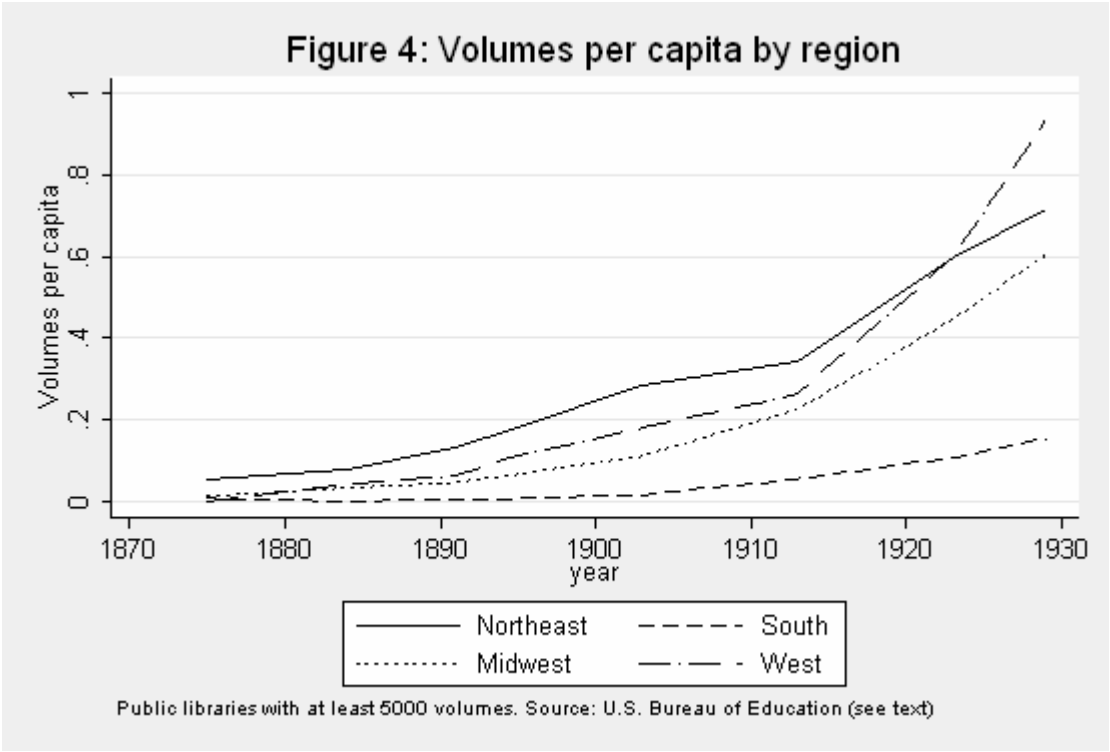
Figure 4: Volumes per capita by region
Volumes per capita
0
.2
.4
.6
.8
1
1870
1880
1890
1900
1910
1920
1930
year
Northeast
South
Midwest
West
Public libraries with at least 5000 volumes. Source: U.S. Bureau of Education (see text)

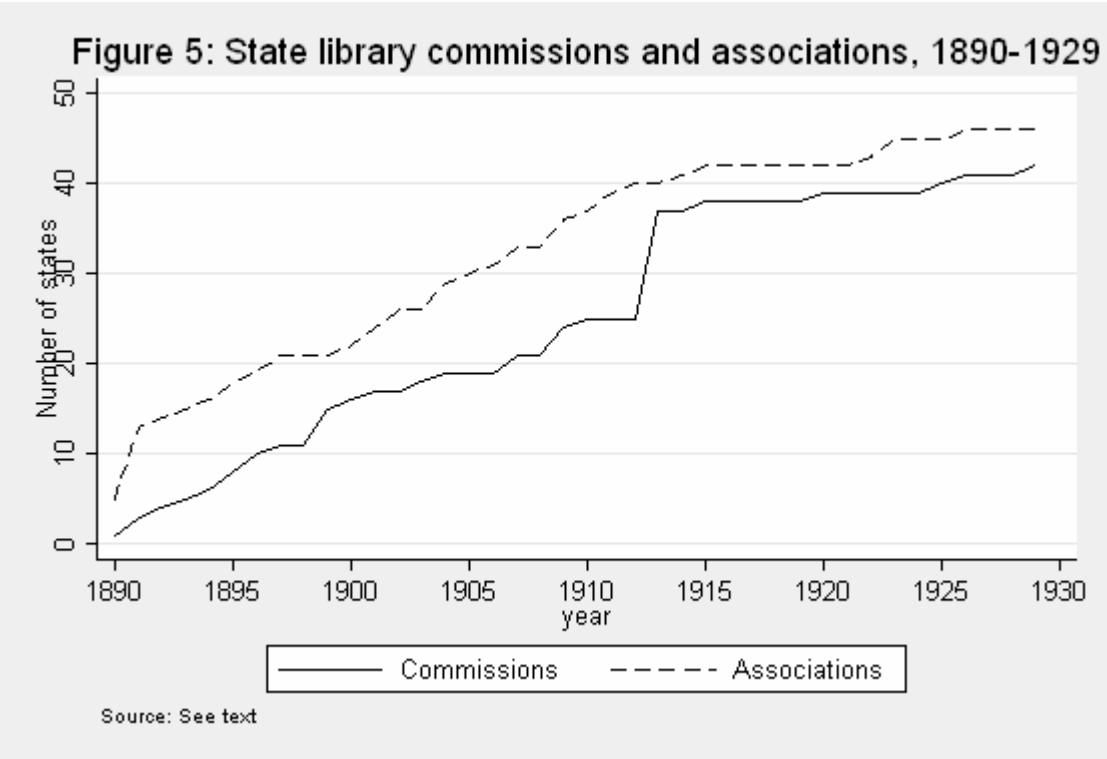
Figure 5: State library commissions and associations, 1890-1929
Number of states
0
10
20
30
40
50
1890
1895
1900
1905
1910
1915
1920
1925
1930
year
Commissions
Associations
Source: See text

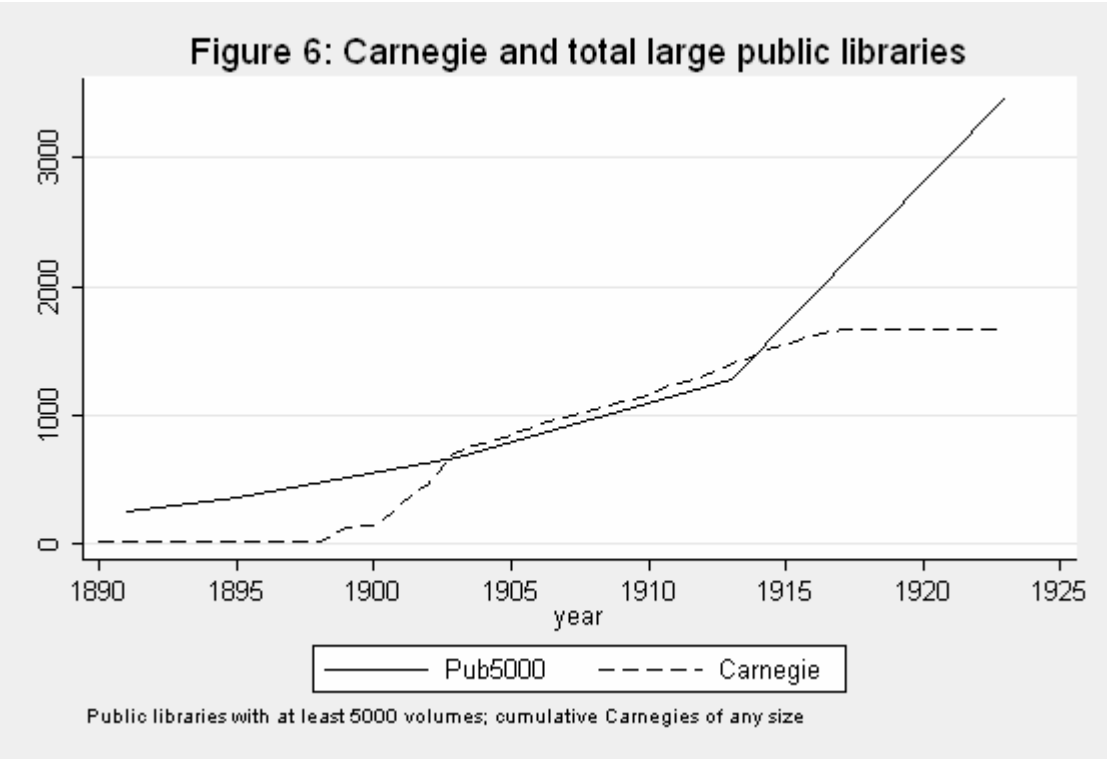
Figure 6: Carnegie and total large public libraries
0
1000
2000
3000
1890
1895
1900
1905
1910
1915
1920
1925
year
Pub5000
Carnegie
Public libraries with at least 5000 volumes; cumulative Carnegies of any size

Table 1.
Number of public libraries and total volumes in public libraries from library surveys, for different minimum size thresholds

	Libraries with at least			Volumes in libraries with at least		
Year	1000 vols	3000 vols	5000 vols	1000 vols	3000 vols	5000 vols
1875	220	127	75	1,436,638	1,273,744	1,073,030
1884	429	251	158	2,701,066	2,399,933	2,049,807
1891	606	388	254	4,609,463	4,234,134	3,726,057
1895	864	519	353	6,941,194	6,321,332	5,681,752
1903	1,546	937	671	12,956,604	11,868,416	10,853,911
1913			1,285			19,997,141
1923		4,284	3,480		46,665,388	44,044,164
1929		6,060	5,544		66,217,558	64,224,107

Source: U.S. library surveys (see text, data appendix).

Table 2.
Summary statistics for county-level data: Mean (s.d.)

Variable	1875	1895	1929
Public library in county, 300+ volumes	.0561		
	(.2302)		
Public library in county, 1000+ volumes	.0371	.1242	
	(.1891)	(.3299)	
Public library in county, 3000+ volumes	.0255	.0866	.4042
	(.1576)	(.2813)	(.4908)
Vols. per cap. in pub. libs. 300+ vols.	.0081		
	(.0499)		
Vols. per cap. in pub. libs. 1000+ vols.	.007	.0352	
	(.0474)	(.1356)	
Vols. per cap. in pub. libs. 3000+ vols.	.0055	.0289	.2802
	(.0424)	(.1219)	(.5177)
Prop. of pop. female	.47	.4678	.4826
	(.0734)	(.056)	(.0234)
Prop. of pop. black	.1498	.1337	.1117
	(.2148)	(.2135)	(.1833)
Prop. of pop. foreign-born	.115	.11	.0475
	(.1524)	(.1309)	(.0597)
Manuf. emp. per capita	.0243	.029	.0386
	(.0347)	(.0421)	(.0476)
Pop. density, 1000s per sq. mi.	.0615	.0735	.187
	(1.012)	(.8534)	(1.9378)
Prop. of pop. urban (2500)	.0747	.1117	.2136
	(.3373)	(.2031)	(.2576)
Prop. of pop. urban (25,000)	.0127	.0257	.0586
	(.0931)	(.1321)	(.1929)
south	.4629	.4452	.455
	(.4987)	(.4971)	(.498)
Prop. of 5-18 attending school	.4456		
	(.2735)		
Common school pupils per age 5-20		.5962	
		(.1584)	
Prop. attending school ages 7-13			.9382
			(.0614)
Prop. attending school ages 14-15			.8638
			(.0824)
Prop. attending school ages 16-17			.5741
			(.1137)
Per capita illiteracy	.1967		
	(.1635)		
Illiteracy rate ages 10+			.0547
			(.0596)
Real & personal wealth per cap. ($1000)	.5795		
	(3.4834)		
Local & county taxes per capita	4.1676		
	(28.8172)		
Churches per capita, any denom.	.0024		
	(.0028)		
Catholic churches per capita	.0001		
	(.0003)		
Church members per capita, any denom.		.309	.399
		(.7532)	(.158)
Catholic church members per capita		.0691	.0842
		(.638)	(.1267)
Prop. pop. age 65+			.0575
			(.022)
Observations	2316	2817	3110

Standard deviations in parentheses
Sources: U.S. library surveys, Haines et al 2004, U.S. Census of Religious Bodies county files downloaded from ARDA.

Table 3.
Probit (dF/dX): Dependent variable: Presence of public library with 1000+ volumes in the county

	1875	1875	1895	1895
Prop. of pop. female	0.1193**	0.0704	0.5608**	0.6009**
	(0.0449)	(0.0383)	(0.1169)	(0.1488)
Prop. of pop. black	-0.038	0.009	-0.137*	-0.124*
	(0.021)	(0.021)	(0.054)	(0.060)
Prop. of pop. foreign-born	-0.009	0.010	0.040	0.044
	(0.013)	(0.012)	(0.033)	(0.040)
Manuf. emp. per capita	0.236**	0.142*	0.526**	0.576**
	(0.070)	(0.060)	(0.115)	(0.126)
Pop. density, 1000s per sq. mi.	0.000	0.000	-0.004	-0.005
	(0.001)	(0.001)	(0.003)	(0.003)
Prop. of pop. urban (2500)	-0.000	0.004	0.191**	0.209**
	(0.002)	(0.003)	(0.028)	(0.030)
Prop. of pop. urban (25,000)	0.039**	0.015	-0.044	-0.045
	(0.013)	(0.009)	(0.024)	(0.026)
South	-0.018*	-0.001	-0.096**	-0.095**
	(0.009)	(0.005)	(0.019)	(0.021)
Prop. of 5-18 attending school		0.027*		
		(0.012)		
Per capita illiteracy		-0.037		
		(0.025)		
Real & personal wealth per cap. ($1000)		0.001		
		(0.002)		
Local & county taxes per capita		-0.000		
		(0.000)		
Churches per capita, any denom.		-2.860		
		(1.637)		
Catholic churches per capita		-20.982		
		(12.520)		
Common school pupils per age 5-20				0.063
				(0.039)
Church members per capita, any denom.				-0.021
				(0.049)
Catholic church members per capita				0.073
				(0.054)
Observations	2287	1929	2634	2551

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Sources: U.S. library surveys, Haines et al 2004, U.S. Census of Religious Bodies county files downloaded from ARDA.

Table 4.
Tobit: Dependent variable: Volumes per capita in public libraries with 1000+ volumes

	1875	1875	1895	1895
Prop. of pop. female	1.6565**	1.4518**	2.1217**	2.0912**
	(0.4749)	(0.5187)	(0.4462)	(0.5399)
Prop. of pop. black	-0.487	0.279	-0.674**	-0.520*
	(0.306)	(0.384)	(0.255)	(0.260)
Prop. of pop. foreign-born	-0.058	0.305	0.159	0.195
	(0.174)	(0.231)	(0.146)	(0.164)
Manuf. emp. per capita	3.189**	2.765**	2.404**	2.444**
	(0.420)	(0.423)	(0.347)	(0.352)
Pop. density, 1000s per sq. mi.	-0.006	-0.007	-0.023*	-0.025**
	(0.007)	(0.007)	(0.010)	(0.010)
Prop. of pop. urban (2500)	0.007	0.106*	0.902**	0.940**
	(0.028)	(0.051)	(0.091)	(0.094)
Prop. of pop. urban (25,000)	0.442**	0.177	-0.390**	-0.375**
	(0.109)	(0.118)	(0.090)	(0.090)
south	-0.203*	0.049	-0.391**	-0.339**
	(0.087)	(0.103)	(0.072)	(0.074)
Prop. of 5-18 attending school		0.591**		
		(0.185)		
Per capita illiteracy		-0.887		
		(0.491)		
Real & personal wealth per cap. ($1000)		0.026		
		(0.038)		
Local & county taxes per capita		-0.001		
		(0.006)		
Churches per capita, any denom.		-58.962*		
		(29.041)		
Catholic churches per capita		-465.332*		
		(211.485)		
Common school pupils per age 5-20				0.421**
				(0.159)
Church members per capita, any denom.				-0.161
				(0.213)
Catholic church members per capita				0.365
				(0.232)
Constant	-1.424**	-1.559**	-1.590**	-1.853**
	(0.258)	(0.305)	(0.226)	(0.261)
Observations	2287	1929	2634	2551
Uncensored obs.	86	81	350	350

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Sources: U.S. library surveys, Haines et al 2004, U.S. Census of Religious Bodies county files downloaded from ARDA.

Table 5.
Probit (dF/dX): Dependent variable: Presence of public library with 3000+ volumes in the county

	1875	1875	1895	1895	1929	1929
Prop. of pop. female	0.0766*	0.0154	0.2787**	0.2950**	2.8377**	2.0370*
	(0.0322)	(0.0136)	(0.0765)	(0.0958)	(0.7479)	(0.8884)
Prop. of pop. black	-0.020	0.007	-0.066	-0.055	0.113	0.370**
	(0.015)	(0.006)	(0.034)	(0.038)	(0.091)	(0.134)
Prop. of pop. foreign-born	0.004	0.005	0.011	0.006	0.872**	1.224**
	(0.010)	(0.005)	(0.021)	(0.026)	(0.304)	(0.322)
Manuf. emp. per capita	0.150**	0.028	0.244**	0.264**	0.535*	0.702*
	(0.049)	(0.023)	(0.071)	(0.076)	(0.272)	(0.287)
Pop. density, 1000s per sq. mi.	0.000	-0.000	-0.002	-0.002	-0.023**	-0.022**
	(0.001)	(0.000)	(0.001)	(0.002)	(0.005)	(0.005)
Prop. of pop. urban (2500)	0.000	0.001	0.123**	0.134**	1.007**	1.018**
	(0.001)	(0.001)	(0.022)	(0.023)	(0.070)	(0.075)
Prop. of pop. urban (25,000)	0.030**	0.003	-0.015	-0.015	-0.240**	-0.225**
	(0.010)	(0.003)	(0.013)	(0.014)	(0.082)	(0.083)
South	-0.007	0.001	-0.047**	-0.046**	-0.539**	-0.385**
	(0.006)	(0.002)	(0.013)	(0.014)	(0.027)	(0.040)
Prop. of 5-18 attending school		0.007				
		(0.005)				
Common school pupils per age 5-20				0.036		
				(0.025)		
Prop. attending school ages 7-13						1.044*
						(0.522)
Prop. attending school ages 14-15						-0.575
						(0.364)
Prop. attending school ages 16-17						0.718**
						(0.207)
Per capita illiteracy		-0.014				
		(0.010)				
Illiteracy rate ages 10+						-0.501
						(0.567)
Real & personal wealth per cap. ($1000)		0.000				
		(0.001)				
Local & county taxes per capita		-0.000				
		(0.000)				
Churches per capita, any denom.		-1.005				
		(0.787)				
Catholic churches per capita		-5.255				
		(5.045)				
Church members per capita, any denom.				-0.017		0.062
				(0.033)		(0.115)
Catholic church members per capita				0.052		-0.108
				(0.035)		(0.157)
Prop. pop. age 65+						4.222**
						(0.761)
Observations	2287	1929	2634	2551	2560	2559

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Sources: U.S. library surveys, Haines et al 2004, U.S. Census of Religious Bodies county files downloaded from ARDA.

Table 6.
Tobit: Dependent variable: Volumes per capita in public libraries with 3000+ volumes

	1875	1875	1895	1895	1929	1929
Prop. of pop. female	1.7910**	1.7166**	2.3610**	2.2659**	-2.8840**	-4.9680**
	(0.5938)	(0.6337)	(0.6155)	(0.7295)	(1.0578)	(1.1897)
Prop. of pop. black	-0.453	0.867	-0.734*	-0.552	0.233	0.733**
	(0.362)	(0.540)	(0.326)	(0.334)	(0.157)	(0.213)
Prop. of pop. foreign-born	0.164	0.696*	0.049	0.014	0.153	0.968*
	(0.229)	(0.333)	(0.200)	(0.226)	(0.390)	(0.400)
Manuf. emp. per capita	3.526**	3.079**	2.175**	2.201**	1.533**	1.858**
	(0.549)	(0.548)	(0.438)	(0.443)	(0.407)	(0.400)
Pop. density, 1000s per sq. mi.	-0.007	-0.009	-0.026*	-0.028*	-0.029**	-0.025**
	(0.008)	(0.008)	(0.011)	(0.011)	(0.008)	(0.007)
Prop. of pop. urban (2500)	0.016	0.176*	1.248**	1.296**	1.445**	1.405**
	(0.032)	(0.073)	(0.124)	(0.129)	(0.105)	(0.106)
Prop. of pop. urban (25,000)	0.567**	0.160	-0.379**	-0.364**	-0.683**	-0.598**
	(0.135)	(0.144)	(0.106)	(0.106)	(0.106)	(0.101)
South	-0.137	0.192	-0.387**	-0.335**	-1.009**	-0.464**
	(0.110)	(0.138)	(0.095)	(0.098)	(0.061)	(0.070)
Prop. of 5-18 attending school		0.839**				
		(0.274)				
Common school pupils per age 5-20				0.487*		
				(0.215)		
Prop. attending school ages 7-13						2.711**
						(0.834)
Prop. attending school ages 14-15						-0.693
						(0.515)
Prop. attending school ages 16-17						1.440**
						(0.279)
Per capita illiteracy		-1.750*				
		(0.760)				
Illiteracy rate ages 10+						0.349
						(0.884)
Real & personal wealth per cap. ($1000)		0.054				
		(0.052)				
Local & county taxes per capita		-0.004				
		(0.009)				
Churches per capita, any denom.		-111.187*				
		(49.676)				
Catholic churches per capita		-661.881*				
		(323.531)				
Church members per capita, any denom.				-0.194		-0.065
				(0.293)		(0.164)
Catholic church members per capita				0.545		0.183
				(0.312)		(0.228)
Prop. pop. age 65+						11.073**
						(1.047)
Constant	-1.728**	-1.978**	-1.945**	-2.216**	1.309*	-1.470
	(0.340)	(0.411)	(0.314)	(0.357)	(0.511)	(0.958)
Observations	2287	1929	2634	2551	2560	2559
Uncensored obs.	59	55	244	244	1190	1190

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Sources: U.S. library surveys, Haines et al 2004, U.S. Census of Religious Bodies county files downloaded from ARDA.

Table 7.
Summary statistics for state-year panel regression data (all years combined)

Variable	Mean (s.d.)
Vols. per cap. in pub. libs. (5000+)	.1834
	(.2997)
Real property taxes per capita	10.5895
	(6.6052)
Prop. of workers in manuf.	.1516
	(.114)
Prop. of pop. age 60+	.0638
	(.0233)
Prop. of pop. foreign-born	.1396
	(.1069)
Prop. of pop. under age 18	.3954
	(.0657)
Prop. of pop. female	.4727
	(.0469)
Prop. of pop. black	.113
	(.1663)
Prop. of pop. urban (2500)	.3458
	(.2287)
Prop. of pop. urban (20,000)	.2204
	(.2177)
Years with state library assoc.	7.4648
	(11.5472)
Years with state library comm.	5.3492
	(9.6749)
Prop. literate among ages 10+	.8757
	(.1336)
Observations	398

Sources: U.S. library surveys, Haines et al 2004, Ruggles et al 2004.

Table 8.
Volumes per capita in public libraries with 5000+ volumes
State-year panel with fixed effects

	(all)	(all)	(Non-South)	(South)
Real property taxes per capita	0.0148**	0.0040	0.0054	0.0277**
	(0.0041)	(0.0038)	(0.0050)	(0.0047)
Prop. of workers in manuf.	0.165	-0.189	0.985**	0.153
	(0.312)	(0.280)	(0.374)	(0.366)
Prop. of pop. age 60+	1.032	-1.309	-2.162	7.376**
	(1.270)	(1.154)	(1.463)	(1.239)
Prop. of pop. foreign-born	1.230**	1.289**	1.367**	1.055
	(0.295)	(0.264)	(0.314)	(0.690)
Prop. of pop. under age 18	2.169**	1.220*	1.657*	1.561**
	(0.549)	(0.513)	(0.671)	(0.514)
Prop. of pop. female	-1.222	0.395	-0.543	-3.433
	(0.801)	(0.778)	(0.889)	(2.162)
Prop. of pop. black	2.627**	0.677	-10.430**	0.302
	(0.440)	(0.457)	(2.633)	(0.259)
Prop. of pop. urban (2500)	-1.258**	-1.021**	-0.870*	-2.096**
	(0.301)	(0.277)	(0.338)	(0.425)
Prop. of pop. urban (20,000)	1.255**	0.727**	0.791**	1.063**
	(0.259)	(0.242)	(0.285)	(0.385)
year1884	0.029	0.094**	0.070	-0.006
	(0.031)	(0.028)	(0.040)	(0.023)
year1891	0.073*	0.182**	0.129**	0.015
	(0.035)	(0.034)	(0.049)	(0.030)
year1895	0.115**	0.243**	0.184**	0.026
	(0.037)	(0.037)	(0.054)	(0.033)
year1903	0.188**	0.349**	0.266**	0.049
	(0.043)	(0.045)	(0.064)	(0.040)
year1913	0.319**	0.516**	0.427**	0.078
	(0.055)	(0.060)	(0.081)	(0.052)
year1923	0.509**	0.711**	0.702**	0.164*
	(0.067)	(0.076)	(0.096)	(0.063)
year1929	0.652**	0.865**	0.955**	0.207**
	(0.076)	(0.088)	(0.108)	(0.071)
Years with state library assoc.		0.001		
		(0.001)		
Years with state library comm.		0.006**		
		(0.002)		
Prop. literate among ages 10+		-1.176**		
		(0.187)		
Constant	-0.885**	0.145	-0.514	0.638
	(0.274)	(0.325)	(0.300)	(1.077)
Observations	378	378	246	132
Number of State postal abbreviation	49	49	32	17
R-squared	0.74	0.80	0.82	0.78

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Sources: U.S. library surveys, Haines et al 2004, Ruggles et al 2004.

Data Appendix: Classification of libraries and notes on the U.S. Bureau of Education library surveys (incomplete)

Beginning with its monumental report on public libraries of 1876, the U.S. Bureau of Education intermittently issued reports based on large surveys of public and related libraries in the United States. These reports often tabulated the returns of all responding libraries above a certain threshold size (in volumes), providing information on their location, type, size, and various other characteristics. We have coded these data for several of the survey years.

1876 report

Source: U.S. Dept. of the Interior, Bureau of Education. 1876. Public Libraries in the United States of America: Their History, Condition, and Management. Special Report. Washington: GPO.

Work on this study of libraries was initiated by the Commissioner of Education (John Eaton???) in 1870. The special report's introduction motivates the study as follows (p. xi): "It was known that within the last quarter of a century the number of public libraries had greatly multiplied, and that they had assumed a position of commanding importance as an educational force, but there were no data for determining the extent of their influence." The introduction recounts various previous efforts to gather library statistics, including studies under the auspices of the U.S. Census in 1850, 1860, and 1870, which are claimed to have been "incomplete and untrustworthy." This view of the Census library statistics seems to have been shared by the Census Bureau itself; the Superintendent of the 9th Census, F.A. Walker, wrote in 1870 census report that "The Statistics of Libraries have never been very creditable to the census of the United States." (orig. source: U.S. Bur. Of the Census, 1872, A Compendium of the Ninth Census (June 1, 1870). Wash: GPO, p. 505).

The Bureau of Education's survey of libraries began with a list of every town "the population of which was sufficient to seem to justify the belief that it possessed a public library of some sort" (p. xviii). Letters of inquiry were then sent, generally to the local postmaster, soliciting the names of any public libraries. In larger towns and in cities, the superintendent of public schools was also contacted, and in the larger cities "persons were selected to make special investigations" (xviii). Previous listings of libraries, city directories, gazetteers, offices of institutions societies, clergy, public officials, etc., were also consulted. Direct inquiries were then sent the libraries identified. "This preliminary work involved the writing of some 10,000 letters, to which the responses have generally been most prompt and gratifying" (xix).

Statistics of libraries with at least 300 volumes for the year 1875 were tabulated in chapter 37 of the special report. The report classifies libraries into the following categories (p. 797):

- Academy and school libraries: includes seminaries, institutions for then higher education of women, business colleges, normal schools, academies, high schools; but not common or district schools (primary) save a few, nor colleges or professional schools
- College
- Society libraries: only includes libraries belonging to students' societies in colleges
- Law
- Medical
- Theological
- Scientific: schools of science, including colleges of agriculture and mechanic arts, scientific societies
- Historical
- Public: all libraries open to public without charge or for nominal fee only
- Mercantile

- Social: includes athenaeums, young men's associations and institutes, and subscription libraries generally
- YMCA
- Government
- State and territorial
- Garrison
- Asylum and reformatory: also includes hospitals, workhouses, reform schools, prisons
- Misc.

We have reclassified many of the smaller categories into categories of Specialized (Prison, Asylum), Academic (Science, Theology) and Fraternal (YMCA, Oddfellow's) libraries. The total for each category are given in the following table.

type 1873	Freq.	Percent	Cum.
Academic	322	8.83	8.83
College	368	10.09	18.92
Fraternal	87	2.39	21.31
Public	443	12.15	33.45
School	1,084	29.72	63.18
Social	695	19.06	82.23
Society	188	5.15	87.39
Specialized	460	12.61	100.00
Total	3,647	100.00	

The census included a question on whether the library was free or subscription or both free and subscription. Using this question, we are able to reclassify many of the General libraries, and some of the Social libraries, as public libraries. If a library is free, or is a combination of free and subscription, or if the name includes the word "Ladies," then it is reclassified as a public library. We end up with two measures of the number of public libraries, a narrow one that includes public libraries identified by their name and whether they are free libraries (774 libraries), and a broader measure that includes all Public, Fraternal, and Social libraries (1225 libraries).

1884 report (to be completed)

1891 report

The 1891 census of libraries contained the general categories indicated in Table xx. The category Public has been constructed by taking libraries that were originally in the General category, and recoding if the name of the library included the words of phrases "Free Library", "Public Library", "Circulating Library", City Library", "Town Library", "Township Library", or "County Library".

type 1891	Freq.	Percent	Cum.
Academic	427	11.32	11.32
College	616	16.33	27.65
Fraternal	120	3.18	30.83
General	503	13.34	44.17
Public	646	17.13	61.29
School	907	24.05	85.34
Social	255	6.76	92.10
Specialized	240	6.36	98.46
Missing	58	1.54	100.00

```
      Total |      3,772      100.00
```

The 503 remaining General libraries have names that include “Library Association” quite often, or have names such as “Jamestown Library.” The census included a question on whether the library was free or subscription or both free and subscription. Using this question, we are able to reclassify many of the General libraries, and some of the Social libraries, as public libraries. If a library is free, or is a combination of free and subscription, or if the name includes the word “Ladies,” then it is reclassified as a public library. We end up with two measures of the number of public libraries, a narrow one that includes public libraries identified by their name and whether they are free libraries (1167 libraries), and a broader measure that includes all Public, Fraternal, General and Social libraries (1524 libraries).

1895-96 report

U.S. Bureau of Education. 1897. Report of the Commissioner of Education for then Year 1895-96. Vol. 1. Washington: GPO. Ch. VIII. “Public, Society, and School Libraries” pp. 339-521. Ch. IX. “Library Legislation in the United States” pp. 523-99.

Statistics are again based on a survey (sent April 1, 1896) of libraries. “Efforts were made to secure the names of all the libraries in the United States…” (p. 340). The list of included all libraries that reported to the Bureau in its 1891 survey, as well as “several thousand others” (p. 340). Nearly 10,000 addresses were obtained, from which about 8,000 responses were received. Non-responding libraries were sent second and if necessary third requests. The published report lists details only for the libraries that reported at least 1000 volumes: “It is safe to assume that the list of 4,026 public and school libraries published in this report includes very nearly all the libraries in the United States having 1,000 or more volumes” (p. 340). The report notes that an additional 3,167 libraries reported between 300 and 999 volumes, and “nearly 1000” reported fewer than 300.

The categories used for classifying libraries in the 1896 report were as follows (listed without definitions, pp. 366-67): General, School, College, College society, Law, Medical, Theological, Scientific, Historical, Mercantile, Social, YMCA, Masonic, IOOF, Government, State, Garrison, Asylum and reformatory, Society. We have recoded to conform to our classification of the previous censuses. We find

```
   type 1896 |      Freq.     Percent        Cum.
-------------+-----------------------------------
    Academic |        403       10.01       10.01
     College |        681       16.92       26.92
   Fraternal |        114        2.83       29.76
     General |        646       16.05       45.80
      Public |        915       22.73       68.53
      School |        932       23.15       91.68
      Social |        167        4.15       95.83
 Specialized |        168        4.17      100.00
-------------+-----------------------------------
       Total |      4,026      100.00
```

Again, if a library is free, or is a combination of free and subscription, or if the name includes the word “Ladies,” then it is reclassified as a public library. We end up with two measures of the number of public libraries, a narrow one that includes public libraries identified by their name and whether they are free libraries (1426 libraries), and a broader measure that includes all Public, Fraternal, General and Social libraries (1842 libraries).

1903 report (to be completed)

1913 report (to be completed)

1923 report

The 1929 library census grouped libraries according to 13 categories. Three of these categories referred to school, college and university libraries. Five categories fall under our definition of public libraries. These are the categories: Borrower, City, County, Township, and Village. Country Bar or Law Libraries were however excluded from our counts of public libraries. Finally, five categories (Association, Corporation, Government, Society, and State) contained a mixed bag of private and specialized libraries. If the name of the library included the word “public”, “free” or “Carnegie” they were counted as public libraries (except if the name also included “Commission”, as in “Public Library Commission Library.”

type 1923	Freq.	Percent	Cum.
Assoc	248	4.87	4.87
College	762	14.96	19.83
Corporate	274	5.38	25.21
Government	77	1.51	26.72
Public	2,438	47.86	74.58
School	950	18.65	93.23
Society	140	2.75	95.98
State	161	3.16	99.14
Missing	44	0.86	100.00
Total	5,094	100.00	

Closer examination of the public libraries revealed that 26 were misclassified, and we end up with a total of 2464 public libraries.

1929 report

U.S. Dept. of the Interior, Office of Education. 1931. Statistics of Public, Society and School Libraries 1929. Office of Education Bulletin, 1930, No. 37. Wash: GPO.

The report begins with an overview of the increase in library use between 1923 and 1929 suggested by a comparison with the results from the previous library survey (p. 1). “Radio notwithstanding, the use of libraries increased along with the increase in the number of books. Libraries of 3,000 and more volumes have 6,000,000 more borrowers’ cards in force than in 1923…The number of books issued per capita increased 45 per cent from 1923 to 1929 (from 1.924 to 2.788 books per person in the total population)” (pp. 1-2). However, it may be worth noting that the report on the 1923 survey raised questions about the completeness of the responses, especially among smaller libraries (see U.S. Dept. of the Interior, Bureau of Education. 1926. Statistics of Public, Society, and School Libraries, 1923. Bureau of Education Bulletin, 1926, No. 9. Wash: GPO, p. 1).

Results were tabulated for libraries reporting at least 3,000 volumes. Unfortunately, the published report for the 1929 survey does not provide information about the survey methods or response rate.

The 1929 library census grouped libraries according to 13 categories. Three of these categories referred to school, college and university libraries. Five categories fall under our definition of public libraries. These are the categories: Borrower, City, County, Township, and Village. Country Bar or Law Libraries were however excluded from our counts of public libraries. Finally, five categories (Association, Corporation, Government, Society, and State) contained a mixed bag of private and specialized libraries. If the name of the library included the word “public”, “free” or “Carnegie” they were counted as public libraries (except if the name also included “Commission”, as in “Public Library Commission Library.”

type 1929	Freq.	Percent	Cum.

Assoc	241	3.72	3.72
College	920	14.22	17.94
Corporate	246	3.80	21.74
Government	57	0.88	22.62
Public	2,759	42.63	65.25
School	2,001	30.92	96.17
Society	101	1.56	97.73
State	139	2.15	99.88
Missing	8	0.12	100.00
Total	6,472	100.00	

Closer examination of the public libraries revealed that 16 were misclassified, and we end up with a total of 2745 public libraries.

Because completeness and response rates may have varied from survey to survey over the years, we are reluctant to draw strong conclusions about aggregate trends in the number of public libraries from the sequence of surveys. Rather, we make use of the surveys as snapshots in time to examine correlates of library development across the United States. We are also able to make use of information on founding dates, provided in the 1929 survey, to examine the timing of library development for the set of libraries existing as of 1929.