A Note on Information Technology, Demographics and the Retail Response

by George Steinlieb
and James M. Hughes

Columbia Institute for Tele-Information
Graduate School of Business
Columbia University
809 Uris Hall
New York, NY 10027
(212)854-4222

A NOTE ON INFORMATION TECHNOLOGY, DEMOGRAPHICS AND THE RETAIL RESPONSE

by

George Sternlieb
James M. Hughes

Prof. Sternlieb is Director, Center for Urban Policy Research, Rutgers University. Prof. Hughes is Chair and Graduate Director, Urban Planning and Policy Development, Rutgers University.

1985

This is a draft copy of a working paper which will be published in final version in a volume entitled The Impact of Information Technologies on the Service Sector, G. Faulhaber, E. Noam, and R. Tasley, eds.

INTRODUCTION

This paper is organized into three broad sections. The first details the demographic matrix of 1995; America will be a much more mature nation, a middle-aged society predominantly "paired and nested." The era of explosive labor force growth will have passed -- a period of labor force shortage arrived. Decentralization and deconcentration trends will continue at regional and metropolitan levels, but older regions -- presently typified by New England -- may secure increasing vigor. And the demographic and economic parameters of the 1990s indicate a far more receptive environment for technological innovation.

The second section highlights a much more difficult task -- forecasting technological impact. The demographic matrix of the balance of the century is relatively "certain" within general boundaries. But there are relatively few technological imperatives with such vigor as to support instant judgement. An overview of the evolution of retailing in America provides an insightful example of the complexities at work.

The concepts of stasis and inertia versus the forces of change unleased by technological innovation are the subject of the final section. Journey-to-work -- the linkage between residence- and workplace -- is evaluated, along with the notion of the "electronic cottage." The impact of the information era may portend households free of spatial ties as they work at their dispersed electronic residences -- with information commuting, not people. But just as shopping malls flourish in the face of electronic retailing, so too will the office remain viable. People will not want to be isolated from other people. Thus the impact of technology must be viewed through a matrix of societal elements which shape its eventual spatial distribution -- and settlement patterns as well.

DEMOGRAPHIC PARAMETERS

The confusion between sequence and causation is a hazard of the social sciences. We are dependent upon past relationships for forecasting the future. When these relationships alter -- or if they are coincidental in time rather than descriptive of immutable linkages -- the predictive failure can be very costly indeed. We are much more competent as historians than as futurists.

This stipulation is essential as we project demographic realities to come. It is made even more significant when we attempt to interpret the applications of communications and information technology both present and anticipated.

In the first domain, for example, it is chastening to observe the demographic forecasts of yesteryear. In the depths of the Depression, the consensus of learned forecasters, typified by the 1933 Hoover Commission Report, envisioned a population peak of 145 million people in the United States in the 1980s.*

The post-World War II baby boom (1946 to 1964) was completely unanticipated both in its scale and its longevity. The rapid increase in reproduction was matched only by its precipitous decline. The subsequent baby bust of the post-1964 years was equally unforeseen. We have moved from national population projections for the Year 2000 of more than 300 million to a consensus of 265 to 270 million. The former was a function of the fertility rates of the 1950s -- the latter of their abrupt reduction in the 1960s and early 1970s. In retrospect, the tendency for straightline extrapolation based on "clear trends" among the nominally learned is all evident.

---

*President's Research Committee on Social Trends, Recent Social Trends in the United States (New York: McGraw-Hill, 1933).

There are, however, three basic demographic phenomena which can be forecast with a reasonable degree of certainty. They revolve around: the powerful dominance of the baby boom cohort moving through its life cycle with enormously consequential societal repercussions; the maturing baby bust generation, introducing the concept of shrinkage at each stage of its life cycle; and the rise of the elderly -- as yet much more a function of longevity than of a unique size of cohort. These three phenomena will dominate our population change through the balance of the century. Anticipations of their future ramifications feed back even now to our vision of social issues to come.

From an areal perspective, there are also three seemingly immutable processes of our time: decentralization, particularly evident in the dominant settlement artifacts -- the major industrial cities -- of a century we now realize ended with World War II; suburbanization and exurbanization, which has resulted in a continuous broadening of the concept of metropolitan areas; and regional shifts, i.e., the transfer of population and economic activity typically from the Northeast and Midwest to the South and West. So consequential has this last element been, as to raise a number of statistical anomalies, i.e., the rise of cities and metropolitan areas as the new growth areas thicken up, and of vast conurbations, perhaps mislabeled metropolitan areas, growing in size while their older forebears decline.

Bounding these elements -- and at one and the same time both dependent on them and serving as accelerants as well -- are transformations of the American labor force, and technological/economic functions as well. The demographic dynamics, summarized subsequently, set the basic stage for the future.

The Population Context

The United States is passing through the pressures exerted by the enormous increments of population growth which have characterized the post-World War II era. From 1950 through the mid-1980s, our population increased by nearly 60 percent. But this is a process which is now slowing. The baby-boom upsurge of the 1950s, marked by an 18.5 percent population increase nationally between 1950 and 1960, gave way to the baby-bust era of the 1960s and 1970s, with decade population increases on the order of 13.4 and 11.4 percent respectively. The dynamics set in motion over these last three decades will dominate the demographics of tomorrow. Much of the adaptation and receptivity to new technology and information systems will be shaped by them.

The stress points of the 1970s are illustrated in the age structure data of Exhibit 1, which highlights the reduction in the absolute number of children under the age of 14 years in the 1970s (the baby-bust generation), with a decline of more than 6 million; and the enormous growth of young adults in the 25 to 34 years of age range (the maturing baby boom), who increased by half. Indeed, nearly all of the population increment of the 1970s was in the 25 to 44 years-of-age sector (20.6 million out of 22.7 million). The growth in older Americans barely compensated for the loss of the young.

The three basic propulsive forces were thus made evident in the 1970s: the sheer size -- and now the aging -- of the baby boom generation; the continued growth in the elderly; and a relative dearth of new, young adults on the horizon. While the baby-boom echo, as a function of the sheer size of the cohort at risk, is illustrated by the resumed growth in the under-5 years of age population between 1980 and 1983, it is but a shadow of the earlier vitality that produced its parents.

EXHIBIT 1

TOTAL POPULATION AGE STRUCTURE, U.S. TOTAL POPULATION
(INCLUDING ARMED FORCES ABROAD): 1970 TO 1983
(Numbers in Thousands)

		Change: 1970 to 1980			Change: 1980 to 1983	
	1970	1980	Number	Percent	1983	Number	Percent
Total	205,052	227,704	22,652	11.0%	234,496	6,792	3.0%
Under 5 Years	17,166	16,457	- 709	- 4.1	17,826	1,369	8.3
5 to 13 Years	36,672	31,080	- 5,592	-15.2	30,116	- 964	- 3.1
14 to 17 Years	15,924	16,139	215	1.4	14,633	-1,506	- 9.3
18 to 24 Years	24,711	30,347	5,636	22.8	30,148	- 199	- 0.7
25 to 34 Years	25,324	37,593	12,269	48.4	40,334	2,741	7.3
35 to 44 Years	23,150	25,882	2,732	11.8	29,492	3,610	13.9
45 to 54 Years	23,316	22,737	- 579	- 2.5	22,342	- 395	- 1.7
55 to 64 Years	18,682	21,756	3,074	16.5	22,219	463	2.1
65 Years and Over	20,107	25,714	5,607	27.9	27,384	1,670	6.5

Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1984 (104th Edition), Washington, D.C., 1983.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 949, Estimates of the Population of the United States, by Age, Sex and Race: 1980 to 1983, U.S. Government Printing Office, Washington, D.C., 1984.

Presented in Exhibit 2 are the age structure shifts projected from 1983 to 1990 and then through 1995. By that terminal date, the demographic profile of America is dominated by the aging of the baby-boom generation. Over 73 million Americans will be between 35 and 54 years old -- a dramatic expansion without parallel in our past. Its companion -- a shrinking number of young adults -- is indicated by the relatively small increments in their historic absolute number. And the much-feared accession rate to the elderly will be substantial, but it will really only become dominant in the next century.

America of 1995 will be a much older nation, with its population concentrated in middle-aged to near-middle-aged groups. It will be much less dominated, at least from a numerical point of view, by the youth orientation of past decades. It should be noted in this context that, subject to changes in immigration flow, population projections to 1995 -- at-least for people over the age of 10 -- are relatively secure in scale. The demographic matrix of the next decade has already been set in place.

Regional Population Shifts

Of considerably less certainty are future regional settlement patterns. In the 1970s, accelerated population growth in the South and West on a national scale brought with it a new vocabulary, of Sunbelt and Frostbelt, to the general media. But more significantly, it represented the visible product of the long-term pyramiding of successive technological innovations.

Before the turn of the century, F.J. Kingsbury isolated three factors portending significant changes in the population distribution between the city and its surrounding countryside -- the trolley, the bicycle, and the

EXHIBIT 2

POPULATION PROJECTIONS BY AGE, U.S. TOTAL POPULATION
(INCLUDING ARMED FORCES ABROAD): 1990 AND 1995
(Numbers in Thousands)

			Change: 1983 to 1990			Change: 1990 to 1995	
	1983	1990	Number	Percent	1995	Number	Percent
Total	234,496	249,731	15,235	6.5%	259,631	9,900	4.0%
Under 5 Years	17,826	19,200	1,374	7.7	18,616	- 584	3.0
5 to 13 Years	30,116	32,183	2,067	6.9	34,443	2,260	7.0
14 to 17 Years	14,633	12,940	- 1,693	-11.6	14,071	1,131	8.7
18 to 24 Years	30,148	25,777	- 4,371	-14.5	23,684	-2,093	-12.0
25 to 34 Years	40,334	43,506	3,172	7.9	40,489	-3,017	- 6.9
35 to 44 Years	29,492	37,845	8,353	28.3	41,994	4,149	11.0
45 to 54 Years	22,342	25,391	3,049	13.6	31,378	5,987	23.6
55 to 64 Years	22,219	21,090	- 1,129	- 5.1	20,951	- 139	- 0.7
65 Years and Over	27,384	31,799	4,415	16.1	34,006	2,207	6.9

Note: Census Bureau Middle Series Projection.

Source: U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 922, Projections of the Population of the United States: 1982 to 2050 (Advance Report), U.S. Government Printing Office, Washington, D.C., 1982.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 949, Estimates of the Population of the United States, by Age, Sex and Race: 1980 to 1983, U.S. Government Printing Office, Washington, D.C., 1984.

telephone. Each of these entrants into American life was seen as expanding the periphery of urban settlement. Kingsbury perceptively suggested that alterations in society's course are often underlaid by the pyramiding of seemingly unimportant and inconspicuous developments into forces of major consequence.

Current modifications of America's demographic evolution have been facilitated by the same general categories of technological innovation recognized by Kingsbury -- public and private transportation and communications. Advances in air transport and dry-bulk cargo shipping, the Interstate Highway System, and the increasing sophistication of place-independent computer linkages -- have served to substantially homogenize time and space, and radically alter patterns of connectivity.

Predecessors of these innovations gave impetus to the suburbanization process in earlier decades. In the 1970s they advanced to the national scale and facilitated increasing disparities in inter-regional population growth. And the processes at work have propelled themselves into the 1980s. In Exhibit 3, we have shown the changes in the regional distribution of America's population from 1980 through 1984. The conventional wisdom of population shifts to the South and West at the cost of the Northeast and Midwest is still valid. Roughly 90 percent of all of America's population growth in the first four years of 1980s was in the former areas; the latter, at least from an aggregate demographic perspective, remained virtually static.

The pattern of change from mid-1983 to mid-1984 indicates a potential break from the past. The slowing down of the natural resource economy -- of

---

*F.J. Kingsbury, "The Tendency of Man to Live in Cities," Journal of Social Science, vol. 33, November 1895.

the mineral base of Texas and the Rocky Mountain areas -- introduces new uncertainty. Wyoming, for example, actually lost population, but this may be only a recession-borne blip. The new information economy, however, may be much less resource-dependent than its predecessor. The world economy which it makes possible further deepens the problems of those domestic areas whose raison d'etre rests on suddenly challenged bases. The copper states are depressed both by fiber optic cables -- and alternative mineral exploitation throughout the world.

The future will hold equally significant and equally unanticipated, developments. In the early 1970s, New England was still considered an economic laggard, depleted by the loss of its historical industrial mainstays over the preceding half century. Spearheaded by new innovations, the information and technological era has reversed New England's economic fortune. Although its 1980 to 1984 population growth still lags the nation, a base for future growth has been established.

Will a similar path be open to other aging industrial regions? The Sunbelt-Frostbelt disparities of the 1970s were linked to shifting energy costs and the obsolescence of the industrial infrastructure of the past. But the age of energy "shortfalls" -- and with it the rush to Texas and the mountain states -- may be over, raising questions as to the long-term pulling power of these areas. The new information era has not only resurrected New York City as the national -- and now worldwide -- financial capitol, but has also given it much greater potency, challenging the role of the "regional cities." The inertia of past spatial demographics will be continually challenged as the future economy unfolds.

Long-term shifts of population -- and with them, jobs, residence place, entertainment facilities, and all the infrastructure of modern-day life -- render obsolete old facilities in left-behind areas, and demand an accelerated level of new capital provisions in the high-growth areas. With them comes the capacity -- at least the potential -- for crest-of-the-wave innovation, for the employment of new means of communication and transportation which do not face the competition of the already-in-place infrastructure of the older sections of the nation. One out of four houses built in the South dates from 1970 or later -- the equivalent for the Northeast is one in ten.

Central City Population

The subject of population change and the concomitant alteration of economic functions in central cities is an enormously complex one. In our own estimation, we do not see the pattern of population decline, shown in Exhibit 4 for selected cities from 1950 to 1980, altering markedly in the future. The long-term nature of the forces underlying this decline makes this evident.

The development of the horse-drawn streetcar in the late 19th century was the initial instrument which stretched the city beyond its circumscribed pedestrian limits. The ability to transmit electricity from a central power station to a moving vehicle, and the development of an efficient electrical streetcar motor, further accelerated movement to the countryside. The diffusion of the telephone and advances in the transmission of electricity economically, including the switch from direct to alternating current, also facilitated population decentralization. But at the same time, they also permitted employment centralization, increasing the number of people who could be gathered at a central locus within a fixed period of time.

EXHIBIT

POPULATION CHANGE, SELECTED CITIES -- 1950 TO 1980

CITY	1950[1]	1970[2]	1980[3]	Change: 1950-1980 Number	Change: 1950-1980 Percent	Change: 1970-1980 Number	Change: 1970-1980 Percent
Boston	801,444	641,071	562,994	-238,450	-29.8	- 78,077	-12.2
Buffalo	580,132	462,768	357,870	-222,262	-38.3	-104,898	-22.7
Chicago	3,620,962	3,369,357	3,005,072	-615,890	-17.0	-364,285	-10.8
Cincinnati	503,998	453,514	385,457	-118,541	-23.5	- 68,057	-15.0
Cleveland	914,808	750,879	573,822	-340,986	-37.3	-177,057	-23.6
Detroit	1,849,568	1,514,063	1,203,339	-646,229	-34.9	-310,724	-20.5
Minneapolis	521,718	434,400	370,951	-150,767	-28.9	- 63,449	-14.6
New York City	7,891,957	7,895,563	7,071,030	-820,927	-10.4	-824,553	-10.4
Newark	438,776	381,930	329,248	-109,528	-25.0	- 52,682	-13.8
Philadelphia	2,071,605	1,949,996	1,688,210	-383,395	-18.5	-261,786	-13.4
Pittsburgh	676,806	520,089	423,938	-252,868	-37.4	- 96,151	-18.5
St. Louis	856,796	622,236	453,085	-403,711	-47.1	-169,151	-27.2

Notes: 1. April 1, 1950 Census.
2. April 1, 1970 Census.
3. April 1, 1980 Census.

Sources: U.S. Bureau of the Census. County and City Data Book, 1956 (A Statistical Abstract Supplement), U.S. Government Printing Office, Washington, D.C., 1957; and U.S. Bureau of the Census, Commerce News, "Three Cities of 100,000 or More At Least Doubled Population Between 1970 and 1980, Census Bureau Reports," CB81-92, Public Information Office, Washington, D.C., June 3, 1981.

The advent of widescale automobile ownership after World War II merely accentuated the suburbanization process. It permitted the working-out of long-standing social desires that had been evidenced in the late 1920s. The data of Exhibit 4 were virtually preordained by the technological introductions of a half century before.

At present, despite much publicity, the often-heralded return of older suburbanites and/or Yuppies to the central city simply has not occurred; future demographics, particularly the slowing growth of household formation, are a distinct negative. The homogenization of space -- and increasingly of time -- available through information technology has made much of the historical functions of the older core areas obsolete, or at best, opened them to very substantial and increasingly successful competition. The major dynamics of dispersion and decentralization made possible by the technology of yesterday can only be accentuated by future innovation; within this latter context, there is little, at least on the horizon, which is unique and specific to central cities, and which might provide them with a new surge of competence and pulling power.

Household Change

The impact of technology is a function of the societal matrix which serves as a shaping device. Within this context, the shifts in America's household configurations are particularly important. The 1970s were the years of nominally unorthodox households -- singles and "mingles" -- and a relatively slow growth in traditional married-couples. Overall, however, there was an enormous expansion in the number of American households. Housing buying power, at least in the beginning of the 1970s, was relatively high -- a variety of household types, therefore, had the capacity

to seek out independence. The future however, in our own estimation, will be quite different.

In Exhibit 5, we have projected household growth increments by age, type, and tenure, from 1983 through 1995. (The 1983 and 1995 totals are presented in Exhibits 6 and 7.) The pattern is one which reflects the maturing of America. First and foremost is a decline in the scale of household formation -- absolute household growth will average only 1.2 million per year in the early 1990s, as compared to 1.7 million in the 1970s.

Secondly, and equally evident, is the continued dominance of ownership. Again, this has significant ramifications for the adoption of new technology. On the one hand, owners may be more desirous -- or perhaps even more capable -- of long-term capital investment in their domicile. A second, and perhaps less salubrious (from the viewpoint of technological innovation, at least) element is the decline in renter households. While not precisely coterminous with multifamily housing -- at best this is indicative of relatively modest increments in large-scale, physically integrated housing configurations. This may have some limiting impact in adoption of equivalent scale centrally located innovation.

Unlike the 1970s, household growth will be dominated by married couples -- typically two-worker households -- concentrated in the 35 to 54 year-old householder age segment. At least in historic terms, these are people moving into the peak income-earning years, with a greater capacity for capital investment. Time will tell whether they have as much desire for crest-of-the-wave "electronics" as they exhibited in the 1970s. At least the more youthful among them are children of the electronics age, already

EXHIBIT 5

PROJECTED HOUSEHOLD GROWTH INCREMENTS: BY AGE
TYPE AND TENURE: 1983 TO 1995
(Numbers in thousands)

OWNER HOUSEHOLDS

		Family Households			Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
All Households	11,03[illegible]	8,005	251	1,031	624	1,124
Under 25 years	- 18[illegible]	- 117	- 13	- 12	-30	-15
25 to 34	4[illegible]	34	- 1	11	15	-16
35 to 44	4,74[illegible]	3,809	114	448	250	120
45 to 54	3,83[illegible]	3,011	105	389	164	171
55 to 64	- 60[illegible]	- 439	- 21	- 44	-21	-84
65 yrs. and over	3,20[illegible]	1,709	67	238	244	948

RENTER HOUSEHOLDS

		Family Households			Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
All Households	3,41[illegible]	1,247	96	734	563	778
Under 25 years	-81[illegible]	- 318	-17	- 118	- 192	- 166
25 to 34	3[illegible]	57	-12	2	2	- 10
35 to 44	2,08[illegible]	854	74	539	414	209
45 to 54	1,15[illegible]	460	46	228	231	191
55 to 64	- 14[illegible]	- 55	-11	- 11	- 38	- 31
65 yrs. and over	1,09[illegible]	249	17	94	146	585

Source: CUPR Household Projection Model.

EXHIBIT 6

OWNER AND RENTER HOUSEHOLDS BY AGE AND TYPE
U.S. TOTAL: 1983
(Numbers in thousands)

OWNER HOUSEHOLDS

	Family Households				Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
All Households	54,494	38,853	1,195	4,427	3,513	6,507
Under 25 years	1,097	759	47	80	163	49
25 to 34	8,985	7,060	162	553	872	338
35 to 44	11,149	8,895	263	1,102	589	299
45 to 54	9,525	7,499	240	929	401	456
55 to 64	10,519	7,709	210	777	440	1,383
65 yrs. and over	13,219	6,929	273	986	1,048	3,982

RENTER HOUSEHOLDS

	Family Households				Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
All Households	29,423	11,055	821	5,043	6,001	6,504
Under 25 years	4,597	1,670	152	727	1,071	977
25 to 34	10,119	4,377	254	1,812	2,175	1,501
35 to 44	4,871	1,997	178	1,222	970	504
45 to 54	2,829	1,109	111	588	553	468
55 to 64	2,555	893	74	346	562	680
65 yrs. and over	4,451	1,009	51	348	670	2,374

Source: U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 388, Household and Family Characteristics: March 1983, U.S. Government Printing Office, Washington, D.C., 1984.

EXHIBIT 7

HOUSEHOLD PROJECTIONS BY AGE, TYPE AND TENURE
OF HOUSEHOLDS, U.S. TOTAL: 1995
(Numbers in thousands)

	OWNER HOUSEHOLDS					
		Family Households			Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
Under 25 years	913	642	34	68	135	34
25 to 34	9,029	7,094	161	564	887	322
35 to 44	15,891	12,704	377	1,551	839	419
45 to 54	13,364	10,510	345	1,318	565	627
55 to 64	9,910	7,270	189	733	419	1,299
65 yrs. and over	16,425	8,638	340	1,224	1,292	4,930
TOTAL	65,532	46,858	1,446	5,458	4,137	7,631

	RENTER HOUSEHOLDS					
		Family Households			Nonfamily Households	
			Other Family			
	Total	Married Couple	Male Householder	Female Householder	Male Householder	Female Householder
Under 25 years	3,786	1,352	135	609	879	811
25 to 34	10,158	4,434	242	1,814	2,177	1,491
35 to 44	6,960	2,851	252	1,761	1,384	713
45 to 54	3,984	1,569	157	816	784	659
55 to 64	2,409	838	63	335	524	649
65 yrs. and over	5,543	1,258	68	442	816	2,959
TOTAL	32,840	12,302	917	5,777	6,564	7,282

Source: COPR Household Projection Model.

shaped by casual ease of access to the computer; this, combined with personal means, may yield a much greater level of adaptation to the era of high technology than we have yet seen.

Labor Force Constraints

It is changes in the labor force that may well be the most important manifestation of the demographic matrix, both in terms of the economy of tomorrow and of technological adoption as well. The United States from 1970 through 1982 was unique among its principal overseas trading partners in terms of total civilian employment growth (Exhibit 8). While it expanded in the brief twelve years by more than 25 percent (almost 21 million jobs), it was actually declining in Germany and Great Britain. Even Japan's performance -- an 11.6 percent growth rate (6 million jobs) -- was dwarfed in comparison.

The level of capital investment in production facilities in the United States was severely impacted by this phenomenon. The costs of money in the 1970s increased very substantially; at the same time, labor was relatively freely available -- and, particularly at unskilled levels, relatively cheap. The temptation to maximize the use of the latter -- and minimize the former -- was pervasive.

The situation is very different, however, as we turn to the future. The Bureau of Labor Statistics projects a total labor force growth from 1982 to 1995 of only 21 million (Exhibit 9). Thus, we will move from a pattern of labor force expansion which in the 1970s averaged 2.4 million participants a year, to 1.8 million in the 1980s, and to 1.3 million in the first five years of the 1990s -- barely one-half that of the 1970s. The technological imperative -- assuming that we have passed through the era

EXHIBIT 8

TOTAL CIVILIAN EMPLOYMENT IN THE U.S., FOUR LARGEST EUROPEAN NATIONS, AND JAPAN: 1970 to 1982[1]
(Numbers in thousands)

	1970	1982	Change: 1970 to 1982 Number	Change: 1970 to 1982 Percent
United States	76,678	99,526	20,848	26.5
Four Largest European Countries, Total	89,290	88,920[2]	- 370	- 0.4
France	20,320	20,980[2]	660	3.2
Germany	26,100	25,090[2]	-1,010	- 3.9
Great Britain	23,780	22,460[2]	-1,320	- 5.6
Italy	19,090	20,390	1,300	6.8
Japan	50,940	56,857[3]	5,917	11.6

1. Includes self-employed, other non-payroll, and agricultural employment.
2. Preliminary.
3. Third Quarter.

Source: Janet L. Norwood, "Labor Market Contrasts: United States and Europe," Monthly Labor Review, Volume 106, Number 8, August 1983, pp. 3-7 (for U.S. and Europe); OECD, Labor Force Statistics: 1969 to 1980, Paris, 1982, and Quarterly Supplements (for Japan).

EXHIBIT 9

CIVILIAN LABOR FORCE, BY SEX, AGE, AND RACE, 1970-1982, AND MIDDLE GROWTH PROJECTION TO 1995

	Labor Force (in thousands)					Participation Rate				
	1970	1980	1982	1990	1995	1970	1980	1982	1990	1995
Total, age 16 and over	82,771	106,940	110,204	124,951	131,387	60.4	63.8	64.0	66.9	67.8
Men	51,228	61,453	62,450	67,701	69,970	79.7	77.4	76.6	76.5	76.1
16 to 24	9,725	13,606	13,074	11,274	10,573	69.4	74.4	72.6	74.7	74.5
16 to 19	4,008	4,999	4,470	4,123	4,043	56.1	60.5	56.7	62.3	62.9
20 to 24	5,717	8,607	8,604	7,151	6,530	83.3	85.9	84.9	84.4	84.1
25 to 54	32,213	38,712	40,357	48,180	51,358	95.8	94.2	94.0	93.8	93.4
25 to 34	11,327	16,971	17,793	19,569	18,105	96.4	95.2	94.7	93.7	93.1
35 to 44	10,469	11,836	12,781	17,469	19,446	96.9	95.5	95.3	95.6	95.3
45 to 54	10,417	9,905	9,784	11,142	13,807	94.3	91.2	91.2	91.3	91.1
55 and over	9,291	9,135	9,019	8,247	8,039	55.7	45.6	43.8	37.4	35.3
55 to 64	7,126	7,242	7,174	6,419	6,311	83.0	72.1	70.2	65.5	64.5
65 and over	2,165	1,893	1,845	1,828	1,728	26.8	19.0	17.8	14.9	13.3
Women	31,543	45,487	47,755	57,250	61,417	43.3	51.5	52.6	58.3	60.3
16 to 24	8,121	11,696	11,533	10,813	10,577	51.3	61.9	62.0	69.1	71.6
16 to 19	3,241	4,381	4,056	3,778	3,761	44.0	52.9	51.4	56.8	58.2
20 to 24	4,880	7,315	7,477	7,035	6,796	57.7	68.9	69.8	78.1	82.0
25 to 54	18,208	27,888	30,149	40,496	44,852	50.1	64.0	66.3	75.6	78.7
25 to 34	5,708	12,257	13,393	16,804	16,300	45.0	65.5	68.0	78.1	81.7
35 to 44	5,968	8,627	9,651	14,974	17,427	51.1	65.5	68.0	78.6	82.8
45 to 54	6,532	7,004	7,105	8,718	11,125	54.4	59.9	61.6	67.1	69.5
55 and over	5,213	5,904	6,073	5,941	6,008	25.3	22.8	22.7	20.5	19.9
55 to 64	4,157	4,742	4,888	4,612	4,671	43.0	41.3	41.8	41.5	42.5
65 and over	1,056	1,161	1,185	1,329	1,337	9.7	8.1	7.9	7.4	7.0

Source: Howard N. Fullerton, Jr., and John Tschetter, "The 1995 Labor Force: A Second Look," Monthly Labor Review, Volume 106, Number 11, November 1983, p. 5.

of economic "shocks" -- is evident. The 1970s, from a demographic point of view, were far from a salubrious era for technological implementation -- the 1980s are much more positive -- and the 1990s, drastically so.

America -- subject to changes in immigration -- is going to be short of labor. This will be manifested in a broad variety of areas. One has only to glance at the increment in individuals over the age of 65, from 20 million in 1970 to 34 million in 1995, to see one reflection of the increased demand for personal services -- and this in the face of a drastic shrinkage in the labor force. Technological innovation will be the key to closing the gap.

It will be services, judging from past trends both here and abroad, which will dominate employment growth. As shown in Exhibit 10, even the success stories of the 1970s -- Germany and Japan -- showed little increment in goods-producing employment; indeed, Germany actually had a small decline. It is the service sector throughout the advanced industrial economies which represent the future.

In this context, while the exhortations for productivity increases to survive within an increasing competitive world economy have been directed toward manufacturing, services have been the real productivity laggards. As labor shortfalls loom -- and as a byproduct, labor costs increase -- the imperatives of mechanization in the service sector are evident. Demographic and economic parameters strongly suggest a far greater degree of receptivity to new technology -- borne of necessity. But predicting its impact is far more problematic.

EXHIBIT 10

TOTAL CIVILIAN EMPLOYMENT IN THE U.S., SELECTED EUROPEAN NATIONS, AND JAPAN BY ECONOMIC SECTOR: 1970 TO 1982[a]
(Numbers in thousands)

	United States	France	Germany	Great Britain[b]	Italy	Japan
Agriculture[c]						
1970	3,567	2,821	2,262	783	3,839	8,860
1981	3,519	1,800	1,402	647	2,731	5,570
1982	3,571	(d)	1,371	(d)	2,525	(d)
Goods Producing[e]						
1970	26,080	7,917	12,465	10,531	7,586	18,190
1981	28,995	7,208	10,885	8,023[f]	7,722	19,700[g]
1982	27,070	(d)	10,480[f]	(d)	7,594	(d)
Service Producing						
1970	49,031	9,605	11,442	13,071	7,656	23,890
1981	67,883	11,968	13,261	14,373[f]	10,003	30,540
1982	68,888	(d)	13,251[f]	(d)	10,277	(d)

a. Small adjustments made to the overall employment data in Exhibit 8 could not be made to certain sectoral data. Includes self-employed, other non-payroll, and agricultural employment.
b. Includes Northern Ireland.
c. Not available.
d. Not available.
e. Manufacturing, mining, and construction.
f. Preliminary.
g. Includes utilities.

Source: Janet L. Norwood, "Labor Market Contrasts: United States and Europe," Monthly Labor Review, Volume 106, Number 8, August 1983, pp. 3-7 (for U.S. and Europe); OECD, Labor Force Statistics: 1969 to 1980, Paris, 1982, and Quarterly Supplements (for Japan).

PREDICTING TECHNOLOGICAL IMPACT

While we have suggested the level of uncertainty in forecasting demographics, much less is our capacity to envision the technological future -- and perhaps even more strikingly the levels and pace of adaptation to the alternatives that it makes possible. It is not yet a generation since the concept of the computer utility dominated the technical literature. This was a vision of super high speed central computers whose capacities were so unique as to require relatively few of them -- with users tied in via dedicated wire networks. Project Multex, the principal effort in this regard, cost the General Electric Company its taste for competing in the computer field -- and this despite enormous levels of financing and a massive input at MIT. At least as of this writing, the free-standing small scale computer linked as a peer to a broad network -- with no necessary central point -- is now being viewed as the pattern for the future.

The uproar on video games as a defiler of youth -- with commercial versions absorbing somewhere on the order of 25 billion quarters in 1982 and even greater market penetration predicted with new technological lures -- has moved to the land of the Hula-Hoop. The best selling toys of 1984 were not computers -- they were not even electronic -- but rather the Cabbage Patch doll and its incident number of accessories and knockoffs. Modernity fell out, dolls fell in.

But technological innovation, can have far-ranging ramifications, changing our folkways. Dedication to location was evidenced in the past by the vast network of baseball leagues. Does anybody still go to the Class A League Albany Senators? The memory of the Newark Bears and the Jersey City Giants has passed into legend. But they have been replaced by new TV

loyalties, seemingly independent of place. The Dallas Cowboys are now advanced as "America's Team" in football.

In a recent suburban garden apartment study conducted by CUPR, respondents tended to describe their location in terms of highways and shopping centers, not municipalities. Areal orientation remains, its axes and artifacts however are altered. The immediacy of the local movie theater and its accompany handful of stores in small town America has largely disappeared -- but the regional shopping centers have become "teenage villages." Adaptation has many forms; there are relatively few technological imperatives with such vigor as to support instant forecasts. Retailing provides an insightful example of the complexities at work.

The Retailing Evolution

The ambivalent nature of technology in altering areal patterns and organizational formats is exemplified by retailing. The pattern of communications of 100 years ago revolved around major city wholesalers who concentrated the products of small-scale manufacturers, and/or imports, and in turn maintained traveling sales forces which serviced the decentralized pattern of small merchants located at every crossroads location, USA. As so ably pointed out by Chandler in The Visible Hand, prior to the Civil War, with the exception of the industries that rose to service the railroads, manufacturing was conducted in very small individually owned facilities.* The railroads provided the transit facilities for the drummers, and for delivery of goods. The communications lines typically were the mail service -- again typically carried by the railroads -- as well as the telegraph, which commonly used the same rights of way.

Given the seasonal character of a largely agricultural society, credit provision was central; both from retailers to consumers -- and from wholesalers to retailers as well. Despite the early rise of advertising, its media and potency were relatively limited. Quality was essentially locally certified and this was increasingly the case as individual retailers grew in scale. As late as 1910 a minority of Americans lived in urban areas, with localism a dominant. The rise of cities was accompanied -- and perhaps aided as well -- by a synergistic relationship between the expansion of local newspapers and local retailing. The growth that ensued permitted the development of the classic department store, an optimization of the economics of central place that was to continue practically to our own

---

*Alfred D. Chandler, The Visible Hand: The Managerial Revolution in American Business (Cambridge: Harvard University Press, 1977).

time. The high-speed press fostered this expansion. The newspaper was king, and retailing its most prominent patron.

Certification of quality was a function of having bought at Bambergers' or Lazarus or Altman's or any of the other major downtown facilities. But this dominance of what was in effect local branding, paralleling the equivalent hegemony of local advertising media and communications, was challenged in the years immediately prior to World War II -- and has nearly disappeared in recent decades.

While the first rise of national magazines of significant circulation occurred around the turn of the century, the rise of true national brands was a function of the development of radio. There had been pioneers before in exotic consumer goods, such as brands of cigarettes; but soon they were joined in by a broad variety of other non-durable consumer goods. This was the era of Jello and Chase and Sanborn coffee.

For the upscale market the national magazines had increasing style/-brand potency, and with it centralization of manufacture. Just prior to World War I, for example, there were more than a thousand individual manufacturers of pianos in America. Steinway and Baldwin, in tune with Vanity Fair and the early version of The Saturday Evening Post soon signaled a very substantial curtailment, with an equivalent process taking place in automobiles. To make a genius of the obvious, this was just the beginning as we moved into the television era, which provided a much broader spectrum of information, of dynamic visuals, and national -- and increasingly international -- brands. The role of local retailers as certifiers of quality gave way before the rise of these national entities whose very scale permitted the development of technology. The relationship was an enormously

development of technology. The relationship was an enormously dynamic one. Color television without the potential availability of advertising dollars would at the very least have waited for another generation -- and perhaps forever.

What was the impact on retailing? In the very act of providing brand certification, the goods in question became commodities. The package of services, of aura and most of all credibility given by the local retailer was subsumed by the manufacturer, and certified by national media. The Good Housekeeping Seal was alive implicitly before it was formalized. Grocery stores might decry the very low markups available and lack of price protection on national merchandise, but they had to carry the goods -- they were literally pulled through the channels of distribution. The rise of the discount house and other forms of reasonably efficient distribution left the old mechanisms -- and their historic areal distributions -- in disarray. Where you bought something became much less important than what you paid for it. The definition of staples/commodities was enormously broadened by the new communications channels. And Main Street America became obsolete.

Paralleling this development, and to a certain degree contravening it, were the rise of the chain store operations. These called for a rigorous standardization of operation, an assumption of replicability of market and location, and the capacity to merchandise and administer from a central node. Again starting up roughly around the turn of the century, their dominance of the urban scene was epitomized by Sinclair Lewis's Main Street with the presence on every Main Street in America of Thom McAn, A & P, J. C. Penney and the like. And the scale of these operations -- without the abilities of our new high technology -- was considerable indeed. J.C.

Penney's, for example, prior to its current consolidation, had more than 1,600 units -- A & P at its peak more than 30,000.

The technologies involved were all in place three generations ago: rail and then truck shipping, telegraph and telephone for communications, and dependable mail service both for parcels and unit-control purposes (i.e., detailed information on a daily base of items sold, stock needs and the like, forwarded to a central location for information processing and response). While chain store dominance of small town America has been decried, it permitted a substantial broadening of market centers, which flourished as a function of -- and undoubtedly facilitated -- the thickening of urban America which so vigorously characterized the 1920s.

None of these institutional developments can simply be characterized as either centralizing or decentralizing in their nature. There is strikingly little in current technology which so far has altered that generalization. Machine-readable unit-control tickets were envisioned in the 1920s -- and came into being in the beginning of the 1950s. So far they have merely replicated the information available utilizing flocks of clericals. At least in the United States, video-text shopping has been notable by its failures. A more vigorous effort in this regard under government auspices is being promulgated in Western Europe, particularly in France. Again, however, the vision of shopping at home, while continuously reinforced by the vigor of mail order, has not significantly altered the broad spectrum of retail merchandising. The modern suburban shopping center, in its replacement of Main Street, is much more a tribute to the national highway program (and, if anything, a belated tribute) than it is to communications or information technology per se.

The influence of technologies and informational processing past is evident in the retailing configurations present. These in turn certainly have impacted on the areal distribution of economic activity and population concentrations as well. As of the moment, while there is much in the way of new information/communications technology which could produce significant shifts in the near-term future, there is little in the way of market success. Even the computer has facilitated but not basically altered extant functions.

Mail order, which a generation ago was viewed as a leftover remnant of an understored, rural America, has expanded. In substantial part this is a tribute to the speed, cost efficiency, and excellence of reproduction made possible by modern color printing mechanisms particularly when linked with the consumer targeting and partitioning made possible by the computer.

Video text, which would be the next logical development in nonstore retailing, is certainly technologically feasible. As of the moment it requires the equivalent of a Sarnoff, with the level of commitment and fiscal competence that was required to deliver color T.V. The threshold conditions are so substantial as to have defeated the several entrepreneurial groups that have assaulted it in this country. Even at its most grandiose, it is difficult to believe that it would serve as a passive surrogate for present-day shopping -- so much of it is, particularly in the suburban shopping center, a tribute to a recreational/social outing as much as it is for exclusively retail purposes.* The two-worker household may

---

*For a more positive view, see William A. Gordon, "Electronic Retailing: Trends and Implications," Urban Land, October 1984.

lean more heavily on nonstore marketing -- but the heft of sales is traditional.

The pre-punched computer control tag has replaced some of the clericals, hard-wired sales registers linked to computers have abated some of the problems of sales audits, and new self-service fixturing combined with brand identification has limited the expansion of sales help; and these and similar elements clearly will be implemented in the future. Similarly, warehouses have given way to the distribution center with concomitant declines in the carrying costs of inventory. This is linked with a far greater capacity to limit costs and target merchandise on short order with real-time information processing. And it has altered labor force requirements and the loci of employment.

Credit

The subject of the provision and sources of credit over time deserves much more attention (and competence of treatment!) than we are able to give it. The old pattern of credit provision by wholesalers to retailers and, in turn, by them to individual customers of a century ago gave way in time to a bifurcation: small retailers continued this pattern -- the larger ones went into the credit business on their own. By working directly with manufacturers and depending only upon normal trade terms -- indeed sometimes paying cash -- they were able to bring down price. In turn they extended credit to their consumers based on their own fiscal competence, and became increasingly dependent on the profitability of consumer credit per se. The range of price, merchandise offerings, and credit certified the unique position of the central city retail giants. They, in turn, assured the pulling power and dominance of the cities they occupied.

Each institution individually provided credit to the same customers; the amount of credit checking and general paper work was enormously redundant. The rise of central credit facilities (i.e. American Express, Visa and their equivalents) represents a very substantial compaction of this process. Enormously more credit transactions can be undertaken with a reduction of staff per transaction as a function of centralization and the automation of procedures which it permits. While precise data on this point are lacking, it is clear that the competence of the new information technologies has permitted an enormous expansion of credit. While person power per transaction has been reduced, the sheer growth of the operation has provided even more in the way of jobs than would otherwise be the case.

Not the least important reflection of the centralization of credit (even some of the major department stores are foregoing the exclusive use of their own credit cards) has been a life line extended to relatively small-scale operations. Local vendors now can be represented in shopping centers and other high transient areas -- where they do not know their customers -- but still extend credit based on central information processing. Personal knowledge gives way to formalized centralized information processing. The former is coterminous with sales place, the latter relatively independent. The rejuvenation of decentralized retailing is in part a reflection, therefore, of the centralization of consumer credit. The back room of the local retailer, once devoted to unit control, to credit files, and perhaps as well even to payroll and sales audit, now can be transported through hardwire to an infinite range of locations. And with them the jobs which are involved.

The Retail Dynamic and the Limitations of Technology

Perhaps the most consequential innovation of the last 50 years in retail distribution has not been a function of technology -- but rather conscious or unconscious systems analysis. This has revolved around the substitution of the customer as order picker for paid labor. Beginning in the depths of the Depression, this was pioneered by the early supermarkets. Clerks behind counters who served as order pickers gave way to bulk stocking (initially in packing cases with, at most, primitive fixturing). The customer served as order picker. The results in terms of efficiency of distribution, largely as a function of the reduction of labor costs, were truly revolutionary.

Efforts at high-tech approaches to the same functional juncture, i.e., how do you go from wholesale lots -- cases -- to individual orders -- have failed because of the low costs made possible by this process. Thus, as early as the 1920s, there were efforts to mechanize order picking with primitive electromechanical devices. And similarly in the 1940s and 1950s Grand Union failed with the same approach. Home delivery of foods, attempted in Sweden through centralized warehousing and customer-telephoned orders -- accompanied by some measure of electronic gadgetry -- foundered on the same rock. Within this context, the development of the shopping cart was much more consequential than the new code marking -- and the laser registers which have come in its wake. At this writing, the latter innovations have made possible the use of lower-class labor (or is it the same class of labor with poorer educations and less arithmetic capacity?) but are dwarfed in consequences by the much more basic systems change. So

efficient has been customer order picking as to be adopted now in a variety of nonfood areas, as witness the fixturing of the modern-day liquor store, hardware store, home improvement center -- and increasingly soft goods merchandise emporiums as well.

Information technology has been more significant in providing, as we have earlier indicated, access to broader-based areally dispersed selective networks of specialized consumers. This has been fostered by specialized publications -- the Radio Controlled Modeler, The American Orchid Review, and literally thousands of other media. It is complemented on a broader base by the increasingly sophisticated utilization of census data for specialized mailing, i.e., the Sharper Image catalog and the ready-to-wear offerings of rugged clothing for the "L.L. Bean-ized" urbanite. The total scale of these latter efforts has been enormously facilitated by the rise of credit mechanisms independent of specific retailers.

STASIS AND INERTIA

The basic locomotion devices employed in the journey to work have been relatively little changed in a half century. As far back as 1929, the United States turned out as many cars per capita as it did last year; and while the trolley has given way wholly to the bus, the commuter railroads have altered little or at all. (If we might interject a parochial note, in our own state of New Jersey we are presently replacing railroad commuter cars from the class of 1928.)

The revolution of suburbanization, we would suggest, has been as much a function of affluence as of technological revolution. Within the latter domain, it is much more a tribute to the national highway program than to communication devices, at least in its first generation (roughly through

1970). It was the Depression of the 1930s, plus five years of wartime constraint, that inhibited the complementary dispersion of population and economic function which was the appropriate complement of the information and transportation innovations of the 1920s, principal among them the telephone. The omnipresence of this incredibly inexpensive device as a facilitator of both centralization and decentralization has often been cited -- its prominence is worthy of reiteration.

But even given the constraints of the 1930s and World War II, there was a very long gap between technological competence and societal reaction. The first major enclosed suburban mall dates from the early 1950s, but the large-scale suburban shopping center really did not come into full blossom until the succeeding decade. It was not until the 1970s that the major part of office construction moved out of the central city.

There is a powerful flywheel of custom which leads to inertia. This is particularly the case when it is linked with the enormous sunk costs and slow replacement cycles that characterize American society. We have both the conservative virtues and demerits of long-term affluence and development. A good housing year is one in which starts are roughly equal to 2 percent of the extant stock, portions of which go merely to replace facilities that are scrapped. In New York City, for example, over the last ten years new housing starts have averaged on the order of 10,000 units a year. Given a base of nearly 2.8 million, this would suggest a building replacement cycle on the order of 300 years. While equivalent data on industrial facilities suffers from changes in their nature over time, the average age of the gross stock of fixed non-residential business capital hovers around

the 10-year mark.* Thus there can be a much more abrupt response to changes in information technology on the part of production facilities than holds true in terms of settlement patterns. The latter are complicated by the enormously potent role that housing plays in the United States as a source of personal savings. More than 60 percent of the equity of Americans is frozen in personal housing ownership.** The conflict between these two elements -- the first with a 50-year "replication cycle," the latter with one only a fifth as lengthy -- is particularly striking as we move toward the end of the 20th century. It has served as a stabilizer of older settlement patterns. Much of what we see as suburbanization or regional shift is a belated response of the latter to new economic spatial imperatives.

---

*U.S. Bureau of the Census, Statistical Abstract of the United States: 1984 (104th edition) Washington, D.C., 1983, p. 542.

**"Survey of Consumer Finances, 1983," Federal Reserve Bulletin September 1984, pp. 679-692.

Journey to Work and the Electronic Cottage

The Journey to Work data available from the 1980 Census illustrates in considerable detail the growing congruence between work and residence place. Journey to work times have not expanded; indeed, there is some indication of their contracting. The central city as the major focal point clearly has given way to peripheral, point to point, commutation, and with this, a growing dominance of private means of transport as against public conveyors.

The incongruity between the vast amounts of funding that the latter are absorbing, versus their declining utilization, raises some very real issues as to their continuance. The degenerative spiral of declining usage leading to increased fares and/or declining maintenance/service leading to further patronage declines, seems to characterize our older facilities. These tend to set up frictions in commuting to places which are dependent upon public transit -- particularly rail transit.

The prototype is New York City. As the commuter linkages begin to generate much more in the way of friction (cost, times and comfort), there is a split in response. On the one hand we have those who can afford to live proximate to the work place -- typically Manhattan -- doing so. The long term decline of Manhattan's population -- a process that has nearly 70 years of antecedent -- now seemingly has, at the very least, plateaued. But a growing proportion of its job base is maintained by commuters -- and there is some indication that their faithfulness to this process has been and will be reduced in time. Thus the rise in peripheral locations (Northern New Jersey being a premier example) of competing office facilities, yields a shift to closer proximity of workplace and residence place. Just as the cutting and styling and selling operations of New York's

garment center lofts could remain there while the sewing shops moved to cheaper locations with linkages of interstate trucking, so we see back room office facilities moving peripheral to the city -- and sometimes at far greater distance. This latter process in information handling has its equivalent technological enabling mechanisms: the era of the computer -- and high speed communications linkages. And clearly the end of this dynamic is not at hand.

In 1983, with roughly similar sized populations, New Jersey secured four times as many new housing units -- and Northern New Jersey by itself alone twice as much office space -- as New York City. While final data for 1984 are lacking at this writing - current estimates suggest an equivalent disproportionate development. And jobs are increasingly footloose. They can follow as well as lead people.

The close linkage of workplace and residence place is exemplified by journey to work patterns. In 1980, there were approximately 75 million workers 16 years of age and over resident in metropolitan America. Of the 29 million of them who lived in central cities, fully 25 million worked inside the SMSA of their residence, but barely three million of them in the central business district of their central city. The combined total of those working inside another SMSA -- or working outside SMSA's -- barely exceeded the million mark.

This is confirmed when the data on workers living outside the central city is viewed. Fully 38 million of the grand total of 45 million for whom data is available worked inside the SMSA of residence -- but only a third within the central city.* The basic technology of communications and

---

*U.S. Bureau of the Census, Census of Population: 1980. Journey to Work: Metropolitan Commuting Flows, Washington, D.C., 1984.

information processing now being implemented have been available for at least 20 years. The lag again caused by the the fly wheel of custom leaves a gap between technological competence and market fulfillment. But this is rapidly receding into the past.

The absolute measure of this spatial dispersion is most difficult to quantify. The extremes may well be the export of the task of updating mailing lists to the English speaking parts of the Caribbean, or the much noted shift of Citibank's credit facilities to the Dakotas, or of Philadelphia's Sun Oil's credit operation to the South and the like.

But there are countervening forces at work as well. Estimates by Regina Armstrong at the Regional Plan Association for example, suggest that roughly one-half million jobs in the New York region are dependent upon foreign investment. And more than 100,000 of these jobs stem from foreign firm operations in Manhattan.* A tribute to this hegemony is the new wave of national centralization of banking, brokerage, and insurance facilities within that city. The World Trade Center may have been a premature title -- it is now representative of a potent reality.

While covered more fully elsewhere it is evident that information technology has subverted localism in terms of banking. Despite the scar tissue of legislation left over from the Depression, the de-facto nationalization of banking is at hand. It is evidenced by the Bank of America consolidating 2,000 employees in New York City; its international equivalent is revealed by the enormous flow of foreign establishments into the city.

Question must be raised in this context, however, as to what happens to the old regional centers with the rise of a national and world economy.

---

*Regina Armstrong, "The Future of New York in the World Economy," Regional Plan Association, Unpublished Paper.

Philadelphia, at least in banking, is becoming a branch city. Even Chicago is threatened by the same fate.

Some measure of the rise of the new dominance of New York in this context is shown in Exhibit 11 which indicates the flow of international phone calls from various major cities in the United States. New York City alone accounted for more than 20 percent of them. "More than twice as many overseas message units were generated by New York City as by Los Angeles. When New York City, Northern New Jersey, Long Island, and the four New York State counties north of New York City are added together, the New York Metropolitan region accounts for almost 30 percent of the total."* While some of this flow undoubtedly represents non-business calls -- proportionate to New York's enormous ethnic population, there is no question of its uniqueness.

The ambiguous role of new information technology as a centralizing and or decentralizing example is exemplified in the growing challenges to the monolithic role of utility companies. The latter had central places as their focal point. The new technology is much more spatially ambiguous. For example, NYNEX derives a disproportionate share of revenues from its largest business customers, with three percent of them providing a third of its business revenues; one percent of New York Telephone's business customers generate 25 percent of its revenues. Fully 85 out of 100 top revenue producing customers of New York Telephone Company are located in Manhattan; the borough in and of itself contains 46 percent of New York Telephone's business access lines, and contributes 35 percent of its total revenues.**

---

*Mitchell L. Moss, "New York Isn't Just New York Anymore," Journal of the International Institute of Communications, July/September 1984, vol. 12, no. 4/5, pp. 10-14.

**Goldman-Sachs, Nynex Corporation Report, December 19, 1984.

EXHIBIT 11

OVERSEAS MESSAGE UNITS

AREA CODE	
New York City 212	22,718,027
Los Angeles 213	9,310,028
San Francisco 115	4,535,474
Chicago 312	4,028,709
Northern New Jersey 201	4,639,122
Connecticut 203	2,129,146
Westchester, Putnam, Orange and Rockland Counties (NY) 914	1,897,576
Nassau-Suffolk, Long Island (NY) 516	1,705,740
Total (USA)	115,001,763

Source: AT&T Communications. Secured from: Mitchell L. Moss, "New York Isn't Just New York Anymore," Journal of the International Institute of Communications, July/September 1984. vol. 12, no. 4/5.

alternative inexpensive approaches geared to large-scale users. An example is the New York Teleport being built by Merrill Lynch, Western Union, and the Port Authority of New York and New Jersey. This is a communications complex nearing completion on Staten Island designed to connect customers in the New York metropolitan area with all outside calling points. The customers in turn are linked directly to the Teleport by fiber cable rather than through New York Telephone facilities. Heavy line users were once substantially tied to central city, but how close to the central "exchange" does one have to be in order to take advantage of these efficiences of scale?

Present technology involving laying of cables, interestingly enough, is following the rights of way of the railroads. Does this suggest office development will be areally defined by the railway line disposition put in place nearly a century ago? Or is there a greater measure of freedom even within today's parameters, much less those of tomorrow? Cable television for example provides a second bypass threat to the New York Telephone Company. Commercial data transmission services will soon be available connecting directly to New York and the American Stock Exchange with link to the Teleport thus enabling subscribers to completely bypass the local loop.

On the one hand, we can envision this type of development as permitting large-scale firms to stay in what is a high cost location -- and making permanent its job base and related settlement pattern as well. But even if technology is so limited as to require this close proximity -- the potential feedback on the cost structures of those firms which are not able to take advantage of the new elements must be viewed with some trepidation. Telephone service (and indeed many other elements of New York) is a very high fixed cost operation. A reduction in the user base could require

catastrophic increases in the pro rated charges to the balance of the utility's customers. This in turn could speed decentralization.

These possibilities are far from unique to New York. We would suggest, however, that they are most potent in our older metropoli with fixed capital costs which are particularly sensitive to reduction in usage. This has already been evidenced in the case of the subways and public transit in general -- and these may only herald things to come.

As pointed out by Mitchell L. Moss however, there are requirements imposed by a world economy which may have a very serious feedback, given the limitations of New York City as a whole -- and Manhattan particularly.* The 24 hour business day is premier among them. The very costs of infrastructure, and the requirements for providing services and information on a world-wide base, impose equivalent staffing requirements. And New York City is not an easy place within which to provide required security. The trans-Hudson City of Manhattan -- Northern New Jersey -- may play a much more imposing role in the future in this regard. This may impose limitations on the growth of Manhattan and the other boroughs as well.

The perfection of communications opens up a variety of alternative locations. The very cost structures of the city and its limited capacity to provide housing for middle management constricts crucial labor force flows. The elite can buy space proximate to work while youthful aspirants are willing to accept very poor housing conditions in order to be close to the dynamo. But other less affluent and/or less flexible homeseekers are driven away.

Amidst an enormous flow of plenty seen by visitors to New York is the harsh reality of median 1983 renter household incomes under $13,000 -- and

---

*Mitchell L. Moss, "New York Isn't Just New York Anymore," Journal of the International Institute of Communications, July/September 1984, vol. 12, no. 4/5, pp. 10-14.

of median homeowner (including co-ops and condominiums) incomes of $25,000. A thin veneer of the rich glamorizes the eye and distracts it from a rather broad spectrum of the poor. However, the sheer animal vitality of the city and its increasing focus (as pointed out very presciently a dozen years ago by Eli Ginzburg) on production services, provides a rare base of opportunity.* Even here, however, there is some indication however that an increasing proportion of this growth is going to commuters. In 1979 roughly 6 percent of Manhattan's jobs were held by New Jerseyans. Estimates by the Port Authority indicate that approximately 23 percent of the growth in jobs in that borough over the last 5 years have flowed to New Jerseyans. Ultimately the jobs will follow the people.

New forms of coaxiale cable, optical fiber, and micro-wave transmission facilities -- and as yet unknown and unseen mechanisms -- will be put in place. What they suggest is an increase in bifurcation: of centralization of functions on the one hand -- and a capacity to spread them out on the other. In this context we would suggest that technology is an enabling element rather than a determinative one. The impact of technology must be viewed through a matrix of societal elements which shape its ultimate areal resolution -- and settlement patterns as well.

Nowhere is this requirement more evident than in predictions of a society of "electronic cottages." The pinnacle of industrial urbanization was the central city that emerged in the 19th century, built on massed population, productive power and industrial technology. In contrast, is the view that the end point of the communications revolution is the electronic cottage. The information era will bring decentralization, just as the

---

*Eli Ginzberg, New York is Very Much Alive: A Manpower View (New York: McGraw-Hill, 1973).

as the industrial era wrought centralization. Households will be free of spatial ties as they work at their dispersed residences -- information will commute, not people. A vision of post-industrial cottage industries is raised; knitting is replaced by information work.

The reality to come will not nearly be so extreme. Just as the regional shopping center flourishes despite the potentials of electronic retailing, so too will the office remain a viable workplace. People will still want to be with people. As Naisbett has suggested, the more technology we pump into society, the more people will seek the "high touch" of the office and shopping mall. "The gee-whiz futurists are always wrong because they believe technological innovation travels in a straight line. It doesn't. It weaves and bobs and lurches and sputters."*

---

*John Naisbett, Megatrends (New York: Warner Books, 1982), p. 41.