The Economic Impact of Base Closure: Letterkenny Army Depot and Franklin County

Jack Benhart, Ph.D.
Brendan Finucane, Ph.D.
Kurt Fuellhart, Ph.D.

TABLE OF CONTENTS

LIST OF TABLES & FIGURES

EXECUTIVE SUMMARY

Once again Letterkenny Army Depot is confronting the prospect of a base closure decision being issued in regard to Base Realignment and Closure (BRAC). This study documents the likely economic impact upon Franklin County if closure occurs. Though military value will be the primary selection criterion in the BRAC process, it is only reasonable that local employees and private firms, as well as their elected representatives, have legitimate concerns about the economic ramifications of closure. This study will serve to frame the local and regional discussions about the significance of the economic linkages between the base and the county's economy.

The Center for Land Use at Shippensburg University has provided the technical expertise for this study, utilizing a computerized regional model, REMI, to simulate the economic impacts of closure upon Franklin County. While closure would have broader, regional consequences as well, this study has defined the impact area as being only Franklin County.

Closure impacts were measured and compared to a non-closure baseline forecast for variables related to employment, gross regional product and personal incomes for the period 2005 to 2020. The table below summarizes the major findings.

Summary of Economic Impacts, 2005

	Baseline	Closure	Difference
Total Employment	66,303	64,042	-2,261
Gross Regional Product ($M)	4,491	4,350	-$141 M
Personal Income ($M)	3,459	3,377	- $82 M

Source: REMI

The Table shows that in 2005, assuming closure:

- County employment levels would decline by 2,261 jobs (or –3.4%) due to both direct and indirect adverse impacts
- Gross Regional Product (GRP) would fall by $141 million (or –3.1%) due to the loss of base related expenditures and the local expenditure and consumption induced by base activity.
- Personal income in the county would be reduced by $82 Million (or –2.4%) due to both direct and induced impacts

Additional expected impacts due to closure include:

- Demographic changes via out-migration of people in their most productive years, intensifying the trends toward a disproportionately "gray" population.

- A continued shift of the industry and employment mix toward a greater percentage of relatively low wage jobs and the further loss of training opportunities which generate human capital and enhance employee productivity.
- Both real per capita income and wages per job trends are likely to become more adverse for the county. Real per capita income has fallen from 94% to 84% of the national average, while wages per job have decreased from 90% to 76% of the national average, both over the 1969 to 2001 period.
- Franklin County has become a greater net exporter of employees with 17,476 county residents having jobs outside the county in 2000, compared to 13,791 in 1990.
- The county's employment structure has become more service and retail oriented, with a large decline in federal civilian and manufacturing employment. Federal civilian employment has dropped from 12% to 2.8% of county employment in the last 30 years, while manufacturing jobs have fallen from nearly 29% to 19%.
- The value of residential and non-residential capital stock (in real 1996 dollars) will fall by approximately $117 million and $30 million, respectively, within 15 years. This is nearly $150 million below the projected levels with no closure.

Such findings are elaborated upon in the full report, together with a regional overview to provide context and an enhanced appreciation for Letterkenny Army Depot's economic role within Franklin County.

INTRODUCTION

As partial fulfillment of the data analysis related to potential base closures under taken via the 2005 Base Realignment and Closure (BRAC05), this study was requested by Franklin County Area Development Corporation (FCADC) to address the scope and magnitude of economic impacts likely to occur if the Depot were to be closed. This study is a collaborative effort initiated by community and Depot leaders who have worked jointly and successfully in response to earlier rounds of BRAC. Shippensburg University's Land Use Center, a regional outreach and consulting entity, has provided technical expertise and prepared the documentation.

BRAC05 will attempt to modernize and reconfigure the military bases to both save money and better support the current force structure. Prior BRACs have achieved significant savings, and the Department of defense (DOD) estimates that it can eliminate 23% of its facilities on 259 major bases. Letterkenny has been impacted by earlier BRAC rounds and base employment was reduced by 2,512 lost jobs.[1] While realignment efforts have had some success, attracting nearly 700 jobs to the private firms located within the Community Valley Business Park, diminished manufacturing activity and the prospects of losing more Depot jobs might have a combined severe impact on Franklin County.

This study has several parts, each of which serve to clarify the economic role of the LEAD within Franklin County and to estimate the economic impacts of base closure. Section A gives information on Franklin County's demographic and economic characteristics and an overview of the past realignment activities at LEAD. This section contextualizes the discussion about possible closure of the Depot and shows how the county is particularly vulnerable to the loss of the base. Closure will intensify or aggravate some negative trends in wages, commuting, and the structure of both employment and the labor force.

Section B gives a brief, non-technical description of the model and the data used for this study and then presents the estimated impacts of a closure, including effects on employment, income, output and capital stock changes among other issues. The economic impacts are compared to the baseline scenario of non-base closure, and are calculated for the years 2005 to 2020.

This study was a joint community-university effort and involved the participation and support of many individuals. The impetus for this study was a request from Mike Ross of the Franklin County Area Development Corporation (FCADC) and Dave Sciamanna of the Chambersburg Area Chamber of Commerce (CACC) to Jack Benhart, Director of the Center for Land Use. Jerry Warnement was our very responsive contact person at LEAD. Jefferson Clarke of REMI patiently answered many questions about the model. Maria Misner was very helpful in preparing the maps and Vickie Shaak, was, as always, ready to prepare the documentation. We thank everyone for their assistance, but tradition requires that we accept responsibility for any shortcomings.

[1] See GAO report on Military Base Closures, April 2002, GAO-02-433, p. 48.

A. OVERVIEW OF FRANKLIN COUNTY AND LETTERKENNY ARMY DEPOT

In this section we present a general overview of Letterkenny Army Depot and selected demographic and economic conditions in Franklin County, Pennsylvania over the past several decades[2]. Impacts on and changes in the local region as a result of a potential closure of Letterkenny Army Depot must be read in light of broader trends both over time, within the region, and in comparison with other areas.

Located 5 miles north of Chambersburg in Greene and Letterkenny townships in Franklin County, Pennsylvania, Letterkenny Army Depot has a strategic location (Figures A-1 and A-2). The Depot is within a few miles of Interstate 81, U.S. Route 11 and 14 miles from the Pennsylvania Turnpike. Letterkenny is 90 miles north and west of Washington, D.C. and 50 miles south of Harrisburg. Most eastern cities can be reached by interstates within a day's travel.

Although Franklin County and the Depot are quite close to many major eastern cities, Franklin County is a non-metro county. As such, it is important to recognize that Letterkenny Army Depot – along with its employees and various other relationships with the region – has been an important part of the socio-economic landscape of Franklin County for many years. To understand both the contributions of the Depot to the local region today, as well as the impacts of potential changes in Depot operations in the future, specific economic "shocks" to the area must be examined in conjunction with these broader patterns.

Below, we provide some historical context on the Depot, particularly in relation to BRAC 1995. In addition, we examine key economic and demographic conditions and trends in Franklin County over a variety of time periods extending as far back as 1969. The purpose of this contextual analysis is to highlight many of the key trends within the county so as to more completely examine the potential impacts of BRAC related changes in Depot operations. Specifically we review: population and population change, employment and unemployment, industrial composition and changes therein, wages, personal income, and earnings.[3]

Letterkenny Army Depot and Responses to Realignment

In 1942, Letterkenny Army Depot (LEAD) acquired approximately 19,500 acres of land from farms and residences to establish an ammunition storage facility in Franklin County. Today 16,000 acres are still devoted to ammunition storage. Over the years most of the employment has been devoted to the repair and maintenance of military vehicles, self-propelled artillery and missile systems. Base facilities include warehousing, vehicle storage, industrial maintenance, offices, military housing and recreation. Today LEAD is one of the top air defense and tactile missile providers for the United States Army. LEAD maintains crucial military systems including the Patriot, Avenger, Sparrow, Sidewinder and Phoenix.

---

[2] It is important to recognize that Franklin County is considered the economic region of interest in this report, even though the impacts of LEAD extend beyond county boundaries. The primary reason for the selection of Franklin County is to be consistent with other reports that have included LEAD such as the GAO's "Military Base Closures: Progress in Completing Actions from Prior Realignment and Closures" (GAO 2002).

[3] Portions of the report follow the format outlined by Glasmeier et al (2001).

Figure A-1: Letterkenny Army Depot in Relation to the Northeastern United States

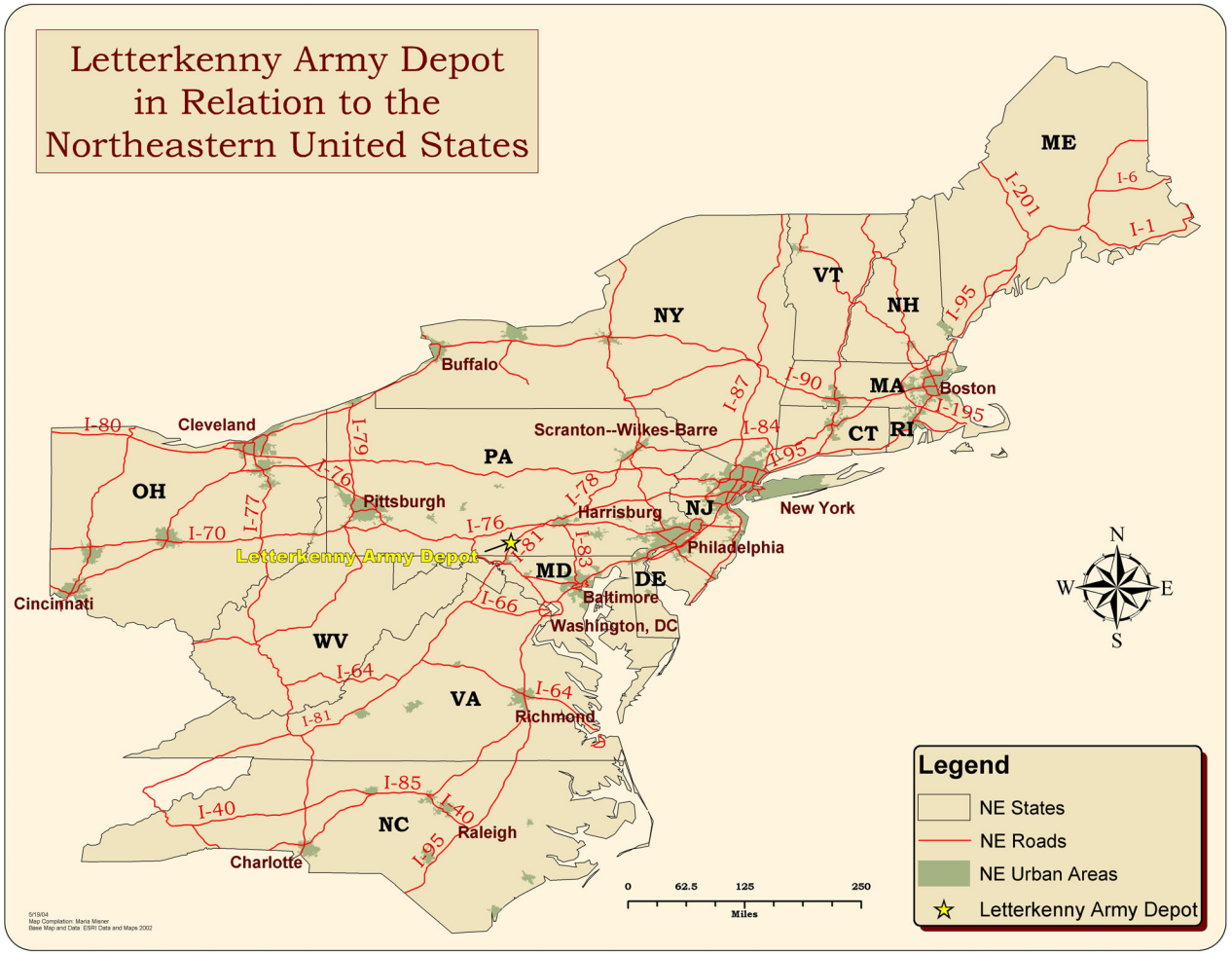
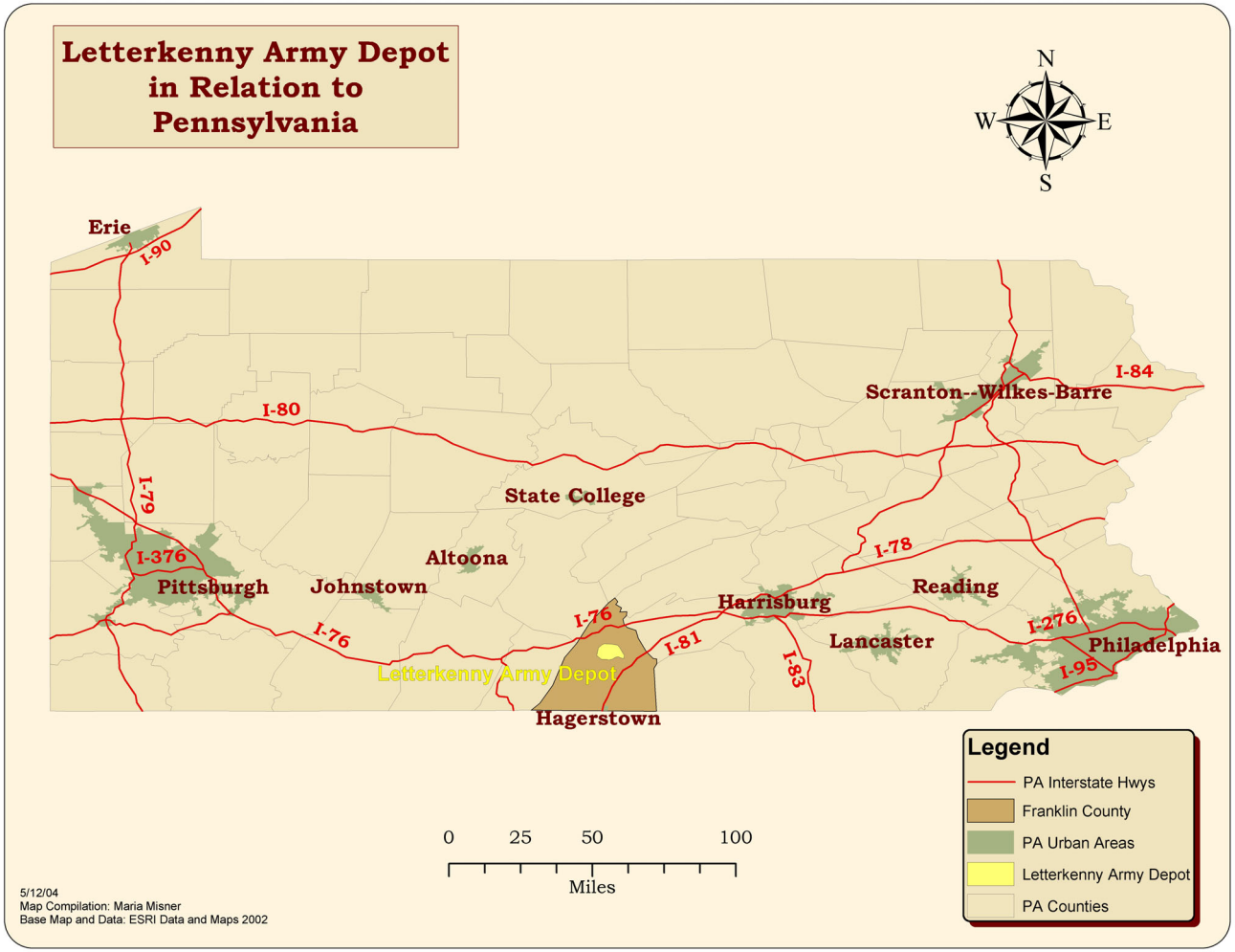


Figure A-2: Letterkenny Army Depot in Relation to Pennsylvania



The commission for the Base Realignment and Closure Act (BRAC) selected over 100 facilities for closure or realignment since 1988. In 1995, the Base Realignment and Closure Act impacted LEAD, with the BRAC Commission recommending realignment of the Depot instead of closure. Realignment for LEAD meant disposing of property excess to the Base's main missions, which were ammunition storage and tactical missile disassembly and storage. The realignment meant dispersion of other LEAD missions and the disposal of excess facilities and 1,450 acres of property for redevelopment. Prior to realignment, the Army conducted extensive environmental studies documented in the *Letterkenny Army Depot Environmental Baseline Survey (EBS)* and an *Environmental Assessment* was prepared to examine the impacts of disposal and reuse of the surplus area. The *EBS* recommended the southeastern area of the base for disposal and reuse.

During 1995, committees were formed to study environmental issues, economic development and real estate implications of receiving the 1,450 acres of Army property from LEAD. Franklin County appointed a community body the Franklin County Reuse Committee (FCRC) to review information from the committees to determine if they should receive the property.

Franklin County decided to accept the property through the creation of two authorities:

A. Letterkenny Industrial Development Authority (LIDA), a 15-member volunteer board of directors (Pennsylvania Economic Development and Financing Law) with responsibilities for real estate and electrical distribution system.

B. Franklin County General Authority (FCGA), a five-member volunteer board of directors (Act 45 authority) with responsibilities for water, sewer and rail operations.

The Reuse Strategy has emphasized four major goals:

1. To generate high-quality stable middle-income jobs.
2. To support continuation of the Army mission, that are being retained by the Army, as an economic anchor for the county.
3. To attract private development.
4. To promote high quality of life in Franklin County, including providing areas for community services and recreation.

LIDA established the Cumberland Valley Business Park Association (CVBPA) to provide internal control of the park and handle common area maintenance. Since 1997, 35 firms and more than 700 employees have been added to the Cumberland Valley Business Park. The economic vitality of the Reuse strategy is strongly related to the continuation of the functions of LEAD. Firms that have located in the Cumberland Valley Business Park are linked to the Depot activities. Land use patterns surrounding the Depot are compatible with activities of the Depot and future expansion opportunities. Closure of Letterkenny Army Depot would seriously impact the Reuse efforts and environmental quality of the region.

Thus while local and regional officials have worked closely together to mitigate the impacts of the 1995 BRAC, many of these redevelopment efforts still hinge on the presence of Depot operations in the area. Moreover, the broader economic and demographic trends of the county show troubling signs – particularly since the second half of the 1990s.

Population Trends

Population and Population Growth

In absolute terms, Franklin County has exhibited steady and positive population growth over the past 30 years (Figure A-3). In 2001, the population of Franklin County was 130,406, up from 99,529 in 1969. In relative terms, Franklin County has averaged 0.84% population growth annually over the period compared with 1.10% for the United States and 0.15% for Pennsylvania respectively. This has resulted in cumulative population growth of 31% for Franklin County versus 42% for the United States and just 5% for Pennsylvania (Figure A-4). An important pattern emerges however. While population growth in Franklin County has consistently outpaced that of Pennsylvania over the period, a different relationship emerges when comparing Franklin County to the nation. In particular, cumulative population growth of the county largely mirrors that of the nation from 1970 to the early/mid 1980s, however, recently growth has slowed *vis a vis* the United States. From 1969 to 1984, the average population growth rates of Franklin County were nearly identical to that of the U.S.A. at approximately 1.1%. However since that time, growth rates have diverged dramatically. During the 1985-2001 period, average growth rates in the county were just 0.67% compared with 1.13% for the nation. Thus Franklin County has clearly fared better than Pennsylvania in terms of population growth. However, the larger trend points to a county that is quickly diverging from national population growth rates toward the slower growth of Pennsylvania as a whole.

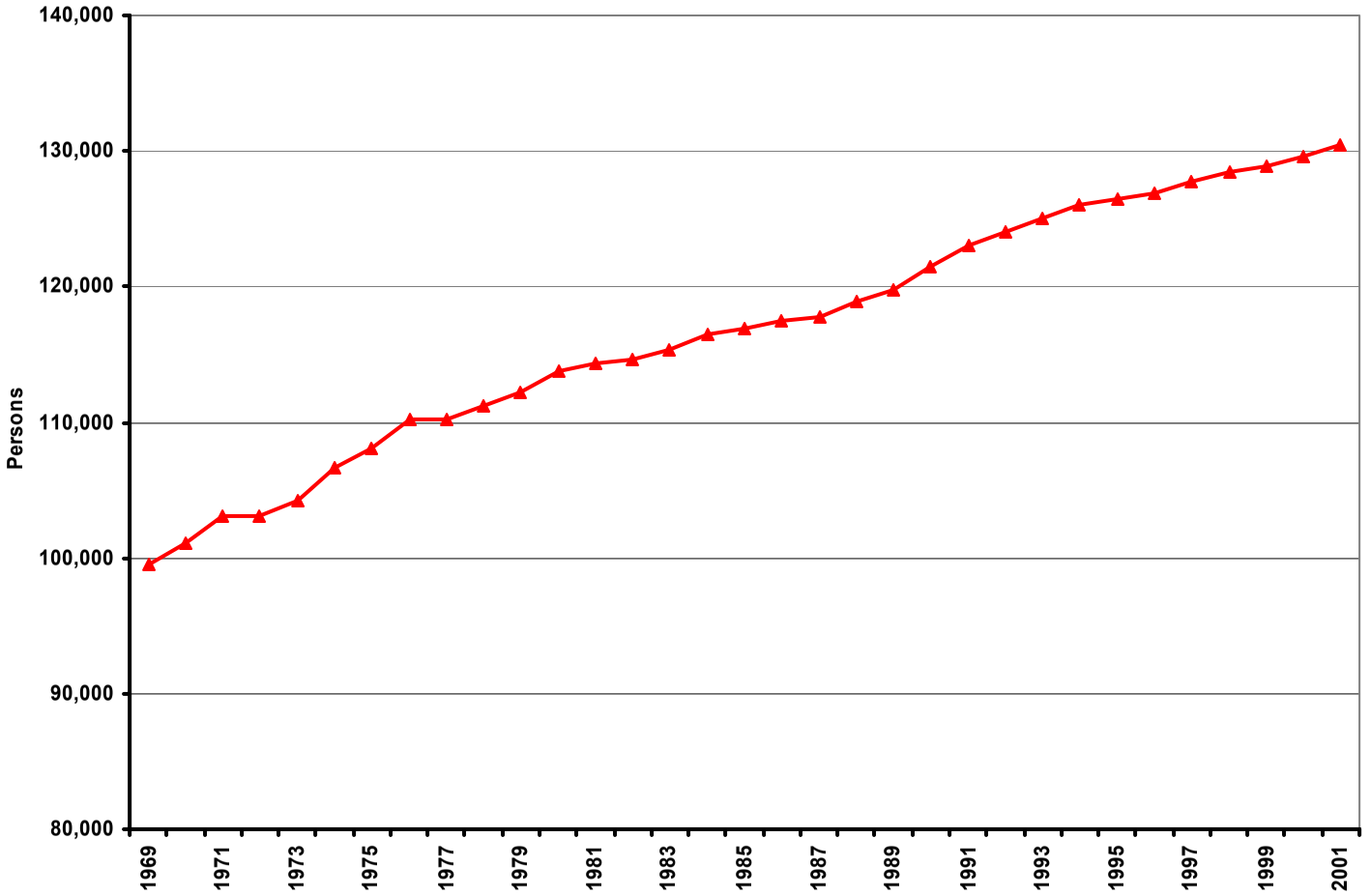
Age Composition of Franklin County Population

It is also important to consider "who" the population of a region is, since a region's population is also typically the largest component of its workforce. The age composition of a region's population is also important in considering the region's collective ability to cope with future economic change.

We examined the age structure of Franklin County's population in 2000 by comparing the percentage of the county's population in various age cohorts with similar data for both the United States and Pennsylvania. The striking results are shown in Figure A-5. Compared with the United States, Franklin County has a smaller percentage of residents in every cohort between 0-44 years of age. Conversely, the county has a larger percentage of residents in every cohort from 45 years of age and older. Although the pattern is slightly weaker, the same general arrangement is also evident when comparing Franklin County with Pennsylvania. With the exceptions of the 0-5 and 25-29 year old cohorts, the county has an equal or lower percentage of residents in cohorts below the age of 50, and an equal or greater percentage of residents in each older cohort. It is obvious that Franklin County is a disproportionately "gray" population. More specifically, 20.7% of Franklin County's population was over the age of 60, compared with 16.2% for the U.S.A. and 19.8% for Pennsylvania.

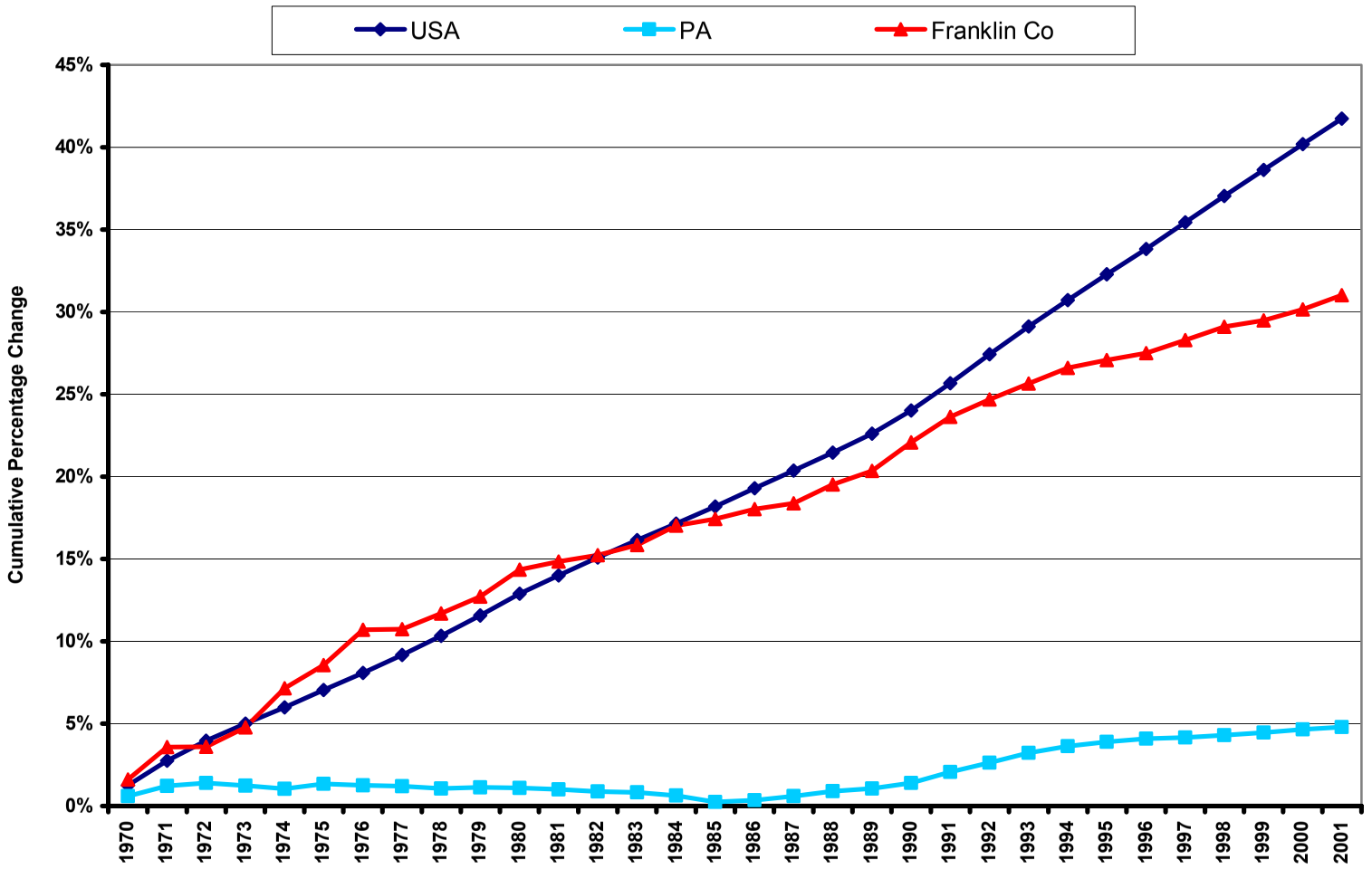
This disproportionately higher percentage of residents in the older age cohorts within Franklin County raises serious questions about the ability of the region to effectively meet significant and sudden economic shifts in the short run – both in terms of numbers of workers, and indirectly, in skill-levels. While it is unfair to generalize that younger (and more recently educated) workers are always more highly trained in the latest skills and technologies, it is certainly true some of the time. Coupled with the relatively low numbers of residents in age cohorts that typically represent beginning and middle points of the "career cycle", this trend does not bode well for short-term economic resiliency.

Figure A-3: Population of Franklin County, PA: 1969-2001



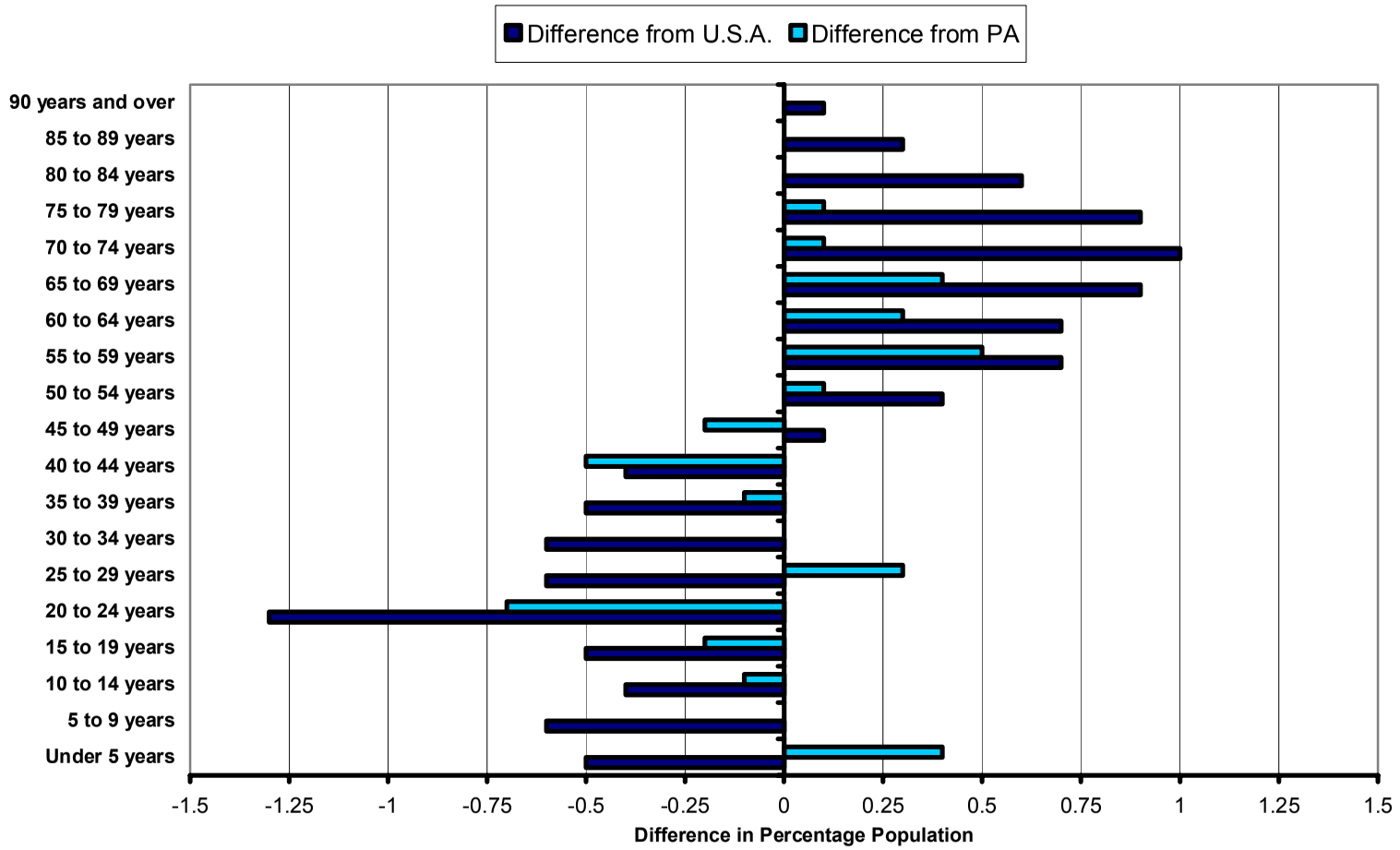
Source: U.S. Department of Commerce, Bureau of Economic Analysis

Figure A-4: Population: Cumulative Percentage Change, 1969-2001



Source: Authors' calculations on data from the U.S. Department of Commerce, Bureau of Economic Analysis

Figure A-5: Differential Percentage of Population by Age Cohort, 2000: Franklin County vs. U.S.A. & Pennsylvania



Source: Authors' calculations on data from the U.S. Census American FactFinder.

Employment, Commuting, and Unemployment

Total Employment and Employment Change

Between 1969 and 2000, as shown in Figure A-6, total employment in Franklin County grew from 45,922 to 65,196 – or cumulatively, by 42%. This compares with cumulative employment growth of 83% and 33% for the United States and Pennsylvania respectively. As part of the so-called "rust-belt", it is not surprising that Pennsylvania's employment growth has been slower that that of the nation's. However, while the relatively higher rate of employment growth in Franklin County compared with the Commonwealth is, at first glance, a positive sign, the more recent trend is not. In particular, since the mid/late 1990's, county employment growth has leveled off and even declined – even as Pennsylvania's has generally risen. Thus, Franklin county's employment growth now seems to be moving into convergence with the much more modest gains of Pennsylvania than keeping up with the growth of the nation's employment as was the case in the 1970s.

To further examine the employment dynamics in Franklin County, we calculated correlation coefficients comparing the yearly percentage change in employment between the county and both the U.S.A. and Pennsylvania respectively between 1969/1970 and 2000/2001. A correlation coefficient of "1" indicates that employment changes move together in perfect synchronization over the years while "0" indicates no relationship between the two data sets. The coefficients are presented in Table A-1.

Table A-1: Employment Change, 1969/70-2000/01 – Correlation Coefficients

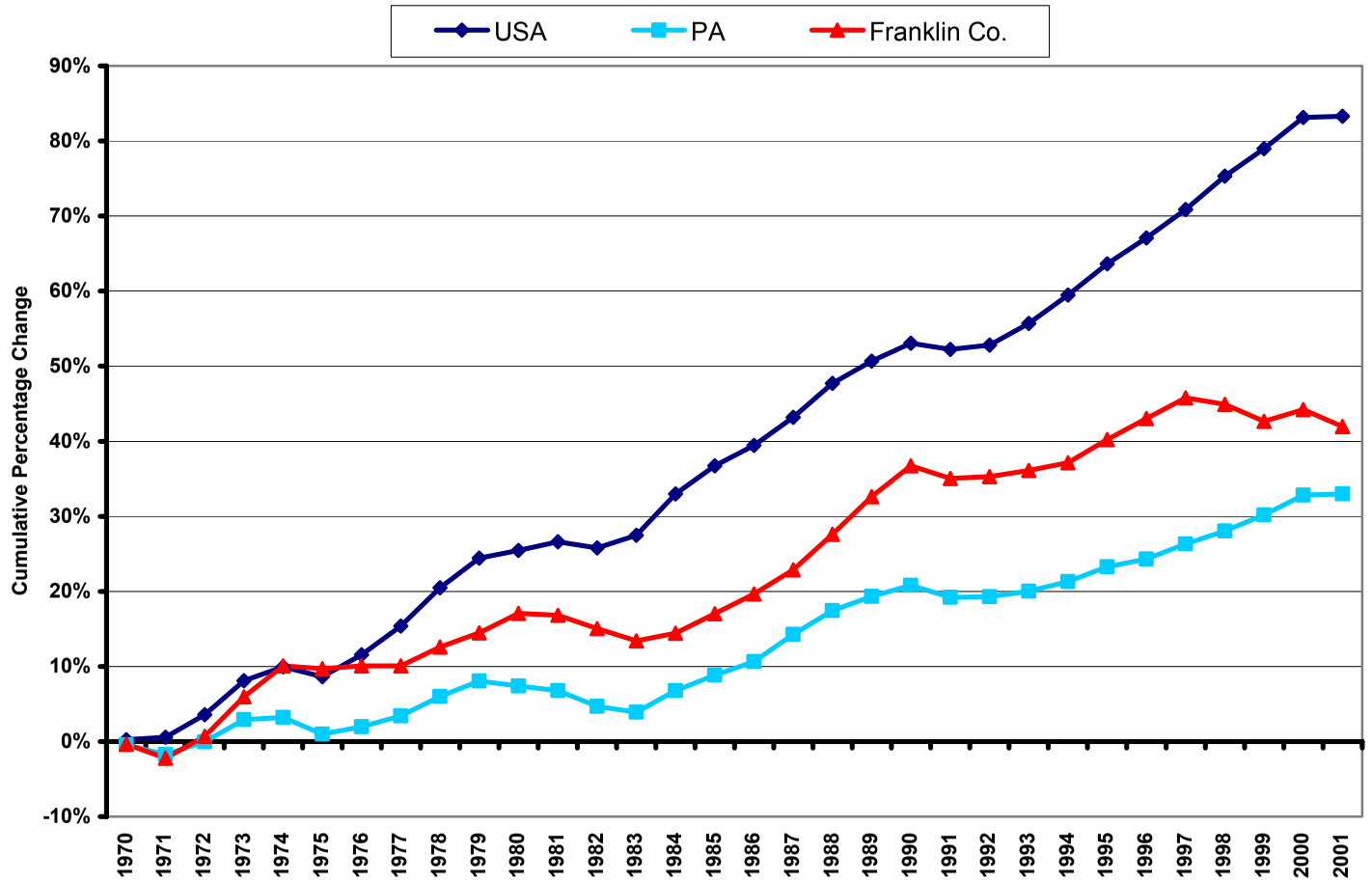
	U.S.A.	PA	Franklin County
U.S.A.	1	—	—
PA	0.90	1	—
Franklin County	0.58	0.64	1

As is expected, there are strong positive, but not perfect correlations between yearly employment change in the county and that of the nation and Pennsylvania. However, what is remarkable in this case is that if the last four years of data are excluded from the analysis, the level of fit between the county and both the U.S.A. and Pennsylvania rises (see Table A-2) from 0.58 to 0.61. The implication is that Franklin County has diverged significantly from broader employment change trends over the recent past – relative to both the U.S.A. and PA. As noted above this divergence seems to be one of slower employment growth than the comparison reasons. This more recent divergence of the county is a common theme throughout the analysis.

Table A-2: Employment Change, 1969/70-1996/97 – Correlation Coefficients

	U.S.A.	PA	Franklin County
U.S.A.	1	—	—
PA	0.92	1	—
Franklin County	0.61	0.74	1

Figure A-6: Employment: Cumulative Percentage Change, 1969-2001



Source: Authors' calculations on data from the U.S. Deparment of Commerce, Bureau of Economic Analysis

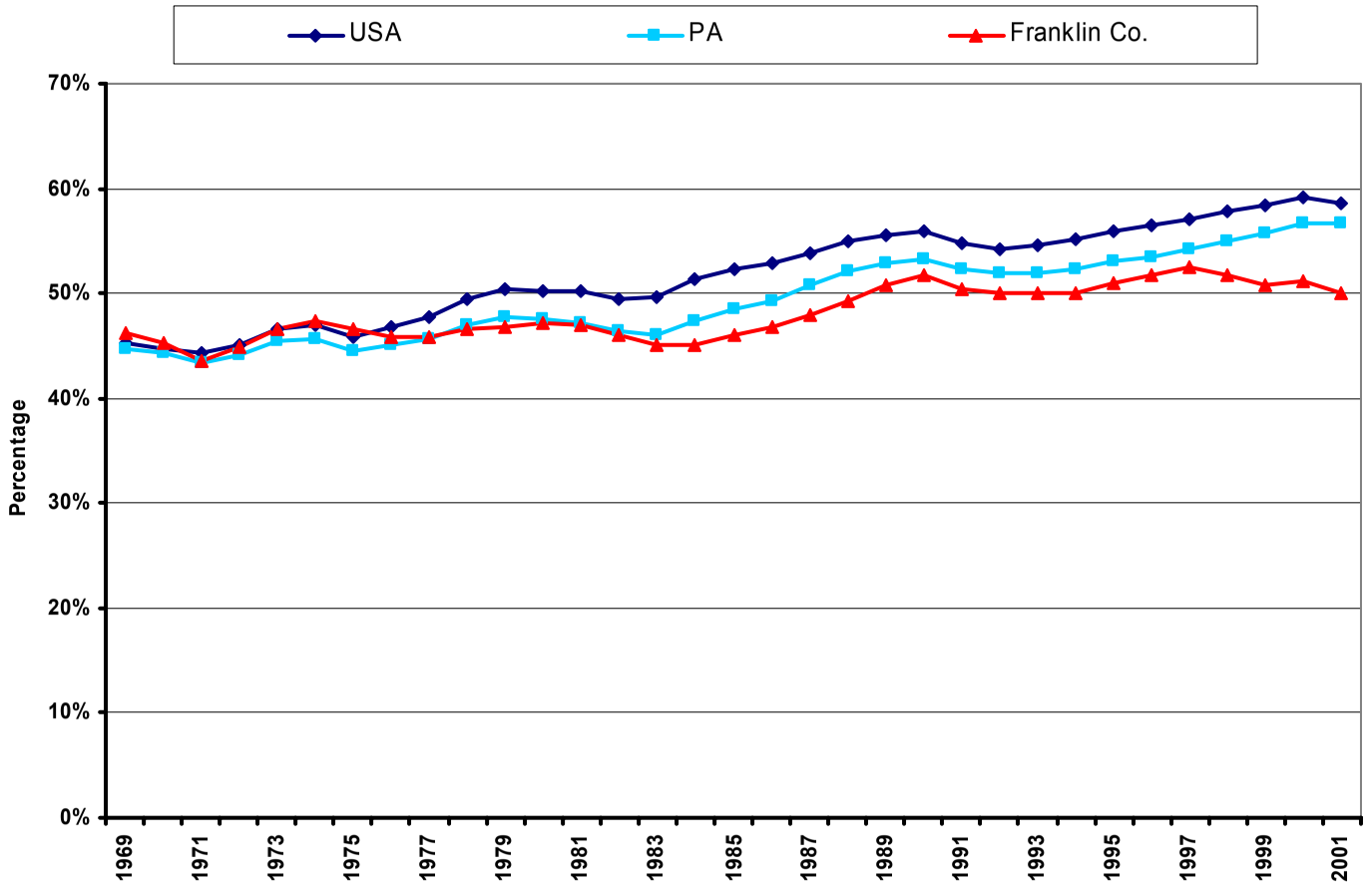
Relationship of Employment to Population

To examine the relationship between the number of residents and the number of employed persons in Franklin County, we calculated a ratio of total employment to total population for each year from 1969 to 2001 and compared it with similar figures for both the United States and Pennsylvania. The results are shown in Figure A-7.

As the figure shows, employment as a percentage of population has increased over the time period for all three geographic scales. In Franklin County in particular, the ratio of employment to population went from about 46% in 1969 to about 50% in 2001. However, the latter figure is substantially below a ratio of 58% at the national level and 57% in Pennsylvania. Moreover, it can be seen that much of this divergence occurred relatively recently, mostly since 1997.

In many ways this corresponds with the population analysis above. Since Franklin County has a much greater percentage of residents in the 50/60+ years of age cohorts, it is not surprising that employment/population ratio is lower than that of Pennsylvania and the U.S.A. The implications are important however. Franklin County's relatively smaller percentage of the population that is employed may serve to depress overall regional income figures, especially if a disproportionate number of residents live on fixed – or nearly fixed – incomes (e.g., retirement income, social security, etc.). In addition, rather than contributing to regional production, a retired, older population contributes to the local economy much more through consumption through the retail and service sectors – sectors that often have lower employment and income multipliers.

Figure A-7: Full and Part-Time Employment as a Percentage of Population, 1969-2001



Source: Authors' calculations on data from the U.S. Deparment of Commerce, Bureau of Economic Analysis

Employment and Commuting

Along with analyzing the total number of employed persons in the county, it is also of interest to examine both the geographic locations of the area residence for those employed in the county along with the geographic locations of employment for persons that reside in Franklin County itself.

To examine this, we analyzed the U.S. Census database "Journey to Work and Place of Work" for both the 1990 and 2000 Censuses[4]. Table A-3 summarizes the top five county-level locations of residence for those employed in Franklin County in 2000 and 1990.

As the data for both 2000 and 1990 show, most workers employed in Franklin County report that they also live in the county. However a temporal pattern is evident. While in 1990 84% of workers employed in Franklin County reported that they also resided in the county, this figure dropped to under 82% in 2000. In other words, the county was less equipped to handle its employment needs with its own residents in 2000 than it was in 1990.

Table A-3: Top 5 Geographic Locations of Residence of Workers Employed in Franklin County, 1990 & 2000

2000 (total = 54,311)		**1990** (total = 54,051)	
County of Residence	**Pct. of Workers**	**County of Residence**	**Pct. of Workers**
Franklin, PA	81.8	Franklin, PA	84.0
Cumberland, PA	4.7	Cumberland, PA	4.6
Washington, MD	3.9	Washington, MD	3.2
Adams, PA	1.8	Fulton, PA	1.6
Fulton, PA	1.7	Adams, PA	1.5

Source: Authors' calculations on U.S. Census data

Table A-4 shows the geographic locations of the top five places of work for employed residents of Franklin County in both 2000 and 1990. A pattern similar to that discussed above emerges when examining the two time periods. In 1990, almost 77% of employed residents of Franklin County worked in Franklin County. By 2000, that percentage had dropped to about 72%. Put another way, a greater percentage of employed Franklin County residents have now looked elsewhere for suitable employment opportunities – sometimes at considerable distances from home.

What all of this amounts to is the Franklin County has become a greater net exporter of labor over the period 1990-2000. Subtracting the number of non-resident employees in Franklin County from the number of county residents employed elsewhere, we obtain the net export of employees as shown in Table A-5. As the number of employees traveling both into and from the county for employment opportunities has increased, the region could be described as being porous or integrated. The net increase of employees traveling from the county would be presumably the result of both push and pull forces, i.e. employees being pushed from the county due to diminished local job opportunities and others pulled toward a better labor market.

[4] The database only includes information regarding the job that the respondent worked at the most hours during the study period. Therefore, employment figures from this data set will no match others used in this report.

Table A-4: Top 5 Geographic Locations of Work for Employed Residents of Franklin County, 1990 & 2000

2000 (total = 61,973)		**1990** (total = 59,189)	
County of Work	**Pct. of Workers**	**County of Work**	**Pct. of Workers**
Franklin, PA	71.8	Franklin, PA	76.7
Washington, MD	12.7	Washington, MD	9.9
Cumberland, PA	5.4	Cumberland, PA	5.1
Frederick, MD	2.9	Adams, PA	2.0
Adams, PA	1.5	Frederick, MD	1.8

Source: Authors' calculations on U.S. Census data

Table A-5: Net Export of Employees from Franklin County, 1990 and 2000

1990		**2000**	
Exported Employees	13,791	Exported Employees	17,476
Imported Employees	8,640	Imported Employees	10,427
Net Export of Employees	5,151	Net Export of Employees	7,049

Unemployment

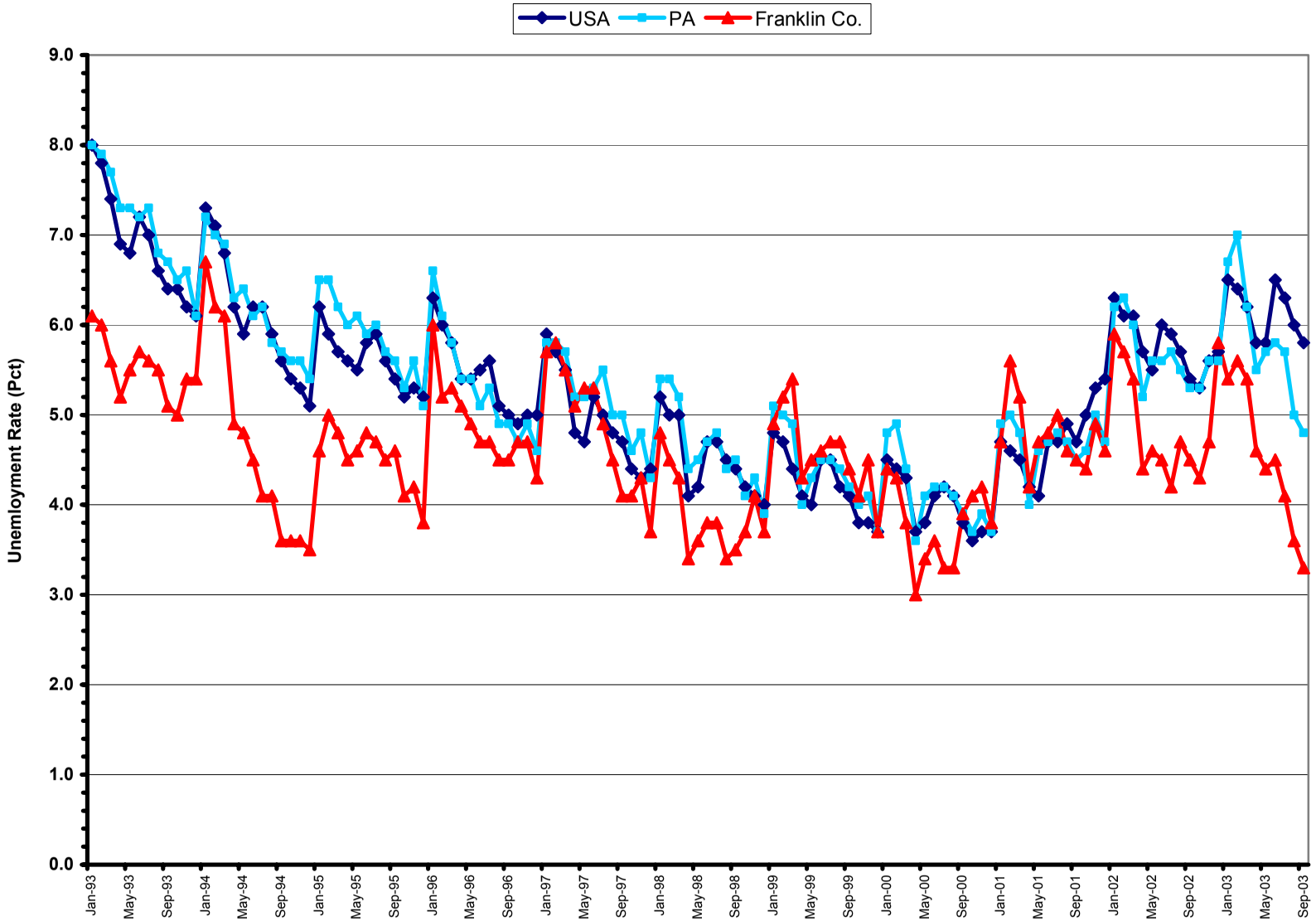
The unemployment picture in Franklin County over the past decade has been one that is largely positive. We examined monthly unemployment rates for Franklin County from January 1993 to September 2003 and compared them with those of the United States and Pennsylvania. The results are presented in Figure A-8. Over most of the time period, the monthly unemployment rate either mirrors that of the United States and Pennsylvania or compares favorably. Over the decade, Franklin County's average monthly unemployment was 4.6% compared with 5.3% for the nation and 5.4% for Pennsylvania.

While these numbers are solid – that is, most people that are actively seeking jobs have them – they must be read in light of the analyses above and the fact that unemployment only relates to those that "had made specific efforts to find employment some time during the 4 week-period ending with the reference week" (BLS 2004)[5]. First, it must be remembered that a disproportionately large percentage of the population of Franklin County is in older age cohorts, and perhaps retired. Therefore, it is likely that a relatively smaller proportion of the population is probably actually seeking employment – creating lower employment demand which can be more easily filled. Second, as the commuting analysis showed, a decreasing percentage of residents are actually working in the county, indicating that they have found employment – but elsewhere – again reducing the demand for jobs within the county. Third, it must also be recognized that the unemployment rate says little about whether the jobs that are filled within the county are good jobs – full time or part time, in high wage or low wage industries, etc.

[5] The full definition of unemployment according the U.S. Department of Labor, Bureau of Labor statistics is as follows:

> All persons who had no employment during the reference week, were available for work, except for temporary illness, and had made specific efforts to find employment some time during the 4 week-period ending with the reference week. Persons who were waiting to be recalled to a job from which they had been laid off need not have been looking for work to be classified as unemployed (http://www.bls.gov/lau/laufaq.htm#Q3)

Figure A-8: Monthly Unemployment Rate (Unadjusted): Jan 1993 - Sep 2003



Source: U.S. Department of Labor, Bureau of Labor Statistics

Employment Composition

Employment by Major Industry

To examine the types of jobs present in Franklin County, we examined the percentage of employment in major industries (based on SIC designations) at five year intervals from 1970-2000. The results are presented in both Figures A-9 and Table A-6 (both are ordered by percentage of total employment in 2000).

As the Figures show, the sector with the largest amount of county employment in 2000 in percentage terms is Services, which comprises almost 26% of full and part-time employment. This is followed by retail (20%) and manufacturing (19%). Military (0.6%), Ag. Services, forestry, fishing, and mining (2%) and Government-Federal Civilian (3%) are the sectors with the least employment in the county. Clearly the Figures show the continuing importance of manufacturing to the county as well as the historical importance of Government-Federal Civilian employment in years past. However, employment composition is not static.

Since 1970, significant changes have occurred in the relative composition of county employment among industries as can be seen in the "PCT CHANGE 1970-2000" column of the table. The sectors with the largest percentage gain have been Services (+90%), Wholesale (+65%), Retail (+49%) and Construction (+40%). The largest percentage losers have been Government-Federal Civilian (-77%), Government-Military (-56%), Farm (-36%) and Manufacturing (-34%).

Industrial Concentration

To examine the levels of employment in each major industrial sector relative to the United States, we calculated employment location quotients for each sector at five year intervals between 1970 and 2000 (Table A-7). Location quotients are simply the ratio of the percentage employment in an individual sector within the county to the percentage employment in that same sector at the national level. A quotient > 1 indicates that a region has a relative concentration of employment in a particular sector while a quotient < 1 indicates that the region is less concentrated than national averages.

Franklin county has long had relative employment concentrations in the Farm, Manufacturing and Government-Federal Civilian sectors. Quotients for each of these sectors have been well above one since at least 1970. Other sectors with relatively high location quotients in 2000 were Retail and Ag. Services, and Forestry, fishing, and mining. The lowest relative concentrations were found in Government-Military, Finance, Insurance and Real Estate, and Wholesale trade.

The far right column of the Figure indicates the percentage change in the location quotient between 1970 and 2000. Wholesale, Farm, Retail, and Manufacturing have shown the largest gains in regional concentration, while Government-Federal Civilian and Government-State and Local have seen the largest decreases. It is important to note that even though the percentages of county workers in some sectors declined (e.g., manufacturing [-34%], see above), the relative concentration of employment in that sector can in fact increase relative to the nation. This is due to the fact that while employment in manufacturing decreased in both the U.S.A. and in Franklin County, the decline was more gradual in the local area. Especially in the case in the case of manufacturing, this fact points to the heavy reliance the region has had – and continues to have – on manufacturing. In contrast, the region still lags well-behind the nation in terms of the

relative concentration of employment in sectors such as advanced services (Finance, insurance, and real estate).

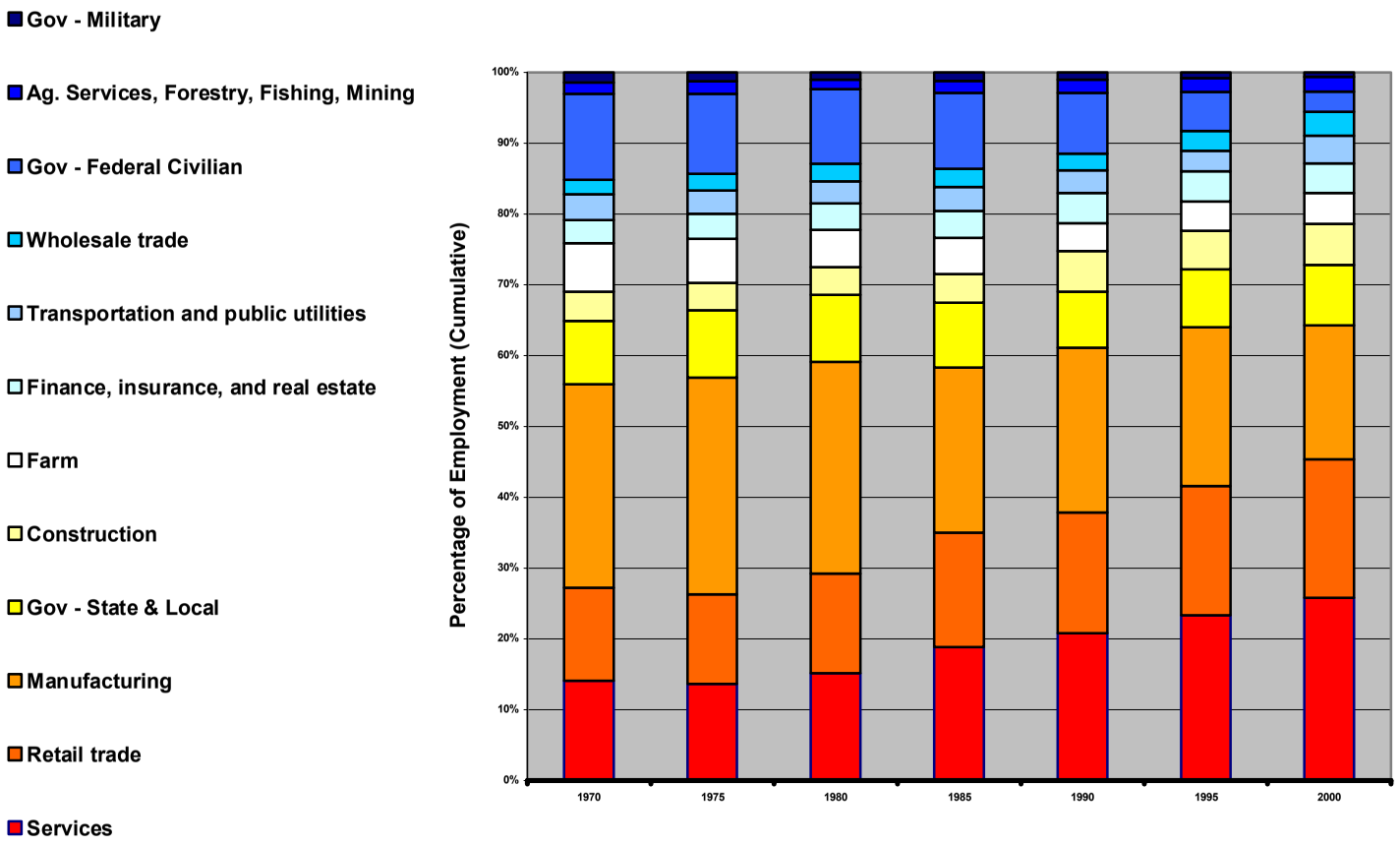
Employment Change: A Dynamic Shift-Share Analysis

To examine the overall dynamics of employment change in Franklin County over the last several decades, we conducted a dynamic shift-share analysis following the method outlined by Barff and Knight (1988) [also see Loveridge (1995)]. In short, a shift-share analysis breaks the actual employment change exhibited by a region into three interrelated components. In this analysis, actual employment change in Franklin County from 1970-2000 is considered to be a function of national employment growth trends, modified by (a) the specific mix of industries present in the county, and (b) other regional and local competitiveness factors. The results are shown in Figure Table A-8[6]. Actual employment change in Franklin County from 1970-2000, calculated as the sum of growth in each 5-year interval was 20,461. If Franklin County had been a perfect reflection of the national economy, actual employment growth would have been 35,401 – almost 15,000 more jobs than what actually took place. The difference between the two can be explained by examining the Industry Mix effect and the Competitive effect. The former adjusts employment growth for the specific mix of industries found in Franklin County. Because the county is heavy in industries that have been relatively slow or negative growth over the time period (e.g., Government, manufacturing), the Industry Mix effect on job growth has been consistently negative. The second adjustment, the competitive effect, captures the local and regional effects not accounted for by the mix of industries (i.e., region-specific trends and events). As the Table shows, this trend has also been largely negative. Moreover, the largest negative effect occurred during the 1995-2000 time period, probably reflecting, at least in part, the effects of the region specific realignment of Letterkenny Army Depot during the last round of BRAC.

In sum, the local and regional effects relating to both the mix of industries and other local events have served to greatly increase the negative deviance between the nation's employment growth and that of Franklin County.

[6] For details on the calculation and interpretation of these effects, see Barff and Knight (1988) and Loveridge (1995).

Figure A-9: Employment by Major Industry (SIC): Franklin County, 1970-2000



Note: Due to the non-disclosure of data, Ag. services, forestry, fishing and mining were combined for this analysis.

Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis

Table A-6: Percentage of Employment by Major Industrial Sector (SIC), Franklin County, PA: 1970-2000

Industrial Sector	1970	1975	1980	1985	1990	1995	2000	PCT CHANGE 1970-2000
Services	14.09%	13.65%	15.15%	18.86%	20.81%	23.37%	25.78%	82.95%
Retail trade	13.13%	12.65%	14.08%	16.13%	17.04%	18.23%	19.59%	49.18%
Manufacturing	28.73%	30.58%	29.90%	23.35%	23.28%	22.40%	18.90%	-34.20%
Gov - State & Local	8.97%	9.54%	9.48%	9.15%	7.92%	8.22%	8.56%	-4.54%
Construction	4.11%	3.88%	3.89%	4.05%	5.71%	5.44%	5.76%	40.30%
Farm	6.87%	6.21%	5.27%	5.08%	3.94%	4.14%	4.37%	-36.43%
Finance, insurance, and real estate	3.25%	3.49%	3.70%	3.78%	4.25%	4.25%	4.17%	28.49%
Transportation and public utilities	3.63%	3.29%	3.14%	3.38%	3.19%	2.91%	3.90%	7.53%
Wholesale trade	2.07%	2.36%	2.48%	2.59%	2.35%	2.80%	3.42%	65.24%
Gov - Federal Civilian	12.12%	11.31%	10.55%	10.71%	8.62%	5.49%	2.84%	-76.57%
Ag. Services, Forestry, Fishing, Mining	1.61%	1.79%	1.33%	1.70%	1.86%	1.97%	2.08%	29.04%
Gov - Military	1.42%	1.24%	1.02%	1.21%	1.02%	0.80%	0.62%	-56.33%

Note: Due to the non-disclosure of data, Ag. services, forestry, fishing and mining were combined for this analysis.

Source: Authors' calculations on data from the U.S. Department of Commerce, Bureau of Economic Analysis

Table A-7: Location Quotients by Major Employment Sector (SIC)
Franklin County, PA: 1970-2000

Industrial Sector	1970	1975	1980	1985	1990	1995	2000	PCT CHANGE 1970-2000
Farm	**1.583**	**1.556**	**1.585**	**1.826**	**1.743**	**1.989**	**2.349**	48.37%
Manufacturing	**1.332**	**1.621**	**1.644**	**1.470**	**1.648**	**1.744**	**1.655**	24.25%
Gov - Federal Civilian	**3.813**	**3.841**	**4.027**	**4.434**	**3.718**	**2.783**	**1.643**	-56.91%
Retail trade	0.875	0.825	0.900	0.991	1.037	1.080	**1.196**	36.75%
Ag. Services, Forestry, Fishing, Mining	**1.161**	**1.151**	0.694	0.832	1.037	1.099	**1.192**	2.68%
Construction	0.852	0.823	0.787	0.781	1.097	1.050	1.012	18.77%
Services	0.755	0.667	0.692	0.752	0.750	0.780	0.807	6.84%
Gov - State & Local	0.824	0.790	0.816	0.845	0.725	0.748	0.806	-2.17%
Transportation and public utilities	0.681	0.653	0.632	0.715	0.678	0.613	0.790	16.04%
Wholesale trade	0.452	0.480	0.493	0.526	0.487	0.604	0.754	66.65%
Finance, insurance, and real estate	0.484	0.471	0.483	0.496	0.554	0.575	0.528	9.21%
Gov - Military	0.402	0.462	0.468	0.548	0.523	0.524	0.502	24.71%

Note: Due to the non-disclosure of data, Ag. services, forestry, fishing and mining were combined for this analysis.

Source: Authors' calculations on data from the U.S. Department of Commerce, Bureau of Economic Analysis

Table A-8: Components of Employment Change: Dynamic Shift-Share Summary
Franklin County, PA: 1970-2000

Employment Change & Components		1970 -- 1975	1975 -- 1980	1980 -- 1985	1985 -- 1990	1990 -- 1995	1995 -- 2000	TOTALS
Actual Employment Change		4,611	3,385	(22)	9,043	1,610	1,834	20,461
Components of Employment Change	**National Effect**	3,823	7,805	4,838	6,437	4,472	7,728	35,104
	Industry Mix Effect	(1,173)	(1,174)	(1,916)	(1,256)	(1,380)	(1,574)	(8,472)
	Competitive Effect	1,961	(3,246)	(2,944)	3,861	(1,482)	(4,320)	(6,171)

Negative values in "( )"

Note: Due to the non-disclosure of data, Ag. services, forestry, fishing and mining were combined for this analysis.

Source: Authors' calculations on data from the U.S. Department of Commerce, Bureau of Economic Analysis

Income, Wages, and Earnings

Per Capita Personal Income

We examined real (i.e., inflation adjusted) personal income[7] both in absolute terms and in terms of cumulative percentage change over the period 1969/1970 to 2001. To make adjustments for inflation, nominal figures reported by the Bureau of Economic Analysis were adjusted using the U.S. Department of Labor's "Consumer Price Index for All Urban Consumers" (2004). All reported figures are in constant 2001 dollars. In addition, because income varies between urban and rural regions, for comparative purposes we have added the metropolitan portion of PA and the non-metropolitan portion of PA to the U.S.A. and Pennsylvania as reference regions.

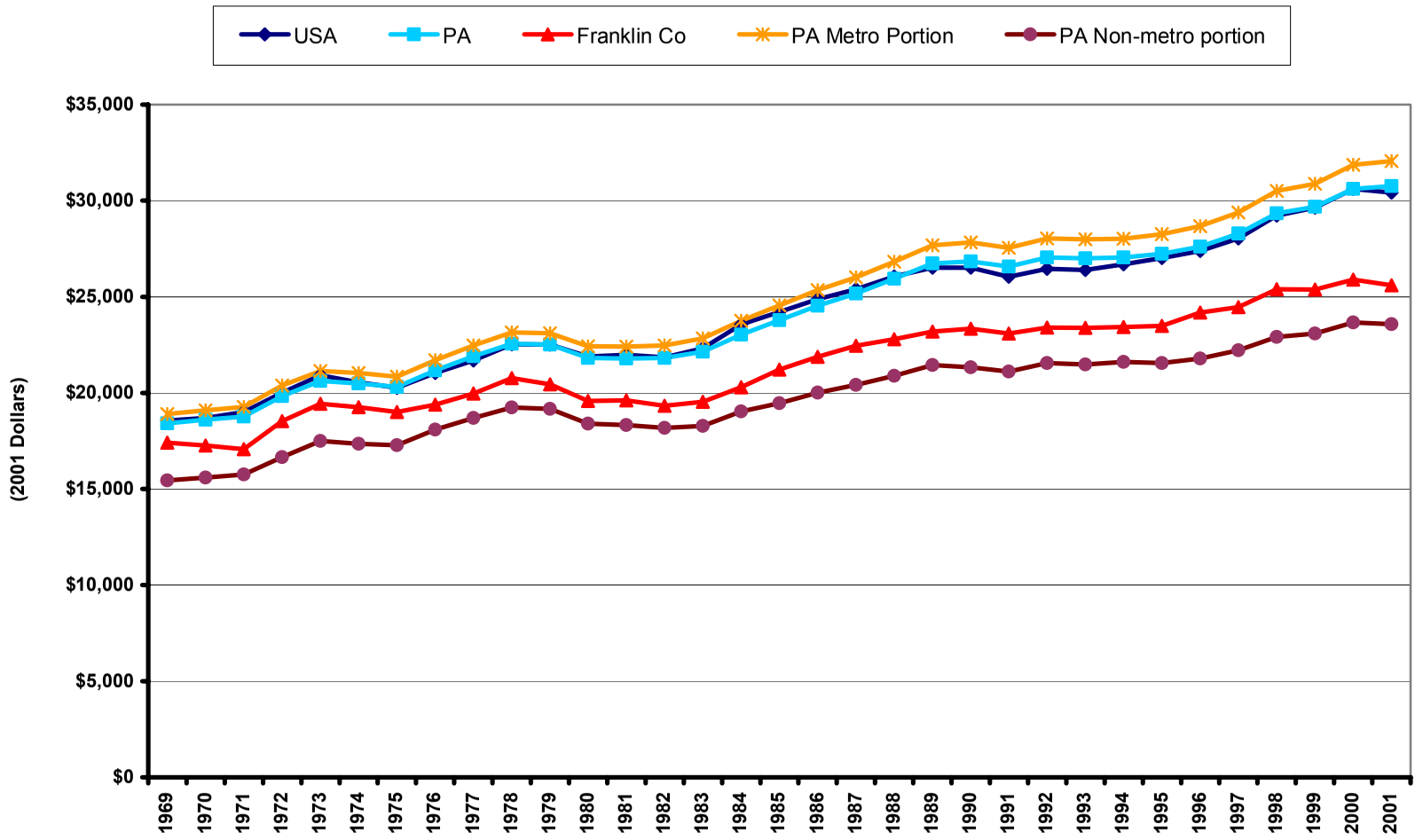
Figure A-10 shows the changes in real personal income from 1969-2001 in constant (2001) dollars. Both Pennsylvania as a whole and the metropolitan portion of Pennsylvania have followed national trends over the period quite closely – all have per capita personal income over $30,000 in 2001. As might be expected, non-metropolitan Pennsylvania as well as Franklin County (which is also non-metro) have had consistently lower per capita personal income over the time period. Franklin County's income rose from $17,411 in 1969 to $25,601 in 2001. While Franklin County's per capital personal income has generally been slightly higher than that of non-metropolitan Pennsylvania as a whole, it is losing ground relatively compared with all of the reference regions.

Figure A-11 shows the cumulative percentage change in per capita personal income in real terms over the past three decades. While cumulative percentage growth has been between 64% and 70% for the U.S.A., Pennsylvania, and metropolitan Pennsylvania – and has been 53% for non-metropolitan regions of the state, cumulative income growth has only been 47% in Franklin County. This can also be seen in Figure A-12 which depicts per capita personal income in relation to national averages. Again, while Pennsylvania as a whole, along with metropolitan portions of the Commonwealth trend quite favorably with the nation, it is quite obvious that Franklin County has actually lost ground. In 1969, real per capita income in the county was 94% of that of the nation. In 2001 in was 84%. The decline has been gradual but consistent.

[7] According to the Bureau of Economic Analysis (2004), personal income is defined as follows:

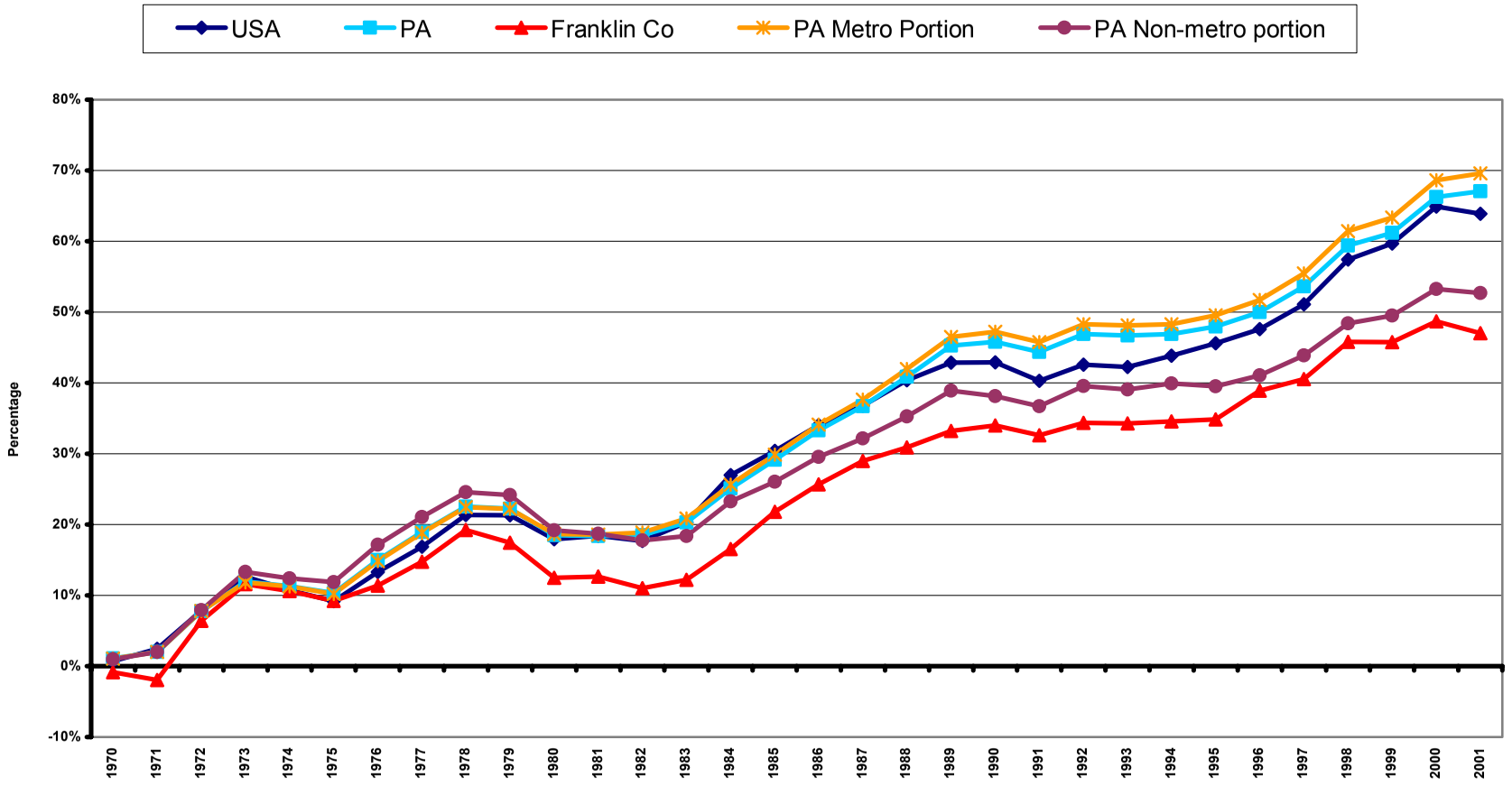
> "Personal income is defined as the sum of wage and salary disbursements, other labor income, proprietors' income with inventory and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and transfer payments to persons, less personal contributions for social insurance."

Figure A-10: Per Capita Personal Income (Real), 1969-2001



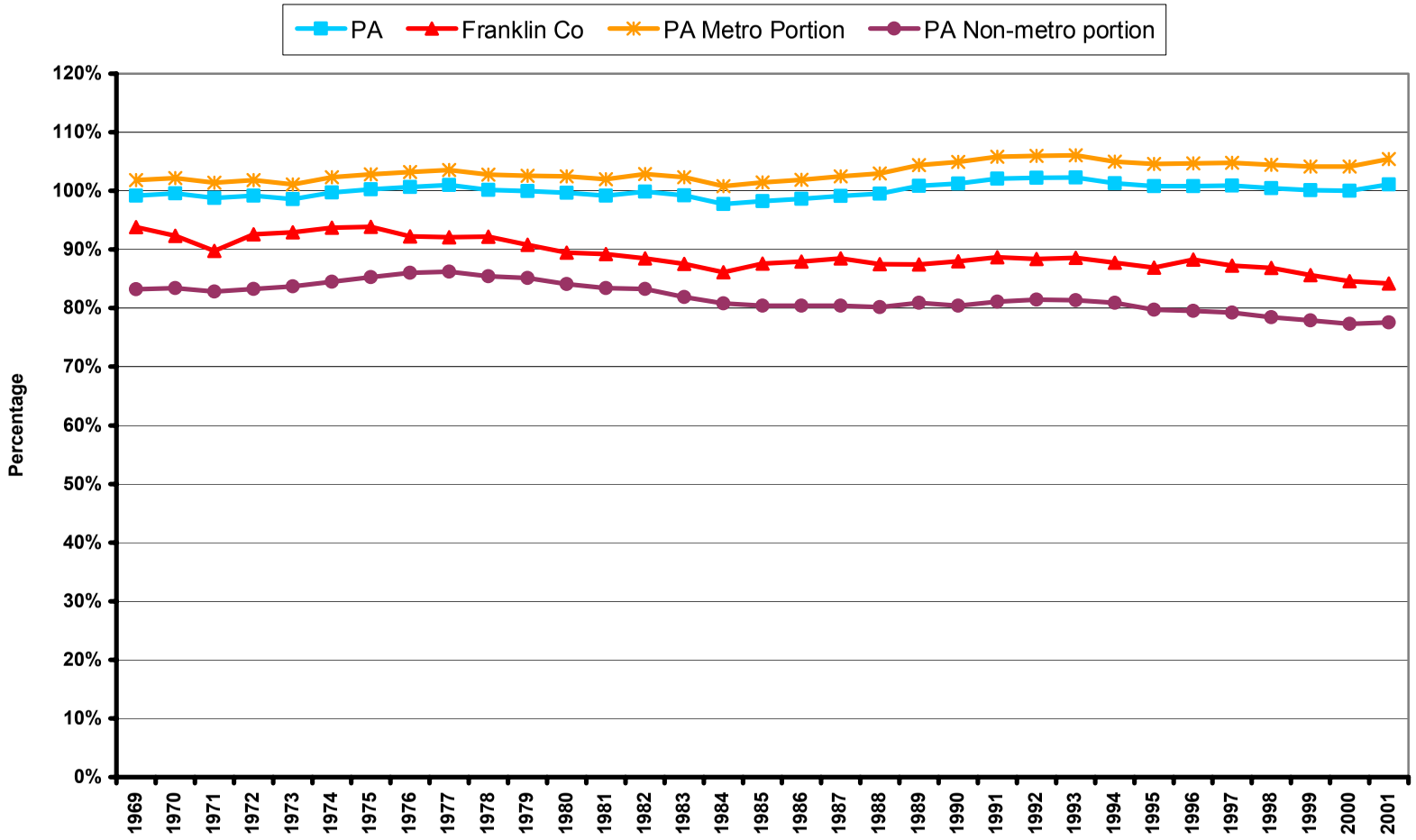
Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Figure A-11: Per Capita Personal Income (Real): Cumulative Percentage Change, 1969-2001



Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Figure A-12: Per Capital Personal Income (Real): Percentage of U.S.A. Average, 1969-2001



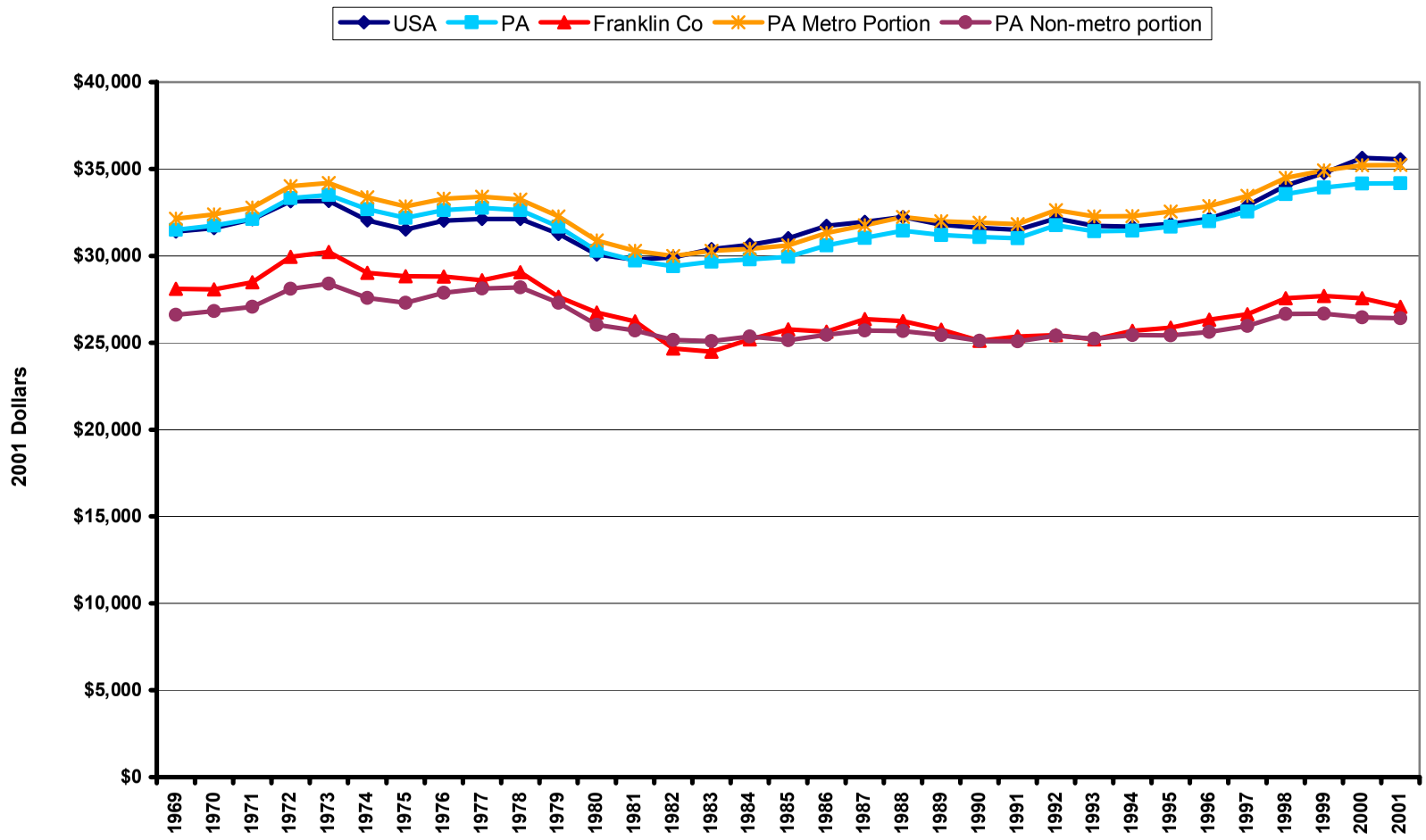
Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Wages per Job

Whereas personal income includes items such as transfer payments, dividends, and other sources of income, wages generally include payments for and related to labor activities. Wages per job, then, reflect a variety of factors including not only changes in wage rates but also the underlying mix of industries that typically pay differing wages as well as the relative proportion of full and part-time jobs.

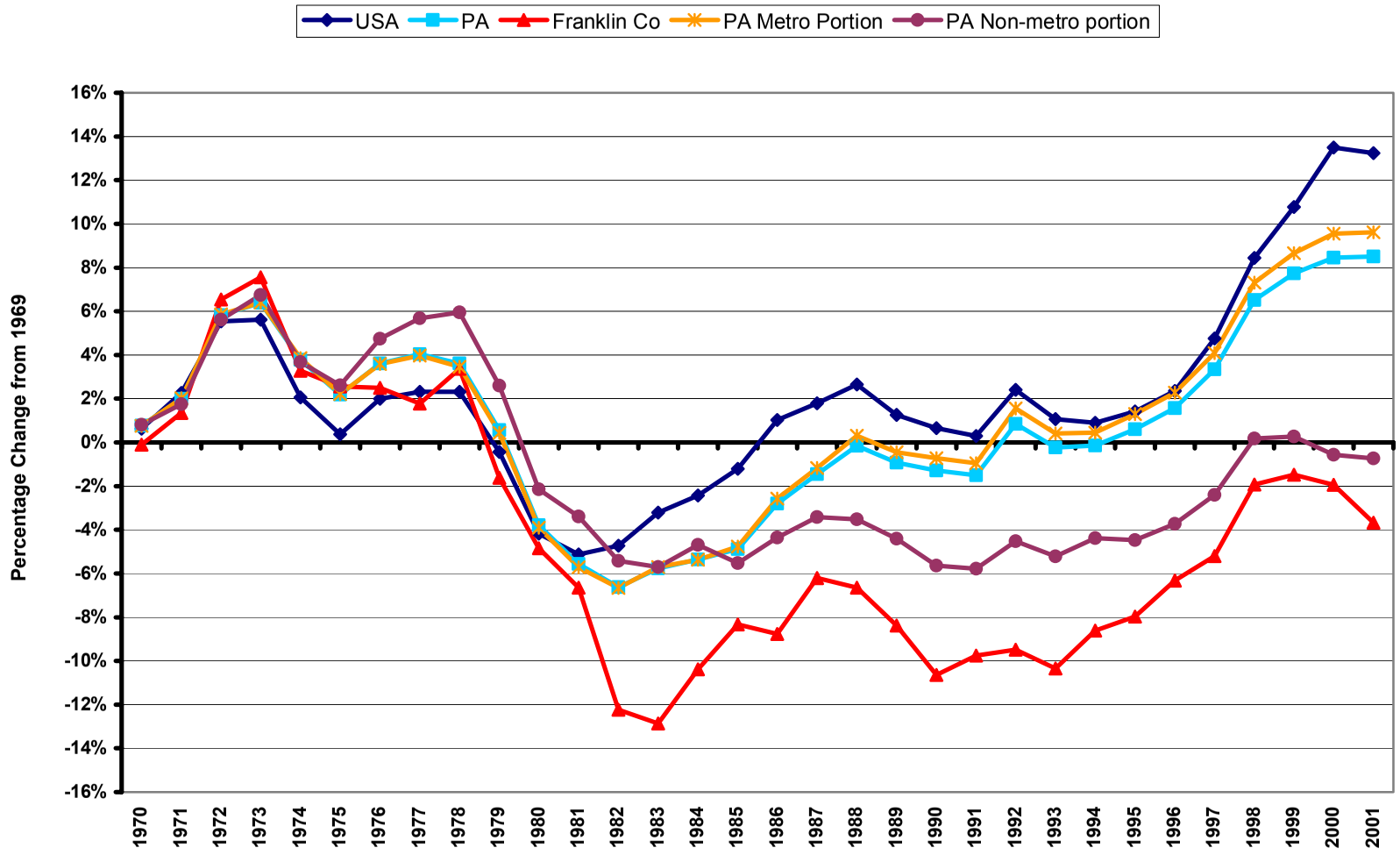
Figure A-13 shows the average wage rates per job (in real 2001 dollars) from 1969 to 2001 and Figure A-14 shows the cumulative percentage change in real wages per job during the same time period. As the two figures in combination show, while the U.S.A., Pennsylvania, and metropolitan Pennsylvania have seen real increases in wages per job over the time period, real wages per job in Franklin County are actually lower today than they were in 1969. Specifically, in constant dollars, the average wage per job in 1969 (in constant 2001 dollars) was $28,104; in 2001 that figure had decline to $27,072, representing a cumulative loss of about 3.7%. This is a greater loss than has been seen in the rest of non-metropolitan Pennsylvania, which lost less than 1% in real terms. The relative decline in Franklin County *vis a vis* the U.S.A., and Pennsylvania can further be seen in Figure A-15 which shows real wages per job as a percentage of national averages. In 1969 wages per job in the county were almost 90% of national averages; in 2001 they were about 76% of the nation's.

Figure A-13: Wages Per Job (Real), 1969-2001



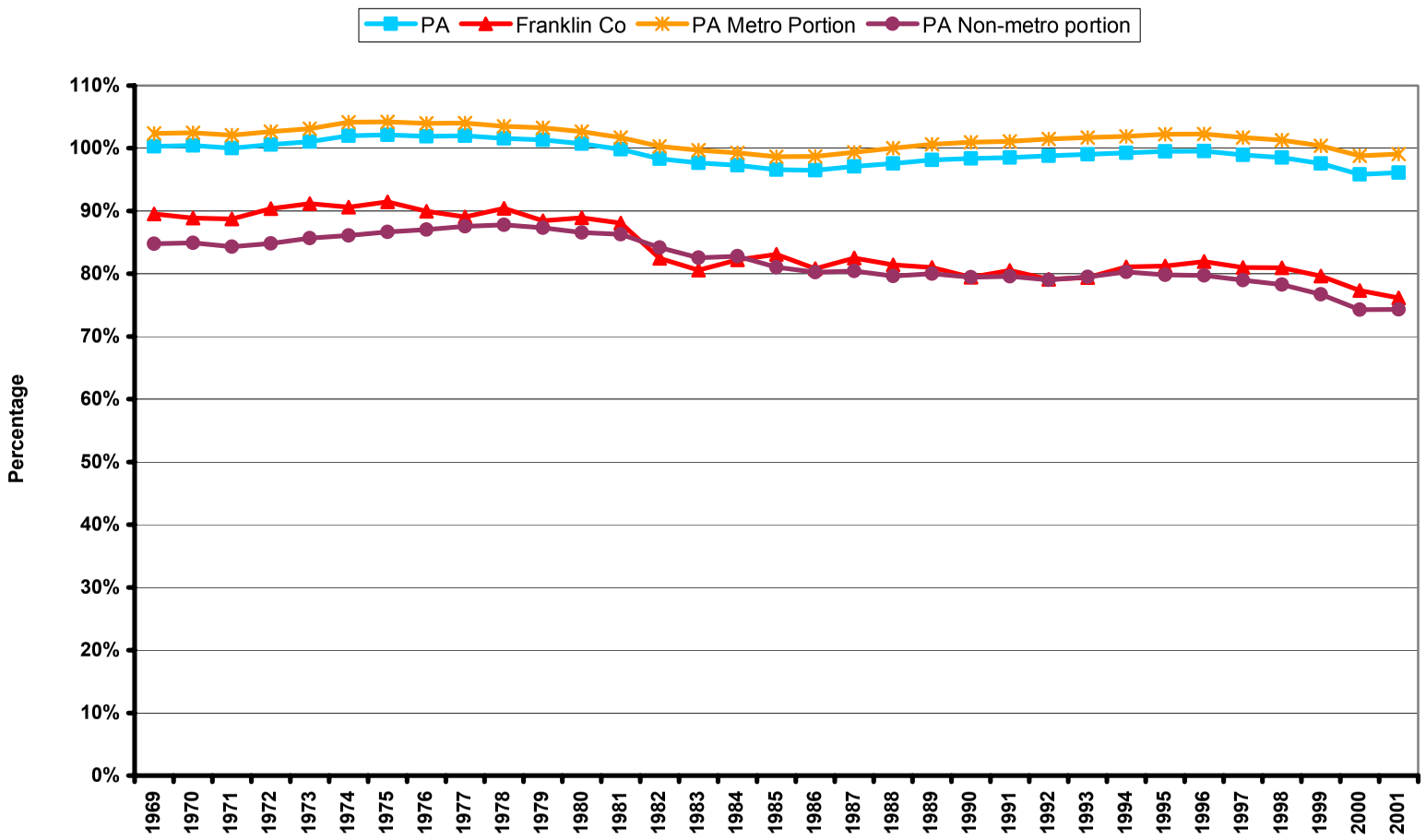
Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Figure A-14: Wages Per Job (Real): Cumulative Percentage Change, 1969-2001



Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Figure A-15: Wages Per Job (Real): Percentage of U.S.A. Average, 1969-2001



Source: Authors' calculations on data from The U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Department of Labor, Bureau of Labor Statistics

Earnings by Employment and Industrial Sector

To link earnings to specific industrial sectors, we calculated the average earnings[8] per employee by major industrial sector within Franklin County in 2000. The results are shown in Table A-9.

Table A-9
Earnings per Employee by Industrial Sector:
Frankin County, 2000

Industrial Sector	Earnings per Employee
Government - Federal, civilian	$67,180
Manufacturing	44,057
Transportation and public utilities	40,050
Government - State and local	35,123
Wholesale trade	29,618
Construction	28,960
Services	24,513
Finance, insurance, and real estate	20,567
Retail trade	17,738
Farm	16,245
Government - Military	15,961
Ag. Services, Forestry, Fishing, Mining	N/A

Note: Due to the non-disclosure of data, Ag. services, forestry, fishing and mining could not be included.

Source: Authors' calculations on data from the U.S. Department of Commerce, Bureau of Economic Analysis

The highest earnings per employee are in the Government-Federal Civilian sector at over $67,000 followed by manufacturing (about $44,000) and transportation & public utilities (about $40,00). As is often the case, jobs in the agriculture sector ($16,245), retail ($17,738) and services ($24,513) are towards the lower end of the scale.

Returning to the analysis presented above regarding employment change, it is evident that Franklin County has lost significant numbers of jobs in high wage industries such as government-federal civilian and manufacturing sectors while lower wage sectors such as services and retail have become relatively more important.

[8] According to the Bureau of Economic Analysis (2004), earnings are defined as follows: “Earnings by place of work is the sum of Wage and Salary Disbursements, supplements to wages and salaries and proprietors' income”.

Context Summary and Implications

Understanding regional context permits a more in depth understanding of the potential impacts of economic shocks. The contextual analysis presented here clearly shows that Franklin County is undergoing significant demographic and economic changes and has been doing so for some time. However, the level of divergence from national trends seems to have increased since the realignment of BRAC 1995.

While the population of the county has increased over the last several decades, the current composition of the populace is significantly older than national averages. Employment growth in the region has also been positive, but has been slower than that of the nation. Meanwhile, while unemployment rates have generally been lower than both national and Pennsylvania averages, it is important to note that this may in fact be due to less pressure for jobs due to the age of the population coupled with an increasing trend of county residents to commute to other counties for job opportunities. Relatedly, there is less employment in the county compared with population levels than in both the Commonwealth and the nation.

At the same time, employment composition, income, and wages exhibit significant trends. In particular, employment growth has been slower in Franklin County than national averages and appears to be converging with that of Pennsylvania. As the shift-share analysis shows, this is largely due to a concentration of employment in slow/negative growth sectors as well as events (such as the Base realignment in 1995) peculiar to the local area.

Franklin County has long had relatively high proportions of its employment in manufacturing and government-civilian sectors – both of which are high wage. Over time, significant losses in employment in these sectors have undermined the high wage earning slice of the community. Instead, jobs appear be increasingly concentrated in sectors – such as retail and services – with much lower earnings rates. Measured by income, residents in Franklin County are losing ground *vis a vis* the nation and the Commonwealth of Pennsylvania. While per capita income has increased, it has increased at a slower rate than either the state or nation. This is likely due to the fact that an increasing percentage of jobs are in low wage sectors. While there is some positive news in that there have also been increases in slightly higher wage jobs such as those in the wholesale and transport sectors, in terms of absolute employment in 2000, the sectors were relatively insignificant.

Particularly important is the temporal pattern of the increasing divergence of Franklin County relative to the Commonwealth and the nation. In particular, the rate of divergence has increased over the most recent years studied, particularly since the late 1990s. This has been the case with population, employment, income, and wages. The correlation of these divergences with the realignment of the Depot during the last round of BRAC is remarkable.

All of this adds up to a county that is not well-prepared to adequately cope with significant economic shocks in the short and medium-terms. An aging population, and increasing focus on lower-skill, lower wage sectors has already had a significant impact on relative income growth. The loss of additional high wage jobs, such as those in the Government-Federal Civilian Sector at Letterkenny Army Depot will have extremely negative and long-lasting effects, especially when it is recognized that a significant number of other private sector jobs related to Depot operations will also be most likely be lost. The loss of these jobs through base closure, not to mention the loss of additional positions through multiplier effects will likely cause severe harm to the local area, harm of much greater magnitude than would be the case in an urban region with more alternative employment opportunities nearby. As the next section

describes, the impacts will be felt not only in employment, but in personal income, gross regional product, population, and capital stocks as well.

B. Modeling the Economic Impact of BRAC on Franklin County

Method

To estimate the potential impacts of the closure of Letterkenny Army Depot due to BRAC 2005, we utilized a complex simulation modeling package developed by REMI, Inc. REMI Policy Insight® which is widely used and is often cited as the model-of-choice for regional analysis.

The REMI model is a hybrid construct which combines the standard input-output (I-O) analysis with an econometric model which adds a more sophisticated dynamic dimension to the analysis. The range of impacts is very comprehensive, covering both economic and demographic reactions and their interactions.

The I-O analysis traces the inter-sectoral flows of expenditure through the economy and allows the analyst to disaggregate the total economic impact of an economic "shock" such as a closure, into its sectoral components. "Shocks" of the same magnitude might cause quite different sectoral and regional impacts. The loss of a facility highly integrated into the regional economy with significant demand and supply linkages would be quite different from the closure of a stand-alone, enclavistic facility lacking economic links to the region, e.g. tourist hotels owned and operated by people from outside the area.

What distinguishes REMI from most other regional models, e.g. RIMSII and IMPLAN, is that it incorporates labor market and demographic feedback mechanisms which induce changes in wages and migration. Those changes eventually alter the regional economy as it makes long-run adjustments to the initial "shock". The advantage of the REMI is that is goes beyond the short-run immediate impact and gives annual data for variables from 2005 to 2020. Though the model has the capacity to project to 2035, the shorter simulation of only fifteen years was considered sufficient for planning purposes.

These long-run or dynamic changes have the potential to either exacerbate or mitigate the initial economic impact. For example, while a base closure might cause the loss of jobs, income, and contracts, a subsequent change might be a reduced average regional wage rate which might attract some additional employers to the area. This would be a simple example of an equilibrium adjustment in the labor market which will partially, in time, offset the initial loss jobs.

The results of the REMI analysis should be read in light of the important demographic and economic characteristics of Franklin County described in the previous section, as this enables us to better appreciate how the base closure will intensify some adverse trends within the county. In particular, REMI's projections on income and migration of trained personnel should alarm us about negative movements in the area which threaten reduced average quality of employment opportunity and lowered levels of trained personnel in their most productive years. Even though employment levels might be acceptable, and unemployment rates low, the quality of job and income prospects might further deteriorate.

Data Considerations

Data for the development of the economic impact models were provided both by Letterkenny Army Depot and by REMI. Data from the Depot included information on employees, contracts awarded, numbers of dependents (to assist with estimation of migration and population change), and base visitation. REMI data were provided in a county-specific data set based upon 2000 data.[9] As mentioned previously, the economic region of interest in this study is Franklin County.

The economic impacts of BRAC will include direct, indirect, and induced effects. Conceptually for the purpose of these estimations, direct effects will include the direct loss of 947 federal-civilian jobs at the Depot held by Franklin County residents. This figure, a subset of the approximately 1300 total jobs at the Depot was determined utilizing payroll data provided by the base and matching Zip codes to county boundaries. In cases where Zip codes spanned multiple counties, we adjusted the figures by using a database that indicates the percentage of all residences in a Zip code in each county that includes that particular Zip code (MelissaData 2004). According to data provided by the Depot, the total salaries for these employees is $59.6M, $43.6M of which goes to employees living in Franklin County.

Indirect effects include a number of items. First, Depot representatives indicated that there would be an immediate loss of a number of private sector jobs in related industries.[10] Second, the loss of base operations would eliminate about $5.4M in contracts awarded to county businesses (using FY03 data provided by the Depot)[11]. This is roughly 10.2% of the of the approximately $53.9M in total contracts awarded by the base in FY03. Finally, based on the estimation of Depot officials, we calculated that there would be an annual loss of almost $741,000 to hotels and restaurants. This figure was derived by multiplying one month of data on reported base visits (provided by Depot officials) times the standard government per diem rate for the area (65% of the per diem was assumed to go to accommodation and the remainder to meals) times 12 months.

The third set of effects are induced. Induced effects capture the additional economic losses that will be felt as a result of reduced regional consumption (largely due to the loss of jobs and salaries), mainly by households and families.

While closure would not occur instantaneously, this study assumes that closure occurs in 2005 and causes the immediate cessation of all base payroll and contract expenditure.

Estimated Impacts of Closure

The impacts of a BRAC closure of Letterkenny Army Depot are made by comparing a baseline scenario for Franklin County's economy under an assumption of no closure in

[9] REMI 2000 data were utilized as the baseline or starting point for the estimations as they were the last year of data fully available and tested from REMI.

[10] Note that some might consider these losses direct effects as well (as does the REMI model in its calculations). Conceptually, however, we separate them from the losses of employment at the Depot itself. Although the figures for this closely related private employment are only estimations, for privacy reasons, we do not specify these employment losses either in number or by industry. Instead, when reported, they are combined with the direct and induced effects.

[11] For the purpose of developing the economic models, these contracts awarded to the local region had to be specified by industry. Because these data were not available, we utilized the breakdown employed by REMI in previous studies.

comparison with the case of the Depot being closed completely. The REMI model allows a direct comparison of policy impacts relative to a forecast of assumed growth in the region based upon past growth relative to national trends. As described previously, the impacts are estimated for the period 2005-2020.

Employment Impacts

The loss of employment in Franklin County due to closure combines the direct loss of jobs on the Depot, the indirect loss of jobs previously related to base contracts and various industry interactions and the induced loss of positions due to the decline in regional demand and consumption levels. Table B-1 gives the total estimated employment changes from 2005 to 2020.

TABLE B-1
Total Employment: Baseline vs. BRAC, 2005-2020

Scenario	2005	2010	2015	2020
Baseline	66,303	70,621	74,206	78,239
BRAC	64,042	68,495	72,147	76,193
DIFFERENCE	**-2,261**	**-2,126**	**-2,059**	**-2,046**

Source: REMI

As the table shows, a loss of about 2,261 jobs is expected due to closure. This figure exceeds the direct impact of the 947 jobs that will be lost at the Depot itself due to indirect and induced effects.

The partial recovery or reduced job loss relative to the baseline over time is explained by labor market adjustments pushing regional wages to relatively lower levels compared to national averages. However, it can be seen that the recovery over time is estimated to be minimal.

Table B-2 presents the estimated sectoral distribution of these employment losses. The uneven impact of these estimations is due both to some sectors having more significant linkages to Depot activity as well as the importance of the loss of regional consumption (e.g., in services and retail) due to the loss of wages.

Gross Regional Product Impacts

The results in Tables B-3 and B-4 show both the total impact on gross regional product (GRP) and its sectoral distribution from 2005 to 2020, expressed in millions of 1996 dollars. GRP includes primarily compensation to employees and profits. GRP falls because of the three-fold impact of closure:

- the direct loss of base payroll and contracts;
- the indirect loss of demand for intermediate goods based upon base expenditures, resulting in additional losses in compensation and profits;
- the induced loss of output due to regional expenditure reductions which are caused by the initial changes of income and related expenditure by households.

In 2005, there will be a loss of approximately $140M in gross regional product due to BRAC closure. Over time this figure increases, likely due to underutilized non-residential capital stock and the migration of working age individuals relative to baseline forecasts.

TABLE B-2
Estimated Employment Impacts Due to BRAC
by Major Economic Sector, 2005-2020*

Employment Sector	2005	2010	2015	2020
Private Non-Farm	-1259	-1089	-1003	-982
Government	-1002	-1037	-1056	-1064
TOTAL	**-2,261**	**-2,126**	**-2,059**	**-2,046**

Employment Sector	2005	2010	2015	2020
Farm	0	0	0	0
Manufacturing	-27	-6	4	5
Mining	0	0	0	0
Construction	-140	-99	-75	-62
Trans.& Public Util.	-7	-4	-3	-4
FIRE	-29	-14	-8	-6
Retail Trade	-275	-235	-214	-206
Wholesale Trade	-201	-196	-191	-187
Services	-568	-526	-508	-512
Ag. Srvc., Fish, Forestry	-12	-9	-8	-9
Government	-1002	-1037	-1056	-1064
TOTAL**	**-2,261**	**-2,125**	**-2,059**	**-2,046**

* Change in comparison with baseline (no-closure) scenario
** Totals may not match due to rounding
Source: REMI

TABLE B-3
Gross Regional Product: Baseline vs. BRAC, 2005-2020
(Millions of 1996 Dollars)

Scenario	2005	2010	2015	2020
Baseline	$4,490.98	$5,829.13	$7,194.04	$8,970.10
BRAC	4,350.28	5,689.99	7,050.86	8,817.88
DIFFERENCE	**-$140.70**	**-$139.14**	**-$143.18**	**-$152.22**

Source: REMI

TABLE B-4
Estimated Impacts to Gross Regional Product* Due to BRAC
by Major Economic Sector, 2005-2020 (Constant 1996 dollars)**

Economic Sector	2005	2010	2015	2020
Farm	$0	$0	$0	$0
Manufacturing	-3,565,100	-609,200	1,696,500	2,338,700
Mining	-1,418	4,282	7,007	7,598
Construction	-6,402,000	-4,952,000	-4,071,000	-3,622,000
Trans.& Public Util.	-1,119,000	-1,070,000	-1,073,000	-1,153,000
FIRE	-4,612,000	-2,482,000	-1,341,000	-937,700
Retail Trade	-8,683,000	-8,320,000	-8,476,000	-9,020,000
Wholesale Trade	-21,220,000	-25,070,000	-29,000,000	-33,690,000
Services	-25,760,000	-26,520,000	-27,450,000	-29,210,000
Ag. Srvc., Fish, Forestry	-210,000	-172,500	-158,300	-167,400
Government	-69,120,000	-69,940,000	-73,320,000	-76,760,000
TOTAL	**-$140,692,518**	**-$139,131,418**	**-$143,185,793**	**-$152,213,802**

*Gross Regional Product = Compensation + Profits
** Change in comparison with baseline (no-closure) scenario
Source: REMI

Personal Income Impacts

One of the most important impacts to Franklin County of a closure of Letterkenny Army Depot would be reductions in consumption due to the loss of income. Again, while the direct losses of income by Depot workers would be felt, the implications of indirect and induced effects compound the issue.

As Table B-5 shows, estimated personal income losses in 2005 would total about $81.6M in the county. It should be recalled that the estimated total salaries to Depot employees residing in Franklin County were only about $43.6M. The model results, therefore imply a significant additional loss of personal income through indirect and induced effects. Although not all income earned by county residents is spent locally, some is. This reduction in personal income at a county level will serve to reduce consumption, hurting local businesses and profits, and ultimately reducing employment opportunities.

TABLE B-5
Personal Income: Baseline vs. BRAC, 2005-2020
(Millions of 1996 Dollars)

Scenario	2005	2010	2015	2020
Baseline	$3,458.75	$4,047.54	$4,623.55	$5,274.94
BRAC	3,377.13	3,954.87	4,519.94	5,160.57
DIFFERENCE	**-$81.62**	**-$92.67**	**-$103.61**	**-$114.37**

Source: REMI

Demographic Impacts

The REMI model assumes that people will respond to changing labor market conditions by migrating out of areas with falling labor demand due to relatively suppressed wage levels and employment opportunities. This will have effects both on total population and the labor force.

While people of retirement age are less likely to move due to a base closure, it's the working age cohorts and their dependents who will be affected. The model does not predict that all job losers will immediately leave the area due to locational preferences and the willingness of some to accept lower wage positions.

Tables B-6 through B-9 show the estimated changes in total population and labor force within the county due to BRAC both in total and by age cohort. Note that the changes, as always, are shown relative to the baseline scenario. These population changes combine workers' locational shift and their dependents' movement as well.

The estimated changes in the labor force due are smaller than the figures for population, since not everyone is a member of the labor force. In combination, however, these estimated indicate that BRAC will contribute to the further "graying" of the county's population. BRAC, in other words, will exacerbate the worrisome demographic shift that has been occurring over time (discussed in Section A).

TABLE B-6
Total Population: Baseline vs. BRAC, 2005-2020

Scenario	2005	2010	2015	2020
Baseline	131,969	135,511	140,908	148,248
BRAC	130,935	133,665	138,577	145,668
DIFFERENCE	**-1,034**	**-1,846**	**-2,331**	**-2,580**

Source: REMI

TABLE B-7
Total Labor Force: Baseline vs. BRAC, 2005-2020

Scenario	2005	2010	2015	2020
Baseline	70,336	73,166	75,532	77,832
BRAC	69,793	72,307	74,521	76,689
DIFFERENCE	**-543**	**-859**	**-1,011**	**-1,143**

Source: REMI

TABLE B-8
Estimated Impacts on Population Due to BRAC:
Total & by Age Cohort, 2005-2020*

	2005	2010	2015	2020
Total Population Difference	-1035	-1846	-2331	-2580

Population Difference by Age Cohort	**2005**	**2010**	**2015**	**2020**
Ages 0- 4	-195	-215	-218	-196
Ages 5- 9	-84	-279	-254	-230
Ages 10- 14	-73	-135	-303	-260
Ages 15- 19	-93	-127	-160	-309
Ages 20- 24	-129	-159	-150	-153
Ages 25- 29	-153	-230	-209	-169
Ages 30- 34	-105	-224	-254	-203
Ages 35- 39	-68	-169	-266	-279
Ages 40- 44	-43	-104	-185	-269
Ages 45- 49	-30	-67	-114	-188
Ages 50- 54	-24	-47	-74	-115
Ages 55- 59	-21	-38	-52	-74
Ages 60- 64	-17	-32	-42	-52
Ages 65- 69	0	-20	-32	-40
Ages 70- 74	0	0	-18	-29
Ages 75- 79	0	0	0	-16
Ages 80- 84	0	0	0	0
85 and over	0	0	0	0

* Deviations in comparison with baseline (no-closure) scenario
Source: REMI

TABLE B-9
Estimated Impacts to the Labor Force Due to BRAC:
Total & by Age Cohort, 2005-2020*

	2005	2010	2015	2020
Total Labor Force Difference	-543	-860	-1011	-1142

Labor Force Difference by Age Cohort	2005	2010	2015	2020
Ages 0- 4	0	0	0	0
Ages 5- 9	0	0	0	0
Ages 10- 14	0	0	0	0
Ages 15- 19	-49	-44	-49	-109
Ages 20- 24	-107	-124	-110	-111
Ages 25- 29	-138	-206	-183	-145
Ages 30- 34	-94	-197	-223	-172
Ages 35- 39	-61	-145	-229	-240
Ages 40- 44	-38	-84	-152	-226
Ages 45- 49	-25	-48	-82	-144
Ages 50- 54	-18	-24	-36	-66
Ages 55- 59	-12	-12	-5	-12
Ages 60- 64	-4	4	21	31
Ages 65- 69	3	12	22	29
Ages 70- 74	1	5	9	14
Ages 75- 79	0	1	3	4
Ages 80- 84	0	1	2	3
85 and over	0	1	2	3

* Deviations in comparison with baseline (no-closure) scenario
Source: REMI

Capital Stock Impacts

Both residential and non-residential capital stocks are estimated by REMI to decline below the forecasted baseline scenario values. Values are expected to fall because of lowered levels of income and business activity. Residential values would be impacted by reduced demand due to the loss of income and employment. Similarly, non-residential capital stocks will be less highly valued because the loss of revenue, upon which its value depends. Closure of the base will reduce the profitability of some county businesses and cause a subsequent reduction in the value of their business capital.

Tables B-10 — B-12 report the changes in capital stock from 2005 to 2020, in millions of 1996 dollars. Property values within the REMI model do not adjust instantaneously, but the impact grows as there are further impacts on personal income, GRP, and the demographics of the county.

TABLE B-10
Capital Stock -- Residential: Baseline vs. BRAC, 2005-2020*
(Millions of 1996 Dollars)

Scenario	2005	2010	2015	2020
Baseline	$4,401.50	$4,879.11	$5,431.33	$6,050.90
BRAC	4,388.66	4,817.45	5,337.15	5,933.55
DIFFERENCE	**-$12.84**	**-$61.65**	**-$94.18**	**-$117.36**

* Deviations in comparison with baseline (no-closure) scenario

Source: REMI

TABLE B-11
Capital Stock -- Non-Residential: Baseline vs. BRAC, 2005-2020*
(Millions of 1996 Dollars)

Scenario	2005	2010	2015	2020
Baseline	$2,587.99	$2,751.63	$2,980.42	$3,279.52
BRAC	2,583.87	2,732.72	2,954.03	3,249.68
DIFFERENCE	**-$4.13**	**-$18.92**	**-$26.40**	**-$29.85**

* Deviations in comparison with baseline (no-closure) scenario

Source: REMI

TABLE B-12
Estimated Impacts to Capital Stocks Due to BRAC:
Residential & Non-Residential, 2005-2020* (Constant 1996 dollars)

Components of Capital Stock	2005	2010	2015	2020
Residential Capital Stock	-$12,840,000	-$61,650,000	-$94,180,000	-$117,400,000
Non-Residential Capital Stock	-4,125,000	-18,920,000	-26,400,000	-29,850,000
TOTAL	**-$16,965,000**	**-$80,570,000**	**-$120,580,000**	**-$147,250,000**

* Deviations in comparison with baseline (no-closure) scenario

Source: REMI

As the tables show, there will be significant reductions in the value of both residential and non-residential capital stock in the county. Combined, these losses will total almost $17M in 2005 and will increase over time — with reduced residential capital stock comprising the lion's share of the deviation.

Other Impacts

While the economic impacts of salaries, contracts, etc. are conceptually obvious, there are other potential impacts which are not. First, LEAD surely acts as a training ground for employees. While they may not spend their entire career at the Depot, the skills that they develop there surely contribute to the overall skill set in the community.

Second, the Depot provides hundreds of emergency ambulance and fire responses to the community, along with the hundreds of person hours that go along with these services. The loss of the Depot will either result in a reduction of such services, or, require that they be provided (and funded) elsewhere.

Third, as mentioned earlier in this report, LEAD, and its employees are part of a community. As such, one-time and recurring charitable contributions of money, time, services and the like will be greatly reduced. While estimating the "impacts" of the loss of these contributions – to organizations such as The American Red Cross and United Way – is beyond the scope of the present study, such losses will be significant, both to the organizations that receive such assistance and the people that ultimately benefit from it.

C. CONCLUSIONS

If Letterkenny Army Depot is closed by BRAC05 there will be a wide array of economic impacts on Franklin County. The county is already facing increases in the concentration of employment in lower wage paying sectors and unfavorable income trends. The estimations of the effects of BRAC on Franklin County, should LEAD be closed in 2005, show a serious deterioration of many aspects of the local economy. This includes not only consequences to personal income and gross regional product, but on demographic trends as well, as the county is predicted to lose significant numbers of working-aged persons. Per capita income and wages per job are likely to under perform national averages as the employment base loses some of its most remunerative, federal civilian employment opportunities.

If one looks only at recent unemployment rates which are very low, one might be sanguine about the economic future of Franklin County in the absence of LEAD. However, allowing for the quality of jobs that would be lost and the income or wage differentials, and the additional multiplier impacts of expected expenditure reduction, the importance of the Depot as a significant, relatively high-wage, anchor for the regional economy becomes compelling. If closure does occur, the past realignment effort will acquire greater significance, and ongoing redevelopment efforts will warrant a greater commitment of resources.

D. LIST OF SOURCES

Barff, R., and P. Knight III. 1988. "Dynamic Shift-Share Analysis." *Growth and Change* 19(2): 1-10.

Glasmeier, A. et al. (2001). Ford Foundation Community Based Forestry Economic Base Assessments. Available at: http://www.onenation.psu.edu/projects/ford_eba/.

Loveridge, S. 1995. "A Practical Approach to Shift-Share Analysis. *Journal of the Community Development Society* 26(1): 110-124.

MelissaData. 2004. "Zip Codes in the county of FRANKLIN, PENNSYLVANIA." Available at: http://melissadata.com.

U.S. Census Bureau. (2004). Journey to Work and Place of Work." Available at: http://www.census.gov/population/www/socdemo/journey.html.

U.S. Department of Commerce, Bureau of Economic Analysis. 2004. "Regional Economic Accounts: Local Area Personal Income". Available at: http://www.bea.gov/bea/regional/reis/default.cfm.

U.S. Department of Commerce, Bureau of Economic Analysis. 2004. "Alternative Measures of Household Income". Available at: http://www.bea.gov/bea/regional/articles/spi2001/household_income.cfm

U.S. Department of Labor, Bureau of Labor Statistics. 2004. "Consumer Price Index, All Urban Consumers - (CPI-U) U.S. City Average, All items." Available at: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

U.S. Department of Labor, Bureau of Labor Statistics. 2004. "Labor Force Characteristics of the Current Population Survey". Available at: http://www.bls.gov/cps/home.htm.

U.S. Department of Labor, Bureau of Labor Statistics. 2004. "Local Area Unemployment Statistics". Available at: http://www.bls.gov/lau/.

U.S. General Accounting Office. 2002. "Military Base Closures: Progress in Completing Actions from Prior Realignments and Closures". Report No.: GAO-02-433. Available at: http://www.gao.gov/.

Warnement, J. 2003/2004. Personal communications. Although not specifically cited in the report, much of the data and information obtained from the base was arranged for, collected by, and organized by Jerry Warnement.