Third District Banking Markets 2003 Revision

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Summary of Changes in Market Definitions

1. The Philadelphia market is changed by subtracting the southwestern part of Mercer County, New Jersey, and adding all of Cumberland County, New Jersey. Cumberland County was formerly the Vineland market, which has been eliminated (page 15).

2. The Metropolitan New York/New Jersey market is changed by adding the remaining half of Mercer County, New Jersey (formerly part of the Philadelphia market), and by adding Monroe County, Pennsylvania. Monroe County was formerly its own market (page 32).

3. The Scranton/Wilkes-Barre market has been reduced by subtracting the southern half of Susquehanna County, Pennsylvania and all of Columbia County, Pennsylvania (page 19).

4. The southern half of Susquehanna County, Pennsylvania has been added to the Binghamton market (page 22).

5. Columbia County, Pennsylvania has been added to the Susquehanna Valley market (page 23).

6. Bradford and Sullivan counties in Pennsylvania have been combined into one market (page 29).

7. The Hagerstown/Chambersburg market has been merged into the new Washington/Baltimore market (page 38).

Introduction

The federal laws governing bank mergers and bank holding company acquisitions require that the acquiring institution's primary regulator do a competitive analysis on the transaction. Before that analysis can be done, two things must be defined: the product market and the geographic market. In their analysis of these markets, federal regulators are bound by the 1963 Supreme Court decision in *U.S. v. Philadelphia National Bank,* which defined the product market as the "cluster" of banking products and services and the geographic market as a local area.[1] However, the decision did not set specific standards for defining local geographic markets, thereby leaving that task up to the regulatory agencies.

A geographic market can be defined as the largest area over which supply and demand factors interact to determine prices and quantities of bank products and services. For example, three banks may have branches in three separate areas. As long as a sufficient number of customers have access to these branches, they are competitors. A geographic market is often confused with a service area, which can be defined as the area from which a particular bank draws the large majority of its customers. This distinction is important. A large banking organization's service area may cover many markets. Conversely, a major metropolitan area market may encompass the service areas of many small banks, and it is not necessary for these service areas to overlap in order for them to be in the same market.

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[1] *United States v. Philadelphia National Bank* (374 U.S. 321) decided June 21, 1963. The court held that banking was a "unique line of commerce" represented by the cluster. The cluster consists of: unsecured personal and business loans, loans secured by securities and accounts receivable, automobile and consumer goods installment loans, tuition financing, bank credit cards, revolving credit funds, demand deposits, time and savings deposits, estate and trust planning, trusteeship services, lock boxes, safety deposit boxes, account reconcilement services, correspondent services, and investment advice.

There is a fairly diverse opinion as to how banking markets should be defined.[2] The methodology used by the Federal Reserve Bank of Philadelphia was first developed in 1995, and it has undergone several refinements since then.[3]   This paper will use our methodology to redefine Third District banking markets using 2000 Census data.

Theoretical Background

In defining geographic markets, the Federal Reserve Bank of Philadelphia begins with two pieces of economic theory. First is the concept of marginal consumers. This should not be confused with the average consumer, who may not be sensitive, or even aware of, the relative price of a good or service among alternative suppliers. However, if a sufficient number of consumers are aware of the relative prices and have the ability to make their purchases accordingly, any firm attempting to raise prices will see its volume diminish. In economic terms, marginal consumers have relatively high cross-price elasticities of demand.

Consider the following example. A study was done in the 1970s of gasoline purchases in a large metropolitan area.[4] Customers were asked what price per gallon they had just paid. The large majority of those customers had only a vague notion of the approximate price and were not aware if lower priced alternatives were available. However, those stations with the lowest prices did sell more gasoline. This was because a sufficient number of consumers were aware of the relative prices and made their purchases accordingly.

The concept of marginal consumers is also recognized in the Department of Justice

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[2] For a summary of the methodologies of used by Federal Reserve Banks, see DiSalvo (1999).

[3] See DiSalvo (1995).

[4] Miller (1978), pp. 8-10.

(DOJ) Merger guidelines with the following passage:

> In defining the geographic market or markets affected by a merger, the Agency will begin with the location of each merging firm (or plant of a multiplant firm) and ask what would happen if a hypothetical monopolist imposed at least a "small but significant and nontransitory" price increase, but the terms of sale at all other locations remained constant. If, in response to the price increase, the reduction in sales of the product at that location would be large enough that a hypothetical monopolist producing or selling the relevant product at the merging firm's location would not find it profitable to impose such and increase in price, then the Agency will add the location from which production is the next-best substitute for production at the merging firm's location.
>
> In considering the likely reaction of buyers to a price increase, the Agency will take into account all relevant evidence, including, but not limited to:
> (1) evidence that buyers have shifted or have considered shifting purchases between geographic locations in response to relative changes in price or other competitive variables;
> (2) evidence that sellers base business decisions on the prospect of buyer substitution between geographic locations in response to relative changes in price or other competitive variables;
> (3) the influence of downstream competition faced by buyers in their output markets; and
> (4) the timing and costs of switching suppliers.[5]

Thus, if a sufficient number of consumers have the opportunity to switch providers in response to a price increase, the DOJ will include the location of any feasible alternative provider in the geographic market.

A second concept used to determine banking markets is known as transitivity. That is, the pricing decisions of firms in one area might be affected by the pricing decisions of firms in another (noncontiguous) area if both areas are sufficiently integrated with a third area.[6] Thus, if firms in county A compete with firms in county B, and firms in county B compete with firms in county C, then firms in counties A and C are competitors as well. Competitive forces would link the three areas, indicating that all of them should be considered one market, even though counties A and C have no direct link. Many of the firms in A and C may not be competing for the same customer base, yet they will each base their pricing decisions on what all other firms in the market are doing.

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[5] Department of Justice, *Horizontal Merger Guidelines,* 1997, Section 1.11.

[6] For and example of transitivity in banking markets, see Tannenwald (1994).

This theory can be illustrated using Hotelling's theory of spacial competition. The basic theory is as follows.[7] Two firms (shops 1 and 2) selling identical products and facing identical cost functions are located at points 0 and 1 (for simplicity, it is assumed that their costs of production are zero, but eliminating this assumption merely complicates the math without changing the conclusion). N consumers are uniformly distributed between the two shops. Assume that they have the same utility functions and derive utility S from the goods being sold. These consumers also face transportation costs in getting to the shops, where t represents the distance traveled. It should be noted that t represents all economic costs to the consumer other than price, including search and opportunity costs. Thus, a consumer located at point x would face transportation costs of tx if he went to shop 1 and $t(1-x)$ if he went to shop 2. The consumer will choose the shop that maximizes his utility. Therefore, the consumer's choice between purchasing at shop 1 or 2 is determined by the prices (p_1 and p_2) each shop charges and by the consumer's transportation cost to each shop. For a consumer located at point x, his total cost of shopping at each shop and the utility he derives from each shop are as follows:

If purchases made at	Consumer x's cost	Consumer x's utility
Shop 1	$p_1 + tx$	$S - p_1 - tx$
Shop 2	$p_2 + t(1-x)$	$S - p_2 - t(1-x)$

This is graphically illustrated in Figure 1.

Consumers located at point x^* get the same utility whether they shop at shop 1 or shop 2, so they will be indifferent between the two shops – these are marginal consumers. Note that if t

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[7] See Tirol (1988). The original model is in Hotelling (1928). The author is grateful to Loretta Mester for her assistance in writing this section.

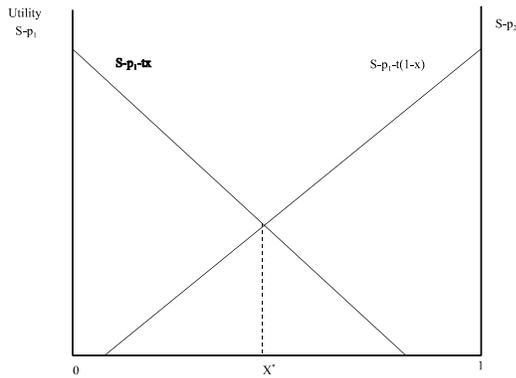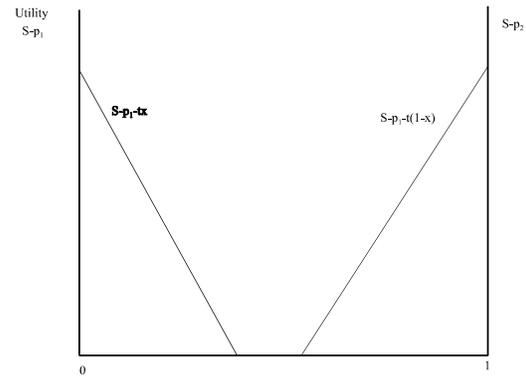*Figure 1*   *Figure 2*

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suffi

ciently high, there will be no marginal consumers (as shown in Figure 2). In this case, the

two

shops are not competing for the same customers; each is a local monopolist.

In order to demonstrate how transitivity works, the model need only be extended to three

shops. Assume that shop 1 is located at 0, shop 2 at 0.5, and shop 3 at 1.   Let x refer to a

consumer located between shops 1 and 2 and y refer to a consumer located between shops 2 and

3. A consumer can shop at any of the three shops and the cost of shopping at each and the utility

he derives from each are as follows:

If purchases made at:	Consumer x's Cost	Consumer x's Utility	Consumer y's Cost	Consumer y's Utility
Shop 1	p_1+tx	$S-p_1-tx$	p_1+ty	$S-p_1-ty$
Shop 2	$p_2+t(0.5-x)$	$S-p_2-t(0.5-x)$	$p_2+t(y-0.5)$	$S-p_2-t(y-0.5)$
Shop 3	$p_3+t(1-x)$	$S-p_3-t(1-x)$	$p_3+t(1-y)$	$S-p_3-t(1-y)$

Again, each consumer will select the shop that yields him the highest utility. The

marginal consumer x^* is indifferent between shops 1 and 2, and the marginal consumer y^* is

indifferent between shops 2 and 3.[8] Thus, x^* and y^* solve to the following:

$$S-p_1-tx^*=S-p_2-tx^*$$
$$S-p_2-t(y^*-0.5)=S-p_3-t(1-y^*)$$

that is, $x^*=(p_2-p_1+0.5t)/2t$ and $y^*=(p_3-p_2+1.5t)/2t$. Figure 3 illustrates the case where x^* and y^*

exist:

Assume that x^* and y^* exist. Since the consumers are uniformly distributed throughout

the area, x^* is the market share of shop 1, y^*-x^* is the market share of shop 2, and $1-y^*$ is the

market share of shop 3. Given N total consumers, demand at shop 1 is Nx^*, demand at shop 2 is

$N(y^*-x^*)$, and demand at shop 3 is $N(1-y^*)$. Since we assumed that the shops' production costs

are zero, the profit functions for the three shops are as follows:

$$\Pi_1=p_1 \, Nx^* \qquad =p_1N(p_2-p_1+0.5t)/2t$$
$$\Pi_2=p_2 \, N(y^*-x^*) =p_2N(p_3-2p_2+t)/2t$$
$$\Pi_3=p_3 \, N(1-y^*) =p_3N(p_2-p_3+0.5t)/2t$$

If we assume that the shops are Bertrand competitors, each shop would choose its price to

maximize its profit, taking the other shops' prices as given. This would yield the following

reaction functions:

$$p_1=(2p_2+t)/4$$
$$p_2=(p_1+p_3+t)/4$$
$$p_3=(3t-2p_2)/4$$

Equilibrium prices are found by solving for the fixed point $p_1=p_2=p_3=0.5t$, but the

important thing to note is that each shop's profit-maximizing price is dependent on the prices of

the other two, because of the interaction between shop 2 and each of the other two shops. That

is, shop 1's and shop 3's prices are interdependent because they are both related to shop 2's price.

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[8] In order for x^* and y^* to exist, $p_2-p_3<0.5t$ and $p_2-p_1<0.5t$

Therefore, if it can be demonstrated that transportation costs between shops 1 and 2 and between shops 2 and 3 are sufficiently low that there are marginal consumers, shops 1 and 3 are competitors. There need not be any direct transportation between shops 1 and 3; in fact, they need have no customers in common whatsoever.

In summary, the economic theory behind defining geographic markets relies on two points: (1) marginal, not average, consumers determine the boundaries; and (2) transitivity throughout the market.

Figure 3
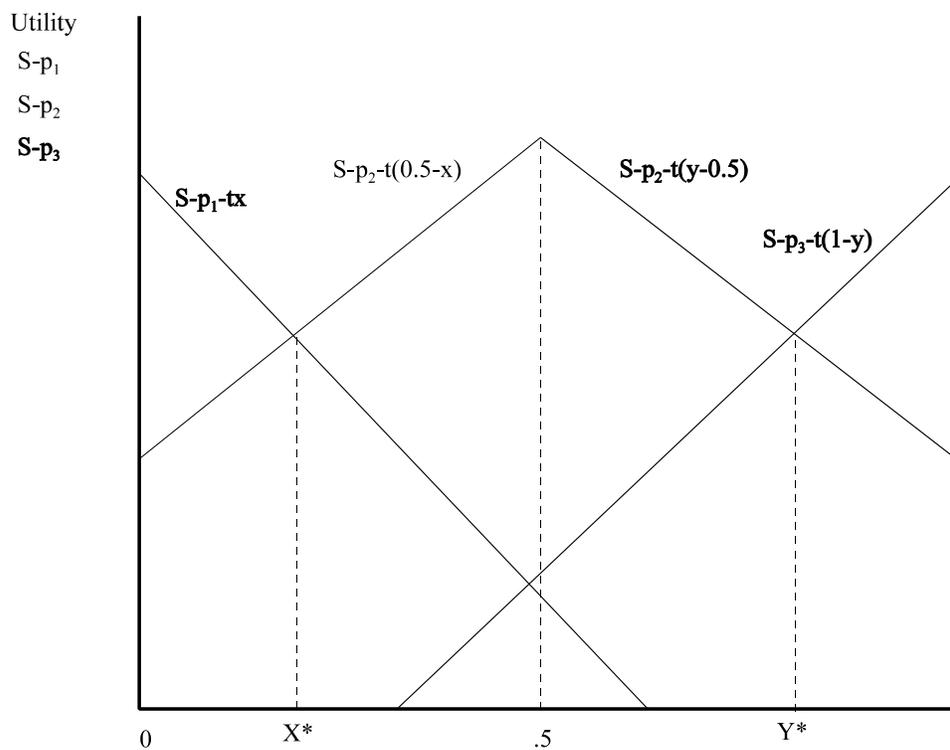
Standardized Urban Areas

Most Federal Reserve Banks begin defining banking markets with some form of standardized area. For urban areas, there are two types: Ranally Metro Areas (RMAs), defined by the Rand McNally Corporation, and Core-Based Statistical Areas (CBSAs), defined by the Office of Management and Budget. The major difference between these two methods is that CBSAs use whole counties (except in New England), whereas RMAs do not. This section will review each of these areas.

RMAs: RMAs use commuting and population density data at the subcounty level. The criteria for delineating an RMA are as follows:[9]

> 1. An urbanized area with a population of at least 50,000.
>
> 2. A population density of at least 70 per square mile.
>
> 3. Commutation of at least 20 percent of the labor force to the central urban area.

CBSAs: CBSAs are defined decennially by the Office of Management and Budget (OMB) using census commuting and population data. For the 2000 census, OMB chose to define two types of CBSAs: Metropolitan Statistical Areas (MeSAs) and Micropolitan Statistical Areas (MiSAs). The major difference between these two is the size of the urbanized core. An MeSA requires an urbanized area (as defined by the Census Bureau) with a population of at least 50,000, while and MiSA requires a Census-defined urban cluster with a population of at least 10,000.[10] Each begins with a central county or counties, which are defined as having one of the following

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[9] Source: *Rand McNally Commercial Atlas and Marketing Guide*, 2002 edition.

[10] See 65 *Federal Register*, pp. 51060-77 (August 27, 1999) and 65 *Federal Register,* pp. 82228-38 (December 27,2000) for the full discussion of how the definition of CBSAs was arrived at. Refer to the Bureau of Census website at http://www.census.gov for a definition of the terms "urbanized area" and "urban cluster."

characteristics:

    1. At least 50 percent of their population in urban areas of at least 10,000 population.

    2. A total population of at least 10,000 with at least 5,000 located in a single urban area.

Once the central county or counties are identified, one or more outlying counties can be included in the CBSA if they meet either of the following requirements:

    1. At least 25 percent of the employed resident in the outlying county work in the central county or counties.

    2. At least 25 percent of the employment in the outlying county is accounted for by workers who reside in the central county or counties.

Two adjacent CBSAs can be combined if the central county or counties of one CBSA qualify (as a group) as outlying counties to an adjacent CBSA using the commuting requirements listed above. Finally, MeSAs can be combined into larger areas, called Combined Statistical Areas, if the employment interchange between the two areas is at least 25 percent. Figure 1 on the following page shows MeSAs and MiSAs for the Third District and vicinity as defined by the OMB in 2003.

Because they don't rely on political boundaries, RMAs may be a more accurate indicator of the actual degree of integration in an area. This is especially true in western states, where counties tend to be rather large and are defined by latitude and longitude rather than natural boundaries. However, the Federal Reserve Bank of Philadelphia generally prefers to use whole counties rather than RMA boundaries for several reasons.

Legend

Micropolitan Statistical Area

Metropolitan Statistical Areas

In the Third District and its vicinity, most counties follow natural borders, with the border being defined in many cases by rivers, streams, and mountains. Second, where CBSAs are delineated decenially, RMAs are done on a more haphazard basis. Some RMAs may have been done using recent population and commuting data, but others may have been drawn using data from the 1990 or even 1980 census. Third, the non-RMA portions of urban counties are generally sparsely populated, with few banking facilities. Thus, their inclusion or exclusion from a particular market generally has an insignificant impact on that market's structure.

FRB of Philadelphia Methodology

The methodology used define markets is not substantially different from the methodology used to define CBSAs. We begin with whole counties. We look for central or core counties and outlying counties based on whether they are net labor importers or exporters. A net labor importer is defined as a county whose ratio of establishment employment to resident employment is at least 110 percent.[11] A net labor exporter is defined as a county whose ratio of establishment employment to resident employment is no more than 80 percent. Although it need not be true, each of these types of counties are likely to be linked to neighboring counties. Figure 2 shows counties that are net labor importers and exporters.

Next, Census Journey-to-Work data is examined to see if there are links between neighboring counties or areas. The idea behind using commuting data is that bank customers are likely to use banks located either near their residence or their place of work.[12] Commuters have

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[11] Establishment employment is the number of people who work in a particular county, regardless of where they live. Resident employment is the number of workers who live in a particular county, regardless of where they work.

[12] See Elliehousen and Wolken (1995).

a ready-made choice of banking locations, and are therefore more likely to be marginal

consumers than noncommuters. Thus, counties or groups of counties will be combined into a

single market if they, in aggregate, meet any of the following criteria:

> 1. At least 15 percent of resident workers in County A commute to County B.

> 2. At least 10 percent of the resident workers in County A commute to County B, and at least 10 percent of employees in County A reside in County B.

> 3. At least 20 percent of the employees in County A reside in County B.

These criteria will be applied in tiers. That is, first, the criteria will be applied to

individual counties to see which counties are linked. We will then take those combined areas

and apply the criteria again to see if any more counties should be added, or if adjacent combine

areas can be further linked. This process will continue through further tiers until no further links

can be established. This is consistent with the theory of transitivity discussed above.[13]

Additionally, we may consider additional evidence of integration. Examples of this

evidence may include: newspaper circulation data, radio and television markets, bank branching

patterns, and shopping patterns. This type of qualitative evidence could be accepted on a case-

by-case basis, but there must also be some evidence of commutation, such as one or more of the

above criteria being nearly met. Also, a county may be split if it is not a core county and there is

evidence that it is linked to two or more counties or groups of counties that are not themselves

directly linked. The next section will apply these criteria using the 2000 Census Journey-to-

Work data.

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[13] This methodology has already been accepted by the Board of Governors as valid. See Board Order approving the application by First Union Corporation to acquire CoreStates Financial Corporation, *Federal Reserve Bulletin,* June 1998, pp. 489-507.

A. Single-County Markets

Each of the following areas were found to have no significant interaction with

neighboring counties, and are therefore designated as single-county markets.

Reading, PA - Berks County, PA. This is the same definition as the Reading MeSA.

Lancaster, PA - Lancaster County, PA. This is the same definition as the Lancaster
        MeSA.

Schuylkill County, PA - This is the same definition as the Pottsville MiSA.

Tioga County, PA

Potter County, PA

Mifflin County, PA - This is the same definition as the Lewistown MiSA

Cameron County, PA

McKean County, PA - This is the same definition as the Bradford MiSA.

Elk County, PA - This is the same definition as the St. Mary's MiSA.

State College, PA - Centre County, PA. This is the same definition as the State College
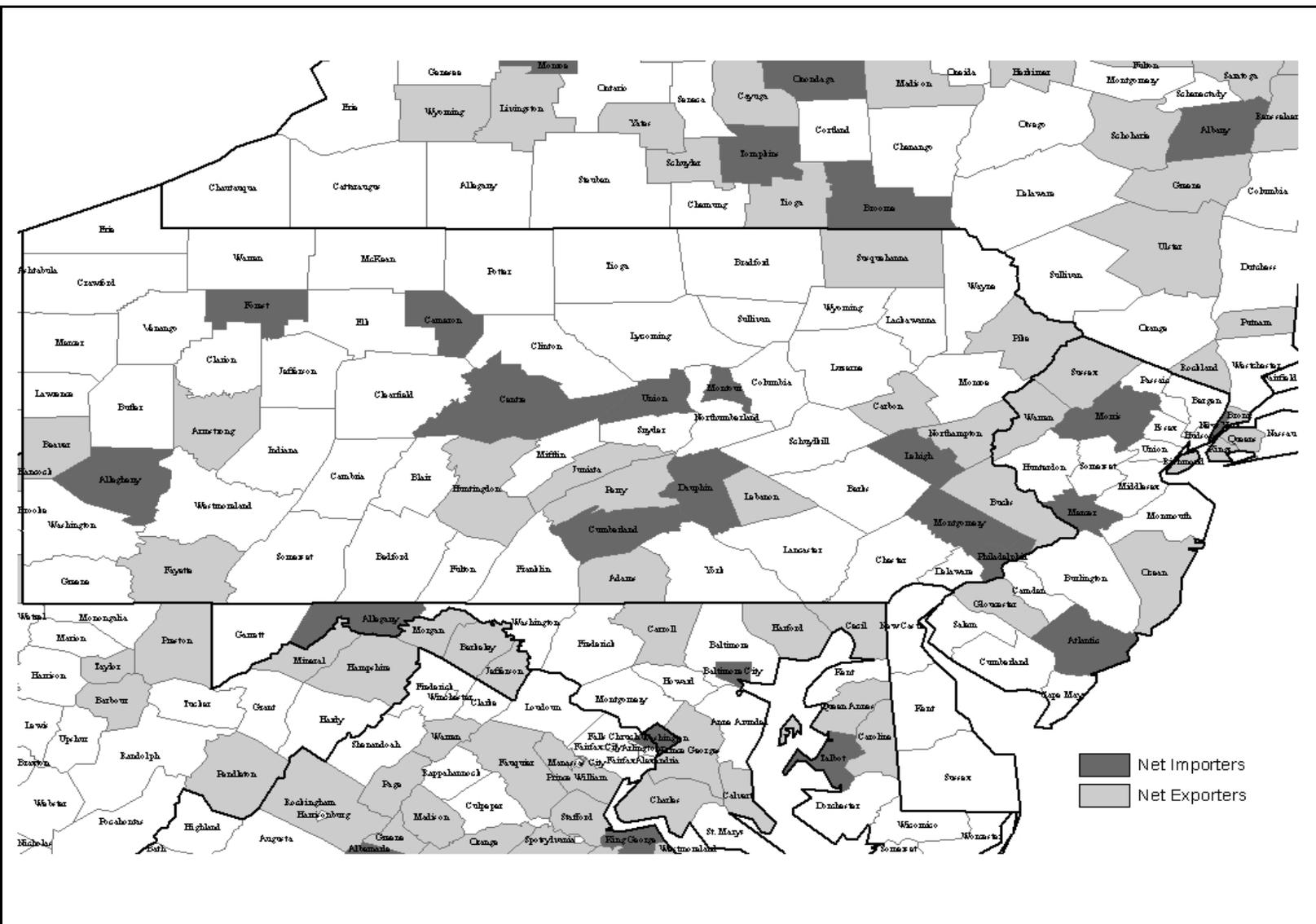   MeSA.

Huntingdon County, PA - This is the same definition as the Huntingdon MiSA.

Bedford County, PA

Altoona, PA - Blair County, PA. This is the same definition as the Altoona MeSA.

Dover, DE - Kent County, DE. This is the same definition as the Dover MeSA.

Sussex County, DE - This is the same definition as the Seaford MiSA

Net Importers
Net Exporters

B. Multicounty Markets

The markets described in this section are defined by linking counties and/or parts of counties using the methodology described above.

Wilmington, DE-MD: This market consists of New Castle County, Delaware, and Cecil County, Maryland. This is the same as the market is currently defined. The commuting data revealed that a significant number of Cecil County residents work in New Castle County. A second run of the data resulted in no further links. The data is summarized in Table 1 below.

Table 1
*Commutation in the Wilmington Area*

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Cecil, MD	New Castle, DE	33.43	12.90
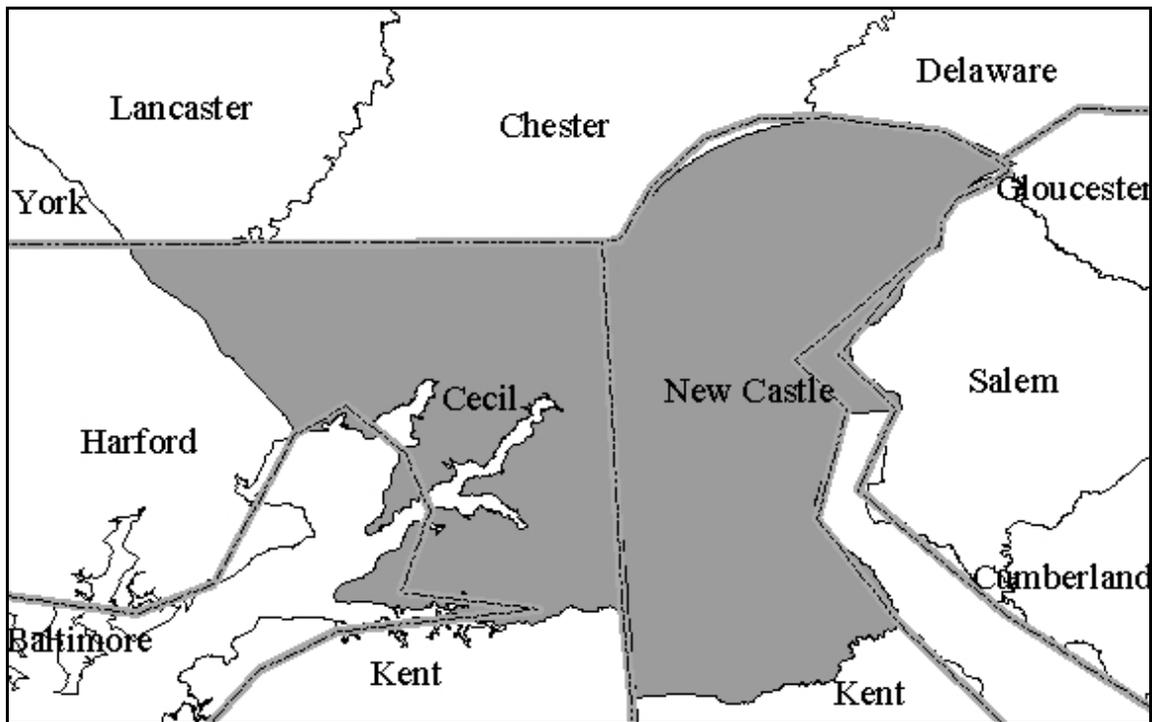
Atlantic City, NJ: This market consists of Atlantic and Cape May counties in New Jersey. This is the same as the market is currently defined. The commuting data revealed that a significant number of Cape May county residents work in Atlantic County. A second run of the data resulted in no further links. The data is summarized in Table 2 below.

Table 2
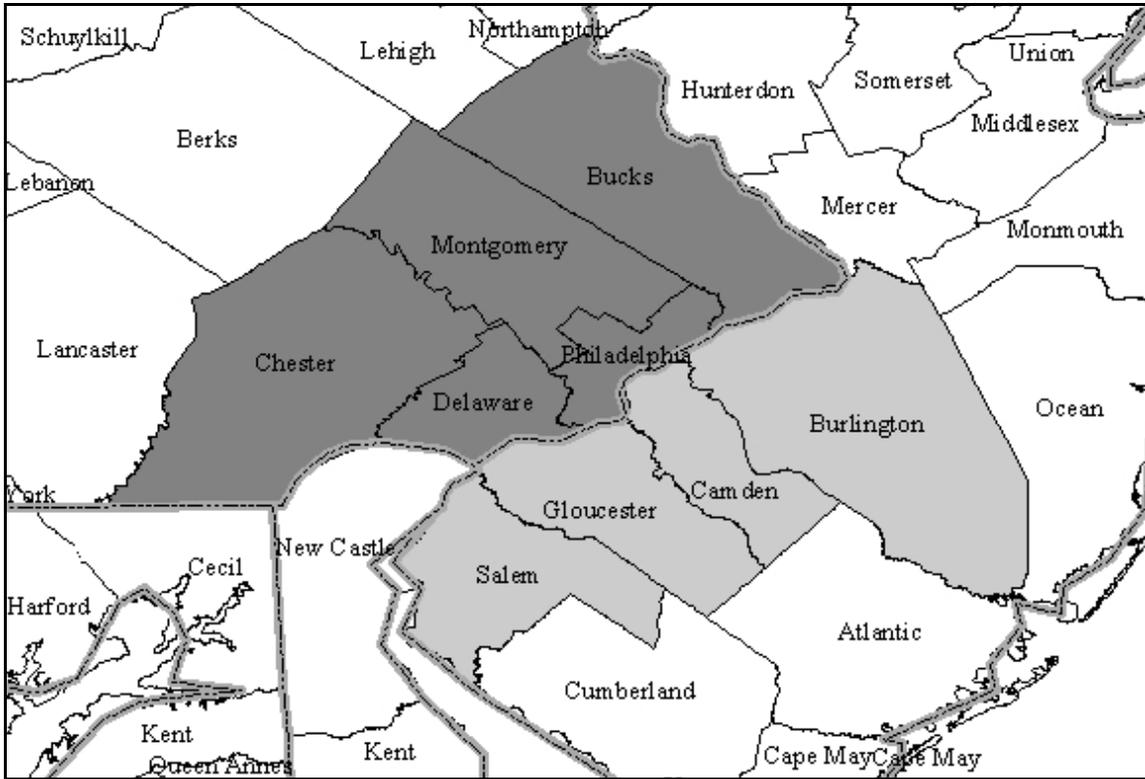*Commutation in the Atlantic City Area*

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Cape May, NJ	Atlantic, NJ	16.93	7.79
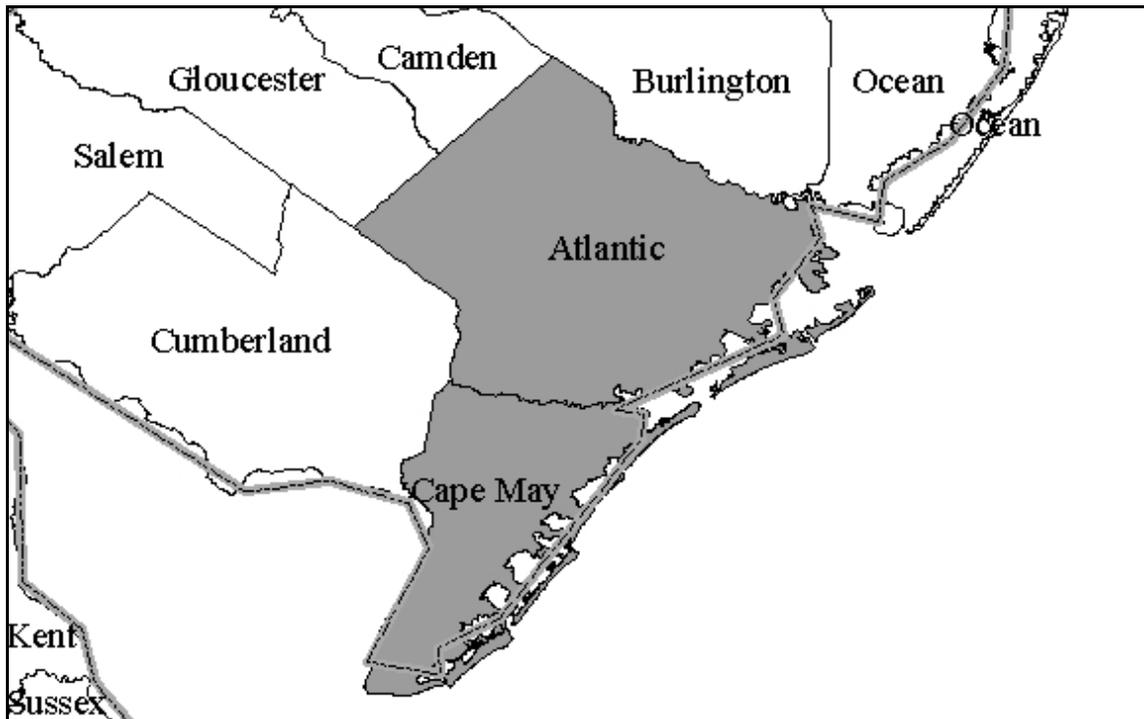
Philadelphia/South Jersey, PA-NJ: The Philadelphia/South Jersey market will comprise Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania and Burlington, Camden, Cumberland, Gloucester, and Salem counties in New Jersey. This definition was arrived at by a two-step process. As shown in Table 3, the first pass of the commuting data yields two separate areas, which will be designated as Philadelphia and South Jersey. For the Philadelphia side, Bucks and Chester counties have direct links to Montgomery County, which is then linked to Philadelphia County. Delaware County is also significantly linked to Philadelphia County.   The South Jersey side of the market is arrived at by linking Burlington and Camden counties to each other, by linking Gloucester county to Camden County, and by linking Salem County to Gloucester County. These links are also shown graphically on the map on the following page.

Table 3
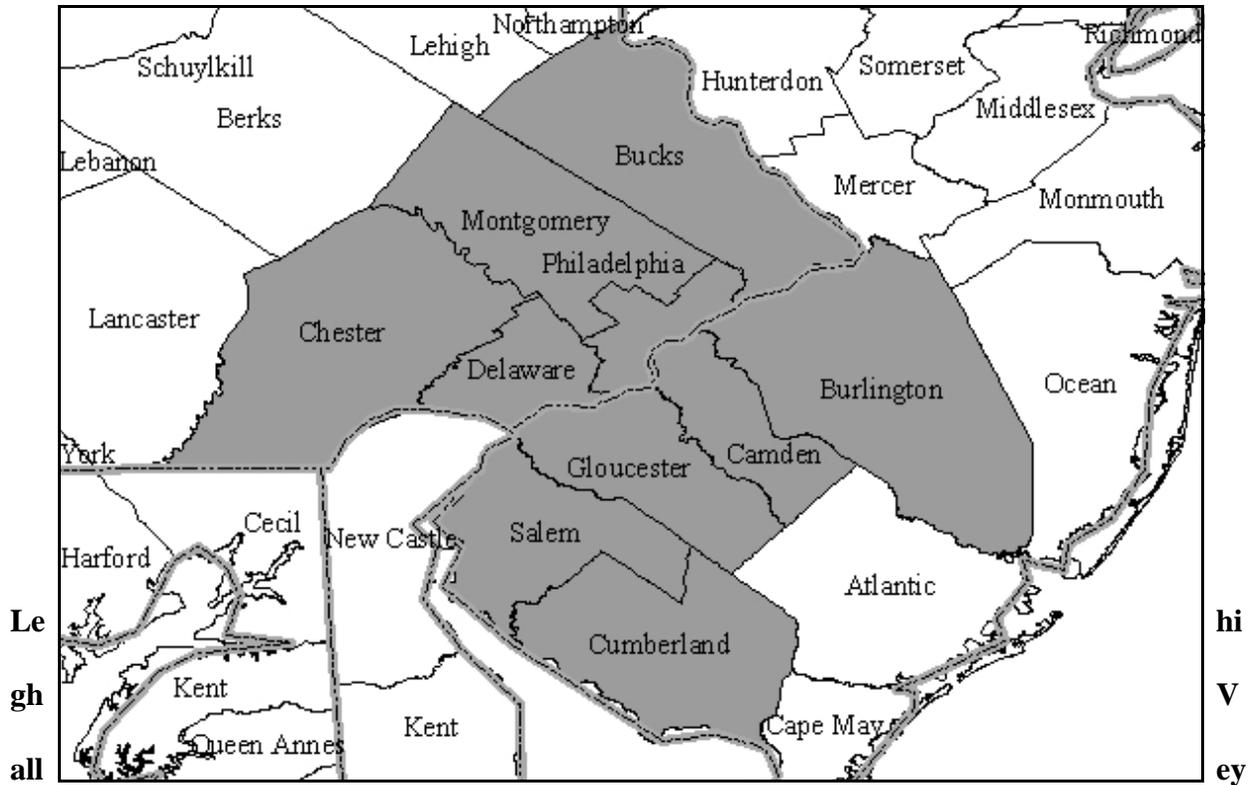*Commutation in the Philadelphia Area - First Tier*

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Burlington, NJ	Camden, NJ	12.61	17.35
Camden, NJ	Burlington, NJ	13.79	13.33
Gloucester, NJ	Camden, NJ	18.60	17.01
Salem, NJ	Gloucester, NJ	15.11	11.10
Bucks, PA	Montgomery, PA	15.95	9.82
Chester, PA	Montgomery, PA	11.77	11.61
Montgomery, PA	Philadelphia, PA	14.37	13.42
Delaware, PA	Philadelphia, PA	18.96	10.09

The second pass of the data, summarized in Table 4, shows that Cumberland County, New Jersey, is directly linked by two-way commutation to the four counties comprising South Jersey, which themselves are then directly linked to the Philadelphia side of the market. This is shown graphically using the map on the following page.

Table 4
Commutation in the Philadelphia Area - Second Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Cumberland, NJ	South Jersey	10.01	14.05
South Jersey	Philadelphia	15.71	6.31

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, PA: The Lehigh Valley market will continue to be comprised of Carbon, Lehigh, and

Northampton counties in Pennsylvania. The data in Table 5 show that there are significant links

between Carbon and Lehigh counties, and between Northampton and Lehigh counties. These

links are also shown on Map 2, with Lehigh County being a net labor importer and Carbon and

Northampton counties being net labor exporters. A second pass of the data revealed no further

links with neighboring areas.

Table 5
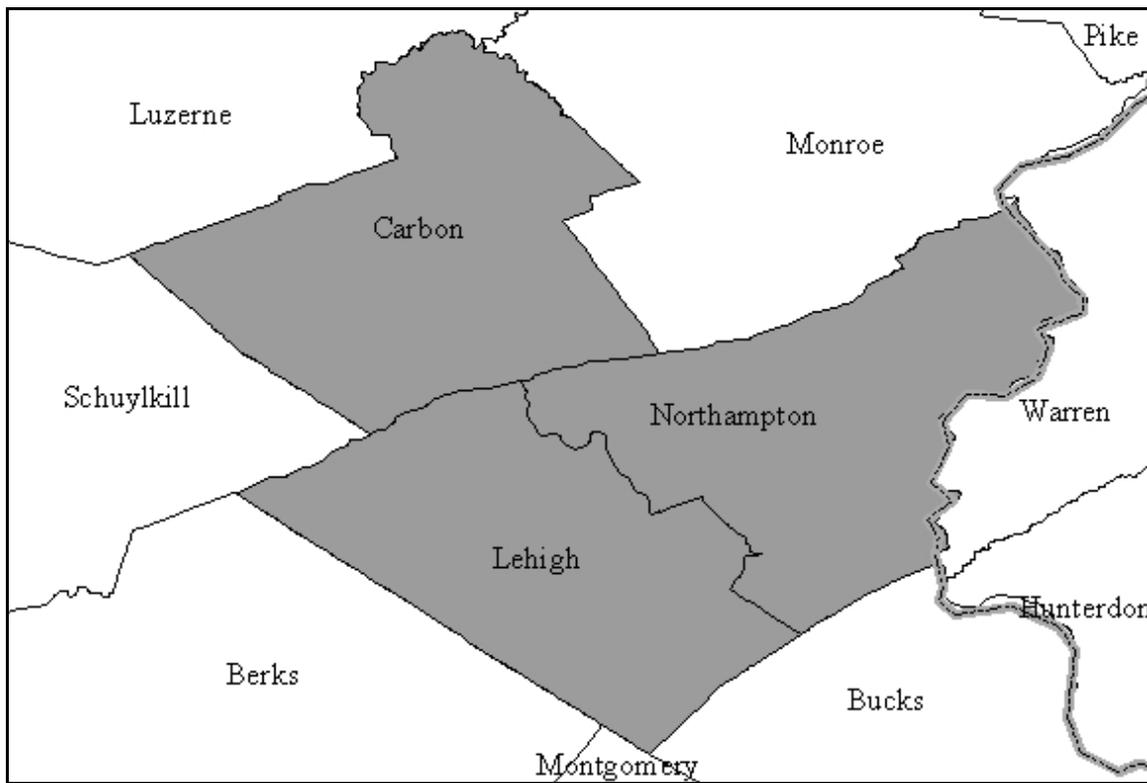### Commutation in the Lehigh Valley Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Carbon, PA	Lehigh, PA	18.03	3.46
Northampton, PA	Lehigh, PA	24.02	18.40
Lehigh, PA	Northampton, PA	12.20	18.37

Scranton/Wilkes-Barre, PA: The Scranton/Wilkes-Barre market will comprise Lackawanna, Luzerne, Wayne, and Wyoming counties in Pennsylvania. At first glance, the commuting data only lukewarmly supports this delineation, with the the sole connection between Luzerne County and the rest of the market being made through residential commuting from Wyoming County (Table 6). Thus, a case could be made for splitting Wyoming County, with half of it joining

Lackawanna and Wayne counties and the other half joining Luzerne County.

However, there are several strong reasons for including Luzerne County with the others. First, the area is an MSA, and has been for 50 years. Second, as shown in the map below the most heavily populated part of the region runs in a northeast line from central Luzerne County to central Lackwanna County, i.e., from the City of Wilkes-Barre to the City of Scranton. These

Table 6
Commutation in the Scranton/Wilkes-Barre Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Wayne, PA	Lackawanna, PA	15.73	9.96
Wyoming, PA	Lackawanna, PA	23.20	8.84
Wyoming, PA	Luzerne, PA	17.57	8.30

cities are approximately 10 miles from each other and are connected by three major roads: I-81, US Rte. 11, and the Pennsylvania Turnpike.

Bank branching patterns provide additional evidence of integration between Luzerne and Lackawanna counties. Of a total of 29 organizations operating in at least one of the counties, 12 operate in both. This total includes 12 of the 16 organizations operating in Lackawanna County. These banking organizations are summarized in Table 7 below.[14]

Finally, Luzerne and Lackawanna counties, together with Wyoming County, make up the Scranton/Wilkes-Barre MeSA.

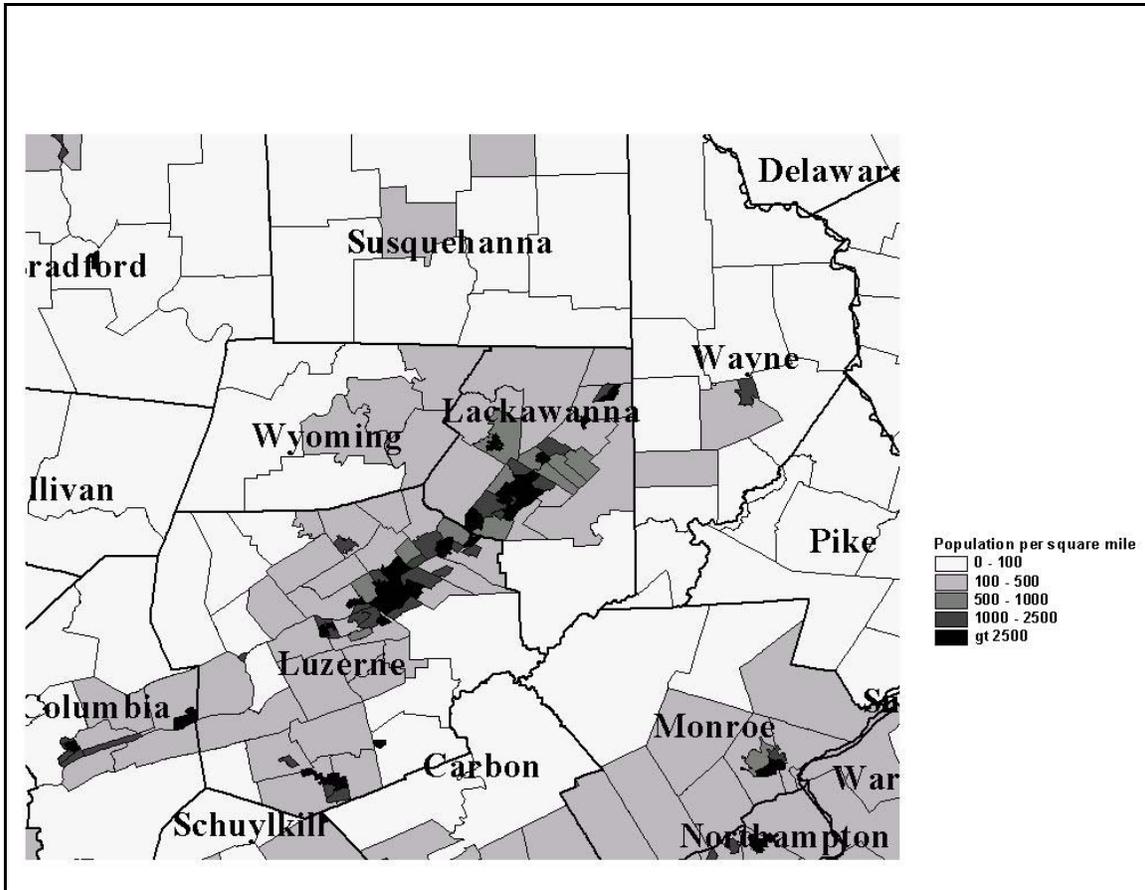[14] Data is from June 30, 2002 FDIC Summary of Deposit data.

Table 7
Organizations Operating in Both Lackawanna and Luzerne Counties

	Lackawanna County		Luzerne County	
Organization	**Deposits**	**Offices**	**Deposits**	**Offices**
Citizens Financial Group	9.2	1	509.4	10
Community Bank System	449.0	11	33.3	2
Fidelity D&D Bancorp	351.9	10	74.2	3
First National Community Bancorp	382.3	6	153.6	8
FleetBoston Financial Corp.	8.1	1	373.7	11
Grange National Bancorp	7.9	1	53.2	3
Honat Bancorp	14.4	1	2.0	1
M&T Bank Corp.	22.0	1	715.1	16

22

| | Lackawanna County | | Luzerne County | |
Organization	Deposits	Offices	Deposits	Offices
NBT Bancorp	344.2	18	46.5	4
Old Forge Bank	154.7	2	20.2	1
PNC Financial Services Group	862.6	11	1,125.0	25
Wachovia Corp.	201.1	5	726.6	12
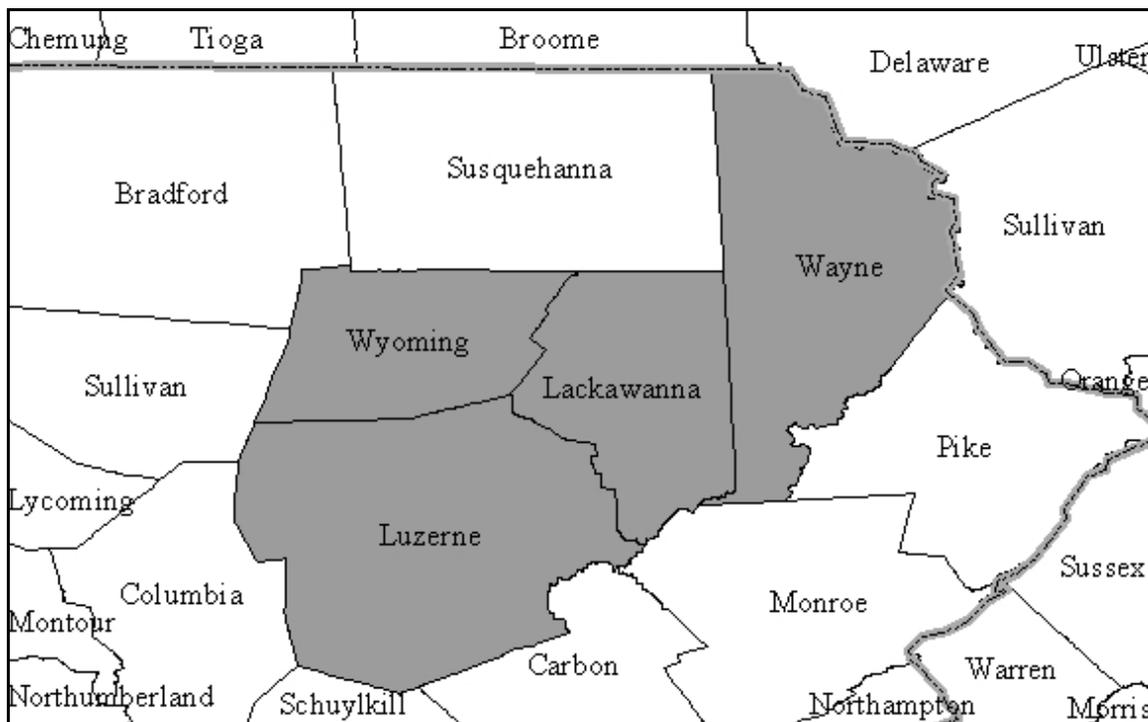
Binghamton, NY-PA: The Binghamton market will be comprised of Broome and Tioga counties

in New York and Susquehanna County, Pennsylvania. Broome County is a net labor importer

while both Tioga and Susquehanna counties are net labor exporters. Also, as shown in Table 8,

there is substantial commutation from both Tioga and Susquehanna counties into Broome

County. A second pass of the data revealed no further links.

Table 8
Commutation in the Binghamton Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Tioga, NY	Broome, NY	33.14	18.72
Susquehanna, PA	Broome, NY	21.57	2.5
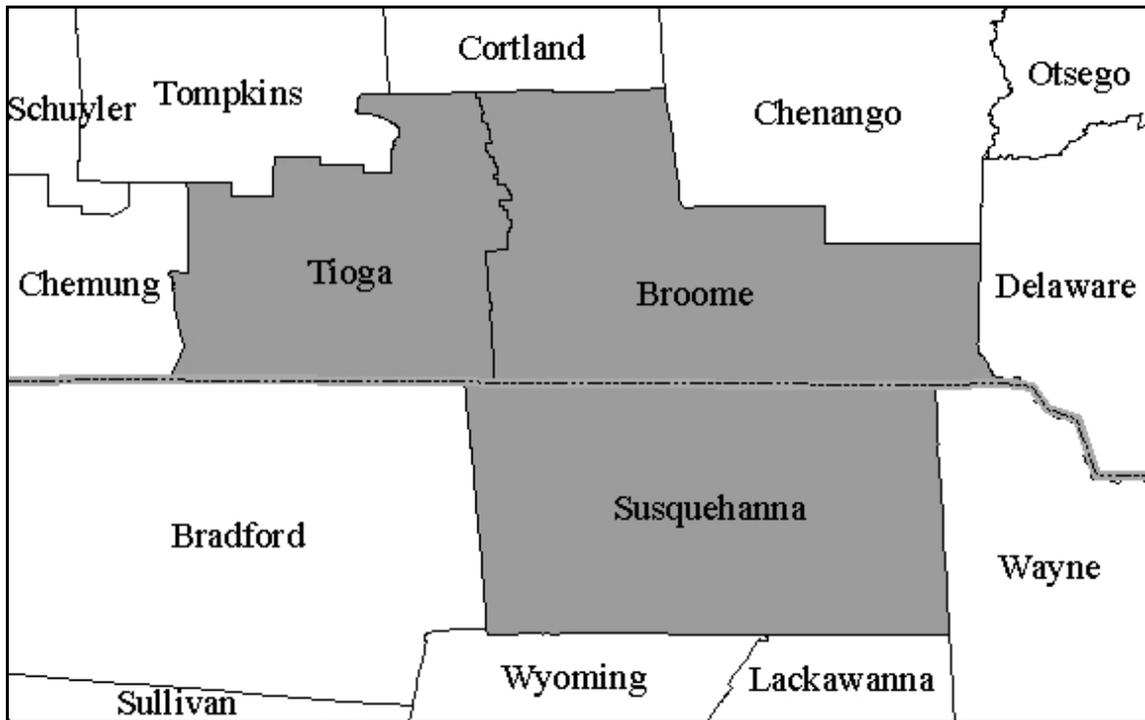
Susquehanna Valley, PA: The Susquehanna Valley market will comprise Columbia, Montour, Northumberland, Snyder, and Union counties in Pennsylvania. This definition was arrived at in two steps. In the first step, significant links were found between Montour and Northumberland counties, Montour and Columbia counties, and Union and Northumberland counties (Table 9). In each these cases, the links were two-way, that is, a substantial percentage of one county's residents worked in the other county, and a substantial percentage of one county's employees

lived in the other county. Both Union and Montour counties were also net labor importers.

Table 9
Commutation in the Susquehanna Valley - First Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Montour, PA	Columbia, PA	12.47	16.22
Montour, PA	Northumberland, PA	14.17	26.48
Union, PA	Northumberland, PA	15.34	20.95

A   se
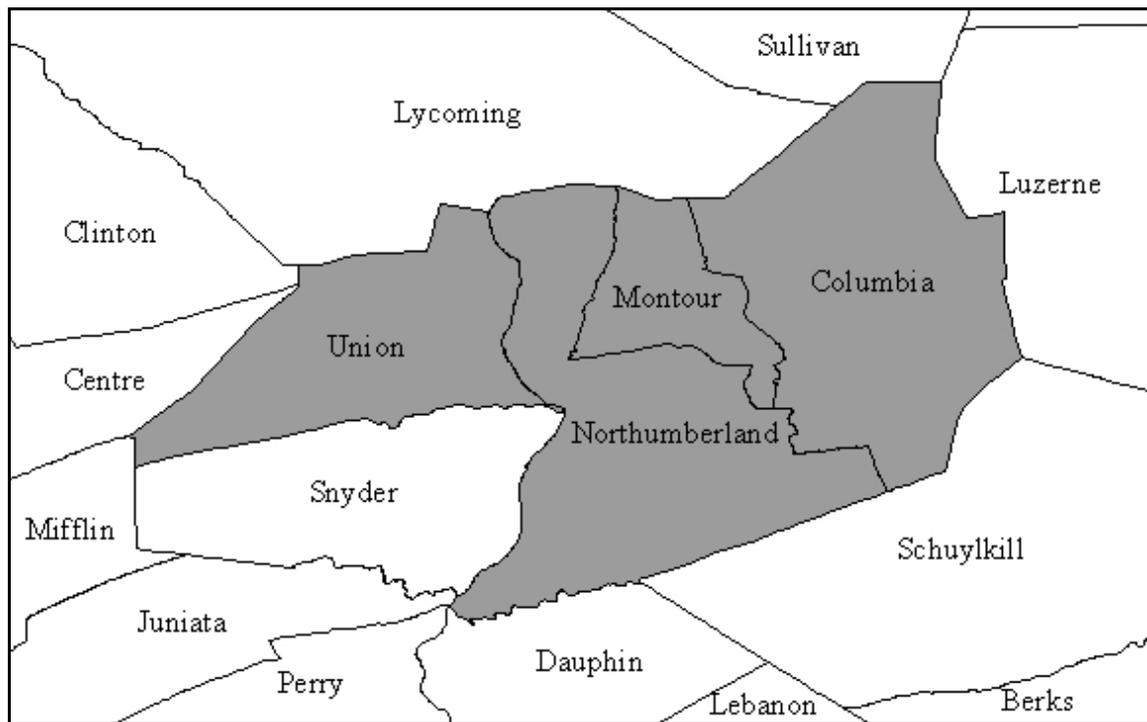
cond pass of the data showed significant two-way commutation between Snyder County and the

other counties in the market (Table 10). The link was so strong that it actually met all three of

the criteria for inclusion. A third pass revealed no other links.

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Table 10
Commutation in the Susquehanna Valley - Second Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Snyder, PA	Susquehanna Valley	20.28	23.56

*Yo   rk*

, PA: This market will comprise York and Adams counties in Pennsylvania. Adams County is a

net exporter of labor, and , as shown in Table 11, nearly one quarter of Adams county residents

commute to York County. Also, over 15 percent of employees in Adams County commute from

York County.

Table 11
Commutation in the York Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Adams, PA	York, PA	24.52	15.06
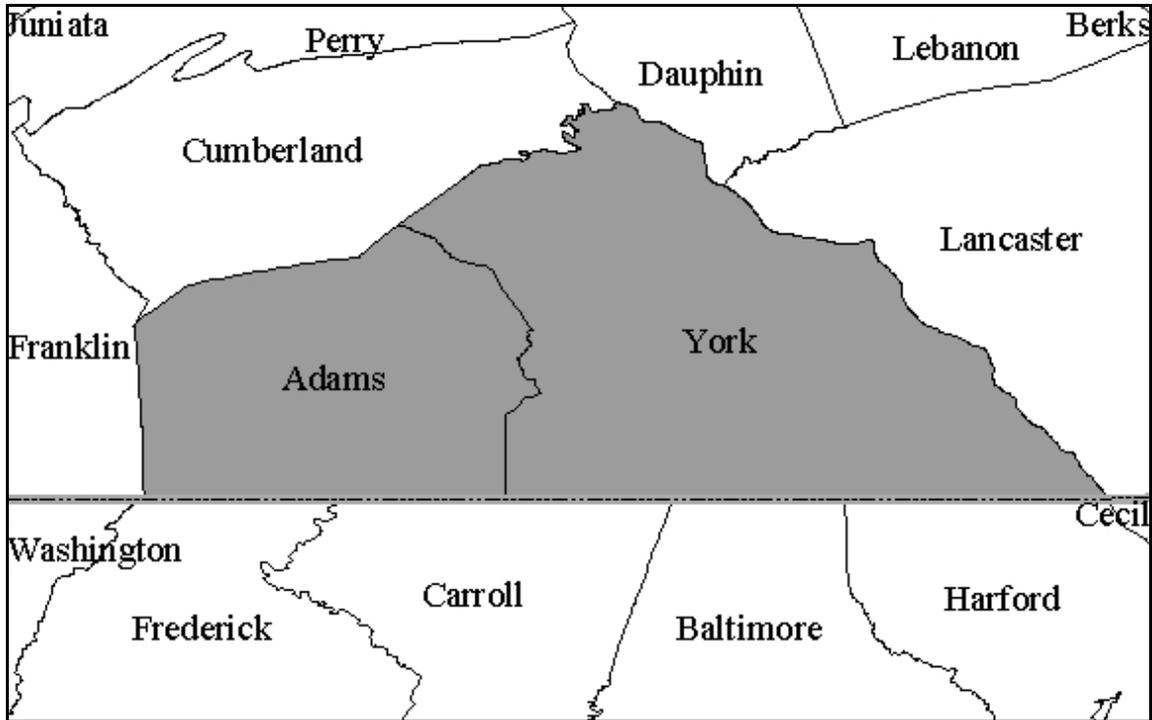
Harrisburg, PA: The Harrisburg market will consist of Cumberland, Dauphin, Juniata, Lebanon, and Perry counties in Pennsylvania. This definition was arrived at in two steps. First, Lebanon and Perry counties are linked with the core counties of Dauphin and Cumberland by the percentage of residents commuting out; while Dauphin and Cumberland counties are linked by two-way commutation (Table 12).

Table 12
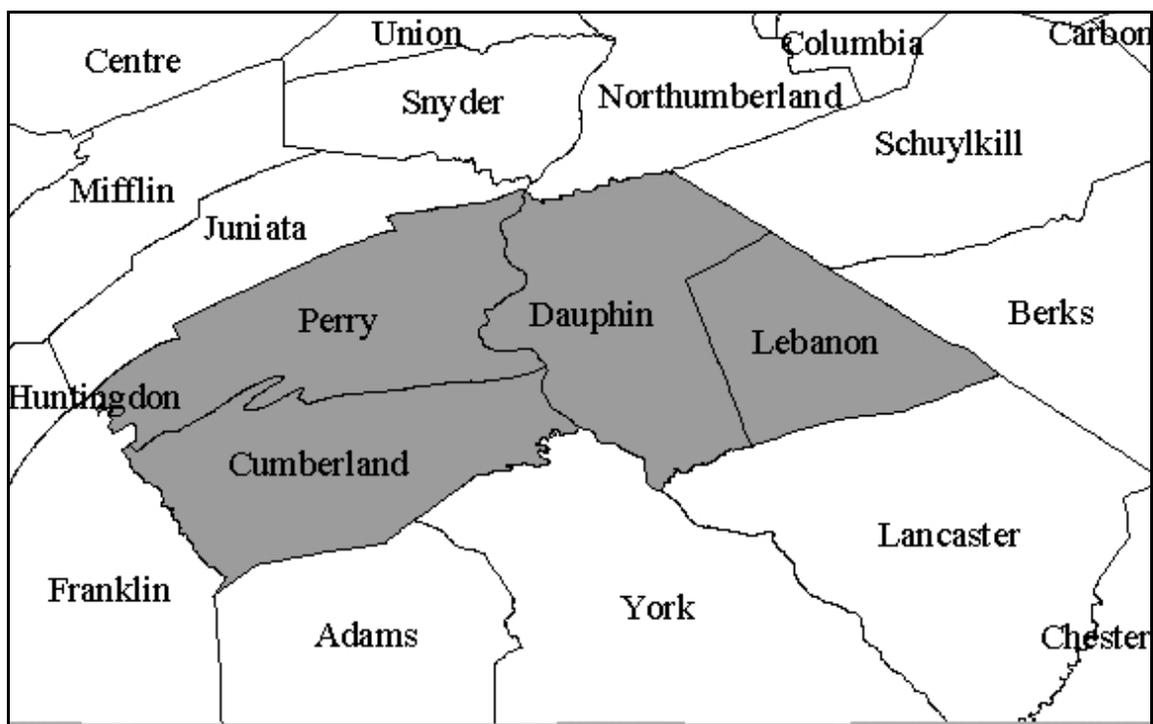### Commutation in the Harrisburg Area - First Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Perry, PA	Cumberland, PA	32.82	4.20
Dauphin, PA	Cumberland, PA	13.45	13.64
Cumberland, PA	Dauphin, PA	21.21	13.60
Lebanon, PA	Dauphin, PA	21.86	5.38
Perry, PA	Dauphin, PA	29.61	5.29

On the second pass of the data, it was found that over a quarter of Juniata County residents work in one of the other four counties in the market, with the vast majority of these working in Cumberland and Dauphin counties (Table 13). A third pass of the data revealed no further significant links with other areas.

Table 13
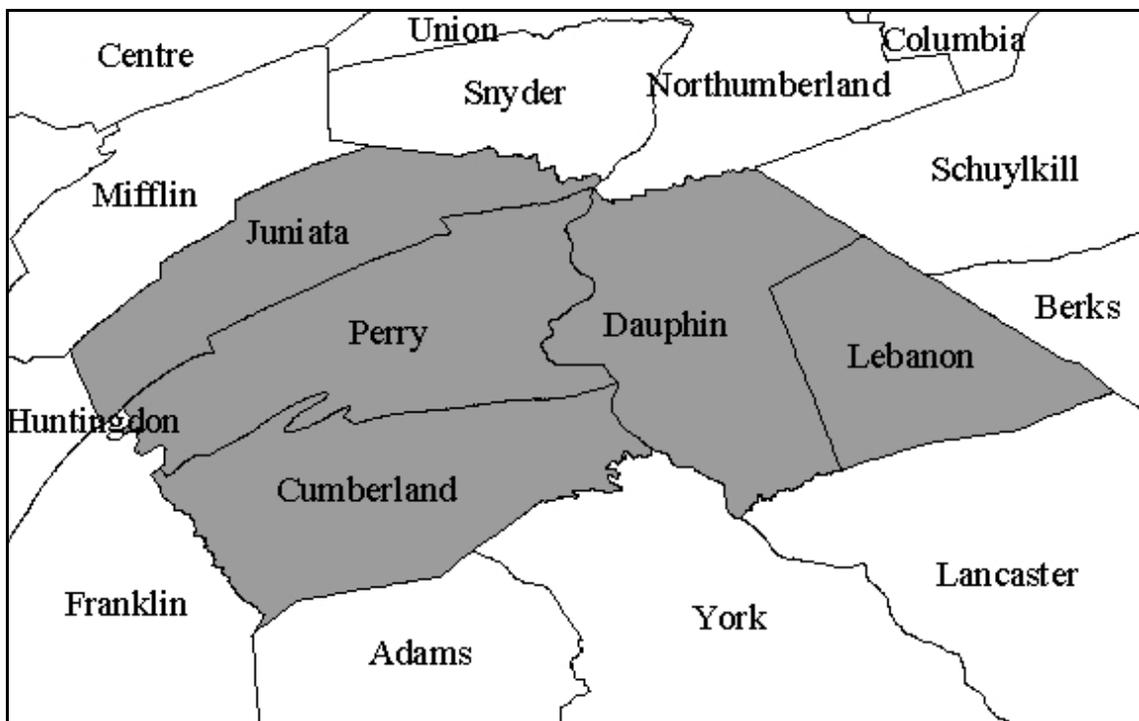***Commutation in the Harrisburg Area - Second Tier***

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Juniata County, PA	Harrisburg	25.57	2.72

Williamsport, PA: This market will comprise Lycoming and Clinton counties in Pennsylvania.

As shown in Table 14, nearly 18 percent of Clinton County residents commute to York County.

Also, approximately 11 percent of employees in Clinton County commute from Lycoming

County.

Table 14
Commutation in the Williamsport Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Clinton, PA	Lycoming, PA	17.69	10.98

Bradford/Sullivan, PA: This market will comprise Bradford and Sullivan counties in Pennsylvania. There is significant two-way commutation between the two counties (Table 15), with over 10 percent of Sullivan County residents commuting to Bradford and a similar percentage of Sullivan County employees commuting from Bradford County.

Table 16
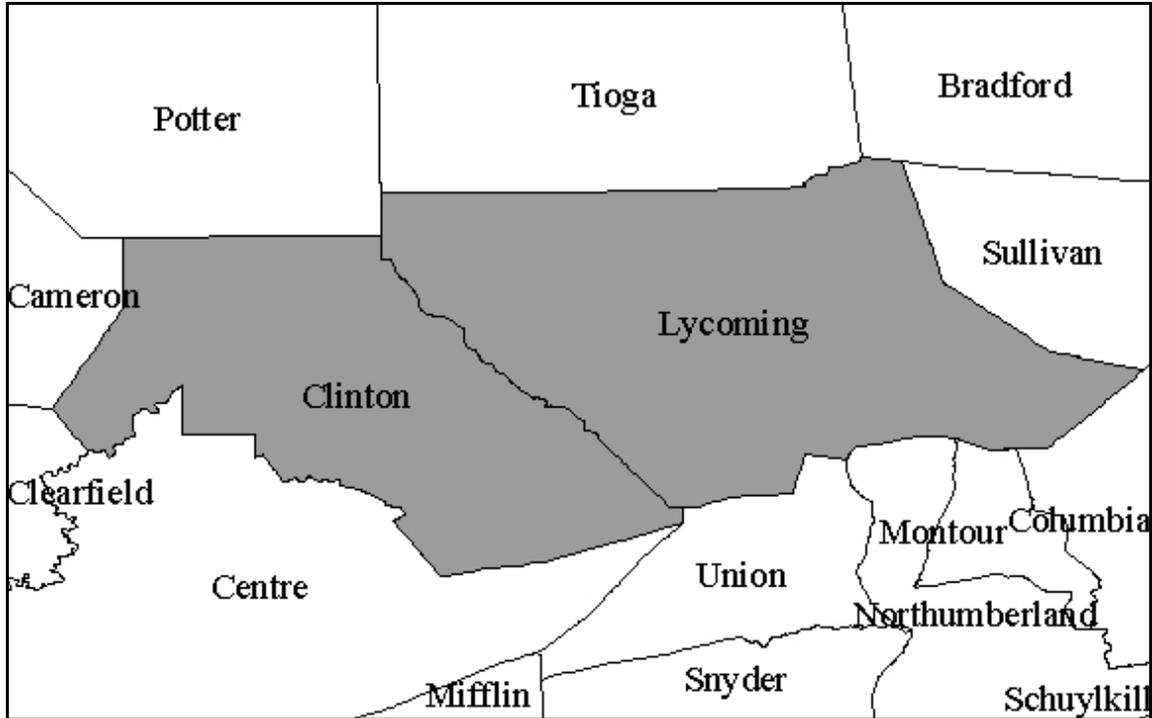### Commutation in the Bradford/Sullivan Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Sullivan, PA	Bradford, PA	11.52	10.75

Clearfield/Jefferson, PA: There is significant one-way commutation from Jefferson County to Clearfield County, with nearly 20 percent of Jefferson County residents commuting to Clearfield (Table 16). Additionally, research done by the Federal Reserve Bank of Cleveland has shown commercial linkage between northern Indiana County and the Clearfield/Jefferson area. Therefore, this market will consist of Clearfield and Jefferson counties, plus the townships of Banks, Canoe, and North Mahoning in Indiana County.

Table 16
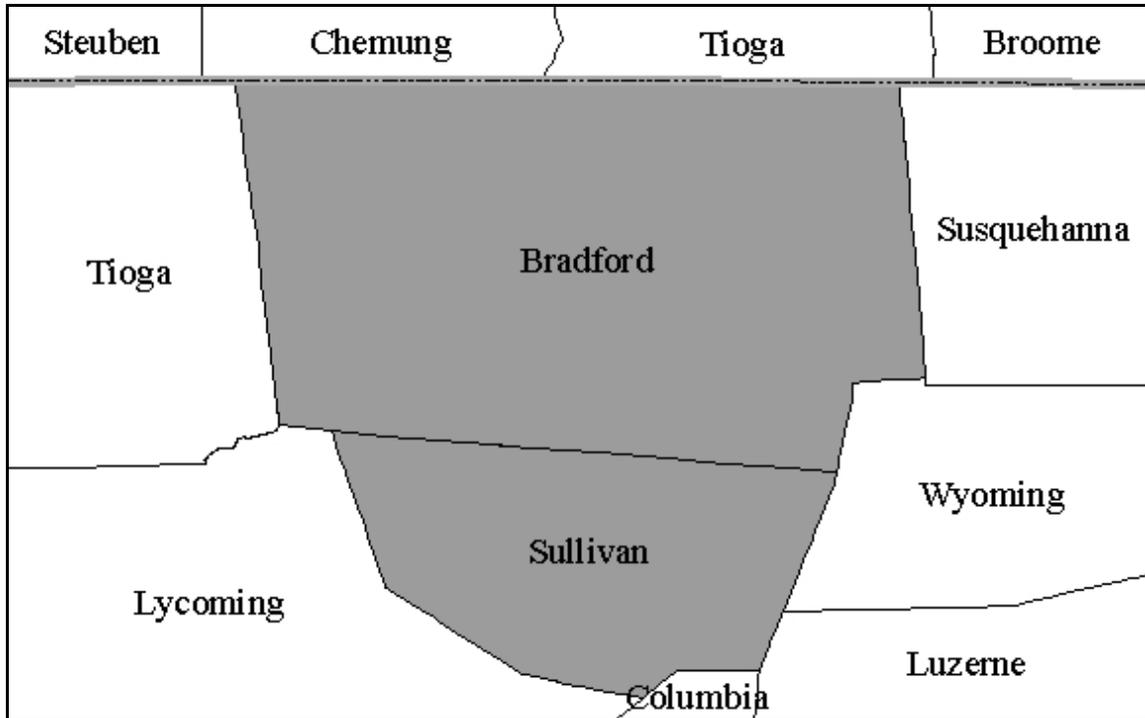***Commutation in the Clearfield/Jefferson Area***

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Jefferson, PA	Clearfield, PA	19.72	9.98

Johnstown, PA: There is significant one-way commutation from Somerset County to Cambria County, with over 15 percent of Somerset County residents commuting to Cambria (Table 17). Additionally, research done by the Federal Reserve Bank of Cleveland has shown commercial linkage between northeast Westmoreland County, Southwest Indiana County, and the Johnstown area. Therefore, this market will consist of Cambria and Somerset counties, plus the St. Claire Township in Westmoreland County and East Wheatfield Township in Indiana County. These two townships are also part of the Johnstown RMA.
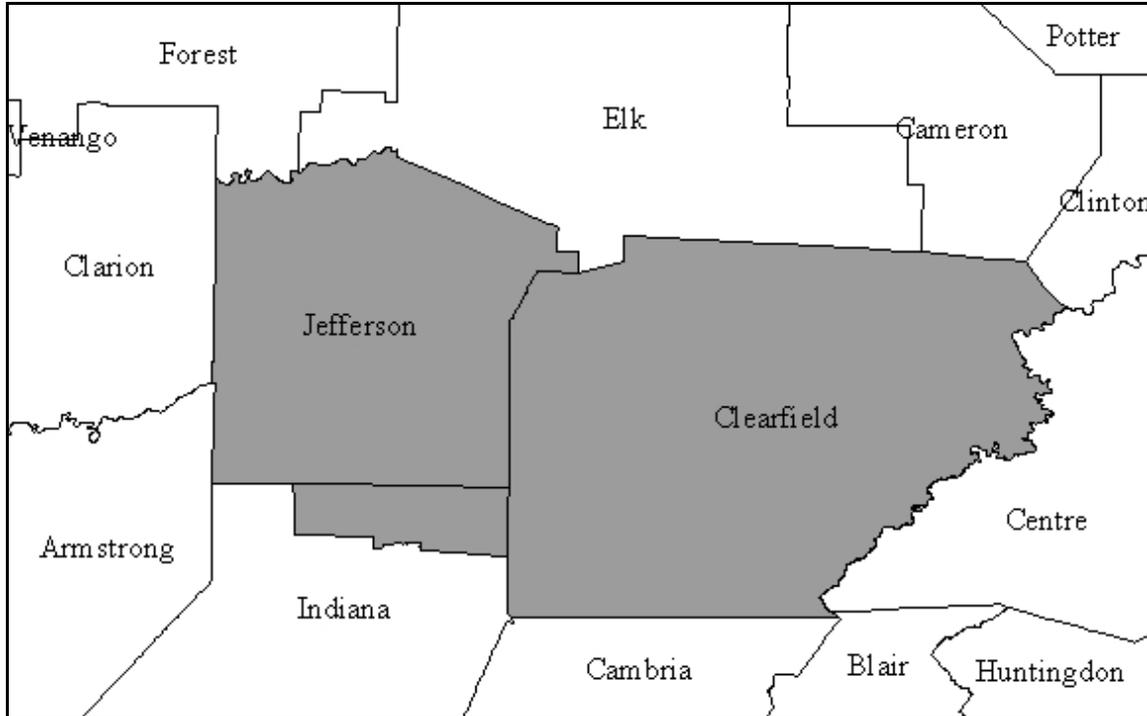
Table 17
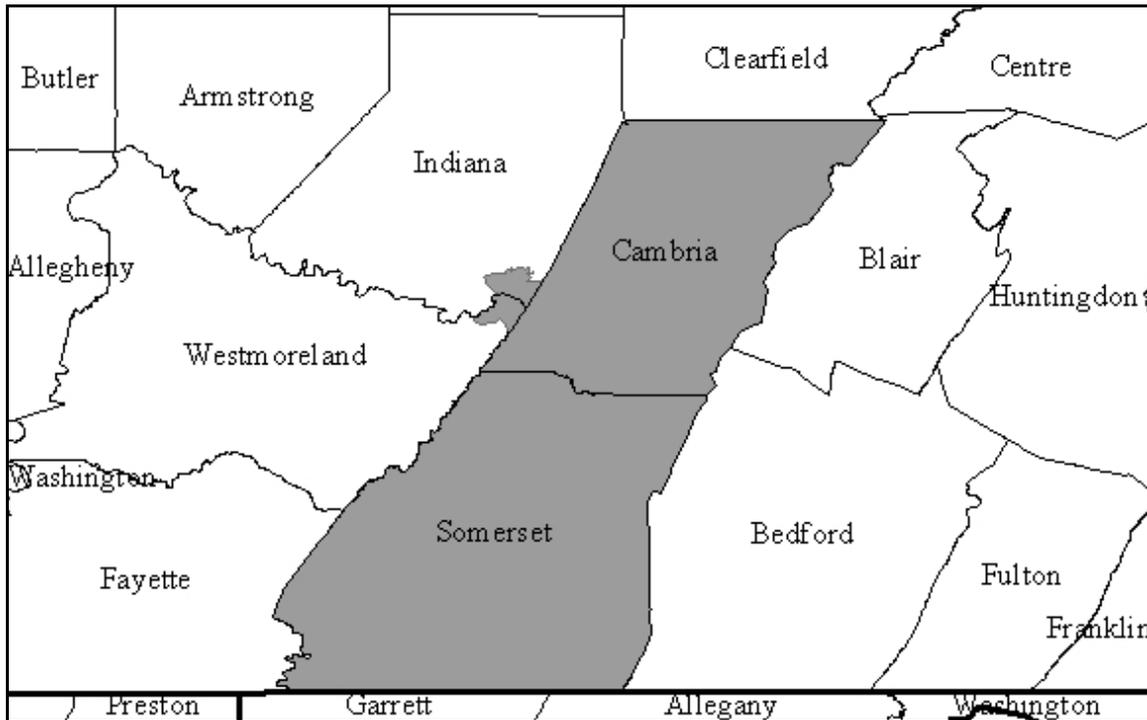### Commutation in the Johnstown Area

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Somerset, PA	Cambria, PA	15.20	9.01

Metropolitan New York/New Jersey, NY-NJ-CT: This is a very large market consisting of Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren counties in New Jersey; Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, and Westchester counties in New York; Monroe and Pike counties in Pennsylvania; and parts of Fairfield and Litchfield counties in Connecticut.

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The market consists of three tiers. The first pass of the data, summarized in Table 18, resulted in the delineation of five areas. The first of these, designated New York, consists of Bergen, Hudson, and Passaic counties in New Jersey, and the New York counties of Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, and Westchester. New York County is a core county, while Bronx, Kings, Putnam, Queens, and Richmond are all net labor exporters.

The second area, called Newark, consists of Essex, Hunterdon, Middlesex, Somerset, and Union counties in New Jersey. There is strong two-way commutation among almost all of these counties.

The third area delineated, called North Jersey, comprises Morris, Sussex, and Warren counties in New Jersey. Morris is a core county, and both Sussex and Warren are net exporters. There is strong one-way commutation from both of these counties to Morris.

The fourth area delineated is also in New Jersey, and it consists of Monmouth and Ocean counties. Ocean county is a net exporter of labor, and nearly 18 percent of its residents work in Monmouth county.

The final area delineated on the first pass of the data is called Middletown/Newburgh, and it comprises Orange and Sullivan counties in New York and Pike County, Pennsylvania. There is strong one-way commutation from Sullivan to Orange County, and Orange County is linked to Pike County by significant two-way commutation.

Table 18
Commutation in the Metro NY/NJ Area - First Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Hudson, NJ	Bergen, NJ	10.00	10.84
Passaic, NJ	Bergen, NJ	25.26	13.90
Richmond, NY	Kings, NY	15.39	7.80
Hudson, NJ	New York, NY	22.08	2.36
Bronx, NY	New York, NY	38.47	7.39
Kings, NY	New York, NY	37.86	3.83
Nassau, NY	New York, NY	15.25	1.10
Queens, NY	New York, NY	37.16	3.37
Richmond, NY	New York, NY	27.86	2.30
Westchester, NY	New York, NY	18.74	1.88
Nassau, NY	Queens, NY	10.67	11.74
Putnam, NY	Westchester, NY	41.58	10.36
Union, NJ	Essex, NJ	13.59	10.50
Somerset, NJ	Middlesex, NJ	17.71	16.86
Hunterdon, NJ	Somerset, NJ	20.82	7.37
Union, NJ	Middlesex, NJ	11.11	11.63
Sussex, NJ	Morris, NJ	28.05	6.54
Warren, NJ	Morris, NJ	18.41	4.34
Ocean, NJ	Monmouth, NJ	17.81	7.39
Sullivan, NY	Orange, NY	16.58	3.66
Pike, PA	Orange, NY	10.24	10.06

On a second pass of the data, the significant links were shown between many of the areas defined above, and other counties were also linked (Table 19). The areas designated as Newark, North Jersey, and Middletown/Newburgh show substantial one-way commutation into the New York area. Three other New York counties, Dutchess, Rockland, and Suffolk, also showed significant one-way commutation into the New York area. Additionally, Mercer County, New Jersey was linked to Newark by both one-way and two-way commutation.

Table 19
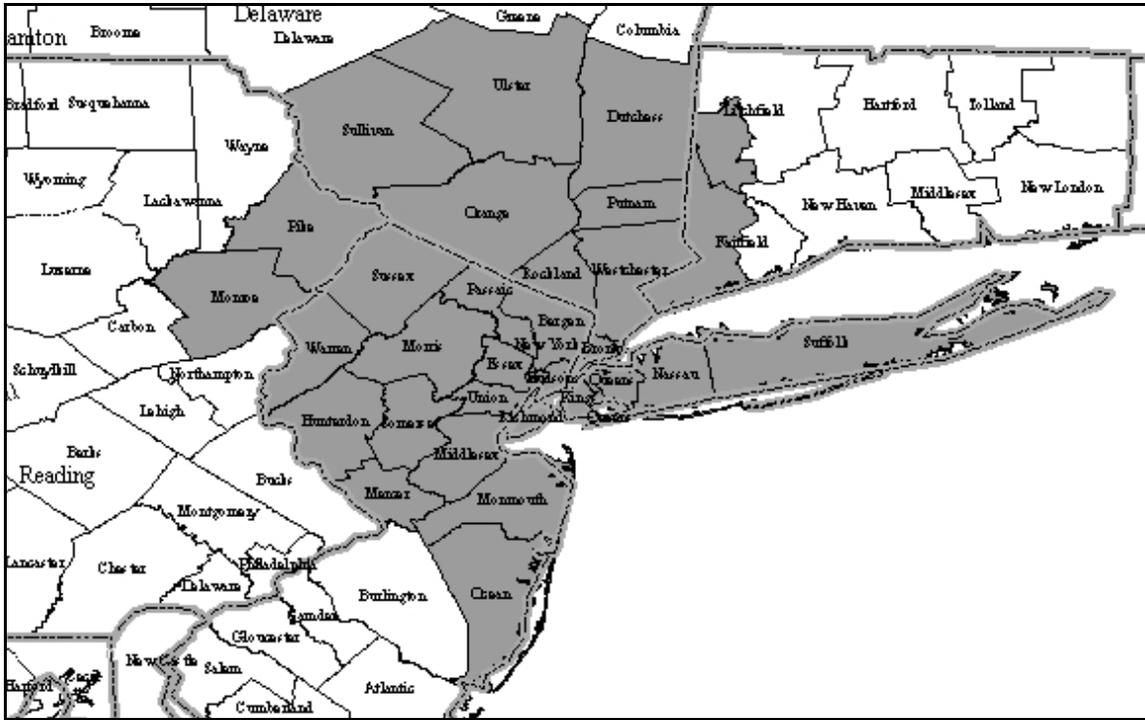### Commutation in the Metro NY/NJ Area - Second Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Mercer, NJ	Newark	15.89	11.95
North Jersey	Newark	18.78	17.16
Newark	New York	16.44	9.75
North Jersey	New York	16.01	10.28
Dutchess, NY	New York	19.95	3.37
Middletown/Newburgh	New York	16.91	2.18
Rockland, NY	New York	40.19	14.76
Suffolk, NY	New York	25.88	12.02

A third pass of the data revealed further tiering among the areas surrounding New York. The Monmouth/Ocean area showed substantial one-way commutation into the New York area, with over a quarter of Monmouth/Ocean residents commuting out. Also, two other counties, Ulster, New York, and Monroe, Pennsylvania, showed significant out-commuting to the New York area.

Also, research done by the Federal Reserve Bank of New York has shown that parts of the Connecticut counties of Fairfield and Litchfield also have significant links with the New York metropolitan area. Therefore, the market will include the townships of Bethel, Brookfield, Danbury, Darien, Greenwich, New Canaan, New Fairfield, Newtown, Norwalk, Redding, Ridgefield, Sherman, Stamford, Weston, Westport, and Wilton in Fairfield County, and the townships Bridgewater, Kent, New Milford, Roxbury, Warren, and Washington in Litchfield County.

Table 20
Commutation in the Metro NY/NJ Area - Third Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Monmouth/Ocean	Metro NY/NJ	28.23	7.94
Ulster, NY	Metro NY/NJ	30.32	11.65
Monroe, PA	Metro NY/NJ	22.11	4.80

Baltimore/Washington, DC-MD-PA-VA-WV: This is also a very large multi-tiered market

consisting of the District of Columbia; the City of Baltimore, plus Anne Arundel, Baltimore,

Carroll, Charles, Frederick, Harford, Howard, Kent, Montgomery, Prince George's, Queen

Anne's, St. Mary's, and Washington counties in Maryland; Franklin and Fulton counties in

Pennsylvania, the cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas,

Manassas Park, and Winchester, plus Arlington, Caroline, Clarke, Culpeper, Essex, Fairfax,

Fauquier, Frederick, King George, Loudon, Madison, Orange, Prince William, Rappahannock,

Richmond, Stafford, Spotsylvania, Warren, and Westmoreland counties in Virginia; and

Berkeley, Hampshire, Jefferson and Morgan counties in West Virginia.

The first tier results in seven sub-areas (Table 21), designated as Washington, Annapolis,

Baltimore, Hagerstown, Madison/Culpeper, Essex/Richmond/Westmoreland, Winchester, and

Table 21
Commutation in the Baltimore/Washington Area - First Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Charles, MD	Washington, DC	17.48	0.76
Montgomery, MD	Washington, DC	21.89	4.63
Prince George's, MD	Washington, DC	31.74	4.62
Arlington, VA	Washington, DC	36.42	7.43
Fairfax, VA	Washington, DC	16.86	2.42
Alexandria City, VA	Washington, DC	30.17	4.97
Falls Church City, VA	Washington, DC	28.98	4.17
Frederick, MD	Montgomery, MD	22.35	4.84
Calvert, MD	Prince George's, MD	21.95	3.25
Charles, MD	Prince George's, MD	22.42	10.06
Arlington, VA	Fairfax, VA	17.64	29.74
Fauquier, VA	Fairfax, VA	19.48	3.63
Loudon, VA	Fairfax, VA	38.92	20.72
Prince William, VA	Fairfax, VA	29.44	8.17
Alexandria City, VA	Fairfax, VA	18.97	33.97
Fairfax City, VA	Fairfax, VA	41.91	50.16
Falls Church City, VA	Fairfax, VA	28.24	45.78
Manassas City, VA	Fairfax, VA	28.35	10.88
Manassas Park City, VA	Fairfax, VA	35.69	12.31
Clarke, VA	Loudon, VA	19.50	1.16
Stafford, VA	Prince William, VA	16.00	6.25
Mannassas City, VA	Prince William, VA	24.18	35.11
Mannassas Park City, VA	Prince William, VA	17.70	34.01
Falls Church City, VA	Arlington, VA	14.30	11.76
Mannassas Park City, VA	Mannassas City, VA	12.10	10.43

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Fredericksburg City, VA	Spotsylvania, VA	20.06	35.69
Stafford, VA	Spotsylvania, VA	5.81	20.25
Spotsylvania, VA	Stafford, VA	12.07	10.61
Fredericksburg City, VA	Stafford, VA	13.08	21.98
Spotsylvania, VA	Fredericksburg City, VA	15.53	7.31
Queen Anne's, MD	Anne Arundel, MD	21.60	6.03
Howard, MD	Anne Arundel, MD	10.33	11.79
Carroll, MD	Baltimore, MD	19.80	7.96
Harford, MD	Baltimore, MD	23.85	8.25
Baltimore City, MD	Baltimore, MD	23.68	31.95
Baltimore, MD	Baltimore City, MD	29.25	17.28
Fulton, PA	Washington, MD	17.21	1.50
Morgan, WV	Washington, MD	17.91	4.23
Madison, VA	Culpeper, VA	19.73	5.79
Richmond, VA	Essex, VA	17.58	8.98
Richmond, VA	Westmoreland, VA	10.52	16.85
Winchester City, VA	Frederick, VA	27.82	42.66
Hampshire, WV	Frederick, VA	18.10	2.11
Frederick, VA	Winchester City, VA	31.09	13.60
Hampshire, WV	Winchester City, VA	16.23	0.00
Jefferson, WV	Berkeley, WV	8.19	22.28

Martinsburg. In each of these areas, there are numerous links between the cities and counties that comprise them. Several of these are centered around the core areas of the District of Columbia and the City of Baltimore. Additionally, many of the Virginia counties are net labor exporters.
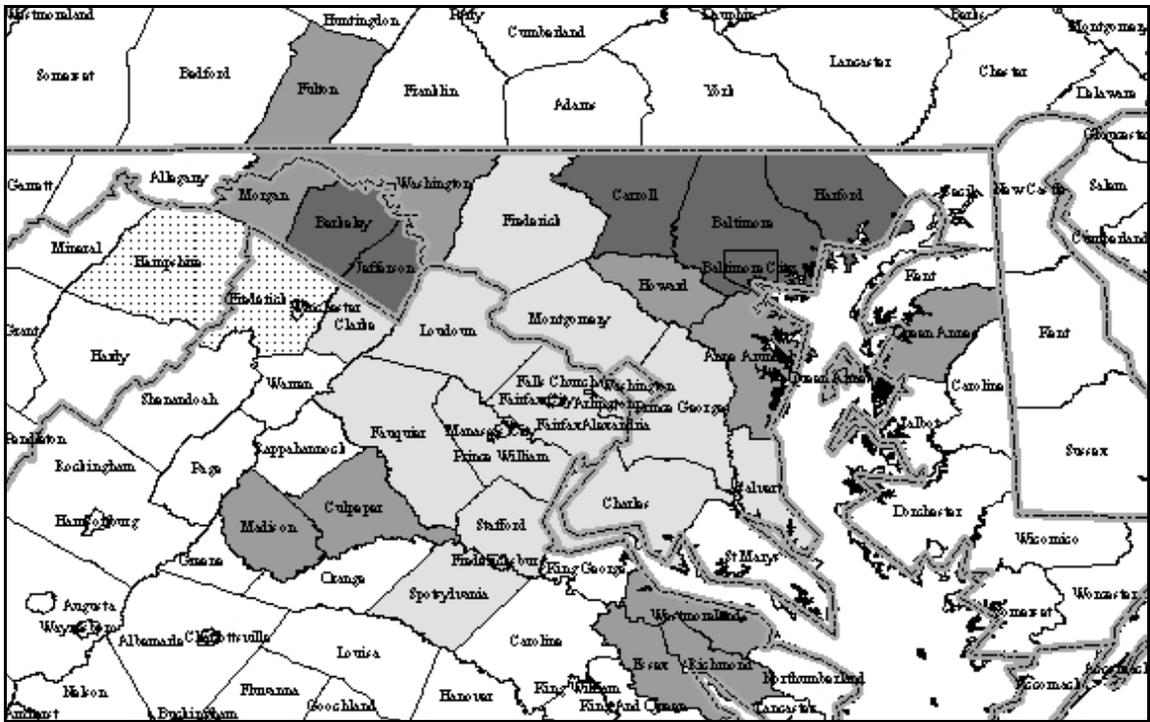
A second tier of the data shows that many of the areas can be combined (Table 22), with several previously independent counties showing substantial linkage to the Washington area. The Annapolis area is linked to both Washington and Baltimore, thus, by the transitivity principle discussed above, Baltimore and Washington are also linked. Additionally, because of one-way residential commuting, the Hagerstown, Culpeper/Madison, and Martinsburg areas are linked to Washington.

Table 22
Commutation in the Baltimore/Washington Area - Second Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Annapolis	Washington	24.34	9.40
St. Mary's, MD	Washington	23.76	17.61
Hagerstown	Washington	15.55	3.47
Caroline, VA	Washington	34.41	15.90
Culpeper/Madison	Washington	31.06	9.43
King George, VA	Washington	39.96	35.90
Orange, VA	Washington	24.41	4.74
Rappahannock, VA	Washington	41.22	44.22
Warren, VA	Washington	38.24	7.73
Martinsburg	Washington	21.06	2.01
Orange, VA	Culpeper	10.16	10.76
Warren, VA	Winchester	10.23	12.55
Annapolis	Baltimore	15.94	21.12

On a third pass of the data, the previously separate areas of Winchester and Essex/Richmond/Westmoreland counties are linked to the market (Table 23). Winchester is linked by both residential commuting and two-way commutation, while Essex/Richmond/ Westmoreland is linked by only residential commuting. Additionally, Franklin County, Pennsylvania is linked by residential commuting, while Kent County, Maryland is linked by employees commuting into the county.
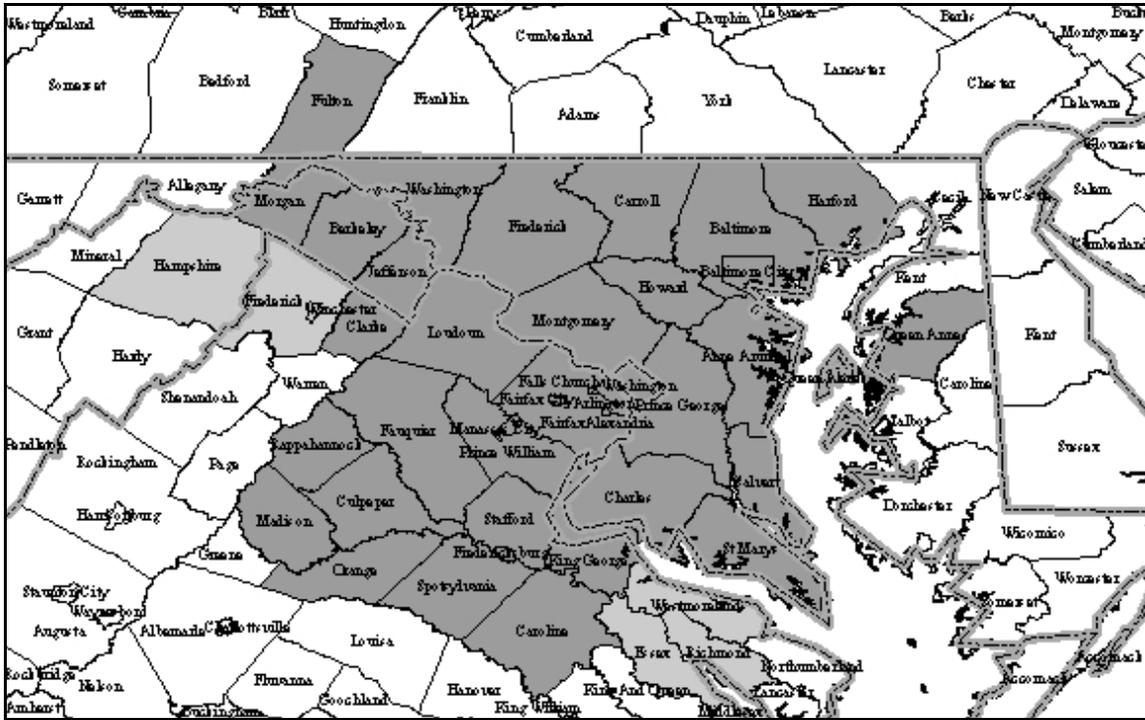
Table 23
Commutation in the Baltimore/Washington Area - Third Tier

Base County	Adjoining County	% of Base County Residents Commuting to Adjoining County	% of Base County Employees Commuting from Adjoining County
Kent, MD	Baltimore/Washington	10.72	20.59
Franklin, PA	Baltimore/Washington	18.35	7.97
Essex/Richmond/ Westmoreland	Baltimore/Washington	22.48	2.87
Winchester	Baltimore/Washington	20.11	15.88
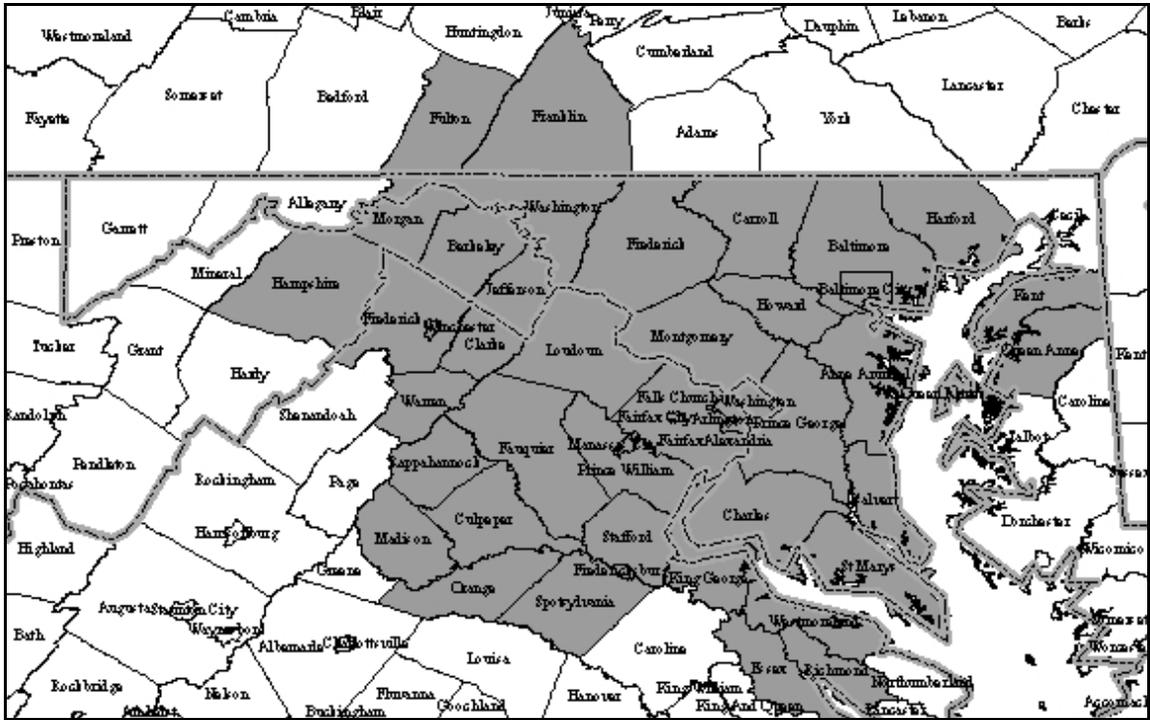
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