Potential Rural Impacts of Pension Reductions

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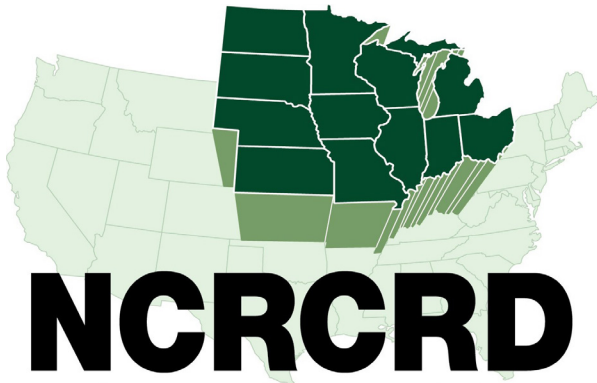
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North Central Regional Center for Rural Development

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The North Central Regional Center for Rural Development (NCRCRD) is one of four regional centers in the United States that work to improve the quality of life in rural communities. With funding from the USDA National Institute of Food and Agriculture and the land-grant universities in our 12-state region, the NCRCRD helps Extension professionals, researchers and other partners address issues that affect rural areas across the region. The center provides leadership in rural development by linking research with education and community outreach to facilitate, integrate, link and coordinate research and action for rural America.

Mission of the North Central Regional Center for Rural Development: Strengthening the ability of the land-grant university system to execute its rural development mission. Michigan State

Abstract

This study explores the exposure of rural communities to the rising risk of public and private pension fund insolvency. As rural communities continue to grey, America's heartlands will increasingly rely on pension incomes to drive their economies. The statuses of private, multiemployer and public pension funds are reviewed and standard input-output multiplier analyses are conducted to relate changes to larger regional impacts. Of the Midwestern counties selected in this study, the share of income tax returns with pension or annuity incomes ranged from 16 percent to 40 percent, comprising between six and 23 percent of total household adjusted gross income.

Background

Pension funds, both private and public, are under pressure. Many pension plans have been underfunded with both private employers and state and local governments deferring payments. At the same time the lingering effects of the financial crisis of the Great Recession and record low interest rates have contributed to pension funds being unable to meet their obligations (GAO 2013). The past rule of thumb for projecting pension fund balances had predicted growth rates of about 7.6 percent. In contrast the average realized return on pension investments was 4.1 between 2000 and now (Damodaran (2017). According to the Pension Benefits Guaranty Corporation (PBGC), the US multiemployer pension funds had $1.8 billion in total assets against $44.2 billion in total discounted liabilities as of September 30, 2014 (PBGC, 2016).

The rising risk of pension fund insolvency is of particular concern for many rural areas because of the disproportionate share of the population that is older and entering retirement. For many of these retirees private and/or public pension funds will provide the majority of their income, with Social Security as supplemental income. In this paper a pension is a defined benefit plan.

Essential services sectors in North Dakota adopted a variety of housing options to address the need for employee housing. These include the use of mobile/trailer homes, the purchasing of homes when they become available in the community, and construction of new multi-family homes. Figure one shows some of the housing options of the North and South Dakota study communities.

Approximately 10 million workers and retirees are covered by multi-employer pension plans, and approximately 10 percent of them are in plans that could run out of money in the next 20 years (Marte, 2016). An analysis of 124 multi-employer funds found an average funding ratio of only 47 percent in 2014, and that they had deteriorated since (Moody's Investors Service, 2016). Bankruptcy of the plans could also bankrupt the fund that guarantees multi-employer pensions, the Pension Beneficiary Guarantee Corporation (Fletcher, 2014; Marte, 2016; Horwitz, 2015). Moody's (2016) found that in fiscal 2015 the PBGC fund had assets of only $2 billion and liabilities of $54 billion.

There exists few options for estimating regional pension earnings. The Pension Rights Center provides U.S. aggregate estimates of retiree incomes. In this they indicate that in 2015, 85 percent of Americans 65 and over received social security payments, 65 percent received income from assets such as stocks, bonds and real estate, 31 percent received payments from pensions and 24 percent received earnings (Pension Rights Center, 2017b). Of those receiving pensions, the 2015 median annual private pension benefit was

$9,376, compared with $22,669 for federal government pensions and $16,742 for state and local government pensions. (Pension Rights Center, 2017a). Those receiving private pension benefits generally also receive social security payments, where those only earning social security generate $15,871 per year compared with $36,270 for those with both a pension and social security.

As an example, the Central States Pension Fund, a multi-employer fund with the main body of pensioners in Michigan, Wisconsin, Minnesota, Missouri, Texas and New York, was on the brink of declaring insolvency. Several companies that paid into this multi-employer fund on behalf of their teamster employees cut back on payments or went bankrupt, forcing the fund to pay out $2 billion more annually in benefits than it receives in contributions. Because of this, it was expected to run out of money in 10-15 years (Fletcher, 2014; Marte, 2016). Central States Pensions applied to reduce benefits, on average 23 percent, for the 407,000 covered by the plan under 2014 legislation that allows multi-employer plans to reduce benefits to improve solvency. This legislation is a major change from 40 years of shielding workers' pensions (Fletcher, 2014). This particular example is of concern for many communities in the Midwest because of the higher dependency of these states for pension fund income (Figure 1). High dependency on pension income is also common on the west coast, New England and the northern plains and the mid and deep south (Wiatrowski, 2012).

The PBGC (2016) reports the maximum plan guarantee benefits of plans that that reduce payments to maintain solvency or become insolvent. For participants with 30 years of service the maximum guaranteed benefits are $12,870 and only if the plan cuts original benefits by at least eighteen percent. Those with fewer years of service have lower maximum guarantees. Interestingly, the guarantee is higher for single employer plans. To keep the PBGC solvent, its premiums doubled in 2015. In 2016 multi-employer plans paid an annual fee of $27 per participant. However, the PBGC acknowledges that current premiums are unlikely to be sufficient to maintain current guarantee levels (PBGC 2016).

The Central States Pension Fund is not the only multiemployer pension fund facing shortfalls. Another example of pension vulnerability is in Appalachia, as utilities shift to other fuels and coal companies close. The public pension difficulties of Illinois are well known, and pensions were a major issue in the Detroit bankruptcy. The Dallas police and fire fighter fund is also under pressure and stopped withdrawals from the fund to maintain its solvency (Hallman, 2016). To remain solvent, many pension funds are reducing payments to pensioners (GAO, 2013). In 2008 the Pension Benefit Guaranty Corporation estimated the reduction in benefit payments had a present value of $141,000 in disposable income (PBGC, 2008). Furthermore, it is not just those with guaranteed pensions who may face reduced income at retirement. It is argued that many people in defined contribution plans are not saving enough because they are basing their savings on past returns and not on the current investment returns (Ilmanen, Rauseo and Truax, 2016.).

In this study, we explore the exposure of rural communities to pension income to address two questions:
- Beyond national averages, to what extent is rural America exposed to the "pension crisis"?
- What are the potential economic impacts on rural jurisdictions affected by the reduction in benefits from pension funds?

The questions and methods shed light on concerns about underfunded public pensions, single-employer pension funds and other multiemployer pension funds like that of the United Mine Workers of America (UMWA), as contributions fall off with reduced employment and mine closures and insufficient savings by those with defined contribution plans.

Rural America's Exposure to the Pension Crisis

While 13% of Americans were 65 and over in 2010, outside of metropolitan and micropolitan areas they were 17.2% of the population (Werner, 2011). Thus, the most rural areas are more exposed to changes in sources of retirement income. Furthermore, since rural earnings lag urban earnings, retirees in rural communities are already strained by lower retirement incomes (USDA, 2016b). Relatively high unemployment and underemployment in rural areas also posit fewer informal and formal work opportunities for those facing pension cuts (Hertz, 2016). While many rural employees are not covered by private pensions, government provides 20% of earnings in non-metropolitan areas compared with 16% in metropolitan areas (BEA 2016 and USDA, 2016a). This increases non-metropolitan dependence on public pensions, which in many cases are also underfunded. The risks to personal incomes because of the higher percentage of retirees, generally lower retirement incomes and fewer economic opportunities, may in turn pose disproportionate risks to rural economies. The nature of the risks to rural pensioners and local economies have not been explored in the current literature.

To address the question of rural America's exposure to the pension crisis we performed a spatial analysis and a series of sub-sample equivalency tests. The income measures are based on IRS data that report pension plus annuity income as categories distinct from taxable social security and investment income.[1] Counties are categorized based on the rural-urban continuum codes, often referred to as the Beale codes (USDA, 2013) and county economic codes (USDA, 2016a).

Spatial Analysis

To gain a better understanding of the dependency of different parts of the U.S. on pension income we build on Figure 1 by mapping county level pension (and annuity) data. We use a four year average (2011-2014) to minimize the influence of year to year fluctuation and achieve a more stable representation. To gain additional insights into the spatial patterns we compute Getis-Ord Gi* statistics to identify hot and cold spots using the various measures of pension dependence. The Getis-Ord Gi* statistic identifies a cluster where the variable in question is higher (hot spot) and lower (cold spot) than would be expected by random chance. Geographic regions that are not part of a hot or cold spot could be considered a random spatial distribution.

We analyze three separate measures of dependency on pensions: (1) average pension income per tax return declaring pension income (Figure 2a and 2b), (2) share of tax returns declaring pension income (Figure 3a and 3b), and (3) share of adjusted gross income from pension income (Figure 4a and 4b). While the three different metrics of pension dependency reveal some spatial variations there are some regions that appear to be more exposed to pension risks. Not unexpected, there are portions of the "rust

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1 The Internal Revenue Service (IRS) provides the best source of county level retirement income data in a timely and uniform fashion. Unfortunately, the data aggregates pension and annuity incomes into one category. Annuity income is a form of personal savings that individual may elect to set aside to supplement pension and social security payments.

belt" that are relatively highly dependent (i.e., hot spots). This is likely due to the legacy of manufacturing, mining and labor union based pensions. Traditional "retirement destinations" areas such as Florida and the coastal Carolinas and parts of the southwestern states also stand out. There are also parts of the Pacific Northwest with pockets of dependency on pensions for income. Not unexpectedly, the central Great Plains that are disproportionately dependent on agriculture are less dependent on pensions. In addition, the region associated with the Mississippi Delta region is less dependent on pensions. The general spatial patterns of dependency on pensions for income tells us, that despite clear hot and cold cluster spots, this is not a regional but rather a national issue that needs to be addressed at the national level.

Sub-Sample Equivalency Tests

We group U.S. counties across three different types of classifications, one across the urban-rural spectrum, one where counties are grouped by economic base, and the third based on type of county, all as defined by USDA (2016a). In the urban-rural spectrum analysis we classified counties as metropolitan, non-metropolitan adjacent and non-metropolitan remote (non-adjacent non-metropolitan), as shown in Figure 5. The third set of comparisons are across retirement destination counties, low education and persistent poverty, among others, as defined by the USDA Economic Research Service (2016a). These latter classifications are often referred to as "policy codes."

We tested for differences among county categories using the F-test, Kurskal-Wallis Test, Median One-way Analysis, Van der Waerden One-Way Analysis, and Savage One-way Analysis. As the threshold for statistical significance we determined a priori that three of the five tests must be statistically significant.

Urban and rural counties: Our comparison of metropolitan, nonmetropolitan adjacent and nonmetropolitan remote or non-adjacent counties' pension dependence is provided in Table 1. Per capita pension income (a measure of overall importance in the economy) is highest in metropolitan counties ($2,070) followed by the nonmetropolitan adjacent ($1,814) and the nonmetropolitan remote ($1,646) and the differences are statistically significant on all measures of subsample equivalency. The difference in average pension per return also follow this pattern, and the differences are statistically significant. Metropolitan counties have the highest average ($21,558) and the remote have the lowest ($18,628). On the other hand, the share of adjusted gross income (AGI) from pensions is slightly higher in adjacent nonmetropolitan counties (9.1%) than metropolitan and remote (8.5%), and again the differences are statistically significant. The percentage change in average pension income from 2011 to 2014 is not significantly different between the three areas.

To examine the robustness of this result we also tested the above measures of pension dependence for the full range of the metropolitan and non-metropolitan continuum (not shown). As counties become more rural, pension income per capita decreases, with the exception of the completely rural, adjacent counties. These counties also have the highest share of AGI from pensions (10%) and the highest share of filings with pension income (22%). For these latter two measures there is no clear increasing or decreasing trend as rurality increases, but the differences among the areas are statistically significant.

County economic structure: To examine how the economic structure of counties may be related to pension income we use the county typology codes developed by the USDA

(2016a). These codes are for all counties, not just rural counties. Farming (391 non-metropolitan counties of 444), mining (183 non-metropolitan counties of 219) and manufacturing (351 non-metropolitan counties of 506) dependent nonmetropolitan counties have the lowest pension income per capita and pensions per return (Table 2). They also have the lowest share of AGI from pensions. This is not surprising given that farmers tend to be self-employed and farm workers generally are not covered by pensions. While we commonly think of mining as coal or oil, which tend to be large operations, there are many types of smaller operations in rural areas, such as quarrying. Many of these workers may not have a pension. The same is true of many of the mid-sized and small manufacturing firms in rural areas.

The recreation counties (288 non-metropolitan counties of 332) are the highest on the measures of pension dependence followed by federal and state government (351 non-metropolitan counties of 506) and the nonspecialized counties (585 non-metropolitan counties of 1,237) (USDA 2016a). All of the differences among the county types are statistically significant. Recreation counties likely have a high percentage of well-off retirees who have moved into the area, contributing to the importance of pensions. The importance of public pensions in rural areas is demonstrated by their importance in counties that are federal and state government dependent.

County Policy Code Types: We also compared counties with specific demographic characteristics to all other counties (nonmetropolitan and metropolitan). The USDA (2016a) defines retirement destination counties (193 non-metropolitan counties of 442) as those where net in migration caused the population 60 and older to grow grew 15% or more from 2000 to 2010. Based on the concentration of retirees it would be expected that these counties would have higher dependence on pension income than other counties. By all of the measures, retirement counties are significantly more dependent on pension income than all other counties (Table 3). It should be noted that there is some overlap of retirement counties with recreation-dependent counties, discussed above, which are the most pension dependent. Average pensions, pension income per capita, pensions as a share of AGI and the share of filings with pensions, all appear higher in the recreation than in the retirement counties, but we did not test if the differences are statistically significant. This may suggest that the counties with the highest recreation amenities attract retirees with higher incomes because there are likely premiums, such as higher housing prices, for living near these amenities.

In low education counties 20 percent or more of the population age 25 to 64 lack a high school diploma or GED based on the five-year average of 2008-2012 (USDA, 2016a). Of these counties, 367 of 467 are non-metropolitan counties. Low education counties have significantly lower dependence on pension income than other counties, but the difference in pension income change is not statistically significant. Given that average education rates change slowly, it is likely that these counties have had low education levels for many years and those with lower skills are less likely to have jobs covered by pension.

Low-employment counties (720 non-metropolitan counties of the 906) are defined based on a five year average, 2008-2012. In these counties less than 65 percent of the population of prime working age, 25-64, were employed. These counties have a significantly lower pension income per capita, but higher share of filings with pension income. Pensions make up a higher share of AGI in these counties, and the average pension per return with a pension is also significantly higher than for all other counties. In tandem this suggest

that these counties are relatively more dependent on pension income, but overall income levels are still low.

Persistent poverty counties (301 non-metropolitan counties of 353) have had 20 percent or more of the population below the poverty line, based on the 1980-2000 decennial censuses and the American Community Survey five-year average, 2007-2011. These counties have significantly lower pension income per capita, a lower share of filings with pension income and lower pension income per return with pension income than all other counties. On the other hand, in these counties, a significantly higher share of AGI is pension income. With pensions contributing a higher share of AGI, decline in pension income in a persistent poverty county can have a notable negative impact at the margin.

There is overlap between the low education, low employment and persistent poverty counties. For the low employment and persistent poverty counties, the share of AGI from pensions is significantly higher than for other counties. This suggests that families in these counties may be more sensitive to changes in pension income than in other counties.

The population loss counties (467 nonmetropolitan of 529) have had declining populations in each decennial census, 1990-2010. The counties are concentrated in the plains states. The population loss counties show a statistically significant lower dependence on pensions than all other counties. There is a substantial overlap between the population loss and farming counties. As noted above, many farmers and farm workers do not have pensions. It is also possible that those with pensions leave the county at retirement, contributing to the population loss.

Summary and Discussion

While we can identify some rudimentary patterns in the dependency on pensions for income, we cannot conclude that there is a specific type of county, rural or urban, that is particularly exposed to pension fund risks. Some counties, for example, those that are more likely to be attractive to retirees or have legacy industries associated with manufacturing or mining, may be more at risk, but the threat of pension insolvency is wide spread across all types of counties.

Potential Economic Impacts on Rural Areas

In order to gain insights into the potential economic impacts of reductions in pension income in rural communities we selected nine counties across the Midwestern states to conduct a set of simulated economic scenarios. In each case, we propose a scenario of a fifty percent reduction in total pension income. Using county level input-output models (sourced by IMPLAN) specific to each county we trace through the economic impact of a hypothetical reduction in pension income.

Literature Review: Impacts of Pension Reductions

Much of the literature on pension reductions focuses on the fiscal aspects of funding and options for maintaining solvency (Brown, Clark and Rauh, 2011). Davis and Hu (2008) found that funding pensions, rather than using a pay-as-you-go system, gains enough in investments to make the funding worthwhile. Other literature examines potential impacts on beneficiary recipients. Butrica and colleagues (2009) estimated how freezing

accruals in all current private and one third of public defined benefits plans and from the freeze forward converting to combined benefit plans affects family incomes. They found that later baby boomers, birthdates of 1961-1965, would have faster declines in income than those born 1946-1950. Twenty-six percent of late boomers with current defined benefit plans will have lower income at 67 and ten percent will have an income decline of five percent. A smaller number of families will have higher incomes with the defined contribution plan.

The literature on the economic and fiscal impacts of public pensions tends to focus on the impacts of pension investment outcomes (Shoag, 2010). This is not our research question. While, a few studies explored the economic contribution of public pensions to state economies (Business Forecasting Center, 2013; Addy and Ijaz, 2007), we could find no literature on the potential net economic impacts of pension cuts, private or public, with no replacement with another pension plan.

The most closely related literature that we could identify is the literature on the economic and fiscal impact of retirees migrating to rural areas or aging in place in rural areas. A summary of this literature and of the findings of a set of studies estimating the economic and fiscal impacts of retirees of various ages and incomes on a rural area is found in Shields, Stallmann and Deller (2003). Overall the literature finds that younger and higher income retirees have positive economic impacts on communities and also positive net fiscal impacts in comparison to other retirees. Lower income retirees and older retirees also have positive economic and net fiscal impacts, contrary to the fear that they could become drains on their communities. At the same time, each group has a differential economic and fiscal impact on the community in terms of the sectors on which they have the most economic impact and which parts of the local public budget are affected. While that literature is about retirees bringing income into the community, it is relevant because it is merely the reverse of retirement income being withdrawn from the community.

Some questions of economic dynamics exist that the literature has yet to address. Serow (2003) notes that the literature on the economic impacts of retirees is short term in nature. For example, is the increase in rural retail demand due to retirees sufficient that those services remain available for all members of the community? In which case, if pensions are cut will this lead to closures of some businesses in rural communities? Research shows that as retirees age some of them move to be near children for assistance, likely to live in urban areas, or to be near urban services, especially medical services. Does a pension cut accelerate the move to be near children or does it delay the move because of higher living costs in urban areas?

Methods and Data

Nine counties were selected, representing a broad range of rural Midwest counties that spans by degree of remoteness from urban centers and by size (Table 4). The counties are split between Michigan, Minnesota, Missouri and Wisconsin. Four of the nine selected counties are not urban-adjacent, while another set of four represent smaller counties. Population counts ranged from 23,102 to 53,951, while total personal income earnings ranged from $30,188 to $43,034. Per capita Incomes tend to be higher in Minnesota counties. Additionally, the share of population above retirement age ranged from 12 to 30 percent. Roscommon County, MI stands out as having a significantly larger share of the population above retirement age.

Internal Revenues Service Tax Stats – County Data (2017b) for 2012, 2013 and 2014 were used to estimate incomes from non-public pensions. In this, the IRS Tax Stats provides the total count of returns (Field: N01700) with, and the aggregate earnings (A01700) from taxable pensions and annuities by county. Filers indicate receipt of taxable pensions and annuities if receiving a Form 1099-R form from program administrators. Such records include distributions from pensions, retirement annuities, 401(k), 403(b), and governmental 457(b) plans, but do not include rollovers and lump-sum distributions that would not be subject to modification. They also do not include disability pensions before reaching retirement age, corrective distributions of excess salary deferrals or excess contributions to retirement plans (Internal Revenue Service, 2015). As such, the data overstate the share of county income earned through public and private pensions that are at risk due to pension shortfalls.

County pension incomes were estimated using three-year averages of taxable pension and annuities (Table 5). The percentage of returns reporting 1099-R incomes ranged from 16 percent to 40 percent, making up about six and 23 percent of reported aggregate income, respectively. Roscommon County stands out from the other counties in terms of the high number of tax filers reporting annuity and pension incomes and the high share of reported income this makes up. This is consistent with the age statistics for Roscommon County.

IMPLAN Pro 3.1, using 2013 data for the corresponding counties in Michigan, Minnesota, Missouri and Wisconsin, was used to model expected economic impacts. We estimate the potential economic impacts of cuts to pension benefits by assuming a 50 percent decline in county pension earnings and modeling this as a reduction in household income for household category Households $35-50k (TypeCode 10005). Because this is a reduction in household expenditures, impacts materialize through changes in household expenditures that reverberate throughout the economy. That is, the impacts reflect induced effects only. To acknowledge the direct change in household income, the direct reduction in pension benefits is then subtracted from the already negative impact.

Findings

The findings are reported in Table 6, where the first column is the initial change in pension allocations and is allocated to changes in county household income. This represents the simulated loss of 50% of total pension income. The second column is the combined direct effect change in pension allocations and changes in labor income from induced effects. Thus, for Clark County, Wisconsin, a 50% loss of pension income, $19.157 million, results in a total loss of $21.341 million of labor income (wages, salary and proprietor income). The third column is the combined changes in pension allocations and changes in all sources of county income through induced effects.[2] For Clark County, this is a loss of $24.495 million in total income (labor income plus all other sources of income). Finally, the reduction in pensions will impact total employment through reduced household expenditures. This is captured in the fourth column and is limited to induced effects on the respective county's employment. Again, for Clark County, Wisconsin, the loss of 50% of pension income will result in the loss of 81 jobs in Clark County.

When comparing estimated impacts to initial changes in pensions via implied economic multipliers, it is evident that the expected change in incomes (labor income and total income) are comparable across all county types (small/medium; urban adjacent/remote)

2 This is also referred to as gross regional product or value added.

at 1.15 and 1.35 for labor income and total income, respectively. However, remote counties tend to generate larger employment impacts than urban adjacent counties. In this, the average implied employment multipliers for remote counties was 5.66 compared to 4.88 jobs for urban adjacent counters per $1 million change in pension payments.[3] The contrasts of employment and income impacts reflects differences in wages and labor productivity, where remote counties may have a labor-productivity disadvantage.

Conclusions

Rural pensioners may be hard hit by any reduction to incomes from public pensions and single- or multiemployer private pension shortfalls. Due to overly optimistic outlooks on revenue growth and declining contributions, an increasing number of pension funds are at risk of insolvency. If pension funds become insolvent, pensioners are forced to absorb significant reductions in payments. In an effort to retain solvency of the Pension Benefit Guaranty Corporation's Multiemployer Program, the Multiemployer Pension Reform Act of 2014 authorizes such plan administrators to petition contributors for reduced benefits if fund insolvency is deemed inevitable. Despite higher PBGC rates per participant, the PBGC has $2 billion in assets to cover $54 billion in future liabilities (Moody's Investor Services 2016).

This study explores the exposure of rural communities to pension income to better understand the spatial distribution of risks to cuts in pension payments and to provide a first assessment of the potential impact of pension benefit losses. This is the first study to explicitly explore the risks of lost pension benefits for rural areas.

There is a definite clustering of pension-dependent areas in the U.S., but such clustering is spread throughout the U.S. Spatial analyses reveals the Midwest farming states (West Texas and Mississippi Delta to North Dakoda) and parts of lower Appalachia have lower than U.S. average dependence on pensions, while parts of the Upper West, Great Lakes and New England have greater reliance. Florida also exhibits a significant reliance on pension incomes, due in part, to retiree migration.

We find that per-capita pension benefits are highest in urban areas, while urban-adjacent counties tended to exhibit higher shares of adjusted gross income made up of pensions. Rural counties steeped in farming, mining and manufacturing have less dependence on pension incomes. This may reflect the smaller-scale businesses with no or few pension offerings that operate in rural counties. Alternatively, recreational counties and those with significant dependence on state and local government tend to be more dependent on pension incomes, where recreation counties likely exhibit a pattern of retiree migration to amenity-rich communities. This is evident when looking at both rural and metro, USDA-designated retirement destinations.

Other demographic characteristics were found to factor into county dependence on pension payments. While USDA-designated low-employment counties and high poverty counties tend to have lower dependence on pension income, a higher proportion of tax filers receive some form of pension or annuity payments as part of their income. Additionally, those counties with high population loss generally exhibited lower dependence on pension incomes. This may be associated with outmigration of retirees.

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3 More specifically, $1 million change in Households $35-50k incomes.

The findings highlight the importance of retirement income. Of the counties selected in this study, the share of income tax returns with pension or annuity incomes ranged from 16 percent to 40 percent, comprising between six and 23 percent of total household adjusted gross income. As rural communities continue to grey, America's heartlands will increasingly rely on pension incomes to drive their economies. The loss of 50% of pension income could cost our sample of rural counties from 81 jobs (Clark County, WI) to 308 jobs (Johnson County, MO). For rural communities that are struggling to rebuild their economies in the wake of the Great Recession these job losses would be considered significant.

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Figure 1. Percentage of employees participating in defined benefit pension plan, by geographic region, private industry 2011
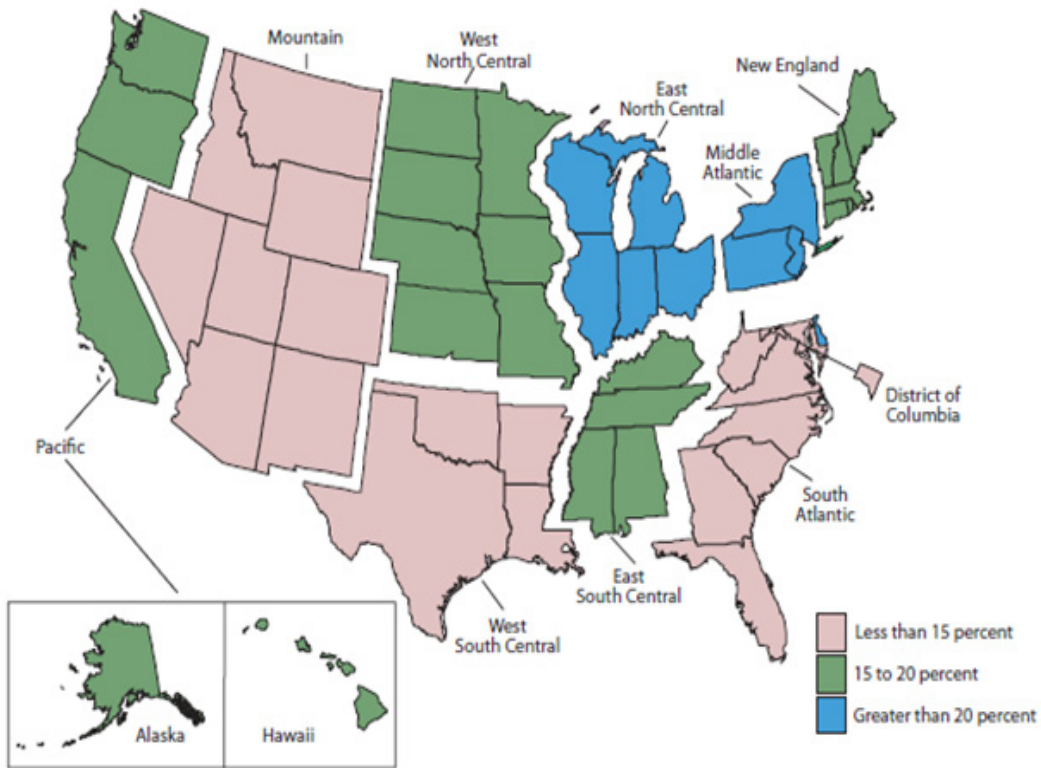
Source of map: Wiatrowski, 2012 using U.S. Bureau of Labor Statistics

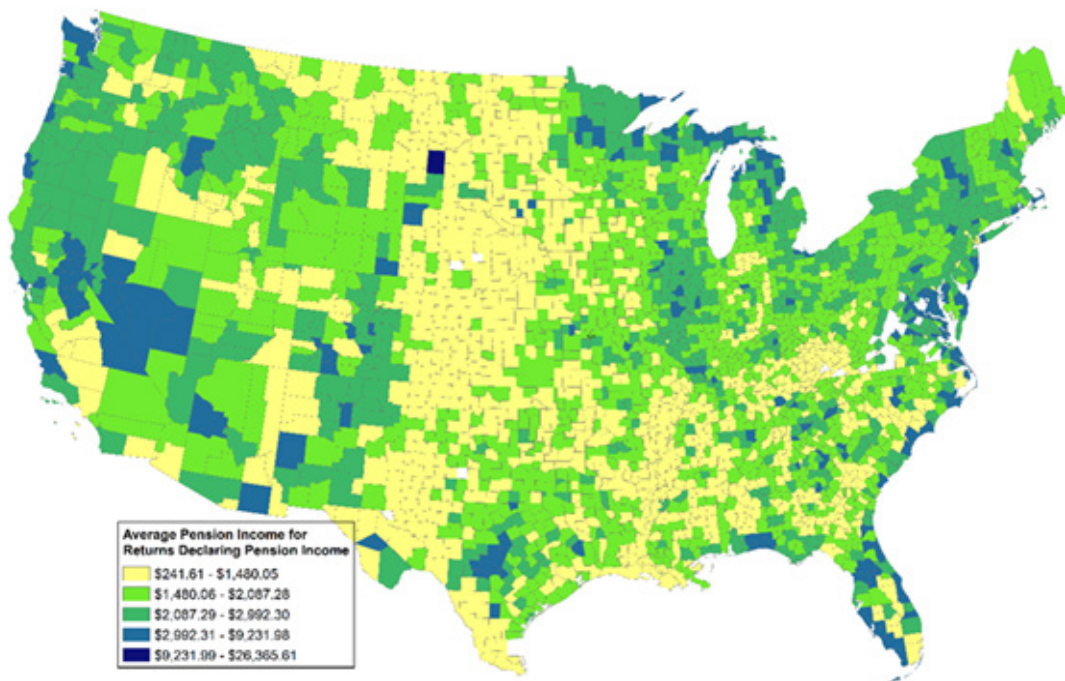**Figure 2a: Average Pension Income per Pension Return (2011-2014)**

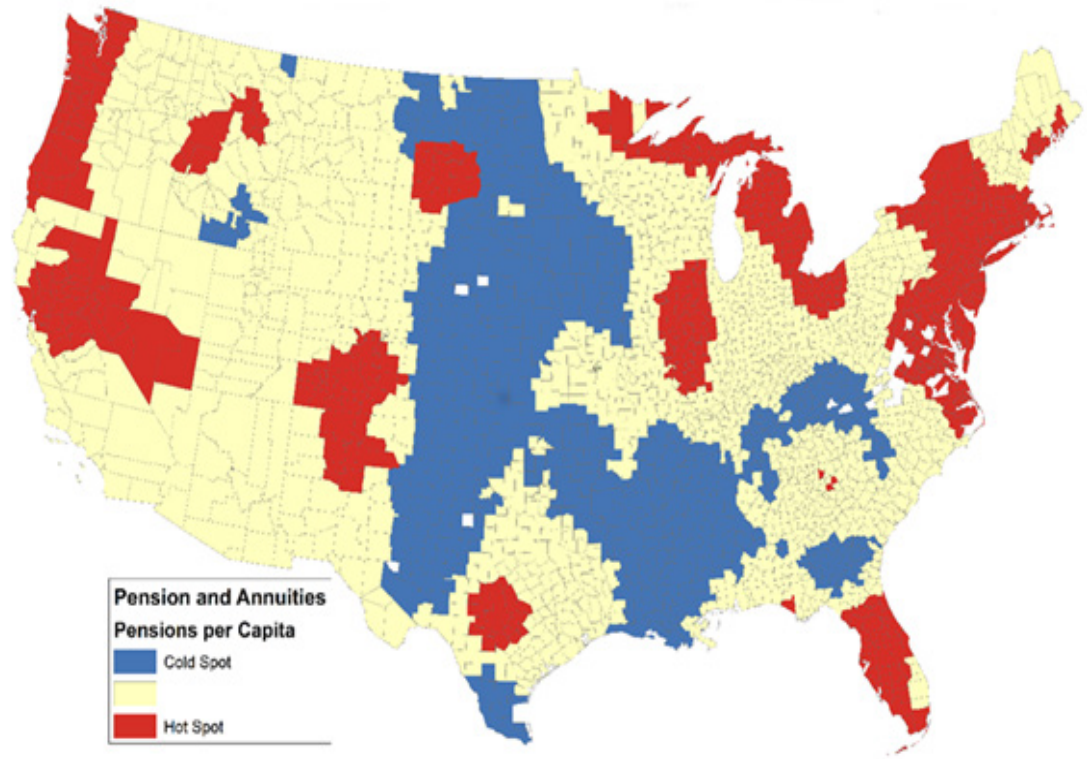**Figure 2b: Spatial Clustering Average Pension Income per Pension Return (2011-2014)**

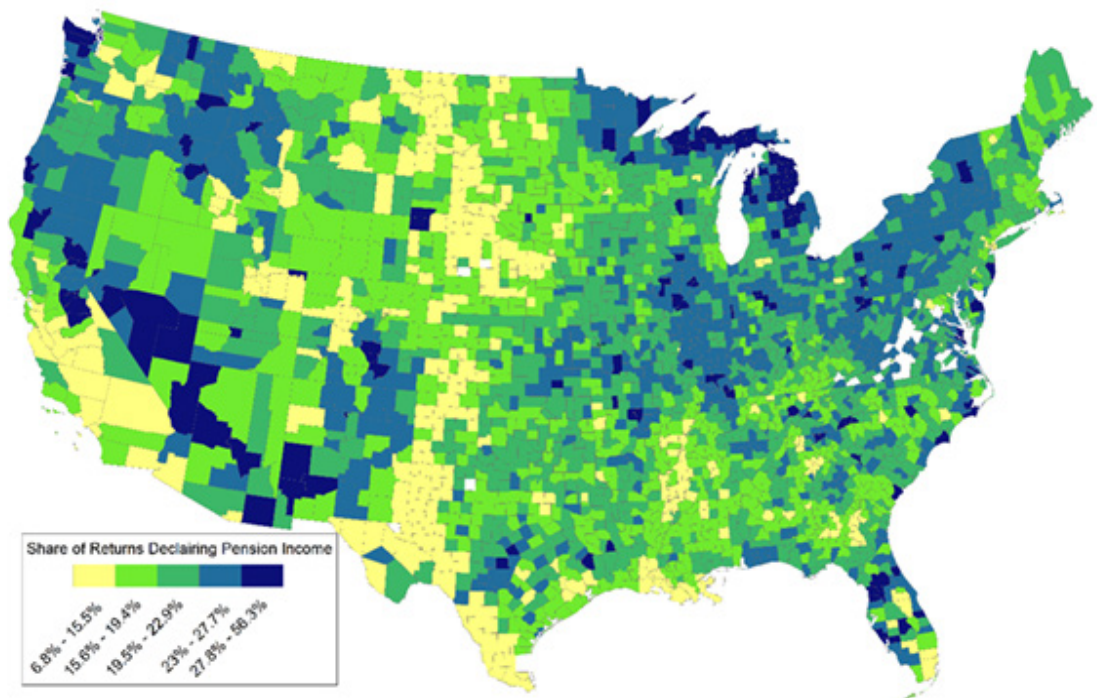**Figure 3a: Share of Returns Declaring Pension Income (2011-2014)**
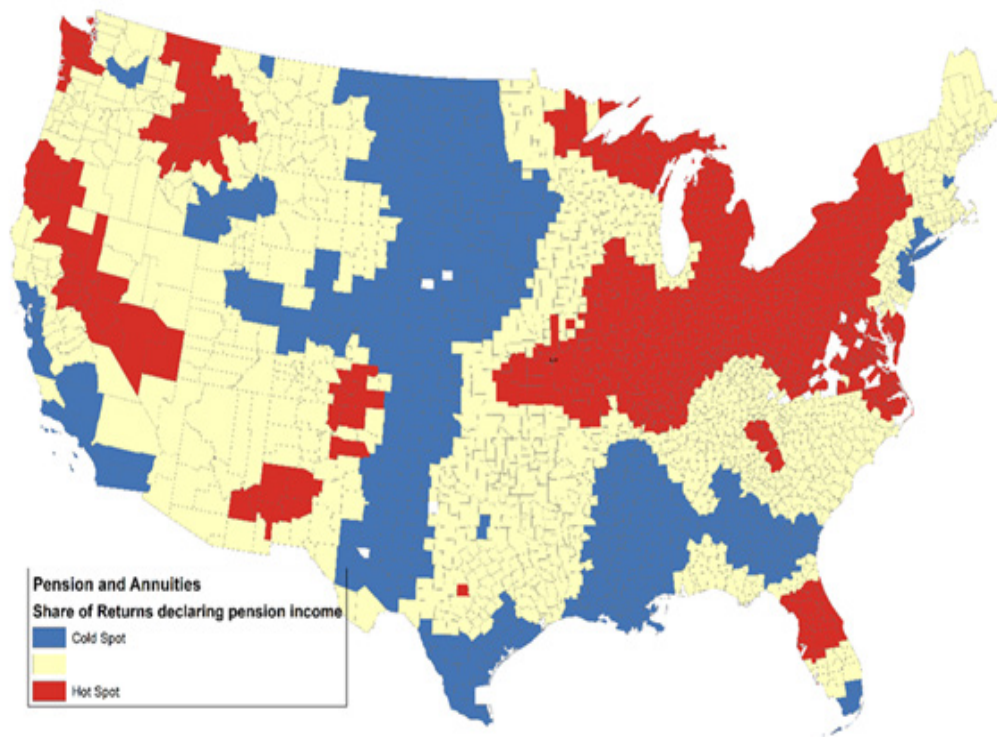
Figure 3b: Spatial Clustering Share of Returns Declaring Pension Income (2011-2014)

Pension and Annuities
Share of Returns declaring pension income
- Cold Spot
- Hot Spot

Figure 4a: Share of AGI Income from Pensions (2011-2014)

Pensions and Annuities
Share of AGI from Pensions
- 1.4% - 5.8%
- 5.9% - 8.3%
- 8.4% - 10.9%
- 11% - 14.5%
- 14.6% - 27%
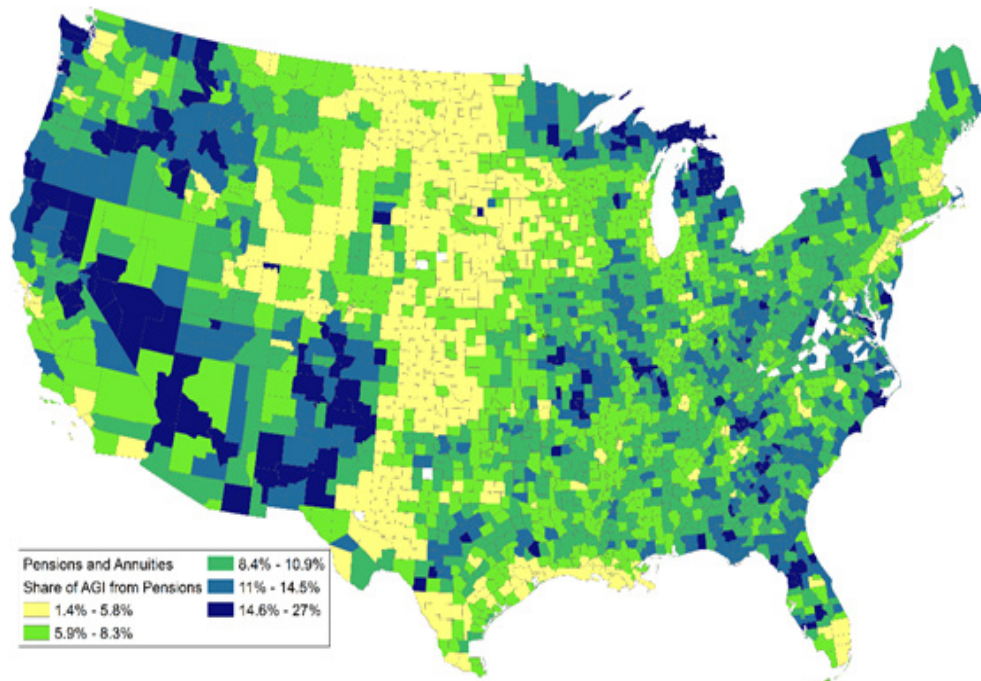
Figure 4b: Spatial Clustering Share of AGI Income from Pensions (2011-2014)
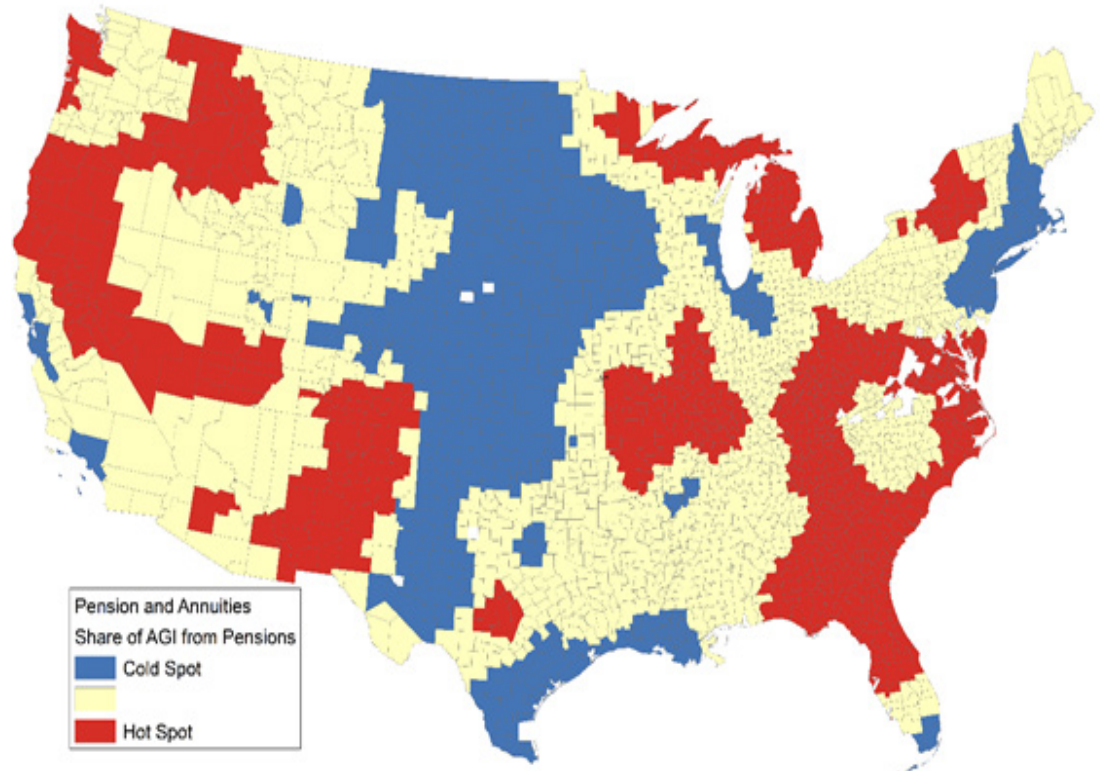
Figure 5. Modified Beale Codes
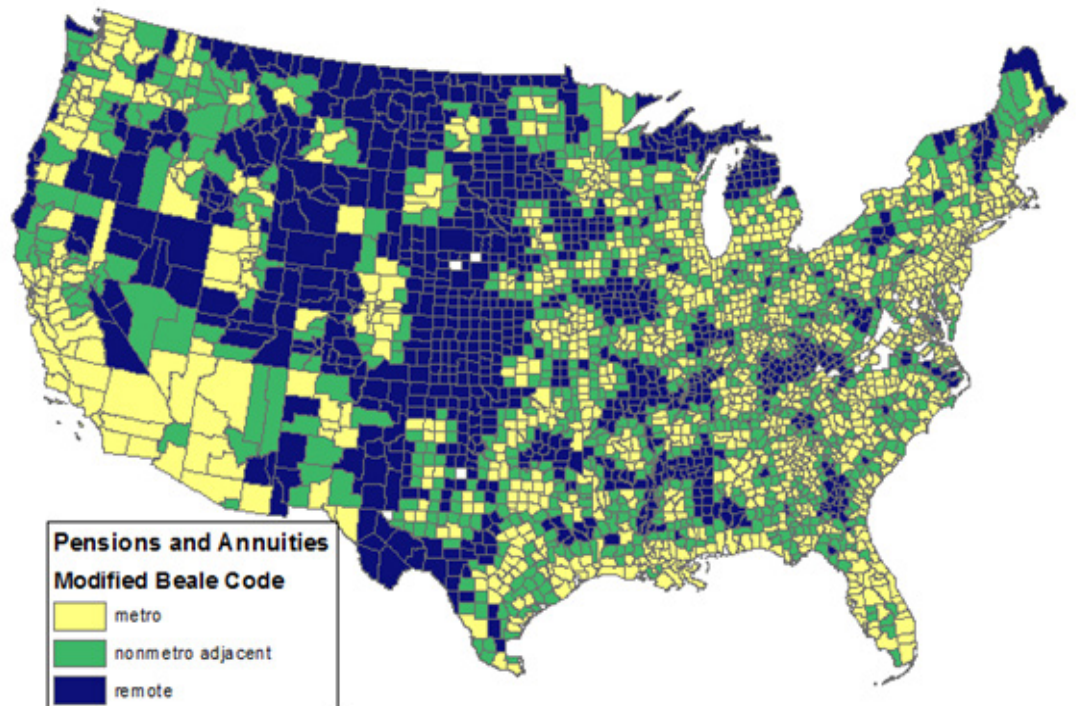
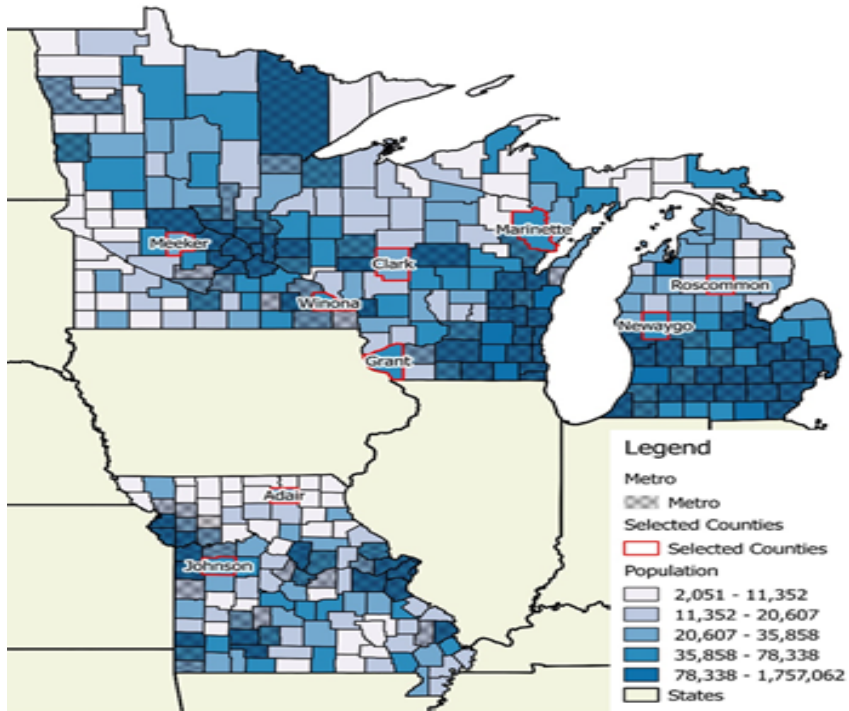**Figure 6: Spatial Location of Selected Counties**

Table 1: Pension Dependency Across Urban-Rural Spectrum

	N	Pension Income Per capita	Share of AGI Income from Pensions	Share of Filings with Pensions	Average Pension per Pension Return	Percent Change in Average Pension per Pension Return
Metro	1,164	2,070.31	0.085	0.208	21,557.93	0.092
Adjacent (Nonmetro)	1,027	1,814.04	0.096	0.214	19,423.30	0.098
Remote (Nonmetro)	944	1,646.13	0.085	0.198	18,628.09	0.093
Fstat		69.2595	36.3161	31.5376	161.0047	1.6707
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.1883)
Kruskal-Wallis Test		304.3713	88.6916	73.8391	315.5761	4.3428
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.1140)
Median One-Way Analysis		252.4933	59.33	59.3895	193.3825	6.3059
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0427)
Van der Waerden One-Way Analysis		276.2596	85.5934	69.9574	328.4547	3.1133
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2108)
Savage One-Way Analysis		164.1985	55.4396	28.016	228.8481	9.6531
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0080)
p-value in parentheses						

Table 2: Rural County Pension Dependency Across Economic Base

	N	Pension Income Per capita	Share of AGI Income from Pensions	Share of Filings with Pensions	Average Pension per Pension Return	Percent Change in Average Pension per Pension Return
Nonspecialized (and Metro)	1236	1,865.85	0.087	0.206	20,317.12	0.097
Farm	444	1,442.44	0.071	0.187	16,686.06	0.092
Mining	219	1,503.45	0.068	0.190	18,486.55	0.120
Manufacturing	506	1,649.93	0.084	0.207	18,037.07	0.102
Federal/State Govt	404	2,026.95	0.107	0.213	22,678.28	0.086
Recreational	331	2,712.57	0.115	0.239	23,762.49	0.064
Fstat		123.7619	140.9142	65.8286	246.8655	12.5939
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Kruskal-Wallis Test		730.0828	541.2846	280.4035	925.9503	95.7702
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Median One-Way Analysis		476.8552	301.3528	183.9998	627.772	72.739
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Van der Waerden One-Way Analysis		747.8741	573.4986	295.6718	944.3165	95.9479
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Savage One-Way Analysis		751.2816	542.1015	359.8946	785.3469	105.1071
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)

County Type	N	Pension Income Per capita	Share of AGI Income from Pensions	Sharre of Filings with Pensions	Average Pension per Pension Return	Percentage Change 2011-2014 in Avergate Pension per Pension Return
Table 3: Dependence on Pension Income by Policy Type of Counties						
Retirement Destination	442	$2,296	10.6%	22.4%	$22,777	8.2%
All Other Counties	2,693	$1,787	8.6%	20.4%	$19,517	9.6%
Low Education	466	$1,304	8.6%	17.5%	$19,371	10.1%
All Other Counties	2,669	$1,955	8.9%	21.3%	$20,082	9.3%
Low Employment	906	$1,748	10.9%	21.5%	$20,175	9.6%
All Other Counties	2,229	$1,904	8.1%	20.3%	$19,896	9.3%
Population Loss	528	$1,567	7.5%	20.0%	$16,791	10.3%
All Other Counties	2,607	$1,918	9.2%	20.8%	$20,622	9.2%
Persistent Poverty	353	$1,323	9.4%	17.7%	$19,600	9.7%
All Other Counties	2,782	$1,927	8.8%	21.1%	$20,024	9.4%
* Difference is not statistically significant						

Table 4: Basic Characteristics of Case-Study Counties

County	Remoteness	Size	Per capita personal income	Personal income (000)	Population (2015)	Population Percent >64	Civilian Labor Force	Percent in Civilian Labor Force	Percent Working in Production Industries
MI									
Newaygo County	Adjacent	Medium	$33,201	$1,591,924	47,948	18%	$20,710	54%	34%
Roscommon County	Remote	Small	$33,199	$793,400	23,898	30%	$8,812	42%	21%
MN									
Meeker County	Adjacent	Small	$40,861	$943,982	23,102	19%	$12,046	67%	39%
Winona County	Remote	Medium	$43,034	$2,189,781	50,885	16%	$30,171	70%	28%
MO									
Adair County	Remote	Small	$30,188	$766,107	25,378	14%	$12,048	56%	15%
Johnson County	Adjacent	Medium	$32,718	$1,765,194	53,951	12%	$25,968	60%	20%
WI									
Clark County	Adjacent	Small	$36,538	$1,258,559	34,445	16%	$16,363	64%	44%
Grant County	Remote	Medium	$38,413	$2,007,102	52,250	17%	$27,425	65%	30%
Marinette County	Adjacent	Medium	$39,681	$1,622,337	40,884	22%	$20,497	60%	38%

Table 5: Base Data for Simulated Analysis

County	Number of Returns w/1099-r	Percent of Total Returns	Pension Percent of AGI	Annual 1099-R Payments (000)
MI				
Newaygo County	4990	24%	10%	$86,938
Roscommon County	4493	40%	23%	$100,793
MN				
Meeker County	2193	20%	7%	$39,723
Winona County	4260	19%	6%	$77,712
MO				
Adair County	1987	21%	10%	$39,629
Johnson County	4943	23%	12%	$116,658
WI				
Clark County	2400	16%	6%	$38,959
Grant County	4650	21%	8%	$83,116
Marinette County	4557	23%	9%	$80,010

Table 6: Base Data for Simulated Analysis

County	Change in Personal Income	Change in Labor Income	Change in Total Income	Change in Employment
MI				
Newaygo County	-$43,469,000	-$49,316,602	-$57,641,148	-192
Roscommon County	-$50,396,333	-$56,388,013	-$65,134,592	-222
MN				
Meeker County	-$19,861,333	-$22,184,606	-$25,814,003	-83
Winona County	-$37,972,375	-$44,560,104	-$52,478,082	-219
MO				
Adair County	-$19,814,333	-$24,156,346	-$28,171,629	-135
Johnson County	-$58,329,167	-$67,057,958	-$77,871,120	-308
WI				
Clark County	-$19,157,375	-$21,341,387	-$24,494,881	-81
Grant County	-$40,602,000	-$47,766,511	-$56,024,351	-230
Marinette County	-$39,299,250	-$47,426,028	-$55,445,609	-247

Table 7: Sources of Personal Income: 2014 IRS SOI Table 1.3

Income Source	Billions	Percent of Total Income
Total Income	$9,916	100%
Salaries and Wages	$6,785	68%
Net Capital Gains	$699	7%
Taxable Pensions and Annuities	$663	7%
Partnerships and S-Corporation Net Income	$584	6%
Business Net Income	$317	3%
Dividends	$447	5%
Taxable IRA Distributions	$235	2%
Taxable Social Security Benefits	$261	3%
Interest	$156	2%
Unemployment Compensation	$33	0%