Assessment of IRP Truck Licensing for Ohio Counties

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16. Abstract

Ohio officials are concerned with the disconnect causing an IRP revenue shortfall. County governments and taxing districts are not given enough IRP revenue to correct the amount of pavement damage caused by commercial vehicles on local roads. Researchers determined the disconnect stems from a combination of Ohio's IRP distribution process and the growing phenomenon of "jurisdiction shopping", which is where companies register trucks in an IRP jurisdiction that is not the vehicle's primary domicile location. Doing this saves the company money on non-IRP taxes and fees. Although IRP fees are still apportioned based on miles traveled, the money is distributed to counties and taxing districts differently than if the vehicle was registered in Ohio. Currently, there are more than 20,000 vehicles belonging to a company with a primary address in Ohio, but registered in another jurisdiction. The result is significant revenue impacts on Ohio counties, municipalities, and townships. In 2015, we predict the direct and indirect impacts will be $10.13 million for counties, $2.89 million for municipalities, and $684,997 for townships. The cumulative effect for all counties and taxing districts is as much as $13.7 million, although the true impact is potentially higher when additional factors are taken into account.

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Project Background

Local government officials in Ohio perceived an imbalance between the percentage of International Registration Plan (IRP) revenue allocated to counties and taxing districts, and the amount of pavement damage caused by commercial vehicles on local roads. The problem is twofold: not only are local revenue allocations from IRP vehicle registration fees insufficient, but local roads are more susceptible to accelerated deterioration due to their pavement design, which differs from that of high-traffic state and federal roads. The allocation problem is a result of both the complex manner in which Ohio allocates its vehicle license tax and the loose requirements for declaring a base jurisdiction with IRP authorities.

IRP policy dynamics are substantially more complex than they appear at first glance. For most jurisdictions, a carrier's base jurisdiction is largely irrelevant as long as they accurately report accrued mileage, which is used to apportion fees. Provided that other jurisdictions do not offer commercial truck registration enticements that violate IRP bylaws (this phenomenon is referred to as jurisdiction shopping, although it indirectly impacts other taxes and fees), there should not be a significant effect on a jurisdiction's apportioned revenue, which it receives from other IRP members. While the state-level revenues are largely unaffected by IRP apportionment, the story is different for counties, municipalities, and townships in Ohio. Ohio's state code has two separate allocation policies for IRP revenue. One policy applies to revenue generated by in-state registrations, the other policy for revenue that comes from other jurisdictions.

Jurisdiction shopping has become more prevalent, particularly for large trucking firms. Some Ohio taxing districts with large fleets have seen sharp IRP revenue decreases, and they have struggled to maintain local roads. The fiscal crunch is felt by county engineers, who are pressured by prospective trucking or trucking-related businesses and economic development agencies to enhance roadways or upgrade traffic control systems. The key to fixing the system is to identify the manner in which the registration issues are impacting the revenue streams in Ohio counties (and the taxing districts situated therein) and what might be done to eliminate, or at least limit, revenue losses in those counties. This report will identify the problems with current IRP revenue allocation and will assess the impact on Ohio counties and taxing districts.

Study Objectives

The study goal was to demonstrate how distributable IRP revenue works under the current model. The research assessed current registration trends, translated those registration trends into revenue trends and forecasts, calculated IRP revenue impacts due to jurisdiction shopping, and provided case studies that further demonstrated the intricacies of IRP tax distribution not addressed by the statewide estimates. Ultimately, the purpose of the study was to determine whether the revenue impact is significant enough to warrant further investigation of IRP tax distribution alternatives. This research will be used to assess how Ohio-based commercial vehicle fleets registered in other states can impact the stream of IRP revenues for Ohio counties, townships, and municipalities.

Description of Work

Researchers gathered data about IRP truck registrations, distributable IRP revenue, and tax distribution mechanisms. Revenue is tabulated for each Ohio county and their constituent taxing districts from 2009 to 2013 (or in some cases, 2014). The researchers calculated the county-level retention of direct IRP registrations, IRP loss compensation, and the annual excess compensation fund. By using revenue trends, IRP impact was forecasted from 2015 to 2019. Using national IRP fleet data, the research team determined the number of vehicles belonging to Ohio-based carriers and registered in another IRP jurisdiction. Using a weighted vehicle weight (as specific vehicle weights were not available for these trucks), the FY 2015 impacts were calculated based on the county location of each carrier. Additional information was gathered via surveys of County Engineers and county-specific investigation. This information was used, along with the forecasts and 2015 IRP revenue impacts, to create an extrapolated five-year impact assessment for Clinton, Mahoning, Butler, and Franklin Counties.

As a result of this work, an IRP licensing impact study was created and written to explain the project background, Ohio's tax distribution policy, registration trends, revenue trends, impacts, and county-specific case studies. For the IRP licensing methodology, the research team created an IRP calculator for county engineers that allows them to enter fleet information and estimate the revenue impacts to their own county if a large firm should decide to engage in jurisdiction shopping in the future.

Research Findings & Conclusions

In 2015, the statewide revenue effect for Ohio's counties and taxing districts was just under $13.7 million. The jurisdiction-shopping impact for Ohio's 88 counties was $10.13 million, with $8.23 million in direct effects and $1.9 million in indirect effects. Municipalities were negatively impacted by $2.89 million, all in direct effects. Total township impacts were $684,997, with $6,633 in direct impacts and $678,364 in indirect impacts. These estimates assume that every potential out-of-state truck registration is repatriated to every county. The direct, county-specific impacts (excluding townships, municipalities or indirect county impacts) vary greatly from county to county. In 14 counties, there was no impact; another 38 counties saw an impact of less than $10,000. Seventeen counties had revenue displacement between $10,000 and $49,999. The next nine counties faced more substantial losses: between $50,000 and $99,999. We estimated that four counties would lose between $100,000 and $199,999 in registration fees. Three other counties lost between $200,000 and $600,000. The three most-impacted counties were Clinton County ($3.13 million), Franklin County ($1.45 million), and Hamilton County ($822,916). Thus, the most significant impacts were concentrated in 19 Ohio counties. We did not produce estimates for each township and municipality.

Recommendations for Implementation of Research Findings

If a Phase II study is approved, Ohio officials and the research team will need to consult about potential marketing strategies and tools to approach this problem, as well as about long-term state strategies available to improve IRP distributions. The technical advisory committee will need to decide: (1) whether to pursue a solution that solely addresses the distribution equity or one that tackles the economic development issue; (2) whether the excess annual compensation funds should be used to remediate problems with equity or if another source of funding is preferable; (3) if a reporting mechanism for domiciled vehicles should be established so that it is easier for Ohio County Engineers to address jurisdiction shopping; (4) on policy solutions that best addresses the issue; and (5) on the general direction for the types of marketing strategies and tools most useful to engineers. The research team developed an IRP fleet impact estimator, which Ohio County Engineers can use to estimate the impact of a fleet in their county who will be shifting its registrations to another state. The calculator lets users select the county from a drop-down menu before inputting the fleet information. The tool estimates the impact on the county, township, and municipalities where the carrier is located. The calculator uses the same methodology as the impact assessment in Chapter 3.

Chapter 1. Introduction

Ohio is a member of the International Registration Plan (IRP), a registration reciprocity agreement for commercial vehicle fleets that travel between its member jurisdictions. The 48 states, District of Columbia, and 10 Canadian provinces that are members of IRP are commonly referred to as jurisdictions by transportation officials. Commercial carriers register with a base jurisdiction and report mileage totals logged within each state and/or province to the base jurisdiction. Registration fees are apportioned based on the percentage of miles logged in each jurisdiction. Each month, nearly all jurisdictions participate in a funds netting process whereby fees are transmitted through the IRP Clearinghouse.[1] In Ohio, the Department of Public Safety (ODPS) coordinates the apportionment process and distributes the registration revenue to Ohio counties, townships, and municipalities (also known as taxing districts).

Local government officials in Ohio perceived an imbalance between the percentage of IRP revenue allocated to their governments from registration fees and the amount of pavement damage caused by commercial vehicles on local roads. The problem is twofold. Not only are local revenue allocations from IRP insufficient, but local roads are especially susceptible to accelerated deterioration due to their pavement design, which differs from that of high-traffic state and federal roads. The allocation problem is a result of both the complex manner in which Ohio allocates its vehicle license tax and the loose requirements for declaring a base jurisdiction with IRP authorities.

IRP policy dynamics are substantially more complex than they appear at first glance. For most jurisdictions, a carrier's base jurisdiction is largely irrelevant as long as they accurately report accrued mileage, which is used to apportion fees. Provided that other jurisdictions do not offer

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[1] New Brunswick, Oklahoma, and Oregon are the exceptions.

vehicle registration enticements that violate IRP bylaws (this phenomenon is referred to as jurisdiction shopping, although it indirectly impacts other taxes and fees) there should not be a significant effect on a jurisdiction's apportioned revenue, which it receives from other IRP members. While the state-level revenues are largely unaffected by IRP apportionment, the story is different for counties, municipalities, and townships in Ohio. Ohio's state code has two separate allocation policies for IRP revenue. One policy applies to revenue generated by in-state registrations, the other for revenue that comes from other jurisdictions. Jurisdiction shopping has become more prevalent, particularly for large trucking firms. Some Ohio taxing districts with large fleets have seen sharp IRP revenue decreases, and have struggled to maintain local roads. The economic crunch is felt by county engineers, who are pressured by prospective trucking or trucking-related businesses and economic development agencies to enhance roadways or upgrade traffic control systems. The key to fixing the system is to identify the manner in which the registration issues are impacting the revenue streams in Ohio counties (and the taxing districts situated therein) and what might be done to eliminate, or at least limit, revenue losses in those counties. This report identifies the problems with current IRP revenue allocation and assesses their impact on jurisdictions.

1.1 Research Context

In most IRP jurisdictions, the base (or home) jurisdiction of a carrier operating in the state is largely irrelevant as long as the carrier accurately reports accrued mileage, which is used to apportion fees. Provided that other jurisdictions do not offer registration enticements that violate IRP bylaws (the phenomenon of jurisdiction shopping, though it does indirectly impact other taxes and fees), this should not have a substantial effect on a jurisdiction's apportioned revenue, which it receives from other IRP members. There are two slight exceptions. During the initial registration period, some carriers make substantial efforts to register in a state with low plate fees. This is because first-year carriers often use estimated mile calculations provided by the jurisdiction, and a large percentage of the plate fee will be apportioned to the jurisdiction in which new carriers register. If a carrier registers in Indiana but operates mostly in Ohio, the carrier will send most of its money to Indiana during the first year if it uses Indiana's mileage estimates for first-year firms. However, the base jurisdiction claimed by a carrier should not impact the revenues sent to other jurisdictions after the first year of operation. Thereafter, plate fees are distributed based on actual miles logged, and the fees paid to each jurisdiction in which the carrier operates would be the same irrespective of which jurisdiction serves as the base jurisdiction (again, assuming the carrier's mileage reports are accurate). The other exception pertains to the Highway Safety Fee portion of Ohio's license tax. For Ohio-based trucks, this fee is not apportioned. The corresponding amount that other state jurisdictions collect from their trucks on Ohio's behalf is apportioned.

While state-level revenues are largely unaffected by IRP apportionment, the story is different for Ohio taxing districts. Ohio's state code establishes a different allocation policy for IRP revenue generated by in-state registrations than for IRP revenue that originates in other jurisdictions. Ohio's IRP allocation policy for apportioned vehicles registered in another jurisdiction, which is spelled out in ORC 4501.044, specifies rules for allocating this revenue to counties, municipalities, and townships. This creates winners and losers because taxing districts with trucks registered in Ohio will also receive out-of-state revenue through the loss compensation process described in Chapter 2. Taxing districts that have lost truck registrations to other states get very little out-of-state revenue for those vehicles because the bulk of IRP revenue distributions are tied to whether a vehicle is registered in Ohio. Because of the prevalence of jurisdiction shopping, particularly among large trucking firms, some Ohio taxing districts where large fleets are domiciled have seen sharp IRP revenue declines. Consequently, they are struggling to maintain local roads with these diminishing revenue streams.

1.2 Previous Research

IRP taxes, fees, laws, regulations and processes vary greatly from state to state. Policy diffusion — the manner in which a public policy is transmitted from one county, state, or local government unit to another — can influence the behavior of jurisdictions. Karsch (2007) identifies four primary diffusion mechanisms: geographic proximity, imitation, emulation, and competition. In short, a jurisdiction is more likely to adopt a particular policy from another jurisdiction if that jurisdiction is located in an adjacent state or county, has similar attributes which could therefore lead to similar policy outcomes, is attempting to implement a policy because it has enjoyed success elsewhere, or is trying to compete with another jurisdiction for purposes of economic development.

A 2003 Texas Transportation Institute (TTI) study of heavy truck registration demonstrated the presence of these patterns. The study compared the success of Oklahoma in attracting a large number of IRP truck registrations, while Texas IRP truck registrations stagnated. The history and success of Oklahoma's policy, the questionable legality surrounding the practices of some trucking companies registering there, and the subsequent legal disputes between IRP member jurisdictions underscores the competition between states to attract carriers (Jasek, Ojah, and Hoover, 2003). The study usefully distinguished between fraudulent and legitimate jurisdiction shopping. Fraudulent jurisdiction shopping occurs when a trucking firm sets up registration in a state where it has not established a legitimate place of business. Typically, these firms use the addresses of permitting services, or potentially a non-physical address, such as a post office box. After an IRP peer review of Oklahoma, IRP rules were changed to require that employees be physically present at the location(s) used. Permitting services were no longer counted as a place of business. However, legitimate jurisdiction shopping was permissible, and firms operating terminals or locations in multiple jurisdictions have several registration options. Likewise, officials in Ohio have made significant changes to truck registration procedures and policies so the state can compete with Indiana, a bordering state that has adopted several business-friendly laws and regulations to pursue trucking industry investment.

In broader practice, the decision to register a vehicle in a particular jurisdiction entails several considerations not always directly related to IRP fees. These decisions exert a large financial and administrative impact on the motor carrier. When trucking firms register their vehicles in a jurisdiction, they are subject to various state or provincial taxes and fees, licensing requirements, policies, procedures, and regulations. Laws, regulations, and taxes enacted at the local level may also apply. Interviews conducted with trucking industry representatives as part of TTI's study indicated that trucking companies consider the effects of regulation, taxes, fees, administrative burden, and quality of customer service when jurisdiction shopping (Jasek, Ojah, and Hoover, 2003). The TTI study advances several suggestions that Texas — or by logical extension, any state — could use to improve its policies in order to repatriate IRP registrations (and all associated taxes and fees). Carriers interviewed as part of the Texas study expressed concerns about the ad valorem tax and the sales tax associated with the purchase of new tractors or trailers. As of 2002, Oklahoma had no ad valorem tax, sales tax for commercial vehicles, or a franchise tax. Indiana has these taxes, but the ad valorem tax has exemptions and the excise tax is fixed at a low amount (Jasek, Ojah, and Hoover, 2003). Another advantage some states provide is permanent truck and trailer plates rather than plates that are reissued annually. Online renewal options and "one-stop shops" for customer service were considered secondary criteria that might encourage trucking companies to register with a particular state. Ohio has taken several steps to adopt some of these policies in order to become more competitive with other jurisdictions.

Perhaps the most interesting insight from the TTI study concerns apportionment. Any taxes or fees that are non-apportioned – meaning that in-state carriers must pay it but out-of-state competitors do not – are viewed by in-state carriers as placing them at a competitive disadvantage. This same logic compelled state officials to create the IRP agreement so that the highway maintenance costs (borne to repair damage caused by interstate truck traffic) could be shared more equitably. This is essentially the same conclusion drawn in the Kentucky Transportation Center's (KTC's) study of a fee-based alternative to its weight-distance tax. Eliminating the weight-distance tax and replacing it with a fee-based system would have apportioned costs less equitably, so that intrastate carriers would pay more while interstate carriers would, on balance, pay less (Martin, Bell, and Walton, 2013). Researchers and Ohio transportation officials plan to sidestep this issue by focusing on the reallocation of current revenues, and not on the imposition of new taxes and fees for in-state carriers.

IRP and the International Fuel Tax Agreement (IFTA) were created to apportion payments equitably to states and other jurisdictions. A recent study suggests that states are generally satisfied with the performance of the IFTA and IRP models, although some concerns about noncompliance and evasion have been voiced (O'Connell, Yusuf, and Hackbart, 2007). Notwithstanding past legal issues documented in the TTI study, most state officials believe the programs have been successful. These perceptions, however, have not precluded changes being made to the program's structure. Specifically, IRP officials are now implementing a major change that was enacted in January 2015.

The change relates to the recently approved Full Reciprocity Plan: "a concept to change the International Registration Plan (Plan) to grant full reciprocity for all apportioned vehicles in all member IRP jurisdictions, making the Plan more efficient to administer and more equitable and more flexible for its member jurisdictions and registrants" (IRP Task Force, 2010). Instead of granting reciprocity for jurisdictions in which organizations declare mileage, this system will let a carrier operate in all 59 jurisdictions if they comply with all other state and provincial laws. The change will streamline the registration process and simplify IRP program administration by eliminating estimated distance calculations, by reducing the need to obtain temporary (or trip) permits, and by decreasing the revenue associated with those two processes. Instead, first-year fees for new fleets will be collected and apportioned to all 59 jurisdictions, and subsequent filings will be based on the company's actual logged miles (Sage, Casavant, and Lawson, 2013). However, the impact this change will have on IRP revenues is unclear. An independent study issued by the Freight Policy Transportation Institute suggests that the elimination of estimated distances and trip permits will be largely replaced because of the way mileage is recalculated and apportioned, with estimated losses and gains not exceeding four percent (Sage, Casavant, and Lawson, 2013). In practice, officials, researchers, and industry members are still unsure how the Full Reciprocity Plan will impact revenues or how the industry will respond to the new plan. Therefore, this change complicates the economic impact estimation for this study. In Ohio, any changes in the allocation of out-of-state apportionment fees will directly impact all counties and taxing districts.

Recent studies of Kentucky and Idaho's commercial vehicle tax-and-fee structure show that the potential effects of fee-based commercial vehicle policies are difficult to forecast (Casavant and Jessup, 2004; Martin, Bell, and Walton, 2013). When officials replaced Idaho's weight-distance tax with a fee-based system (following a 2001 court ruling), they did not anticipate the trucking industry's response. Truck registrations declined sharply as trucking companies consolidated shipping routes to take advantage of a loophole capping the mileage-based fee. The change was intended to be revenue-neutral, but Idaho now collects $15-20 million a year less than it would have if its weight-distance tax was still in effect. Kentucky's weight-distance tax revenues have been much more stable and predictable than its IRP revenues. The latter fluctuate wildly due to the complex nature of jurisdiction funds netting, changes in plate fees, journal vouchers, and other economic factors. While Kentucky's weight-distance tax revenues tend to exhibit a strong positive correlation with highway usage and therefore the economic strength of the trucking industry, registration-based fees tend to weaken the relationship between highway use and user cost.

Competition from other states, uncertainty about the impact of the Full Reciprocity Plan, and potential volatility of IRP registrations could magnify the volatility of tax- and fee-based revenues garnered from commercial vehicle activities at the local level, particularly in Ohio. This KTC study will be critical for helping both Ohio and its constituent local governments assess the degree to which state and local policies are impacting its interstate truck registrations and for assessing the economic impact of losing registration fees.

Chapter 2. Ohio Motor Vehicle License Tax Distribution

The Ohio Department of Public Safety's Tax Distribution Section distributes vehicle license taxes – including the IRP taxes paid by commercial vehicles weighing over 26,000 pounds – to Ohio's counties, municipalities and, townships.[2] The distribution mechanism is very complex, as it involves registration fees from commercial vehicles registered in the state of Ohio, revenues from out-of-state carriers located in other Ohio jurisdictions, and the mechanism consists of several allocation formulas that push the license revenue to Ohio taxing districts.

When the state decided to join IRP, lawmakers and officials wanted to design a system that compensated counties and taxing districts for losses in registration revenue. Before joining IRP, counties and taxing districts received the entire apportionment of an Ohio license plate. Assuming the vehicle was registered for an entire year (i.e. not prorated), the entire plate cost was collected for the vehicle. When Ohio became an IRP jurisdiction, carriers began tracking mileage on each vehicle to determine how much of the apportionment should go to Ohio, instead of to other jurisdictions.

When Ohio entered IRP, officials decided that compensation for lost registration revenue on in-state plates would be offset by using the new revenue stream created from the remittance of apportioned registration dues from vehicles registered in other jurisdictions but operating in Ohio. Known as "loss compensation", the revenue from carriers registered in other jurisdictions would be used to mitigate losses stemming from the apportionment of in-state IRP registrations. Since joining IRP, Ohio has collected enough revenue so that, even after providing all of the loss compensation for each Ohio-based vehicle, there is money remaining from the out-of-state funds

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[2] IRP vehicles are generally defined in this document as an apportioned truck with a GVW over 26,000 lbs. However, the Plan includes other vehicles that are 26,000 GVW and under, as well as vehicles other than trucks.

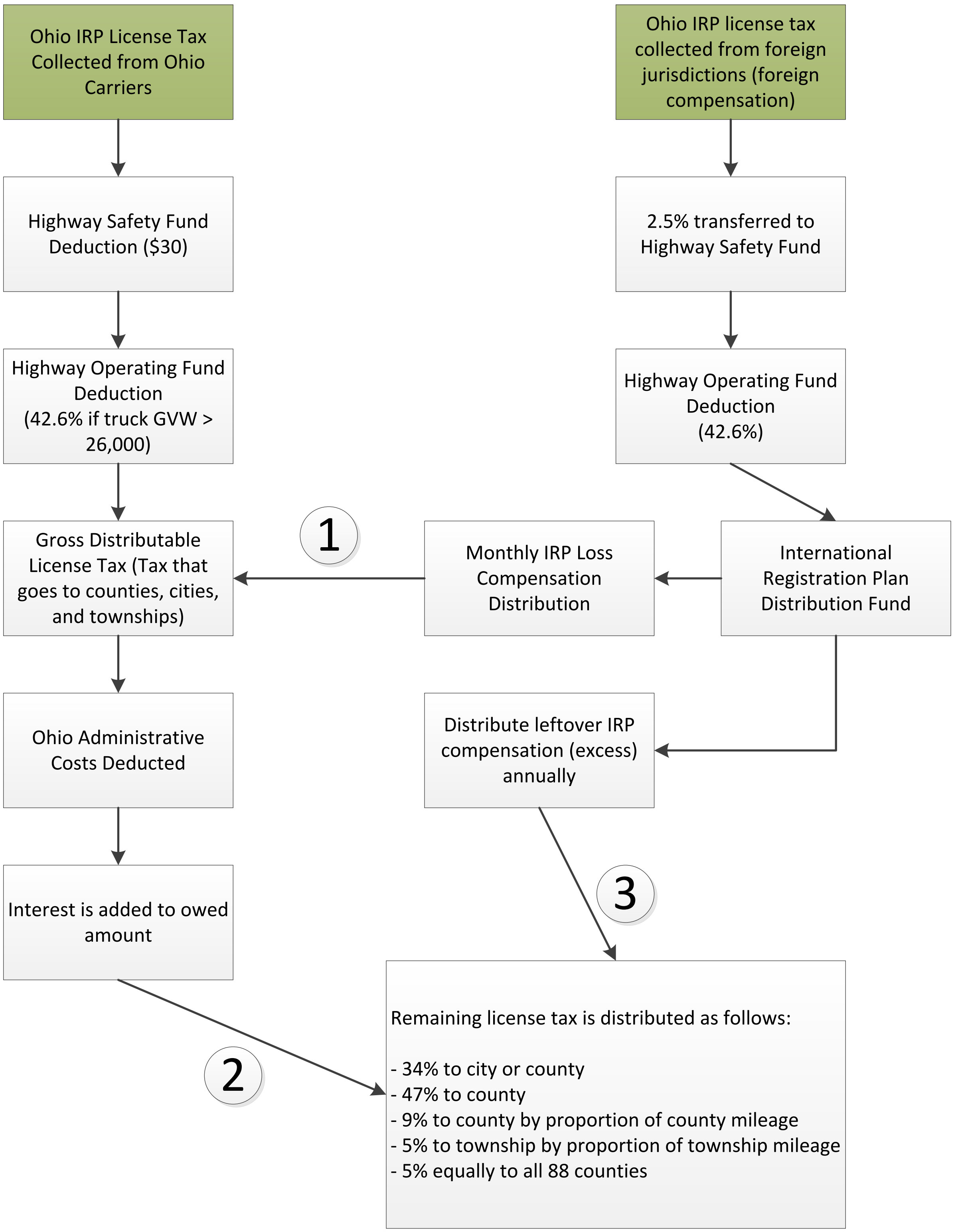
at the end of each year. This money accumulates in a fund known as the IRP distribution fund. At the end of the year, once all Ohio-based IRP registration revenue and loss compensation revenue have been distributed, the remaining funds are distributed via Ohio's annual IRP excess compensation procedures.

Figure 1 is a flowchart that delineates Ohio's IRP tax distribution system. As the green box in the upper left-hand corner demonstrates, the initial revenue comes from Ohio-based carriers when they register or re-register a commercial vehicle. For each in-state registration, a $30 fee is deducted and deposited in the Highway Safety Fund.[3] Once that money is deducted, the remaining money is split between Ohio's Highway Operating Fund (the state's highway trust fund), the counties, and the taxing districts. If the vehicle is an IRP truck (i.e. its GVW > 26,000 pounds), the Highway Operating Fund receives 42.6 percent of the remaining license fee and the other 57.4 percent (the gross distributable license tax) goes to Ohio counties, municipalities and townships. Before money is disbursed, several things happen. Loss compensation must be calculated and added to the total.

As the second green box indicates, Ohio IRP license tax revenue is collected from other jurisdictions. It then moves through distribution steps similar to the in-state registration revenues before it eventually reaches the IRP distribution fund. The main difference is that rather than setting aside a specific amount for the Highway Safety fund, 2.5 percent of all out-of-state IRP revenues are transferred. The way IRP's Clearinghouse is set up, jurisdictions are only capable of tracking gross amounts from each jurisdiction. As such, Ohio officials do not see the amount of

[3] According to ORC 4501.06, the Highway Safety Fund shall "be used for the purpose of enforcing and paying the expenses of administering the law relative to the registration and operation of motor vehicles on the public roads or highways. Amounts credited to the fund may also be used to pay the expenses of administering and enforcing the laws under which such fees were collected. All investment earnings of the state highway safety fund shall be credited to the fund."

Figure 1. Ohio IRP License Revenue Distribution Flowchart



revenue that is associated with each vehicle registered with another base jurisdiction. As with the Ohio-based IRP vehicles, 42.6 percent of the remaining out-of-state IRP revenue goes to the Highway Operating Fund, and 57.4 percent goes to the IRP distribution fund, which becomes part of the gross distributable license tax. This particular step is noted by the ① in Figure 1. The total amount of loss compensation depends on the weight class, percentage of logged miles run on Ohio roads, and the number of vehicles.

Table 1 illustrates how loss compensation works for a single truck in each of Ohio's weight classes. For example, the owners of an 80,000-pound truck registered in Ohio that logs 40 percent of its miles in Ohio would pay 40 percent of the full in-state fee, which is currently $1,340. The Ohio portion of the bill is therefore only $536; the remaining 60 percent of the vehicle mileage would be paid according to reported mileage and plate costs in other states in which the vehicle operated. For instance, if the truck accumulated 25 percent of its mileage in Kentucky, the carrier would pay 25 percent of a full Kentucky plate. This process would continue until all mileage was accounted for. When the truck's owners make their initial payment, it goes to Ohio's BMV. Once the BMV receives it, it distributes money due to other jurisdictions every month. Under this arrangement, carriers only have to pay a single state.

With an intrastate commercial truck, the amount sent to counties, townships and municipalities equals the amount remaining once the state's Highway Operating Fund share (42.6 percent) is deducted. Continuing with the example from the previous paragraph, assuming a full fee, this would have amounted to ($1,340)×(0.426), or $570.84. The remainder ($769.16) is the raw amount distributable to the counties and taxing districts. However, the Highway Operating Fund share on an IRP truck with a 40 percent apportionment is $228.34, with the remaining $307.66 distributable to Ohio counties and taxing districts. Consequently, the shift to the IRP system would create real losses in those counties and taxing districts where the vehicles are registered. To shield Ohio counties and taxing districts from large revenue declines under IRP, loss compensation was created.

Table 1. IRP License Fees and Loss Compensation by Weight Class

GVW	Full Year($)	Sans HSF ($)	Collected (40%)($)	HOF($)	Gross($)	Loss Comp. ($)	Total ($)
26,001 - 30,000	385	355	142	60.49	81.51	122.26	203.77
30,001 - 34,000	450	420	168	71.57	96.43	144.65	241.08
34,001 - 38,000	510	480	192	81.79	110.21	165.31	275.52
38,001 - 42,000	570	540	216	92.02	123.98	185.98	309.96
42,001 - 46,000	630	600	240	102.24	137.76	206.64	344.40
46,001 - 50,000	690	660	264	112.46	151.54	227.30	378.84
50,001 - 54,000	755	725	290	123.54	166.46	249.69	416.15
54,001 - 58,000	815	785	314	133.76	180.24	270.35	450.59
58,001 - 62,000	885	855	342	145.69	196.31	294.46	490.77
62,001 - 66,000	955	925	370	157.62	212.38	318.57	530.95
66,001 - 70,000	1,025	995	398	169.55	228.45	342.68	571.13
70,001 - 74,000	1,110	1,080	432	184.03	247.97	371.95	619.92
74,001 - 78,000	1,230	1,200	480	204.48	275.52	413.28	688.80
78,001 - 80,000	1,370	1,340	536	228.34	307.66	461.50	769.16

Table 1 displays the IRP license plate fees and the first-pass calculation for commercial trucks registered in Ohio. The first column sorts vehicles according to weight class, and the acceptable range for vehicle plates. The second column contains the price for a 100 percent Ohio registration for a full year, but the $30 reduction that goes to the Highway Safety Fund is deducted first. The collected amount is the total per vehicle based on apportionment, which is listed as “Collected (40%)” in the adjacent column. Next, the HOF fund represents the 42.6 percent distribution that goes to the Highway Operating Fund, whereas “Gross” is the gross distributable amount before loss compensation is included. The “Total” column is the distributable amount that goes to the county or taxing district as a result of the registration. It is identical to the distributable amount from an intrastate registration; the taxing district share that is left over after the Highway Safety

Fund and Highway Operating Road fund is deducted is identical to an IRP registration that is supplemented by the loss compensation.

Loss compensation is therefore determined by subtracting the distributable amount (i.e. the total amount going to Ohio's counties and taxing districts from the in-state registration) in the apportioned registration from the distributable amount in the full registration. For example, on an 80,000-pound vehicle that receives a plate with a 40 percent apportionment, there would be $307.66 in gross distributable income rather than $769.16, which would be the case if the truck were registered as an intrastate vehicle or an IRP vehicle that ran all of its miles in Ohio the previous year. If the apportioned amount is subtracted from the full amount, what remains is the loss compensation amount – $461.50. This is the amount of money that comes from the out-of-state transmittals for trucks registered in other jurisdictions and operating in Ohio. As a result, there is still $769.16 in distributable revenue – but only $307.66 comes from the Ohio carrier.

The second major step is the distribution formula, which is denoted as ② on

Figure 1. According to O.R.C. Section 4501.04, the revenue must be distributed as follows: 34 percent goes to the county or municipality the vehicle is registered in; 47 percent goes to the county the vehicle is registered in; 9 percent is totaled statewide and then distributed to all counties based on each county's proportion of total road miles; 5 percent is totaled statewide and then distributed to all townships based on the proportion of each township's road mileage; and 5 percent is divided evenly between each of Ohio's 88 counties. Table 2 displays the approximate distribution ratios for each vehicle based on weight class. Because the loss compensation equalizes the amount of distributable revenue per vehicle, the apportionment does not matter in terms of this

distribution, although it impacts the amount drawn from the IRP distribution fund to cover the distributable revenue portion that does not come from the Ohio carrier.

Table 2. Breakdown of Ohio IRP Distributable Revenue per Vehicle, GVW

GVW	Total Non-HOF	Muni/Township (34%)($)	County (47%)($)	County Miles (9%)($)	Township Miles (5%)($)	County Even (5%)($)
26,001-30,000	203.77	69.28	95.77	18.34	10.19	10.19
30,001-34,000	241.08	81.97	113.31	21.70	12.05	12.05
34,001-38,000	275.52	93.68	129.49	24.80	13.78	13.78
38,001-42,000	309.96	105.39	145.68	27.90	15.50	15.50
42,000-46,000	344.40	117.10	161.87	31.00	17.22	17.22
46,001-50,000	378.84	128.81	178.05	34.10	18.94	18.94
50,001-54,000	416.15	141.49	195.59	37.45	20.81	20.81
54,001-58,000	450.59	153.20	211.78	40.55	22.53	22.53
58,001-62,000	490.77	166.86	230.66	44.17	24.54	24.54
62,001-66,000	530.95	180.52	249.55	47.79	26.55	26.55
66,001-70,000	571.13	194.18	268.43	51.40	28.56	28.56
70,001-74,000	619.92	210.77	291.36	55.79	31.00	31.00
74,001-78,000	688.80	234.19	323.74	61.99	34.44	34.44
78,001-80,000	769.16	261.51	361.51	69.22	38.46	38.46

In each weight class, the distribution formula is basically the same. The 34 percent municipal/township distribution is returned to the municipality if the truck is registered in an Ohio city or village. However, if it is registered in a township the money goes to the county. Therefore, counties with a large percentage of township registrations generally receive more revenue per vehicle, all else being equal, than counties with a large proportion of municipal registrations. The 47 percent distribution always goes to the county, and as shown in Table 2, this is the largest amount.

Table 3 provides a hypothetical breakdown of the IRP license for a truck registering for a full year, based in a township of Adams County. Of the $769.16 in distributable revenue for the 78,001 pounds and up plate, $361.51 goes directly to the county. The 34 percent city or township distribution goes to the municipality if the vehicle is based there. If the vehicle is based in a township, this money goes to the county. The remaining pools of money go to a statewide pool that combines all license revenue based on all vehicle registrations — not just IRP vehicles. The county mileage and township mileage money is summed statewide and then distributed based on statewide mileage percentages. The county's even (5%) amount is also technically distributed in this way. The initial calculation determines the amount of distributable revenue for each registration in each county and taxing district. The distribution is how much the county or township keeps after all of the calculations have been made.[4]

Table 3. Hypothetical Ohio IRP Registration and Tax Distribution (Adams County)[##]

Distribution	%	Amount ($)	To Adams County ($)	To Other Counties/TDs ($)
City/Township	34	261.51	*261.51	0.00
County	47	361.51	361.51	0.00
County Miles	9	69.22	0.90	68.32
Township Miles	5	38.46	**0.35	38.11
County Even	5	38.46	0.44	38.02
Total	100	769.16	[#]624.71	144.45

*If it is a township registration, the 34 percent goes to Adams County, and to the city otherwise

**This money passes through Adams County but ultimately goes to its townships

[#]Adams County keeps $624.36 after deducting the township money

[##]Figures shown do not reflect cost or interest

The county mileage share (9%) is divided based on each county's proportion of all county road miles in the state. In this example, the truck is registered in Adams County, which has 375.81 of the statewide total (28,976.38 county miles). Dividing the county road miles in Adams County miles by the total number of county miles in Ohio yields 0.013. This means that 1.3 percent of all money in the county mileage pool is apportioned to Adams County. Using an 80,000-pound truck as an example would mean that approximately 90 cents of the $69.22 of that particular vehicle's county mileage distribution go to Adams County irrespective of what county it was registered in.

The same logic can be applied to township mileage. Adams County has 15 townships, with 383.95 township miles – just under 1 percent (.009) of the state's 41,497.3 aggregate township

[4] This does not apply to municipalities, who are only eligible to receive 34 percent of the license distribution for each vehicle registered within its boundaries.

miles in 2013. As such, for a single 80,000-pound truck registration, assuming it is not prorated, approximately 34.6 cents from each registration goes to Adams County based on its share of statewide township mileage, regardless of where in Ohio the vehicle is registered. It could be in Adams County, another county, or even a municipality in another county. All other counties would receive allocations for its townships based on their number of township miles (which is used to calculate the proportion of statewide township miles that fall within their borders). The initial distribution is transferred from the Ohio Department of Public Safety to the counties, which then allocates each township its share.

The last distribution is less complicated. Basically, the 5 percent county distribution is divided evenly between the 88 counties. Continuing the example of an 80,000-pound truck, Adams County would get about 44 cents of the $38.46 amount, as would each of the 87 other counties in the state. This would apply to every IRP truck in the state that was registered for the 78,001-pound-and-up plate.

In sum, if the hypothetical vehicle were registered in an Adams County township, the county would receive $261.51 from the city/township share, $361.51 from the county share, 90 cents from the county mileage share, and 44 cents from the county even share. Adams County's 15 townships would split the 35 cents it collected based on those townships' mileage share. The remaining money acquired from the county mileage, township mileage, and county even shares would be distributed to each of the other 87 counties accordingly. As such, the vehicle registered in Adams County would result in $769.16 cents in distributable revenue, but Adams County would only keep $624.36 of that registration. When the additional factors of prorated registrations, BMV costs, and interests are taken into account, the total amount Adams County retains averages less than $624.36

per 80,000-pound truck registered in a township, illustrating the tax distribution process's complexity.

The last phase of the IRP tax distribution process, which is marked with the ③ in Figure 1, concerns the handling of the remaining out-of-state revenue received from other jurisdictions. At the end of each calendar year, the ODPS Tax Distribution Section determines the amount of out-of-state revenue left over after loss compensation, interests, and other adjustments are made from the out-of-state IRP revenue generated from vehicles registered in other base jurisdictions. This amount varies from year to year, but since Ohio joined IRP there have always been leftover out-of-state IRP funds after loss compensation, interest, and other adjustments. Table 4 summarizes the statewide annual excess IRP compensation distribution for Ohio since 2009. The revenues have averaged $9.6 million over the last six years, and ODPS distributed them to Ohio's 88 counties in a manner similar to the distribution of in-state registrations and loss compensation.

Table 4. Ohio Statewide Annual Excess IRP Compensation Distribution

Year	Total ($)
2009	9,930,742.72
2010	9,310,356.89
2011	8,545,913.47
2012	9,494,625.38
2013	10,682,385.59
2014	9,788,898.74

To distribute the annual excess loss compensation, the ODPS Tax Distribution Section calculates the total amount of license revenue that each county and taxing district received in the past year's monthly license tax distribution. This total includes all forms of license revenue – IRP trucks, non-IRP commercial trucks, passenger vehicles, buses, and motorcycles, among others.

The annual excess loss compensation amount is divided up in the same proportion as the motor vehicle tax distributed in the last year, undergoes the 34/47/9/5/5 calculation, and then final calculations to determine the amount each county and taxing district will receive.

For 2014, approximately $9.79 million was distributed in annual excess compensation along with $304.62 million in total license tax. The ratio of excess annual distribution to overall license tax is 0.032. This is the excess compensation ratio (ECR). A key difference between the license tax and loss compensation distribution versus annual excess distribution is that the latter is calculated using all vehicle license tax as the basis for the ratios. To determine each county's initial share of the annual excess compensation, the ECR ratio is applied to the total license revenue for all Ohio counties. For example, Vinton County and Vinton County's taxing districts received $849,650.69 in license revenue. To arrive at Vinton County's portion of the $9.79 million annual excess compensation revenue, $849,650.69 is multiplied by the ECR, which is $27,303.74.

Table 5. Annual Excess Compensation for Vinton County, 2014

Category	%	Amount to be Distributed ($)	Amount Retained ($)
Muni/Township	34%	9,283.26	*8,999.60
County	47%	12,832.76	12,832.76
County Miles	9%	2,457.34	6,045.97
Township Miles	5%	1,365.19	#0.00
Counties Evenly	5%	1,365.19	5,561.88
Total	**100%**	**27,303.74**	**33,440.21**

Table 5 extends this example by summarizing the breakdown of annual excess compensation revenue that Vinton County received for the 2014 calendar year. Here the 34/47/9/5/5 calculation and distribution are accounted for. The original amount to be distributed based on the ECR ratio is noted in the second column. Vinton County, according to the calculation, received $9,283.26

for the municipality/township share of the registrations, $12,832.76 for the county share of the registrations, $2,457.34 for the county mileage, $1,365.19 for the township mileage, and $1,365.19 for the even county split. What the county actually retained after the distribution looks quite different. Specifically, for the municipality/township portion of the registration revenue, only the township revenue remains with the county – the municipality gets the rest. This amount is calculated by identifying the proportion of city and township revenue and multiplying each by 34 percent. This number is then multiplied by the ECR.[5] This indicates that Vinton County kept $8,999.60.

Counties always retain the 47 percent amount of the calculation after the 34/47/9/5/5 distribution. In this case, Vinton initially received and retained $12,832.76 after the ECR and county mileage apportionment were applied to the annual excess distribution fund. The county mileage apportionment works quite differently, however. Vinton County's calculated amount of the money for its county road mileage was $2,457.34, a figure derived from multiplying the ECR times the county's total vehicle license tax receipts times the 9 percent distribution amount. In fact, the initial $2,457.34 was divided among Ohio's 88 counties based on their respective proportion of total county road miles. Vinton County currently has 0.7 percent of all county road miles in the state.[6] Thus, Vinton County retained 0.7 percent of the $2,457.34 – or $17.20. However, Vinton County also received 0.7 percent of the county road mileage calculation for each county – $6,045.97 once it was distributed.

None of the township mileage money from the annual excess compensation fund ultimately stays with the county; it is distributed in a manner similar to the county mileage. Vinton County's initial calculated amount of its township mileage was $1,365.19 (calculated by multiplying the

[5] The township and municipality splits for Vinton County are not included.
[6] Based on ODPS mileage reports from 2013.

ECR times the total county's vehicle license tax receipts times the 5 percent distribution amount). As with the county mileage, this distributed amount is redistributed based on the proportion of state township mileage located in each county. In the case of townships, Vinton County's mileage proportion is 0.77 percent. Only $10.92 of the township share went to Vinton County's townships, but as with the county mileage share, Vinton county's townships received 0.77 percent of this amount from the other 87 counties, making the total redistributed township mileage share $3,762.90. Vinton County townships would share this money based on the total number of miles located in each township, but that breakdown goes beyond the scope of this study.

Lastly, the remaining 5 percent of the excess annual compensation is distributed to Ohio counties evenly. The simplest way to conceptualize this distribution is not to use the ECR but to multiply the total excess annual compensation amount by 5 percent and then divide by 88. In 2014, this equation would be $\frac{\$9{,}788{,}898.74 * .05}{88}$ = $5,561.88.

If all of these redistributions are added together, Vinton County's retained total (as opposed to the initial distribution total) from the annual excess compensation distribution for calendar year 2014 came to $33,440.21, with an additional $3,762.90 going to its townships. This was in addition to the $117,494 Vinton County retained for based on its IRP registrations and loss compensation (after redistribution), as well as the $19,426 passed along to its townships. In total, 2014 IRP registrations netted Vinton County $150,934, and its townships received $23,189. These calculations are performed for each county and taxing district by the ODPS Tax Distribution Section.

The vehicle-level and county-level assessments of the Ohio IRP vehicle registration serve as micro-level illustrations of macro-level tax distribution policies. These examples illuminate the distribution mechanisms inherent to the system and clarify how we arrived at statewide totals for

Ohio IRP taxes. Table 6 displays the statewide Ohio IRP distribution numbers, 2009–2014. The first column lists the calendar year. The second reports the distributable amount for the IRP license tax collected from Ohio trucks based on each vehicle's in-state apportionment. The HSF and HOF deductions have already been made. The next column summarizes the loss compensation amount. The fourth column has the total amount that was actually distributed from in-state registrations and loss compensation after removing costs and interests, and therefore the total is slightly less than if the second and third columns were simply added together. The distribution amounts encompass what goes to counties, townships and municipalities. The fifth column contains the IRP excess distribution, which includes leftover IRP loss compensation funds after all of distributions to taxing districts, administrative costs, and interests have been taken into account.

Table 6. Statewide Ohio IRP License Tax Distribution, 2009-2014

Year	Ohio IRP ($)	Loss Comp ($)	Distributed ($)	IRP Excess ($)	Dist. + Excess ($)
2009	$20,930,496	$25,694,032	$41,978,599	$9,930,743	$51,909,342
2010	$21,003,028	$27,074,290	$43,319,618	$9,310,357	$52,629,975
2011	$21,780,550	$28,934,120	$46,003,101	$8,545,913	$54,549,014
2012	$22,350,550	$29,814,617	$47,434,570	$9,494,625	$56,929,195
2013	$22,077,017	$30,375,930	$47,358,198	$10,682,386	$58,040,584
2014	$23,828,117	$32,216,767	$50,535,487	$9,788,899	$60,324,386

The data in Table 6 begin in 2009 and run through 2014. The total distributed amount shows a year-over-year increase for the entire period. This time period aligns with the economic recovery that followed the Great Recession. Economic growth is generally a good predictor of increased revenue from taxes and fees, other factors notwithstanding. The average annual distributable amount (excluding IRP excess) during this period was $51,013,252. The IRP excess fluctuated from year to year, but deviated little from the $9,625,487 average. When the monthly distribution and excess distribution are both taken into account, there was steady growth in the amount of IRP revenue received by Ohio counties and taxing districts.

Figure **2** displays the estimated IRP distribution kept by each county for 2014. The total comprises the adjusted distribution amount, which takes the initial 34/47/9/5/5 calculations and distributions into account. Only funds that counties actually get to keep are included in these totals. Annual excess compensation is not included. The totals exclude the share of funds going to municipalities, which receive the 34 percent share. As previously noted, counties keep the 34 percent share if the vehicle is registered in a township, so that amount is included. The 5 percent distribution by township miles goes to the townships, so it is not included. The figure is color-coded by revenue category.

Estimated totals show significant variability, from $98,622 in Morgan County to $2,902,108 in Franklin County. Unsurprisingly, most of the top recipients are the most populous counties in Ohio, with the three most populous counties (Cuyahoga, Franklin, and Hamilton) among the top five in terms of retained revenue. In some cases, this differs significantly from the initial distribution. Counties with a large proportion of their registration in municipalities lose the 34 percent distribution they would have otherwise received had the trucks been registered in townships. Spatial distributions of county totals are strongly related to the location of Interstate routes throughout Ohio. Interstates 74 and 75 in Southwest Ohio; Interstates 70 and 71 in the Columbus area; and Interstates 77, 76, 80, and 90 in Northeast Ohio all pass through counties with higher volumes of trucking activities. Counties that are ports-of-entry also tend to collect more trucking registration revenue than the state’s interior counties.

Figure 2. Estimated IRP License Distribution Kept by County, 2014

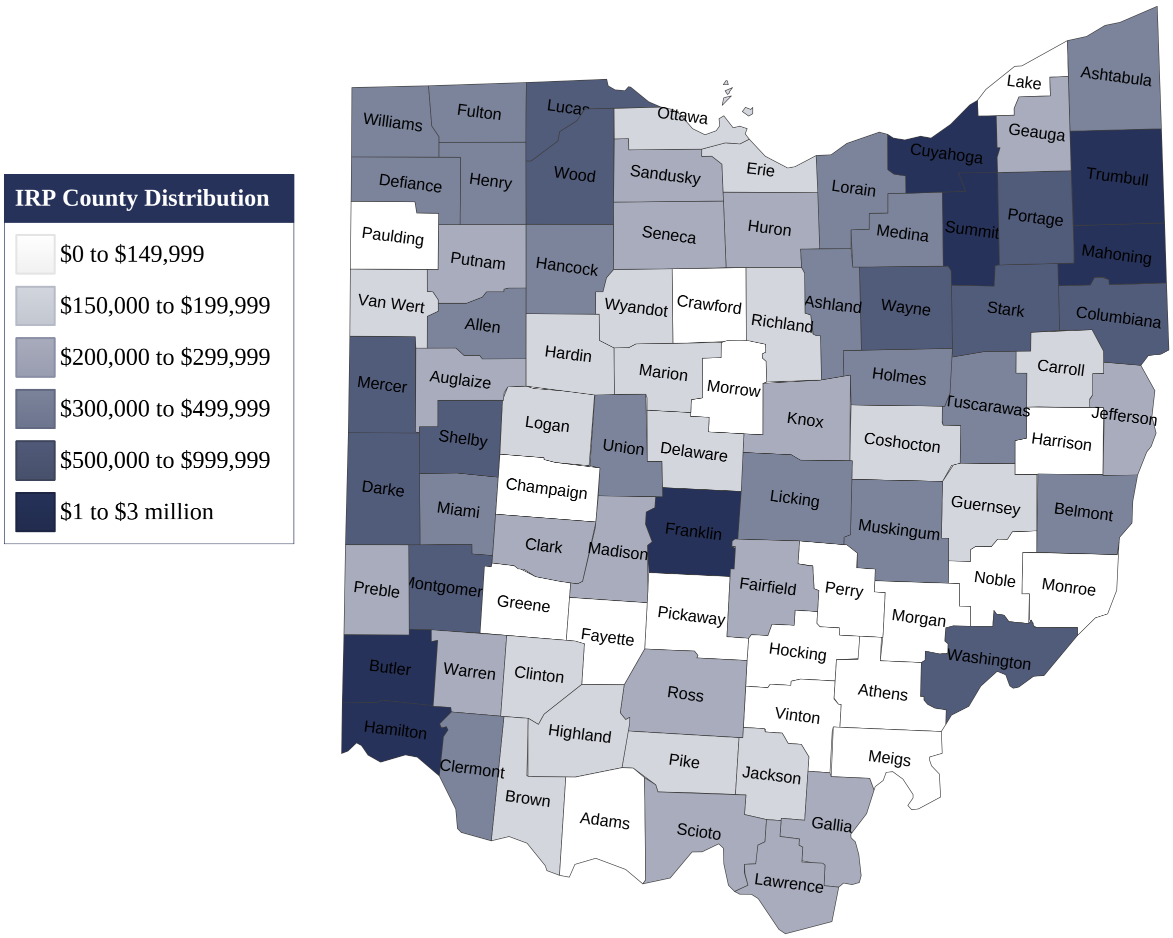


Figure 3 displays the total IRP annual excess compensation kept by each county after remaining out-of-state IRP funds were collected, calculations completed and distributed according to the 34/47/9/5/5 ratio. The key difference is that each county's initial allocation from the excess compensation fund is based on a ratio of its share of all motor vehicle license tax, not just the IRP component. In 2014, Ohio distributed over $304 million in vehicle license taxes from passenger vehicles, motor homes, motorcycles, house vehicles, mopeds, commercial and non-commercial trailers, non-commercial trucks, farm trucks, buses, non-IRP trucks and IRP trucks. The ECR was calculated by dividing the annual excess fund (≈ $9.79 million) by the $304 million total. In 2014, the ECR was ≈ 0.032. The ECR was applied to each county's total motor vehicle license revenue to determine totals allocations for individual counties. For example, Cuyahoga County and the taxing districts within the county received $20.7 million in license revenue in 2014, which multiplied by 0.032 comes to about $665,772. This money then undergoes the 34/47/9/5/5 calculation.

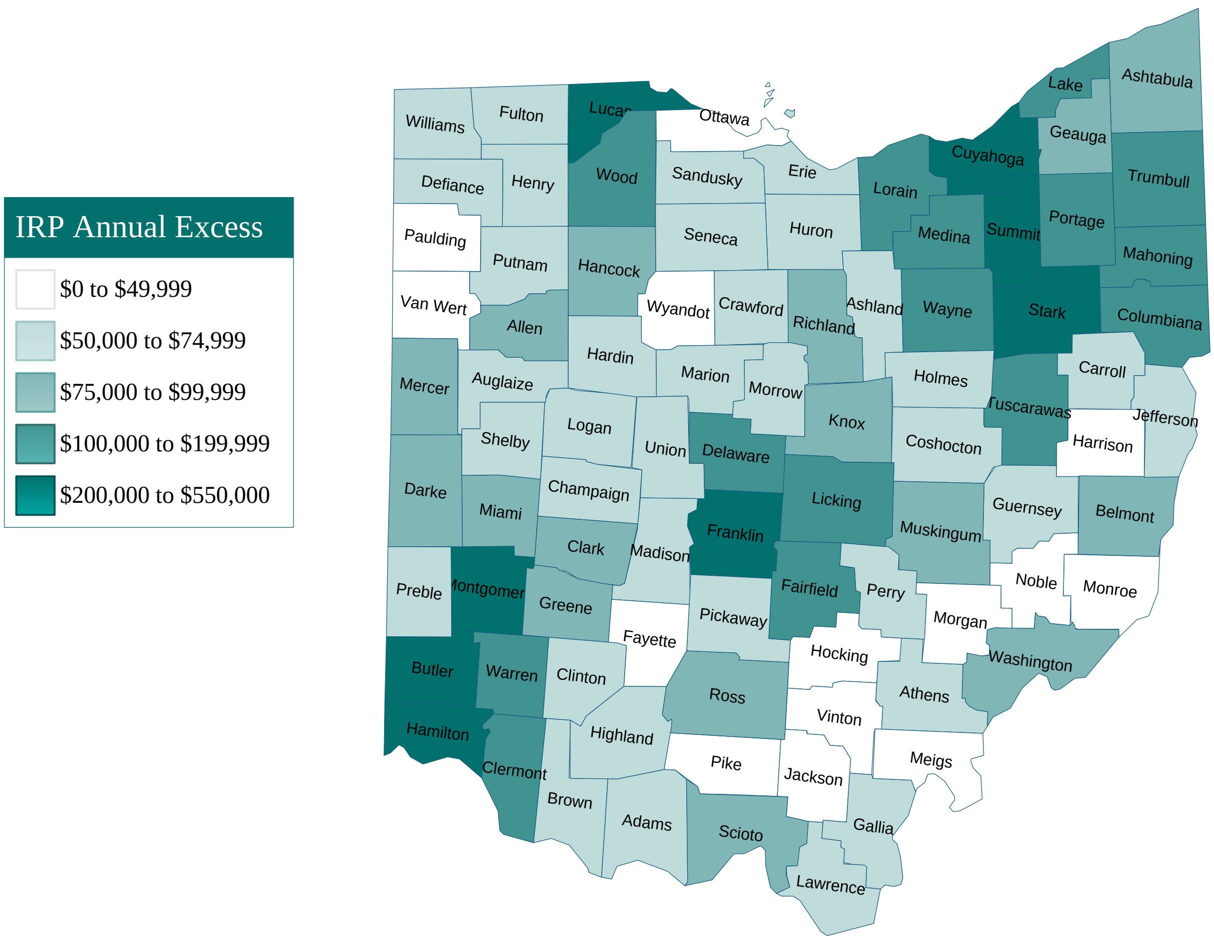
As Figure 3 indicates, none of the counties retained more than $550,000 of the annual excess compensation. How can we explain Cuyahoga County's totals in light of this knowledge? The answer is that some of the $665,772 is diverted to other taxing districts, as was the case with the Vinton County example. The largest recipients of distributable county revenue and loss compensation are similar to the largest recipients of annual excess compensation. The correlation coefficient for the two amounts is .910.[7] In a few cases divergence emerges if there is a county with a large amount of IRP truck revenue but a relatively small amount of overall license revenue, or a small amount of IRP truck revenue and a large amount overall license revenue. Counties with stark distributions of commercial and residential areas in municipalities and townships may also observe such a divergence, though it is not common.

Although complex, Ohio's system of motor vehicle license tax distribution was designed as a compromise between state and local entities. All of these stakeholders demand resources to maintain and improve roads and related infrastructure. The allocation formulas for distributable income were designed to provide money to counties, municipalities and townships. In most cases, the system works well because vehicle registrations are not generally a fungible obligation. Individuals who attempt to avoid paying the vehicle license tax risk being stopped and fined by

[7] Correlation statistics measures the strength and direction of a linear relationship between two variables, which in this case are 1. distributable county revenue plus loss compensation, and 2. annual excess compensation.

law enforcement, even those who purchase a vehicle in another state in an effort to evade their home state's tax.

Figure 3. Estimated IRP Excess Annual Distribution Kept by County, 2014



However, IRP rules give trucking companies significant flexibility over where they register commercial vehicles, particularly if they have terminals in multiple states. Carriers often choose the state with the most lucrative tax policies and register vehicles there, even if they do not intend to maintain significant operations in that state. This practice, coupled with Ohio's motor vehicle tax distribution policy changes the IRP revenue allocation, and in many instances localities lose funding as a result. The next section discusses IRP registration issues and their impact on license revenue distribution in Ohio.

Chapter 3. Ohio IRP Registration Issues

After understanding the complex mechanics Ohio's IRP tax distribution process, it is easier to anticipate how changes in motor carrier registration patterns affect taxing districts across the state. The registered location of Ohio's commercial vehicle is of paramount importance, because the registration is what anchors the IRP revenue to Ohio counties and taxing districts. Per county, this is particularly important given that most of the IRP funds go to the counties for roadway improvement and maintenance purposes. When trucking companies engage in jurisdiction shopping to reduce their tax burden – that is, to reduce taxes other than IRP taxes – it changes the IRP tax distribution mechanisms in ways detrimental to Ohio's taxing districts. If the company continues to domicile most or all of its vehicles in the taxing district that previously received its IRP revenue, but now registers those vehicles in another state to save money, the community loses many of resources historically allocated to assist with highway infrastructure improvement and maintenance.

Economic development initiatives may encourage multistate companies to move headquarters or to register vehicles in another state, and the company benefits from providing incentives or exemptions for taxable assets. Technically, it is not the avoidance of IRP fees that save a company money, but the avoidance of other taxes a company pays because it has assets in a particular state. If a company registered in Ohio moves a registration to Indiana but still runs the same proportion of its total miles in Ohio, the amount remitted to Ohio remains largely unchanged. As noted in the introduction, the taxes, fees, administrative costs, customer service, licensing requirements, regulations, IRP registration payment options, and other policies tied to a registration typically have a more decisive effect. When a county, municipality, or township loses a registration because the vehicle is registered in another state, but still operates in Ohio, the state still receives the same amount of money, assuming the proportion of miles, registered weight class, and registration duration (i.e. no proration) stay the same.

However, instead of putting money in the in-state pool for distribution to its taxing district, all of the funds are shifted to Ohio's IRP distribution fund. These funds are then used to supplement remaining in-state registrations or are allocated as part of the annual excess compensation distribution. This is based on a percentage of all motor vehicle license revenue, not just IRP license revenue. Consequently, if a county loses a significant number of IRP registrations due to jurisdiction shopping, revenue may still go to the state through interjurisdictional funds netting and through direct payment from jurisdictions not participating in the IRP Clearinghouse, but the revenue is not distributed in the same manner. The effects are difficult to project because of a multitude of other factors related to IRP revenue distribution in Ohio.

Conceptually, the problem is easily defined. However, addressing it is an entirely different matter. IRP allows carriers to register in any jurisdiction where they meet the base residency requirements. According to IRP, Inc., the base jurisdiction "is where the motor carrier has an established place of business and owns, leases or rents a physical structure that is designated by a street name or road" (IRP, 2015).[8] There are several methods carriers can use to prove their base jurisdiction residency, including: utility bills with the owner(s) or company's name and address, state government documents showing corporate residency, a weapons permit, bank statements, a

[8] IRP, Inc. 2012. "IRP Frequently Asked Questions." Retrieved 15 April 2015 at: http://www.irponline.org/?page=EDUFAQ#23.

driver's license, titles, tax returns with the home jurisdiction in the return address, and a health care card (in Canadian provinces only).

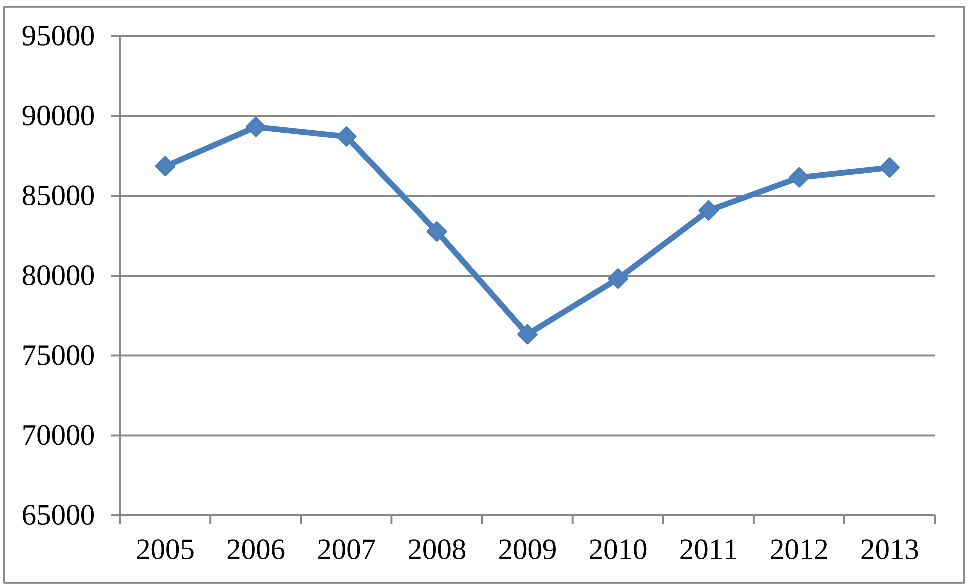
It is possible for carriers to illegitimately claim residency in a jurisdiction by fraudulently manipulating these documents to demonstrate residency where none exists. However, legitimate jurisdiction shopping can also occur, whether a carrier moves its terminal to another jurisdiction or expands to a jurisdiction with more favorable policies. The former is something IRP members have tried to address, but the latter is more difficult to remedy. Carriers engaged in jurisdiction shopping are more likely to be larger companies because they have the resources necessary to study and understand the system so it can be exploited to their advantage. With the constant flux of registrations within jurisdictions and across jurisdictions, economic boom-and-bust business cycles, businesses changing ownership, registrants changing USDOT numbers, and data limitations, gauging the extent to which jurisdiction shopping occurs can be difficult.

There are several ways to assess the impact of jurisdiction shopping on Ohio counties. The first method is to evaluate the difference in registration numbers or registration share over time to identify if certain counties are trending downward. The second method is matching IRP vehicles plated in other states to trucking companies in Ohio by based on USDOT numbers, in which identifiers are tied to individual vehicles and the Ohio companies. Third, an analysis of IRP registration revenue trends in Ohio's 88 counties could provide clues about whether the changing dynamic of revenue is related to registration trends. A final strategy is to look at known instances of jurisdiction shopping and determine its effect in particular Ohio counties.

3.1 Registration Trends

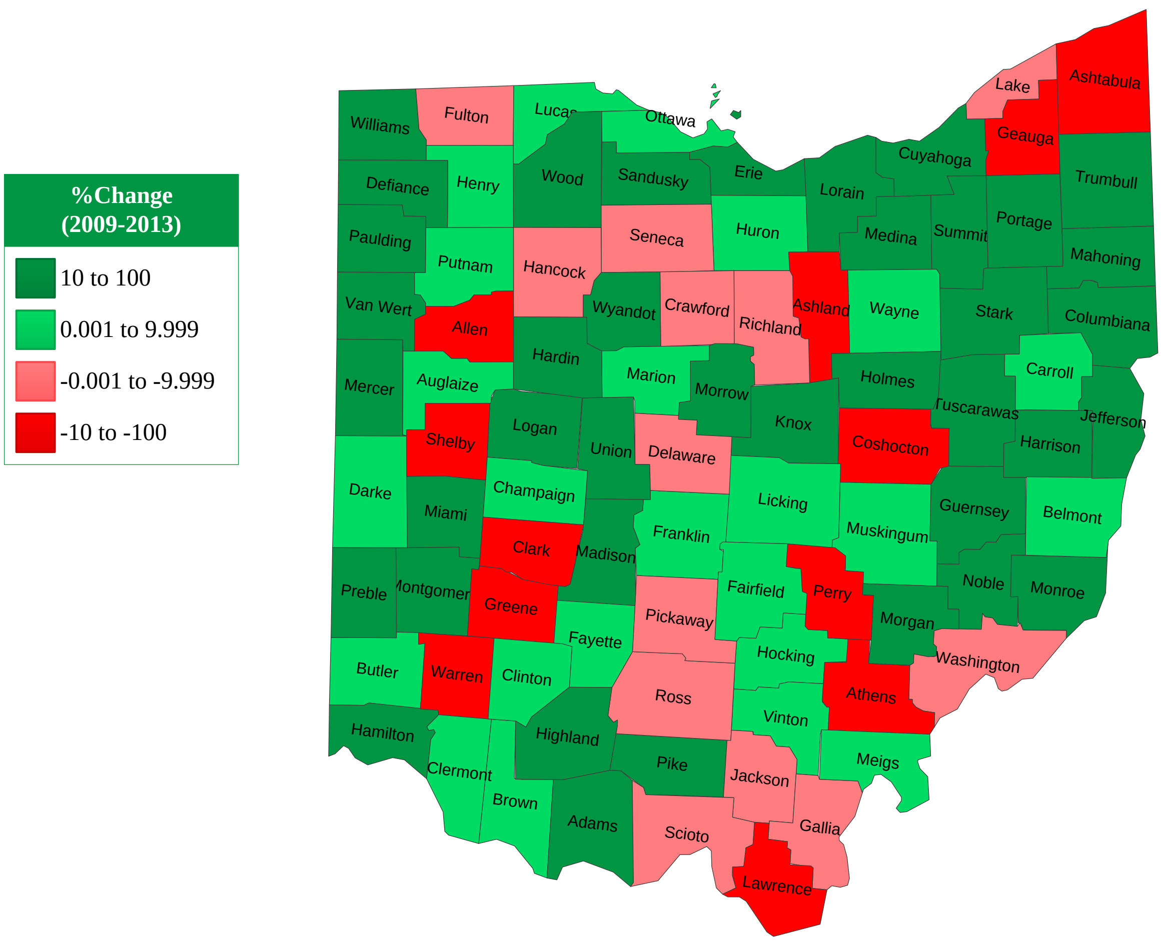
Following the 2009 recession, Ohio's IRP truck registration numbers declined significantly before rebounding. Figure 4 displays the registration totals from 2005 through 2014. In-state IRP registrations peaked in 2006 at 89,307 before falling slightly in 2007 and then dropping sharply through 2008 and 2009. Registration numbers have since rebounded, reaching 86,766 in 2013, which falls just short of 2006 levels. For county-specific analysis, 2009 is the optimal starting point because the economy had reached its bottom. As such, isolating specific counties where jurisdiction shopping is most prevalent is a more straightforward procedure. Registration drops could still be related to economic issues or normal patterns of business termination, but these factors are more prevalent during recessions than during recoveries.

Figure 4. Ohio IRP Truck Registrations, 2005-2013



IRP registrations might fluctuate significantly within a county for internal and external reasons. Economic performance and development, shifts in industrial production and product distribution, population changes, or trucking company startups and closings may drive these numbers — and they have little to do with jurisdiction shopping. Given that most of the data correspond to a period of general economic expansion, a negative trend might raise flags. There are several ways to temporally analyze the registration activity to identify clues about which areas are most vulnerable to jurisdiction shopping might. The first is to compare the change in registration percentage over time. Figure 5 shows the percent change in registration percentage between 2009 and 2013 (data were not available for 2005 to 2008). All counties show either positive or negative trends (none remained unchanged). Counties with positive trends are indicated in green, and counties with negative trends are indicated in red. Shading indicates the magnitude of change. For example, as the positive change in registration becomes more pronounced, it is indicated with a darker shade of green (the same logic applies to registration declines and the corresponding red shading).

Figure 5. Ohio IRP Registration Change, 2009-2013



Between 2009 and 2013, total IRP registrations rose from 76,334 to 86,766, an increase of 13.7 percent. Therefore, registrations increased in 63 counties but decreased in 25 counties. The percent increase was quite sizable in several instances, with 39 counties showing at least a 10 percent increase. Conversely, only 12 counties suffered a decline of 10 percent during the study period. The other 37 counties saw registration increases or decreases within 10 percent of their 2009 numbers. The counties to scrutinize are those that had large IRP disbursements in 2014 (see Figure 3) but which also had registration decreases preceding those disbursements. These counties – Lake, Geauga, Ashtabula, Columbiana, Scioto, Delaware, and Warren Counties – are where we would anticipate sizable revenue losses. As such, they may be good candidates for investigation of prevalent jurisdiction shopping activities.[9]

Another factor to consider is patterns of IRP registration terminations. Under this scenario, a trucking company eliminates all of its IRP registrations in Ohio. To determine the number of companies fitting this profile, we took Ohio's IRP vehicle data and calculated the number of trucks registered by each company (or unique USDOT number) in the state from 2009 to 2013. Only a 100 percent year-to-year fleet reduction counted as a termination. Additionally, if a trucking company re-registered vehicles after a year or suspended operations they were not counted. After starting with 12,099 companies listed in the vehicle data for 2009-2013, this approach whittled the number of down to 3,905 – roughly a quarter of the companies registered in Ohio during those years.[10] Lapsed IRP vehicle registrations totaled 10,250.

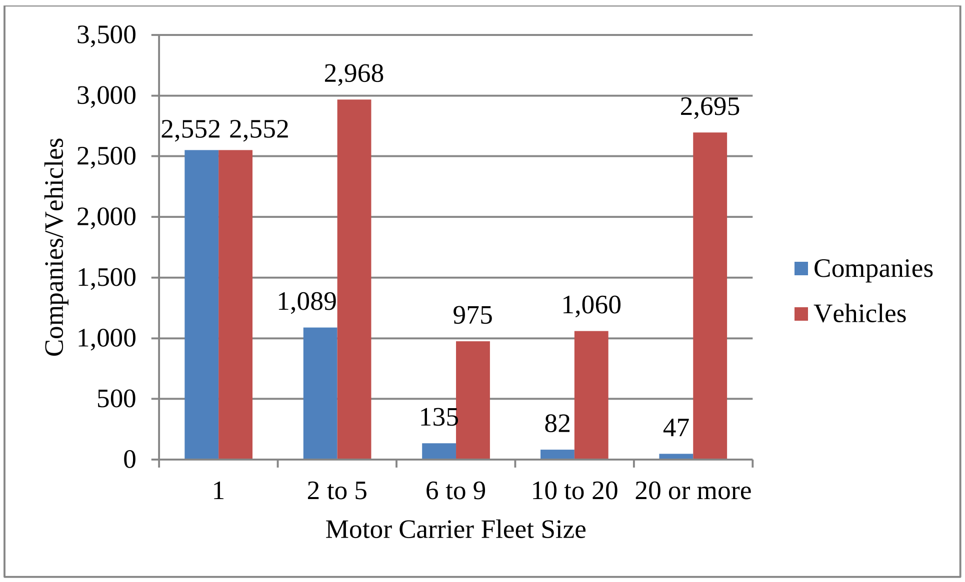
Figure 6 shows the distribution of IRP companies that stopped registering all their vehicles in Ohio during the 2009–2013 interval as well as the total number of vehicles no longer registered. Classification was based on a company's total number of Ohio registrations: one vehicle, 2 to 5 vehicles, 6 to 9 vehicles, 10 to 20 vehicles, and 20 or more vehicles. As the data for Group 1

[9] Revenue trends will be addressed in Section 3.2.

[10] The Xerox vehicle data and BMV registration data do have some discrepancies, so the vehicle totals are not the same.

indicate, 2,552 of these companies were single-truck operations. Despite these owner-operators' large numbers, these companies accounted for just under a quarter of all the vehicles whose IRP registrations were discontinued. There were 1,089 companies with 2,968 vehicles in the 2 to 5 grouping; they both comprised just under 30 percent of all companies and vehicles. In the 6 to 9 range were 135 organizations and 975 registrations. While the 10 to 20 and 20 or more categories only accounted for 3.3 percent of these organizations, they comprise 36.6 percent of all the registrations.

Figure 6. Companies and Vehicles with Lapsed IRP Registrations in Ohio, 2009-2013



These registration terminations could stem from three causes: (1) the company is no longer in operation; (2) the company relocated its registrations (and possibly its operations) to another jurisdiction; or (3) the company continues to operate in Ohio but did not resume operations until 2014 or later. To determine the frequency of each scenario, the USDOT numbers of vehicles with terminating Ohio IRP fleet registrations were matched to IRP's current database of vehicles to identify states where a carrier still had registered vehicles.

Error! Not a valid bookmark self-reference. Table 7 summarizes data on Ohio fleet cancellations. It includes the current status of the terminating companies as well as the total number of vehicles that had registrations cancelled between 2009 and 2013. The rightmost column reports the number of vehicles currently associated with any company that has reactivated operations in Ohio or continued them in other jurisdictions. The vast majority (3,308) of the companies no longer operate as interstate trucking companies, although it is possible some of these continued operations as intrastate companies. Consequently, no currently registered IRP vehicles are associated with these companies. These companies terminated 7,947 registrations between 2009 and 2013. 131 of these companies have since reregistered 448 vehicles and recommenced operations after cancelling 362 registrations between 2009 and 2013. A glance at the year-to-year registration records of Ohio's IRP carriers shows that deregistration, a year of no operations, and re-registration in a subsequent year is not uncommon, particularly with smaller companies. We identified 466 companies that no longer register IRP vehicles in Ohio that are still active in other jurisdictions. They cancelled 1,941 vehicles in Ohio, and no longer register any vehicles in the state. Currently, they have 101,905 registrations active in other IRP jurisdictions. Most of these companies are multistate carriers with large regional or national operations.

Table 7. Ohio Fleet Cancellations by Company and Vehicle Numbers, 2009-2013

Status	**Companies**	**Cancelled Registrations**	**Current Registrations**
No longer operating	3,308	7,947	-
Have current Ohio operations	131	362	448
Active in other jurisdictions	466	1,941	101,457
Total	3,905	10,250	101,905

The last category includes companies that have taken one of three paths. First, it is possible these companies halted operations in Ohio but continued them in other states. It is also possible these companies continued operating in Ohio but no longer registered vehicles there. Last, it is possible that gaps in data (i.e. the fact that the historical Ohio data ends in 2013) will ultimately show how a company shifted its primary location but still registers some vehicles in Ohio. The fluid nature of IRP registrations and trucking company operations makes it difficult to pin down the number of vehicles involved. The 466 companies terminating 1,941 vehicles during their last year of registration had a total 2,763 vehicles during the 2009 to 2013 period, which means the companies eliminated some vehicles in previous years before terminating the remainder of their fleet. A match process for these 2,763 vehicles shows that 1,808 of these vehicles are still active, including 375 in Ohio. Thus, 375 vehicles belong to out-of-state companies that once had fleets in Ohio but cancelled registrations, moved operations elsewhere, and then re-registered some of the same vehicles with the state. The remaining 1,433 vehicles were registered in Ohio at one time but are now registered in another state. These vehicles represent possible instances of jurisdiction shopping.

Based on conversations with Ohio officials about jurisdiction shopping, the 1,433 potential IRP vehicles registered elsewhere but potentially operating in Ohio is lower than expected. Because this practice has been in effect for several years, many vehicles never show up as having been registered in Ohio. For example, Greenwood Motor Lines, which does business as R & L Trucking, is a large carrier based in Wilmington, OH that has registered its vehicles in Indiana since 2008. Their Ohio registrations moved from the state before the historical data began. Another possibility is that Ohio-based companies deregister some – but not all – of their fleet. The matching criteria should therefore be relaxed.

The most straightforward approach is to match IRP vehicles registered in other states to any Ohio-based carriers. To do this, the IRP vehicles were matched to a database of the current primary address for Ohio motor carriers based on corresponding USDOT numbers. The results of the matching process identified 20,601 vehicles associated with 769 carriers. The state-by-state breakdown is provided in Figure 7. As the map shows, there are out-of-state registrations in most U.S. states, although the trend is more prevalent in some states than others. There were no such registrations associated with Canadian provinces, and so in this context out-of-jurisdiction and out-of-state can be used interchangeably. Not all of these registrations are necessarily cases of jurisdiction shopping – Ohio carriers may have terminals in multiple states. It is best to think of these numbers as *potential* jurisdiction shopping cases. Notice that the vast majority of these cases are clustered in a few states. The top five states – Indiana, Oklahoma, Illinois, Tennessee, and Alaska – account for 80.3 percent of the out-of-state IRP registrations associated with out-of-state plates.[11] While Ohio still receives money from the IRP registrations based on apportioned miles, because of the way Ohio distributes its IRP tax revenue, the counties where the vehicles are domiciled receive but a small fraction of the money.

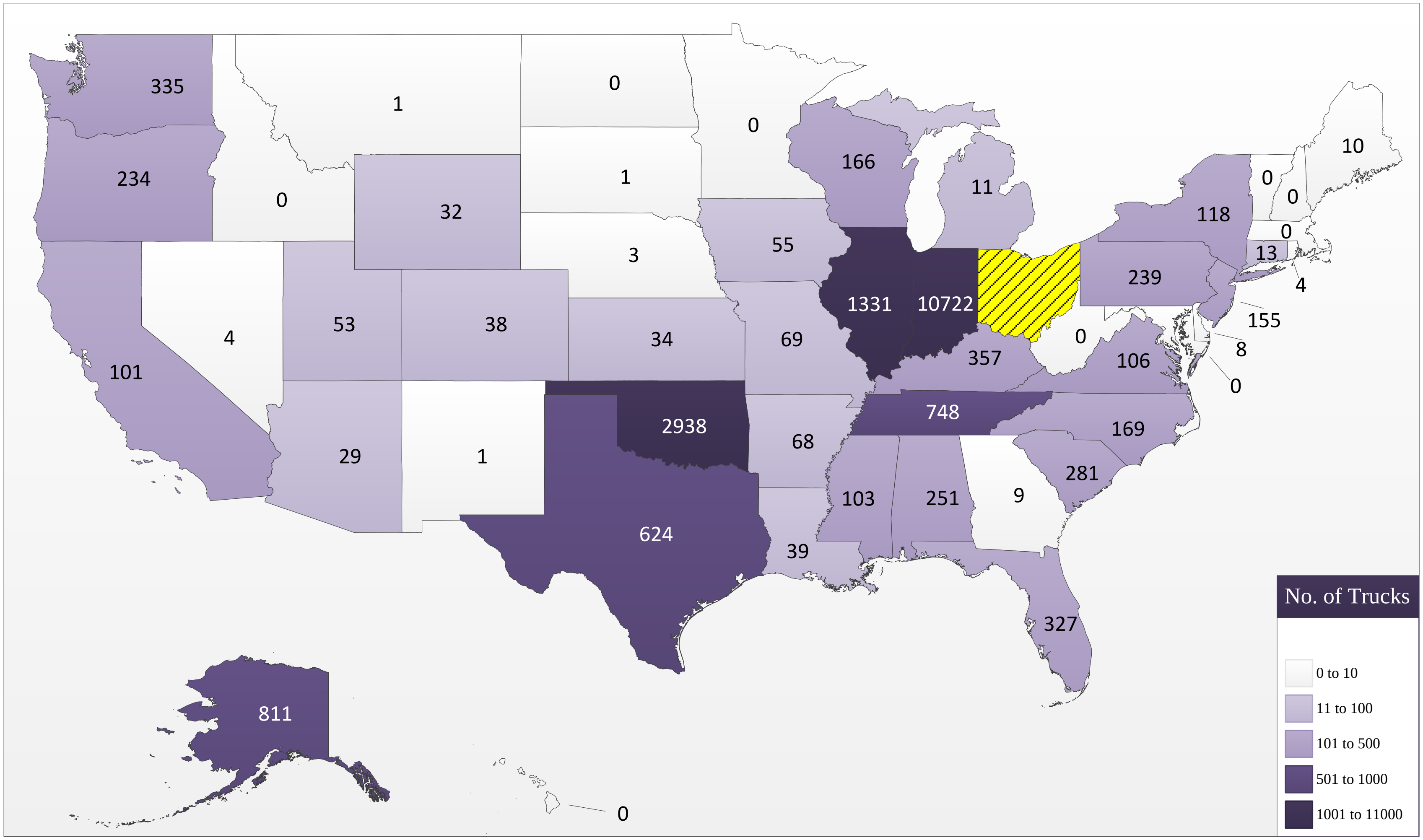
To assess county-level impacts, we first determined how many out-of-state registrations are associated with companies in county-specific taxing districts. Many of the companies are absent from the Ohio vehicle data because they do not register any vehicles in the state. Therefore, to associate a taxing district and registration (and therefore a particular county) a list of the carrier addresses maintained by FMCSA were provided to the Ohio Department of Administrative Services (DAS). (DAS) used a geolocation software application to determine the appropriate taxing district for each company, which was then matched to each vehicle by the corresponding USDOT number. Without knowing the gross registered weights of these vehicles, our best option

[11] Ohio does not receive money from trucks registered in Alaska because it is not a member of IRP. However, repatriating those licenses would require carriers to pay registration fees not currently going to Ohio.

was to multiply the number of vehicles times the weighted average of registration fees based on the statewide distribution of Ohio IRP registrations by weight class in 2014.[12] If we had assumed

[12] For example, 71.1 percent of Ohio IRP registrations were for 78,001 pounds and up. Therefore, the distributable amount ($769.16) was multiplied by .711, and this was done for every weight class to derive a weighted average. Additional estimates were computed using various assumptions: a high-end estimate where every vehicle was registered with a 78,001-pound plate, a low-end estimate where every vehicle was registered with a 26,001-pound plate, and a composite of the high, low, and weighted average estimates.

Figure 7. Out-of-State IRP Registrations Associated with Ohio-Based Carriers



a specific weight class it would have biased the estimates, making them too high or too low depending on the assumption. Vehicles were also classified based on whether the registration was located in a township or a municipality because the amount of distributable revenue a county retains varies significantly according to the type of taxing district.[13]

Figure 8 illustrates the potential number of out-of-state vehicles registered to Ohio carriers by county. It shows the geographic distribution of all 20,601 out-of-state registrations based on where they registered in the county of the carrier's physical address. [14] There is no way to know for certain whether these vehicles are domiciled in Ohio, but given that the registrations all belong to Ohio-based carriers, it is likely that a sizable percentage of these vehicles probably operate in Ohio. The way IRP is structured, these carriers are still remitting payments via their chosen base jurisdiction, but revenues are distributed much differently than they would be if the registration were tied to a particular county. The county where the carrier is based still enjoys some revenue, but in most cases only a fraction of what they would get if the vehicles were registered there.

The number of out-of-state registrations associated with Ohio carriers vary substantially across counties. There are 14 counties with no out-of-state registrations; additionally 50 more counties have 50 or fewer vehicles that fall into this category. There are 12 counties where there are 51 to 200 vehicles, 7 counties with 201 to 500 vehicles, and 5 counties with 501 to 6,000 vehicles. 97.3 percent of these registrations are concentrated in 24 counties, each of which has 51 or more vehicles, but the largest category in particular, with 77.3 percent in five counties. Just two counties – Clinton County (5,810) and Franklin County (4,597) – account for over 50 percent of

[13] As noted in Chapter 1, the county gets to keep the 34 percent share if the registration is in a township, but not if the registration is in a municipality.

[14] It should be noted that Alaska registrations are included in spite of Alaska's not being a member of IRP. In practice, revenue from these registrations does not go to Ohio. Apportioned registration is possible, but carriers operating these vehicles may have little incentive to register with IRP.

these vehicles. Hamilton (2,608), Cuyahoga (1,776), and Summit (1,133) Counties have the next-highest concentrations of these registrations.

Figure 8. Carrier Vehicles Registered in Other Jurisdictions, by County

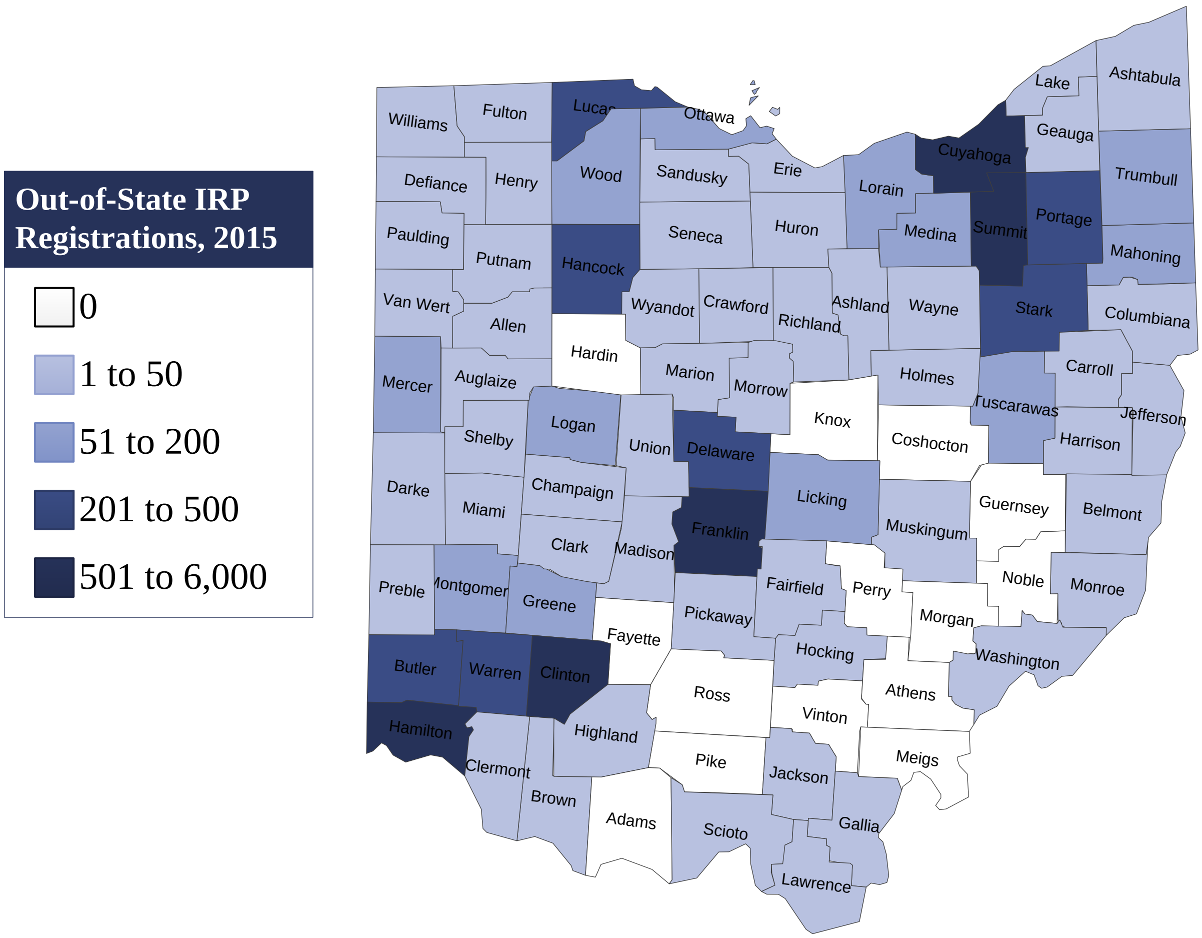


Table 8 shows the distribution of the out-of-state IRP registrations by fleet size. The first column contains fleets with fewer than 20 vehicles and the second fleets with more than 20 vehicles. Intuition suggests that the likelihood of these smaller companies' vehicles operating in Ohio is quite good, as smaller companies should be less likely to own and operate terminals in other states or jurisdictions. The numbers bear out this story, with companies in this group accounting for 88.6 percent of Ohio carriers with out-of-state IRP registrations. However, the 87 large carriers with 20 or more out-of-state registrations account for 88.3 percent of all vehicles with these registrations. Some of these vehicles probably operate outside Ohio, but if even a modest fraction of those vehicles operate within the state, larger companies exert a more pronounced effect on IRP revenue distribution because of jurisdiction shopping than do smaller carriers.

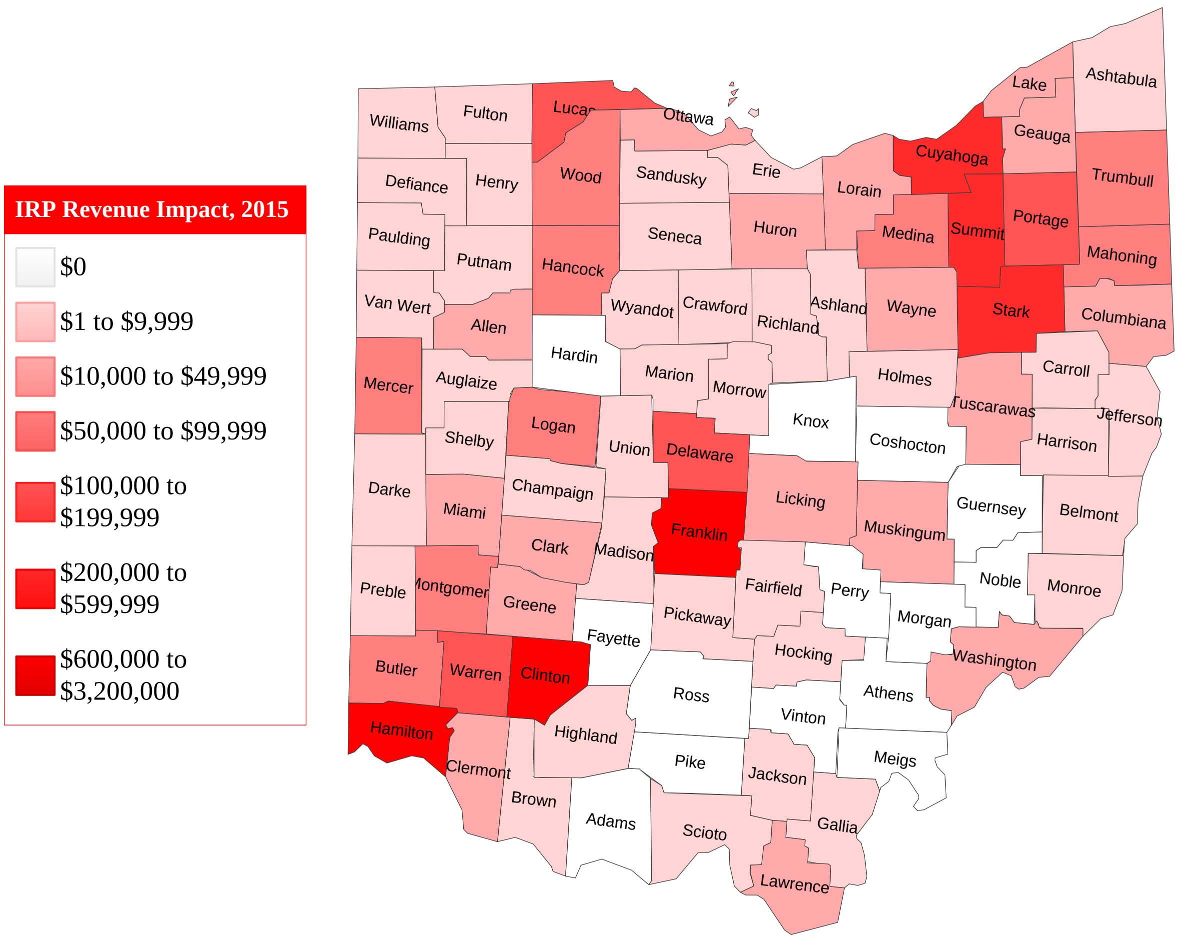
Table 8. Ohio and Out-of-State Registration Distribution by Fleet Size

OOS Fleet Reg.	1 to 19	20 or more	Total
Total Carriers	682 (88.6%)	87 (11.4%)	769
Total Vehicles	2,412 (11.7%)	18,189 (88.3%)	20,601

Figure 9 provides the estimated direct revenue impacts on Ohio counties due to out-of-state registrations by Ohio carriers. To be clear, these estimates are only the amount of distributable revenue lost if one assumes every vehicle registered in another state should be registered in Ohio because it is domiciled in the county where the carrier's terminal is located. Potentially, this revenue is distributed, albeit through the loss compensation and excess annual compensation mechanism, which allocates money based on all motor vehicle tax revenues (not just IRP truck revenues). It is unclear how much of this revenue would be recovered if jurisdiction shopping were curbed or prohibited because we do not know the actual number of these trucks operating in Ohio.

Furthermore, the net effect of this effect is difficult to calculate without making several assumptions and complicated calculations based on the allocation mechanisms discussed in Chapter 2. It is beyond the scope of this study. However, the purpose of this estimate is to demonstrate the degree to which various counties are impacted by IRP jurisdiction shopping – not to master the minutia of policy tradeoffs that would have to occur in wake of a resolution to this problem. It is estimated the average out-of-state truck would repatriate $665.0138 in revenue distributable per truck, which comes to $13,699,949.29. These totals include distributions to counties, townships, and municipalities, but do not include administrative costs or interest accrued.

Figure 9. Estimated Direct Impact of Out-of-State Registrations on IRP Distributions



The impact ranges from negligible to significant. The total direct county impact on IRP revenue distributions is estimated at $8.23 million for 2015. More specifically, 14 counties will see no impact; 38 counties see an impact of less than $10,000. 17 counties experience revenue displacement between $10,000 and $49,999. Nine counties will lose between $50,000 and $99,999. Four counties will lose $100,000 to $199,999 in registration fees; and an additional three are predicted to lose between $200,000 and $600,000. The three biggest losers are Clinton County

($3.13 million), Franklin County ($1.45 million), and Hamilton County ($822,916). The reason for Clinton County's disproportionately high losses is that virtually all of its Ohio-based out-of-state registrations are based in a township, whereas a large number of Franklin, Hamilton, and even Cuyahoga County registrations are in their respective municipalities.

Table 9 breaks down the various impacts of jurisdiction shopping by direct and indirect effect, and by district type. The direct impacts on counties, municipalities, and townships is pretty straightforward, but there are also indirect county and township impacts. These indirect impacts are based on the assumption that all 20,601 IRP registrations can and should be repatriated to Ohio as valid registrations. The small shares of all IRP registrations that go to each county and township based on mileage, as well as the equal share that goes to each county, can also be taken into account. The direct effect to counties constitutes $8.23 million, followed by $2.89 million to municipalities and $6,633 to townships. The indirect effects to the county consist of the 9 percent share-based county miles and the 5 percent share that is allocated equally to each county; these effects collectively sum to almost $1.9 million. Indirect township effects are much larger ($678,364) than the direct effects because of the mileage-based structure of township revenue

Table 9. IRP Revenue Impacts Related to Out-of-State Registrations to Ohio Carriers

Category	**Amount**
Direct County	$8,230,544.19
Direct Municipalities	$2,886,452.50
Direct Township	$6,633.12
Total Direct	$11,123,629.81
Indirect County Miles	$1,220,741.74
Indirect Township Miles	$678,364.34
Indirect County Equal	$677,213.40
Total Indirect	$2,576,319.48
Total Impact	$13,699,949.29

allocations. In total, the cumulative direct and indirect effects for counties amount to $10.13 million, $2.89 million for municipalities (as they have no indirect effects), and $684,997 for townships. The total impact is just under $13.7 million.

3.2 Revenue Trends

Another way to examine the impact of jurisdiction shopping on IRP registrations is to look at IRP revenue trends in each of Ohio's 88 counties. The revenues for each county were calculated based on what each county keeps, excluding disbursements to townships and municipalities.[15] As with registration numbers, other factors can drive changes in IRP revenue, including increased or decreased economic activity in the trucking sector, differences in fees or interest, fluctuations in the ratio of municipal and township registrations, and trucking companies physically moving or terminating operations. If jurisdiction-shopping estimates are correlated with revenue changes in these areas, then jurisdiction shopping may be a primary factor in explaining why those revenue changes occurred.

Forecasting models are commonly used in the social sciences. As such, it is useful to review the context and guidance from the literature that supports the forecasts in this study. Zarnowitz identifies attributes common to successful forecasts (1992). These include verifiability of the forecast, absence of bias, use of the same variables across forecasts, and the adoption of objective methods. Incorporating all available information into the forecast is cited as another element that can be used to evaluate forecasts (Feenberg et al., 1988) and improve their accuracy (Moca & Azad, 1995).

[15] Actual county-by-county revenues for 2009-2014 are provided in Appendix A. Statewide Forecasts are provided in Appendix B. Forecasts for 2015 to 2019 are provided in Appendix E.

Techniques commonly used for forecasting are trends, time series models, causal models, and accounting-type approaches (Frank, 1993). Most state governments use forecasts for revenues that rely on econometric models of varying complexity (Grizzle & Klay, 1994). These models use regressions and related economic variables to estimate future revenue collections. However, in some cases, econometric models have been shown to produce results that are functionally equivalent to those derived from simpler methods such as data extrapolation and judgment (Ahlers & Lakonishok, 1983; Armstrong, 1978; Ascher, 1981). For short-term forecasting, extrapolation has proven as successful as the complex time-series features of econometric models (Armstrong, 1984; Brandon, Jarrett, & Khumawala, 1983; Mahmoud, 1984). Irrespective of the approach taken, obtaining lengthy historical data when generating a forecast is recommended in order to improve results (Cirincione, Gurrieri, & Van de Sande, 1999; Schroeder, 1982; Downs & Rocke, 1983). Combining forecasts that use different methods can produce more accurate estimates than a single model can (Grizzle & Klay, 1994).

A number of studies have found that state revenue forecasts have been consistently underestimated (Feenberg et al., 1988; Frank & Gianakis, 1990; Klay, 1983; Albritton & Dran, 1987). Some researchers argue that forecasts in general are intentionally low in order to reduce the likelihood that reduced spending will be necessary if actual receipts fall short of the forecast (Klay, 1983; Rodgers & Joyce, 1996). Lower estimates result in small forecast errors during recessions, while errors are magnified during periods of economic growth. As forecasts are an estimate and subject to error and uncertainty, forecasters often build a buffer into forecasts to guard against unexpected declines in revenue (Rubin, 1987). Using judgment is prone to greater error than relying on data, such as cross-section or time series (Moca & Azad, 1995).

It is with these factors in mind that we turn to methods. Forecasts for future county IRP distributions from 2015 to 2019 were generated for aggregate county level distributions rather than for each part of the distribution formula across each county. To produce estimates for each part of the distribution formula, we first averaged those categories from 2009 to 2014 to obtain an average percentage. We then applied that to the forecasted total to develop estimates for the underlying parts of the distribution formula. While it is possible to apply forecasting models to these individual categories, limited historical data and the use of so many forecasting models would introduce unnecessary forecasting error to our estimates. The county level forecasts for IRP distributions were estimated using historical data from 2009 to 2014. A wider span of historical data would have likely improved the results; however, there were enough data to generate forecasts that explained over 90 percent of the variance. Attempting to predict changes in IRP distributions and the factors driving these changes beyond the five-year point would entail significant speculation and would be of limited value.

The three approaches used to generate the forecasts were a time-trend, time-trend-squared, and lag model. A time-trend model regresses historical distributions against a time variable. A time-trend-squared model follows this approach but it also squares the time variable. A lag model regresses historical distributions against the same distributions; however, the distributions are lagged by one year. The time-trend model is shown in equation (1) below.

$$Y_t = \beta_0 + \beta_1 T_t + \varepsilon_t \qquad (1)$$

Y_t represents the distribution in year t, while T is the time-trend value for each year t, β_0 is the constant, and ε_t is the error term. β_1 is the value of the independent variable. The trend forecast implicitly captures various factors that are difficult to predict, such as economic changes. Nevertheless, the trend forecast error will be larger if there are sudden shifts or accelerated changes in factors that affect IRP distributions. The trend-squared variable captures exponential growth or diminishing growth rates. Equation (2) displays the time-trend-squared model, which is similar to the time-trend model.

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 T_t^2 + \varepsilon_t \qquad (2)$$

The lag model, more formally known as the autoregressive (1) model[16], exploits the relationship between the current year's distribution and the previous year's distribution to future distributions. It relies heavily on prior-year distributions to forecast successive years. Equation (3) below shows the lag model. Y_{t-1} is the prior year's revenue. The coefficient on the lag model is essentially the percentage of last year's revenues that are added to the constant to obtain the predicted value.

$$Y_t = \beta_0 + \beta_2 Y_{t-1} + \varepsilon_t \qquad (3)$$

[16] Autoregressive (1), or AR(1) model relies on the previous term in the process to predict the next term. In this case, that means that prior year revenue is used to predict current year revenue and so on.

In order to generate the forecasts, we then averaged the resulting estimates from each of the models. Still, each model was checked for goodness of fit and significance, with attention paid to the resulting estimates (compared to the historical data). In some cases, a downward trend in the historical data yielded values in outlying years that indicated negative distributions. These were unrealistic, thus when this occurred the forecast method was removed from the average calculation entirely. The regression results for each model are shown in Appendix I.[17]

Table 10. Statewide IRP Distribution, County Share, 2009-2019

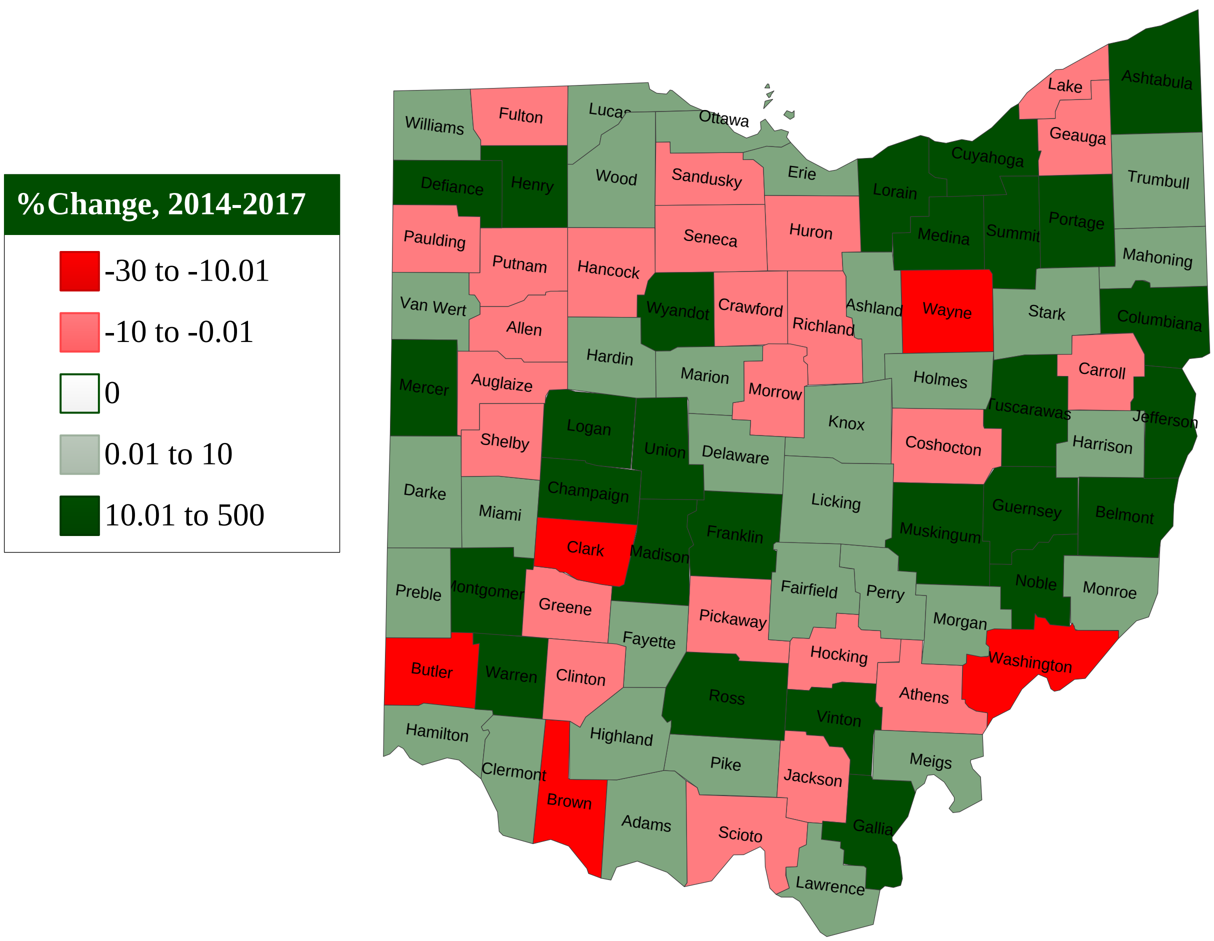
Year	County IRP Share
2009	$30,357,776
2010	$31,433,750
2011	$33,257,341
2012	$34,133,826
2013	$34,102,690
2014	$36,380,037
2015*	$37,826,661
2016*	$39,612,134
2017*	$42,413,268
2018*	$48,150,890
2019*	$62,085,832
*Projected	

To put these projections in context and simplify the interpretation of our results, the future statewide projections are shown in Table 10. The totals are based on the sums of county-level forecasts. Included are actual numbers from 2009 through 2014. The revenue projection is the amount the counties are expected to keep; it does not include final distributions to municipalities or townships. The projections increase slowly at first. Increases accelerate significantly in 2018 and 2019. The time-trend-squared models are primarily responsible for this sharp uptick, which

[17] County Time-Trend Forecasts are the time-trend model, County Time-Trend-Squared Forecasts are the time trend-squared model, and County Lag Forecasts are the lag model. For the County Time-Trend Forecasts, year is the time variable, year2 is the squared term in County Time-Trend-Squared Forecasts, and the lagged value for the County Lag Forecasts is var2 for Adams County, var4 for Allen County, and so on.

should be interpreted cautiously, as the other models do not show as strong of an increase. Beyond the three-year mark, the time-trend-squared model diverges substantially from the time-trend and lag models. Our future economic prospects are uncertain, however. For example, if a deep recession were to occur during the forecast period, even the more conservative forecast models may overestimate revenues.

Figure 10. Forecasted Change in County IRP Revenue, 2014-2017



Despite uniform upward trajectory in IRP county revenue forecasts at the state level, the individual county projections look quite different. The variation is based on the individual trend line for each county, which typically has greater volatility (and therefore statistical noise) than the state-level forecast. The forecasted percent change in revenue between 2014 and 2017 is reported in Figure

10. Positive revenue trends are indicated in green, and negative revenue trends in red. Lighter shades of either color indicate a change of 10 percent or less over the time period, whereas darker shades of red and green signify a change of more than 10 percent.

The Figure 10 forecast anticipates three-year growth over 10 percent in 27 counties, and growth of less than 10 percent for an additional 32 counties. As such, we expect revenue growth in 59 of Ohio's 88 counties. Conversely, 24 counties have a projected loss of revenue of less than 10 percent, and in five cases we expect declines larger than 10 percent. Overall, the revenue picture appears to be positive in most contexts. However, a non-negligible number of counties face declining revenues, just as local funds for highway infrastructure maintenance and enhancements from federal and state sources are stagnating. Even in counties where the forecasts project revenue growth, IRP funds are not distributed as equitably as many officials would like.

A correlation coefficient, which measures the strength of association between two variables, was calculated to relate the number of out-of-state vehicles in each county to the percent change variable used to create Figure 10. The resulting coefficient (.033) was weak, which indicates there is little association between out-of-state vehicles and projected revenue changes. The lack of association does not mean out-of-state jurisdiction shopping is disconnected from revenue losses. Given that these vehicles are typically never registered in Ohio, the impacts would not appear in a model that does not use out-of-state registrations to project revenue effects. Our intuition was that the forecasting models might be driven by indirect economic effects, but these trends are independent of the jurisdiction shopping issue. There are positive revenue projections for counties in which potentially large numbers of out-of-state registrations are domiciled (e.g. Mahoning County), and negative projections for counties where jurisdiction shopping is not a significant issue (e.g. Brown County).

Chapter 4. Case Studies

Statewide discussion of the IRP tax distribution, the registration trends and jurisdiction shopping phenomenon, revenue impacts, and revenue forecasts clarify several of the problems with IRP jurisdiction shopping that reverberate in Ohio. However, to appreciate fully the intricacies of the policy issue it behooves us to examine the particulars of this problem at the county level. Specifically, this section develops case studies to provide additional insights into factors not evident from the high-level quantitative analysis. The case studies provide greater detail about issues that emerged from surveys and from conversations with county engineers.

We sent surveys to engineers asking them about trucking industry practices in their county. Questions asked respondents to identify large fleets (50+ vehicles), whether they have noticed a substantial number of commercial vehicles garaged in the county with out-of-state plates, if they have received requests for road improvements by local businesses, the degree to which road improvements are necessitated by heavy volumes of truck traffic, the significance of jurisdiction shopping in their county, the state of IRP revenue disbursements, the degree to which revenue changes may be associated with jurisdiction shopping, and whether they would support changes to the mechanisms that distribute IRP registration fees for large fleets registered out-of-state but domiciled in Ohio. Nineteen of the 88 counties returned surveys, including:

- Allen
- Carroll
- Champaign
- Columbiana
- Coshocton
- Darke
- Defiance
- Geauga
- Greene
- Lake
- Lawrence

- Logan
- Madison
- Mahoning
- Mercer
- Morgan
- Richland
- Sandusky
- Shelby

The responses provide additional information to consider when developing potential policy solutions for the IRP revenue distribution problems.[18] In some cases, county engineers cited examples of companies missed in the impact study. Several companies moved their registrations out-of-state before 2009, when the available vehicle data starts. Additionally, distribution centers for large multi-state companies were left out of the impact analysis. These companies have primary addresses in other states, so their out-of-state IRP registrations did not emerge during the matching process. Nevertheless, several hundred trucks are domiciled in these distribution centers, which are located throughout Ohio. Verifying these registration numbers is difficult, as carriers have been reluctant to respond to county engineers' requests for information about the size of their fleets. In several cases engineers reported large companies do in fact maintain local registrations. Each case is different.

A few county engineers reported having been approached by representatives of out-of-state trucking companies or by economic development officials in Ohio about upgrading access roads, intersections, and other highway infrastructure near their distribution centers. The difficulty is that engineers have few resources to make such upgrades because only a very small fraction of the registration fees actually make it back to their counties when vehicles are registered in other jurisdictions. Ohio County Engineers would like to assist with economic development and local

[18] Other county engineers provided additional information but did not fill out the survey.

industry needs, but they lack funding to make some of the requested improvements in areas that have lost funding due to jurisdiction shopping.

Specifically, shale-drilling companies have approached at least one Ohio County Engineer about improving roadways that were originally designed to handle agricultural and residential traffic. They sought enhancements that would make the roads amenable to vehicles and traffic levels associated with the industry. Large distribution companies have proposed projects related to terminal or distribution center expansions. Further, heavy truck traffic requires substantial road maintenance that has not been requested but is nevertheless necessitated by motor carrier operations. These projects may include resurfacing, in-place recycling, full-depth repairs, mill and fill, installation of traffic signals and turn lanes, as well as additional projects specific to particular requests. Some engineers reported they have not received these requests.

When asked whether they would support changes to IRP registration distribution methods to help counties with large fleets offset losses due to jurisdiction shopping, most engineers agreed. Specifically, 12 of 19 engineers responded “yes” or provisionally agreed, assuming that the resulting impact did not cost their county revenue or impact Roadway Use and Maintenance Agreement (RUMA) processes currently in place. Five others were unsure how severely the problem affected their county, or they requested more information about the issue. Those engineers who did not support changes usually cited concerns about revenue losses. One engineer contended that most large companies have distribution centers by interstates and do not make heavy use of local roads.

Some engineers noted that alternative approaches – aside from changing the revenue distribution – might be warranted. One respondent suggested tax credits might help counties attract economic development and persuade businesses to site facilities locally. Another respondent suggested looking at the administrative costs that Ohio's Departments of Transportation or Public Safety recoups from IRP revenues, and determine whether those administrative costs could be reduced or shared more equitably. Another engineer suggested a cost-sharing mechanism be put in place for companies that operate vehicles in multiple counties so that registration fees are shared based on actual operations.

Based on our survey results and the empirical evidence analyzed in Chapter 3, four counties will be profiled in this chapter: Clinton County, Mahoning County, Franklin County, and Butler County. We selected Clinton County because it is where jurisdiction is most consequential; it has cost the county millions in IRP revenues. We chose Mahoning County because it has several significant issues not obvious from our quantitative analysis. The quantitative analysis missed some of problems that have arisen due to jurisdiction shopping. Franklin County was included because we estimated its losses were second highest behind Clinton County. However, Franklin's issues are somewhat different because most of the jurisdiction shopping has been pursued by carriers located in a municipality rather than a township. Butler County was chosen because it also faces a number of unique challenges, including a decline in registrations from 2012 to 2013, a large out-of-state impact due to jurisdiction shopping, and a shared border with Indiana, the state where the vast majority of out-of-state registrations are logged.

Case Study 1: Clinton County

Clinton County is located in southwestern Ohio. According to the U.S. Census Bureau's 2014 estimate, it has a population of 41,835. The Bureau's County Business Patterns data indicates there were 888 workers employed by 13 establishments in the truck transportation industry in 2012.[19]

[19] According to the U.S. Census Bureau's North American Industry Classification System, the truck transportation industry is a subsector of the transportation and warehousing industry. It related to transportation of cargo using motor vehicles, namely tractor-trailers and other trucks.

The annual payroll in 2012 for this industry was approximately $33.4 million. According to the Ohio's IRP vehicle data, there were 258 vehicles registered to 71 distinct USDOT numbers in Clinton County during 2013[20] [21]. For 2015, The number of out-of-state vehicles registered to Ohio carriers in the initial impact analysis of Clinton County was 5,810 – the largest of any county. Based on that vehicle count, the estimated IRP impact on the county (excluding townships and municipalities) is $3.13 million for the current year.

Clinton County's situation revolved almost entirely around a single carrier based in Wilmington. In 2008, the Ohio-based carrier decided to move all of its IRP truck registrations from Clinton County to Indiana. Current vehicle registration records indicate the company has 5,804 trucks registered in Indiana, which are all but six of the out-of-state vehicles registered in the county. Attempts by Clinton County Engineer Jeff Linkous to convince the company to repatriate those registrations to Ohio have so far been unsuccessful.

According to the *Wilmington News-Journal*, the company moved its IRP licensing because it was easier for the company to register online, and there were significant cost savings associated with registering the plates in Indiana (Huffenberger, 2015). Cost reductions stemmed from a reduction in the company's administrative effort to register trucks in Indiana as compared to the effort required to register the trucks in Ohio. Fees unrelated to the specific IRP registration costs also contributed to cost reduction. These additional fees, Linkous estimated, amounted to $75,000 for the company for 5,000 vehicles. This is a fraction of the windfall the county would enjoy were the registrations reverted to Ohio. The company still must remit IRP registration fees to Ohio, but

[20] The Census Bureau defines an establishment as a physical location where business is conducted and industrial operations are held. The discrepancy between establishment numbers and USDOT numbers is difficult to reconcile, but registration records do not necessitate a physical place of business – just the use of equipment.

[21] The Ohio BMV's official IRP truck vehicle registration tally was 245 in 2013.

only a small portion of those fees go to Clinton County because of the distribution mechanisms. Linkous noted that the funds would make more maintenance, enhancements, and repairs possible. Representatives for the company said that it would provide Ohio assistance in improving its own registration process and is still committed to the well-being of Clinton County.They mentioned plans to expand corporate headquarters, which would bring an additional 200 jobs to the area. Of course, neither of these factors improve revenue shortfalls that challenge local and state officials responsible for maintaining roads in Clinton County.

According to a 2014 estimate assembled by the Tax Distribution Section of the ODPS, Clinton County has lost an estimated $2.6 million a year in IRP distribution revenue.[22] Our estimate is even higher, at $3.13 million. The difference is based on the assumptions made in the methodology of both estimates. The earlier ODPS estimate is based on former registrations held in 2008 (4,775), and includes the specific plates associated with each vehicle. Their estimate also included other fees and taxes beyond the scope of this study. Nevertheless, when our methodology is used on the same number of vehicles, the estimated impact is $2.58 million, which is very close to the ODPS estimate. Because specific weight information was not available, we assumed a distribution similar to the state's overall IRP distribution. In addition, administrative fees and interest were not taken into account in our estimate.

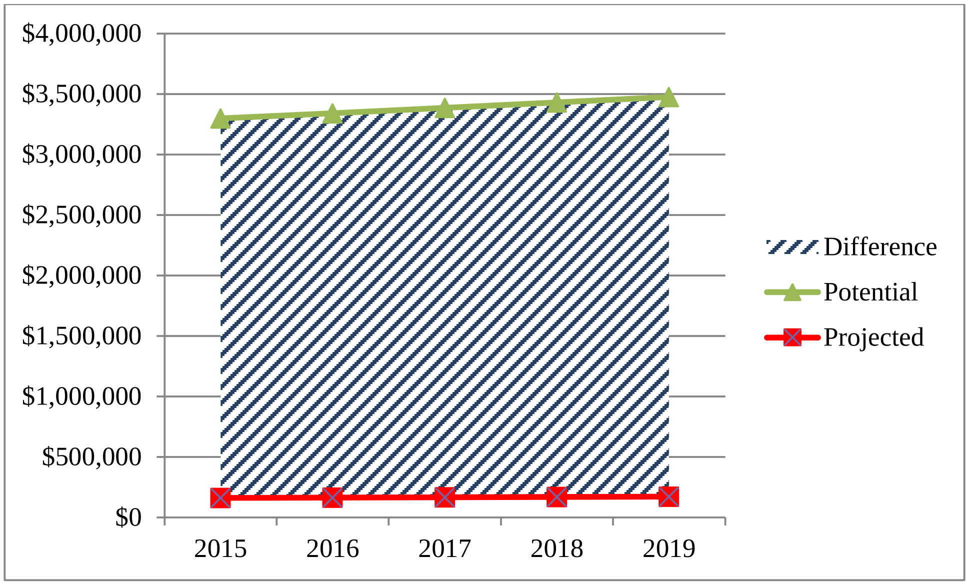
Figure 11 shows the projected IRP revenues for Clinton County from 2015 through 2019. Instead of using the weighted average of the three forecasts (which is used in the IRP calculator tool created as part of this analysis), only the time trend is shown here.[23] Time trends tend to be somewhat conservative and more likely to yield positive revenue trends over the long term

[22] The ODPS estimation is included in Appendix G.

[23] We used the time-trend models here because their predictions for revenue trends tend to be more modest, which is consistent with our knowledge about the historical trends of registration revenue in several states.

compared with the other models, but their year-to-year changes are less pronounced. The trend-squared model and lag models show stagnating or even declining IRP revenues for Clinton County. Regardless of which forecast proves correct, the impact will only

Figure 11. Clinton County IRP Impact Forecast, 2015-2019



be a fraction of the potential revenue the county would collect if the county's outstanding registrations we repatriated to Ohio. The impacts were calculated for 2015 based on the methodology described in section 3.1 and indexed according to its 2015 proportion of the time-trend forecast for 2016-2019. The model shows the projected revenue with the red square plot. Potential revenue that could be collected if all of the county's out-of-state registrations were returned to Ohio is depicted by the green triangle plot. The shaded area between the two represents the difference – or impact – to the county.

Projected revenue, under the current registration arrangement, increases from $163,456 in 2015 to $172,232 in 2019. If the slow, steady growth of the time-trend forecast persists, the total revenue for Clinton County over the five-year forecast period is $839,220. If the out-of-state registrations (which are the current out-of-state registrations corresponding to companies located in the county) were repatriated, the potential revenue recouped over this period would be $16.93 million. The potential difference to Clinton County over a 5-year period would exceed $16 million. A shift of this magnitude would dramatically change the outlook for county road maintenance and enhancements in Clinton County.

Case Study 2: Mahoning County

Mahoning County is located in northeastern Ohio, and according to the U.S. Census Bureau's 2014 estimate has a population of 233,204. According to the Bureau's County Business Patterns data, there were 1,224 workers employed by 87 establishments in the truck transportation industry in 2012. The annual payroll for the industry in 2012 was approximately $54.3 million. According to the Ohio's IRP vehicle data, there were 3,885 vehicles registered to 324 distinct USDOT numbers in Mahoning County during 2013.[24] The number of out-of-state vehicles registered to Ohio-based carriers in the initial impact analysis of Mahoning County was 127 for 2015. Based on that vehicle count, the estimated IRP impact on the county (excluding townships and municipalities) is $68,133 for the current year.

The impact analysis as originally conceived does not fully account for all of the potential jurisdiction shopping issues in Mahoning County. Mahoning County Engineer Randy Partika provided examples of companies with distribution centers located in the county but whose primary addresses are listed in other jurisdictions. These carriers were not included because without firsthand knowledge there was no way of knowing which carriers with primary addresses outside Ohio have distribution centers in the state. The two examples are large distribution companies that plate in Indiana. Both house approximately 100 trucks at their distribution centers, adding 200 trucks to the original estimate. One of the two companies is expanding a terminal, which will

[24] The Ohio BMV's official IRP truck vehicle registration tally was 3,928 in 2013.

translate to an additional 100 trucks in the area, with the possibility of adding 100 more. Thus, Mahoning County will soon have 300 to 400 trucks using its roadways that were not accounted for in the original impact estimate.

To recalculate the impact analysis and index it to the time trend forecast, we added 300 trucks to the current Mahoning County out-of-state IRP registration estimate of 127. This yielded an estimate of 427 out-of-state registrations for Mahoning County in 2015, although depending on the speed of the companies' expansion some of these registrations may not be a factor until next year. Each of the additional vehicles would be registered with a township instead of a municipality, which equates to 425 township registrations and 2 municipality registrations. The estimate still uses the weighted plate average, which may be a bit conservative, as most of the trucks are said to be 18-wheelers, which usually register on the 78,001-pound plate. The 2015 impact estimate grows from $68,133 to $230,145. It is plausible that such carriers are operating around the state under similar circumstances, and paying indirectly to the state's out-of-state funds netting transactions, which are applied to existing in-state registrations as loss compensation and to the annual excess compensation distribution.

Another factor contributing to the Mahoning County situation is that jurisdiction shopping at one time had far greater impact than it does currently. Mahoning County's registrations dropped from 3,625 in 2008 to 2,858 in 2009 and stabilized in 2010. Most of that drop was due to the loss of another large company that also moved its registrations to Indiana. According to the ODPS impact estimate, this move cost Mahoning County $445,029 annually.[25] Partika had discussions with company executives about how out-of-state registrations influenced the distribution of IRP registration fees. Once aware of the issues, the company agreed to switch its registrations back to

[25] The ODPS estimate is provided in Appendix H.

Mahoning Count in 2010, thereby stemming the losses. Had this situation persisted, our estimates indicate that Mahoning County would potentially lose nearly $700,000 each year in IRP disbursements. However, the process of convincing a carrier to repatriate can be difficult and time-consuming task. In Partika's opinion, carrier-by-carrier negotiations are not a viable long-term strategy.

Figure 12. Mahoning County IRP Impact Forecast, 2015-2019

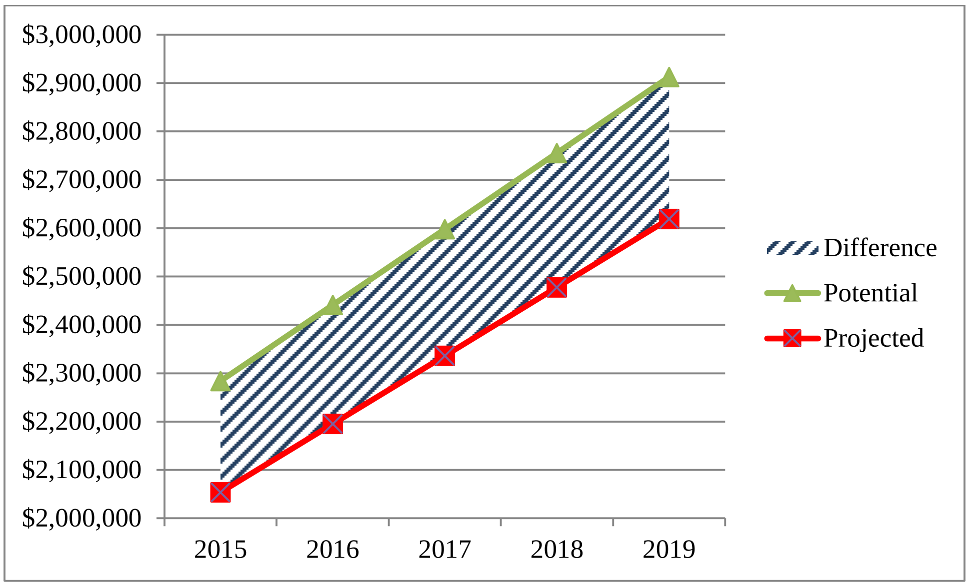
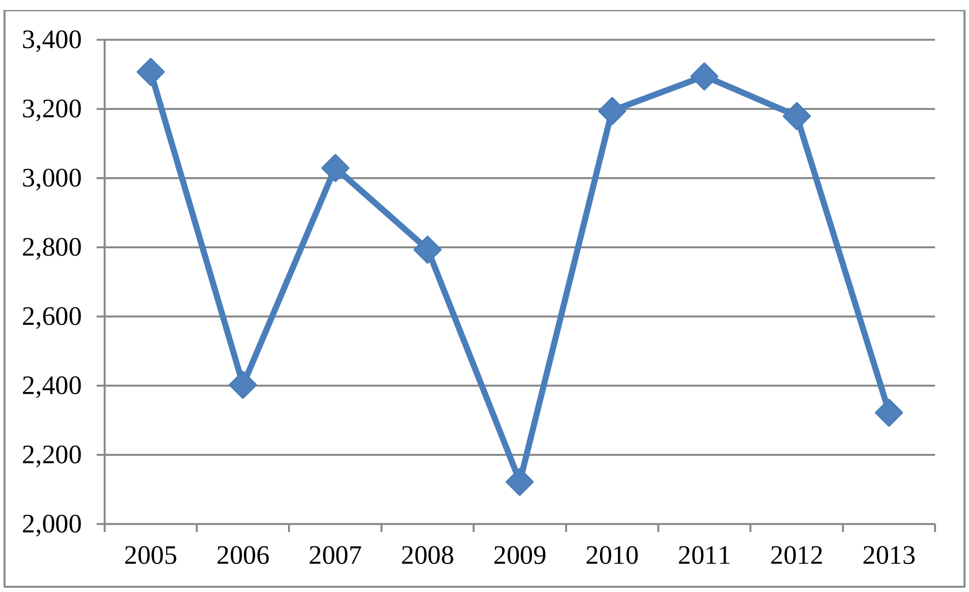


Figure 12 shows the time-trend forecast for Mahoning County for 2015 to 2019. The time-squared-trend forecast indicates that revenues will stagnate at roughly $1.8 million for the entire period, the lag model shows a precipitous drop, and the weighted model suggests gradual drop in revenues. The time-trend model is the most optimistic of the four forecasts created for this particular county. To reiterate, time-trend forecasts created with only six years of back data tend to be volatile and noisy, and as such are subject to considerable variation. Projected revenue increases steadily from $2.05 million to $2.62 in 2019, which means the total IRP revenue for Mahoning County totals $11.68 million over the five-year period. If all out-of-state registrations with Ohio carriers in located Mahoning County were reestablished in the state, the additional registrations would contribute $1.31 million in additional revenue between 2015 and 2019.

Case Study 3: Butler County

Butler County is located in southwestern Ohio, and according to the U.S. Census Bureau's 2014 estimate has a population of 374,158. According to the Bureau's County Business Patterns data, there were 3,412 workers employed by 115 establishments in the truck transportation industry in 2012. The annual payroll for the industry in 2012 was approximately $168.8 million. According to the Ohio's IRP vehicle data, there were 2,585 vehicles registered to 344 distinct USDOT numbers in Butler County during 2013.[26] The number of out-of-state vehicles registered to Ohio-based carriers in the initial impact analysis of Butler County was 204 for 2015. Based on that vehicle count, the estimated IRP impact on the county (excluding townships and municipalities) was $97,641. Butler County's registration history is quite unusual.

Figure 13. Butler County IRP Registrations, 2005-2013



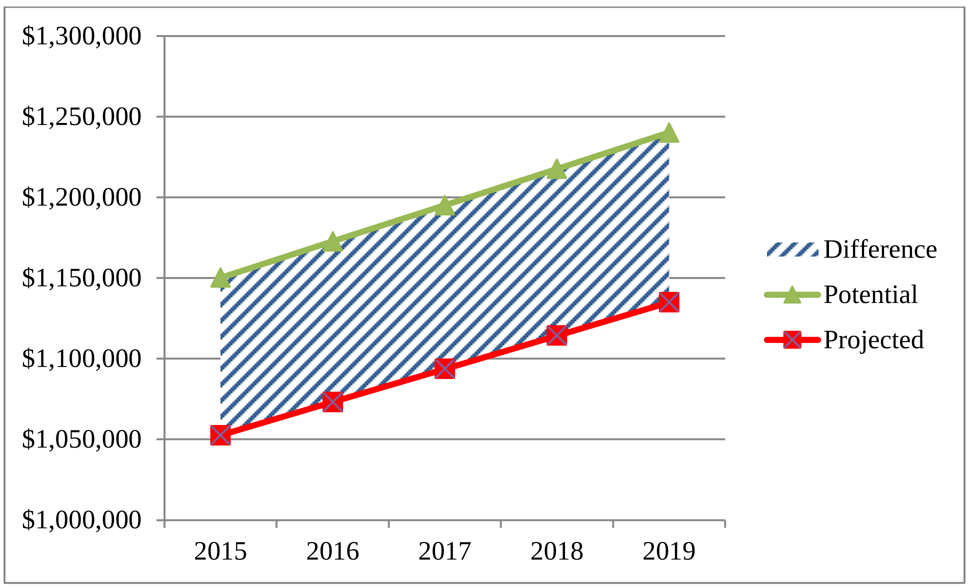
[26] The Ohio BMV's official IRP truck vehicle registration tally was 2,323 in 2013.

Figure 13 indicates that Butler's registration totals dropped abruptly between 2012 and 2013 from 3,180 to 2,323. In fact, the registration patterns have been somewhat erratic for the entire period for which county-level figures are available. Registrations dropped from 3,308 in 2005 to 2,403 in 2006, before returning to 3,030 in 2007. They dipped slightly in 2008 before plummeting in 2009, sharply rising in 2010, and stabilizing for two years before plummeting again in 2013. The IRP impact analysis found 204 vehicles plated in other states that belonged to carriers located in Butler County. The large variability in these data suggests there were erratic business and economic patterns or even cases of jurisdiction shopping not picked up by the initial analysis.

The forecast and potential impact for 2015 through 2019 is depicted in Figure 14. The projected increase in revenue runs from $1.05 million in 2015 to $1.13 in 2019. This is a very slight increase, and might be on the high side if the alternative forecasts are better predictors of future revenues. The time-trend-squared model predicts stagnant revenues, and the lagged and averaged models predict a substantial decline in revenue. However, sticking with the time-trend model, the expected impact rises from $97,641 in 2015 to $105,281 in 2019. Over the five-year period, projected revenue is $5.47 million, but this number would increase to $5.98 million if the out-of-state registrations of vehicles housed in the county were registered in Butler County. This would push up the estimated impact over the same period to $507,304. These IRP impacts are not as large as in Clinton, Mahoning, or Franklin Counties, but the distortion may have a negative impact on the county engineer's ability to maintain local roads.

In 2013, *The Journal-News* reported that Butler County officials approved a local tax abatement to assist a multistate carrier with the expansion of its operations in Hamilton (Schwartzberg, 2013). The company, which has nearly 1,300 registered IRP vehicles, has its primary address in Wisconsin. Of its fleet, there are 13 vehicles registered in Ohio, but we cannot know if that reflects the number of vehicles domiciled in the county without more follow up. Another reason for the erratic registration numbers is that another large company had 627 registrations in Butler County in 2012, but all of those registrations disappeared in 2013. The associated USDOT number is no longer active, and it is not clear whether this business ceased operations, moved operations, or turned transit over to another freight and logistics company. Both of these companies may impact on the IRP registrations that do not register in the impact estimate and forecast provided in Figure 14.

Figure 14. Butler County IRP Impact Forecast, 2015-2019



Case Study 4: Franklin County

Franklin County is located in central Ohio, and according to the U.S. Census Bureau's 2014 estimate has a population of 1,231,393. Based on the Bureau's County Business Patterns data, there were 8,845 workers employed by 340 establishments in the truck transportation industry in 2012. The annual payroll in 2012 was approximately $370.8 million for those employees. According to the Ohio's IRP vehicle data, there were 9,560 vehicles registered to 783 distinct

USDOT numbers in Franklin County during 2013.[27] The number of out-of-state vehicles registered to Ohio-based carriers in the initial impact analysis of Franklin County was 4,597 for 2015. Based on that vehicle count, the estimated IRP impact on the county (excluding townships and municipalities) was $1.45 million for the current year.

Franklin County has more out-of-state vehicles registered to its carriers than any other county except Clinton County. Unlike Clinton County, there are 88 Franklin County carriers of various sizes that have out-of-state IRP registrations. The county has 9 carriers with 50 or more trucks registered in another state, and 8 more with 10 to 21 carriers registered in another state. These 17 medium- and large-sized carriers account for 96.5 percent of all out-of-state registrations in Franklin County. Nevertheless, having the out-of-state registrations spread across 17 distinct carriers poses a greater challenge for the County Engineer's Office than if a single carrier were responsible.

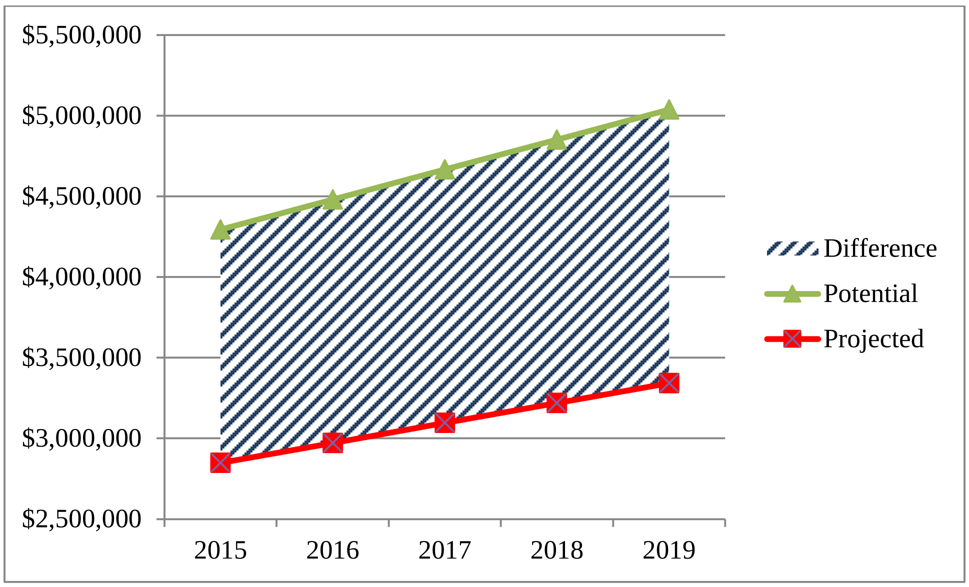
A complicating factor is the distribution of carriers among municipal taxing districts. Franklin County is essentially the inverse of Clinton County in that 99 percent of all its out-of-state registrations are in municipal taxing districts. This means a smaller potential revenue impact to the county because a large chunk of those revenues will go to the municipalities in the county. This study has focused on the impact to the counties, but other Ohio taxing districts are affected by jurisdiction shopping, particularly municipalities. The 2015 revenue impact for Franklin County municipalities is $1.03 million. The overall township impact is only $1,335 – an amount that gets divided between each of the townships in Franklin County.

Figure 15 reports the Ohio IRP revenue projections for Franklin County from 2015 through 2019 as well as the potential revenue the county would collect if its carriers with out-of-state

[27] The Ohio BMV's official IRP truck vehicle registration tally was 9,715 in 2013.

registrations repatriated them to Ohio. The projected revenue based on the time-trend forecast increases steadily from $2.85 million in 2015 to $3.3 million in 2019. All of the forecasting models project IRP revenue increases for Franklin County, with the time-trend model being the most conservative. As noted previously, the out-of-state revenue impact is calculated to be $1.45 million and is projected to increase to $1.70 million by 2019. The five-year impact for out-of-state registrations on Franklin County IRP revenues is $7.86 million, and would be the difference between $15.48 million projected and $23.33 million potential revenue over that time.

Figure 15. Franklin County IRP Impact Forecast, 2015-2019



Chapter 5. Conclusion

The primary objective of this study was to determine the degree to which jurisdiction shopping impacts the distribution IRP registration fees to Ohio counties and taxing districts. Jurisdiction shopping occurs when a carrier based in one state registers vehicles in another state, usually to avoid related taxes, fees, or for greater convenience if another state has a more streamlined registration process. Some county engineers in Ohio have noticed large fleets of trucks operating in their area but registered in another state. As a result, our analysis focused on the county level because most of the IRP revenue goes to counties, and not to townships or municipalities.

Ohio's motor vehicle license taxes are distributed based on a complex distribution formula. It contains distribution allocations for state use, administrative costs, and distributable revenue and interest for counties and taxing districts. Chapter 1 outlined this mechanism in detail. Essentially there are two pools of funds: in-state IRP registrations and out-of-state IRP registrations. Because IRP registrations are prorated according to the mileage reported in each state, only a percentage of the registration fees stay in Ohio. To alleviate the negative impacts of this arrangement, Ohio supplements the distributable revenue with out-of-state registration revenue so that local taxing districts receive the same amount of revenue that they would have from an intrastate truck plate. At the end of each year, remaining revenue is apportioned through the annual excess compensation, which allocates revenue based on each county's share of all motor vehicle license tax revenue, not just license revenue from interstate commercial trucks.

Registration location is what anchors the funding to the taxing district. Carriers can legally register their vehicles in another state, but when they do, the money once intended for the county, city, or town they are located in flows into the out-of-state revenue pool. The money is used for loss compensation of the remaining in-state registrations or is distributed in the annual excess compensation distribution, which uses different criteria for disbursement. The state receives the same amount of IRP fees from these carriers, but it is apportioned much differently compared to when those carriers register in the state. As a result, counties where this practice is most common are losing a substantial amount of revenue.

Registration trends from 2009 to 2013 provide an interesting context in which to analyze jurisdiction shopping by Ohio-based carriers. Even using vehicle data to track IRP registrations over time makes it difficult to identify vehicles that were once registered in Ohio but are now registered in another IRP state. A better approach – and the one adopted during analysis – is to identify Ohio-based carriers with vehicles plated elsewhere. This method revealed 20,601 vehicles registered to carriers whose primary address listed in Ohio. The vast majority of these trucks belong to carriers with medium-to-large fleets. We cannot know for certain how many of these vehicles are domiciled or garaged in the state. However, following the basic ideal that every truck belonging to an Ohio-based carrier is apportionable and should be registered in-state, it is possible to calculate the revenue impacts of these registrations.

In 2015, the statewide revenue effects due to jurisdiction shopping were estimated at $10.13 million for counties, $684,997 for townships, and $2.89 million for municipalities. These estimates assumed the additional revenue that would accrue to each Ohio taxing district if every IRP truck belonging to an Ohio carrier bore an in-state registration. The direct, county-specific impacts (excluding townships, municipalities or indirect county impacts) vary greatly from county to county. In 14 counties, there was no impact; another 38 counties saw an impact of less than $10,000. Seventeen counties had revenue displacement between $10,000 and $49,999. The next nine counties faced more substantial loses: between $50,000 and $99,999. The study estimated that four counties would lose between $100,000 and $199,999 in registration fees. Three other counties lost between $200,000 and $600,000. The three biggest losers were Clinton County ($3.13 million), Franklin County ($1.45 million), and Hamilton County ($822,916). Thus, the most significant impacts were concentrated in 19 Ohio counties. We did not produce estimates for each township and municipality.

Case studies and surveys of Ohio County Engineers provided additional information about the dynamics of this issue. In surveys, most county engineers supported reallocating funds to make up for these impacts, although a few opposed this and others requested more information on the issue. Another potential source of IRP truck impacts is for large, multi-state carriers with large distribution terminals around the state whose trucks are also garaged or domiciled in Ohio. There was no way to include reliable counts of vehicles, unless specific numbers could be obtained from county engineers. Another issue to consider is economic development. Carriers sometimes make requests for improvements to access roadways and other infrastructure enhancements that are expensive for local authorities to build and maintain. This causes an equity issue with the distribution of IRP funds; there is an economic development component as well. The inability to quantify the impacts of lost fees due to multi-state carriers and externalities such as economic development costs means these estimates may understate the total IRP revenue impacts.

Ultimately, if out-of-state IRP registrations belonging to Ohio carriers were to be repatriated to the state, there would be a back-end impact that would reduce the amount of funding available for the excess annual compensation process. Without knowing which carriers could be recruited to return those registrations, the actual direct and indirect impacts could be significantly different from the initial estimates. Any assumptions used as a proxy are potentially tenuous and problematic. Second, these calculations do not speak to any potential impact on state revenues. The study's task was to estimate the impact of IRP jurisdiction shopping on Ohio counties and local taxing districts – not estimate state-level impacts. There exists the possibility that the state is also losing significant revenue to its Highway Safety Fund because of the difference in how in-state and out-of-state registration fees are assessed. Nevertheless, these issues can be addressed in the long-term solutions that flow out of Phase II of this study, if approved.

5.1 Recommendations for Implementation of Research Findings

If Phase II proceeds, Ohio officials and the research team will need to consult about the potential marketing strategies and tools, as well as long-term state strategies that are available to improve IRP distributions. The technical advisory committee will need to decide: (1) whether to pursue a solution that solely addresses the distribution equity or one that tackles the economic development issue; (2) whether the excess annual compensation funds should be used to remediate problems with equity or if another source of funding is preferable; (3) if a reporting mechanism for domiciled vehicles should be established so that it is easier for Ohio County Engineers to address jurisdiction shopping; (4) on policy solutions that best addresses the issue; and (5) on the general direction for the types of marketing strategies and tools most useful to engineers. The research team has developed an IRP fleet impact estimator, which Ohio County Engineers can use to estimate the impact of a fleet in their county that will be shifting its registrations to another state. The calculator lets users select the county from a drop-down menu before inputting fleet information. The tool estimates the impact on the county, township, and municipalities where the carrier is located. The tool uses the same methodology as the impact assessment in Chapter 3.

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Appendices

Appendix	Description
A	IRP County Revenue, 2009-2014
B	IRP Statewide Taxing Distributions, 2009-2014
C	IRP Annual Excess Compensation, 2009-2014
D	IRP Out-of-State Registration Impact by County, 2015
E	IRP County Revenue Forecast, 2015-2019
F	IRP Case Studies Data for Clinton, Mahoning, Butler, and Franklin County
G	ODPS Impact Estimate for Clinton County
H	ODPS Impact Estimate for Mahoning County
I	State IRP Forecast Output
* Appendices A-H are in an accompanying Excel document.	

Appendix I. State IRP Forecast Output

County Time Trend Estimates

```
. reg adams year

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  139.58
  Model |   499968628     1   499968628      Prob > F =  0.0003
    Residual |  14327739.3     4  3581934.82      R-squared     =  0.9721
-------------+------------------------------      Adj R-squared =  0.9652
  Total |   514296367     5   102859273      Root MSE =  1892.6

------------------------------------------------------------------------------
  adams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5345.057   452.4179    11.81   0.000     4088.944    6601.171
  _cons |   114151.5   1761.915    64.79   0.000     109259.6    119043.3
------------------------------------------------------------------------------

. reg allen year

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   12.84
  Model |  2.5292e+09     1  2.5292e+09      Prob > F =  0.0231
    Residual |   787755973     4   196938993      R-squared     =  0.7625
-------------+------------------------------      Adj R-squared =  0.7031
  Total |  3.3170e+09     5   663400889      Root MSE =   14033

------------------------------------------------------------------------------
  allen | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     -12022   3354.647    -3.58   0.023    -21335.99   -2708.007
  _cons |   410265.3   13064.47    31.40   0.000     373992.5    446538.1
------------------------------------------------------------------------------

. reg ashland year

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.97
  Model |   591882690     1   591882690      Prob > F =  0.0710
    Residual |   396585472     4    99146368      R-squared     =  0.5988
-------------+------------------------------      Adj R-squared =  0.4985
  Total |   988468162     5   197693632      Root MSE =  9957.2

------------------------------------------------------------------------------
     ashland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5815.657   2380.232     2.44   0.071    -792.9277    12424.24
  _cons |   302587.2   9269.674    32.64   0.000     276850.5    328323.9
------------------------------------------------------------------------------

. reg ashtabula year

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    1.57
  Model |   477468382     1   477468382      Prob > F =  0.2784
    Residual |  1.2161e+09     4   304019918      R-squared     =  0.2819
-------------+------------------------------      Adj R-squared =  0.1024
  Total |  1.6935e+09     5   338709611      Root MSE =   17436

------------------------------------------------------------------------------
```

```
   ashtabula | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+--------------------------------------------------------------
   year |     5223.4   4168.041     1.25   0.278    -6348.937    16795.74
  _cons |   251837.3   16232.19    15.51   0.000     206769.5 296905
------------------------------------------------------------------------------

. reg athens year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    1.23
  Model |  5442176.06     1  5442176.06      Prob > F =  0.3298
    Residual |  17718835.9     4  4429708.99      R-squared     =  0.2350
-------------+------------------------------      Adj R-squared =  0.0437
  Total |    23161012     5   4632202.4      Root MSE =  2104.7

------------------------------------------------------------------------------
 athens | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+--------------------------------------------------------------
   year |   557.6571   503.1165     1.11   0.330    -839.2182    1954.533
  _cons |    97534.2   1959.357    49.78   0.000     92094.15    102974.2
------------------------------------------------------------------------------

. reg auglaize year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    3.59
  Model |   232235786     1   232235786      Prob > F =  0.1310
    Residual |   258673961     4  64668490.3      R-squared     =  0.4731
-------------+------------------------------      Adj R-squared =  0.3413
  Total |   490909747     5  98181949.4      Root MSE =  8041.7

------------------------------------------------------------------------------
    auglaize | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+--------------------------------------------------------------
   year |   3642.886   1922.327     1.90   0.131    -1694.351    8980.122
  _cons |   230533.7   7486.389    30.79   0.000     209748.2    251319.3
------------------------------------------------------------------------------

. reg belmont year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   11.26
  Model |  4.6902e+09     1  4.6902e+09      Prob > F =  0.0284
    Residual |  1.6667e+09     4   416679953      R-squared     =  0.7378
-------------+------------------------------      Adj R-squared =  0.6723
  Total |  6.3569e+09     5  1.2714e+09      Root MSE =   20413

------------------------------------------------------------------------------
     belmont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+--------------------------------------------------------------
   year |   16370.97   4879.578     3.35   0.028     2823.091    29918.85
  _cons |   303059.9   19003.23    15.95   0.000     250298.5    355821.3
------------------------------------------------------------------------------

. reg brown year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    4.08
  Model |   557796571     1   557796571      Prob > F =  0.1136
    Residual |   547101722     4   136775430      R-squared     =  0.5048
-------------+------------------------------      Adj R-squared =  0.3810
  Total |  1.1049e+09     5   220979659      Root MSE =   11695
```

```
------------------------------------------------------------------------------
  brown | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5645.714   2795.664     2.02   0.114    -2116.294    13407.72
  _cons |   150652.7   10887.55    13.84   0.000  120424    180881.3
------------------------------------------------------------------------------

. reg butler year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.48
  Model |  7.4195e+09     1  7.4195e+09      Prob > F =  0.5246
    Residual |  6.1229e+10     4  1.5307e+10      R-squared     =  0.1081
-------------+------------------------------      Adj R-squared = -0.1149
  Total |  6.8648e+10     5  1.3730e+10      Root MSE =  1.2e+05

------------------------------------------------------------------------------
 butler | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   20590.63   29575.24     0.70   0.525    -61523.41    102704.7
  _cons |   908417.1     115179     7.89   0.001     588628.9     1228205
------------------------------------------------------------------------------

. reg carroll year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.66
  Model |  55345586.4     1  55345586.4      Prob > F =  0.0761
    Residual |  39135790.4     4   9783947.6      R-squared     =  0.5858
-------------+------------------------------      Adj R-squared =  0.4822
  Total |  94481376.8     5  18896275.4      Root MSE =  3127.9

------------------------------------------------------------------------------
     carroll | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   1778.371   747.7183     2.38   0.076    -297.6275     3854.37
  _cons |   159470.5   2911.945    54.76   0.000     151385.7    167555.4
------------------------------------------------------------------------------

. reg champaign year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   15.74
  Model |   247686318     1   247686318      Prob > F =  0.0166
    Residual |  62956615.8     4  15739153.9      R-squared     =  0.7973
-------------+------------------------------      Adj R-squared =  0.7467
  Total |   310642934     5  62128586.8      Root MSE =  3967.3

------------------------------------------------------------------------------
   champaign | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3762.114   948.3566     3.97   0.017     1129.054    6395.174
  _cons |   116858.6   3693.318    31.64   0.000     106604.3    127112.9
------------------------------------------------------------------------------

. reg clark year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   13.00
  Model |  2.2994e+10     1  2.2994e+10      Prob > F =  0.0227
    Residual |  7.0776e+09     4  1.7694e+09      R-squared     =  0.7646
-------------+------------------------------      Adj R-squared =  0.7058
  Total |  3.0072e+10     5  6.0144e+09      Root MSE =   42064
```

```
------------------------------------------------------------------------------
  clark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -36248.74   10055.26    -3.60   0.023    -64166.63   -8330.857
  _cons |   409028.3   39159.62    10.45   0.000     300303.7    517752.8
------------------------------------------------------------------------------

. reg clermont year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   14.21
  Model |  3.9958e+09     1  3.9958e+09      Prob > F =  0.0196
    Residual |  1.1251e+09     4   281273172      R-squared     =  0.7803
-------------+------------------------------      Adj R-squared =  0.7254
  Total |  5.1209e+09     5  1.0242e+09      Root MSE =   16771

------------------------------------------------------------------------------
    clermont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   15110.66   4009.084     3.77   0.020     3979.656    26241.66
  _cons |   375817.5   15613.14    24.07   0.000     332468.5    419166.6
------------------------------------------------------------------------------

. reg clinton year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.39
  Model |  84229854.2     1  84229854.2      Prob > F =  0.1973
    Residual |   141213529     4  35303382.3      R-squared     =  0.3736
-------------+------------------------------      Adj R-squared =  0.2170
  Total |   225443383     5  45088676.7      Root MSE =  5941.7

------------------------------------------------------------------------------
     clinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2193.886    1420.33     1.54   0.197    -1749.581    6137.353
  _cons |   148097.7   5531.389    26.77   0.000     132740.1    163455.3
------------------------------------------------------------------------------

. reg columbiana year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.03
  Model |  2.0986e+09     1  2.0986e+09      Prob > F =  0.2272
    Residual |  4.1323e+09     4  1.0331e+09      R-squared     =  0.3368
-------------+------------------------------      Adj R-squared =  0.1710
  Total |  6.2308e+09     5  1.2462e+09      Root MSE =   32141

------------------------------------------------------------------------------
  columbiana | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   10950.74   7683.248     1.43   0.227    -10381.37    32282.86
  _cons |   577264.1   29921.95    19.29   0.000     494187.4    660340.7
------------------------------------------------------------------------------

. reg coshocton year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.00
  Model |  33748.1286     1  33748.1286      Prob > F =  0.9846
    Residual |   318397821     4  79599455.3      R-squared     =  0.0001
-------------+------------------------------      Adj R-squared = -0.2499
```

```
  Total |   318431570     5  63686313.9      Root MSE =  8921.9

------------------------------------------------------------------------------
   coshocton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -43.91429   2132.731    -0.02   0.985    -5965.324    5877.495
  _cons |   166602.2   8305.793    20.06   0.000     143541.6    189662.8
------------------------------------------------------------------------------

. reg crawford year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    6.41
  Model |  50517216.5     1  50517216.5      Prob > F =  0.0645
    Residual |  31500461.5     4  7875115.37      R-squared     =  0.6159
-------------+------------------------------      Adj R-squared =  0.5199
  Total |    82017678     5  16403535.6      Root MSE =  2806.3

------------------------------------------------------------------------------
    crawford | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   1699.029   670.8253     2.53   0.064    -163.4811    3561.538
  _cons |    96678.4   2612.489    37.01   0.000     89424.97    103931.8
------------------------------------------------------------------------------

. reg cuyahoga year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  130.87
  Model |  1.8159e+11     1  1.8159e+11      Prob > F =  0.0003
    Residual |  5.5499e+09     4  1.3875e+09      R-squared     =  0.9703
-------------+------------------------------      Adj R-squared =  0.9629
  Total |  1.8714e+11     5  3.7427e+10      Root MSE =   37249

------------------------------------------------------------------------------
    cuyahoga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   101864.3   8904.199    11.44   0.000     77142.24    126586.3
  _cons |    1083952   34676.87    31.26   0.000     987673.5     1180230
------------------------------------------------------------------------------

. reg darke year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   53.10
  Model |  3.9499e+09     1  3.9499e+09      Prob > F =  0.0019
    Residual |   297521781     4  74380445.3      R-squared     =  0.9300
-------------+------------------------------      Adj R-squared =  0.9124
  Total |  4.2475e+09     5   849493320      Root MSE =  8624.4

------------------------------------------------------------------------------
  darke | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   15023.69   2061.628     7.29   0.002     9299.688    20747.68
  _cons |   493104.9   8028.889    61.42   0.000     470813.2    515396.7
------------------------------------------------------------------------------

. reg defiance year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   48.29
  Model |  2.6429e+10     1  2.6429e+10      Prob > F =  0.0023
    Residual |  2.1890e+09     4   547253537      R-squared     =  0.9235
```

```
-------------+------------------------------          Adj R-squared =  0.9044
  Total |  2.8618e+10     5  5.7236e+09      Root MSE =   23393

------------------------------------------------------------------------------
    defiance | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   38861.77   5592.104     6.95   0.002 23335.6    54387.94
  _cons |   110381.8   21778.12     5.07   0.007     49916.05    170847.5
------------------------------------------------------------------------------

. reg delaware year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  1,     4) =   16.56
  Model |   141591388     1   141591388      Prob > F =  0.0152
    Residual |  34210465.7     4  8552616.42      R-squared     =  0.8054
-------------+------------------------------          Adj R-squared =  0.7568
  Total |   175801853     5  35160370.7      Root MSE =  2924.5

------------------------------------------------------------------------------
    delaware | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2844.457   699.0858     4.07   0.015     903.4838     4785.43
  _cons |   153700.1   2722.548    56.45   0.000     146141.1    161259.1
------------------------------------------------------------------------------

. reg erie year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  1,     4) =   55.00
  Model |  1.0666e+09     1  1.0666e+09      Prob > F =  0.0018
    Residual |  77575811.1     4  19393952.8      R-squared     =  0.9322
-------------+------------------------------          Adj R-squared =  0.9153
  Total |  1.1442e+09     5   228843779      Root MSE =  4403.9

------------------------------------------------------------------------------
   erie | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7807.114   1052.723     7.42   0.002     4884.286    10729.94
  _cons |   130542.3   4099.767    31.84   0.000     119159.5 141925
------------------------------------------------------------------------------

. reg fairfield year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  1,     4) =   25.33
  Model |   528484375     1   528484375      Prob > F =  0.0073
    Residual |  83447016.4     4  20861754.1      R-squared     =  0.8636
-------------+------------------------------          Adj R-squared =  0.8295
  Total |   611931391     5   122386278      Root MSE =  4567.5

------------------------------------------------------------------------------
   fairfield | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5495.371   1091.833     5.03   0.007     2463.956    8526.787
  _cons |   170652.5    4252.08    40.13   0.000     158846.9    182458.2
------------------------------------------------------------------------------

. reg fayette year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  1,     4) =    5.92
  Model |  83433172.6     1  83433172.6      Prob > F =  0.0718
```

```
    Residual |  56416333.4     4  14104083.3      R-squared     =  0.5966
-------------+------------------------------      Adj R-squared =  0.4957
  Total |   139849506     5  27969901.2      Root MSE =  3755.5

------------------------------------------------------------------------------
     fayette | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2183.486   897.7459     2.43   0.072    -309.0564    4676.028
  _cons |   134243.8   3496.218    38.40   0.000     124536.7    143950.9
------------------------------------------------------------------------------

. reg franklin year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   14.96
  Model |  2.6682e+11     1  2.6682e+11      Prob > F =  0.0180
    Residual |  7.1343e+10     4  1.7836e+10      R-squared     =  0.7890
-------------+------------------------------      Adj R-squared =  0.7363
  Total |  3.3816e+11     5  6.7633e+10      Root MSE =  1.3e+05

------------------------------------------------------------------------------
    franklin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   123478.6   31924.58     3.87   0.018     34841.74    212115.5
  _cons |    1984039   124328.4    15.96   0.000 1638848     2329230
------------------------------------------------------------------------------

. reg fulton year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.59
  Model |   776469440     1   776469440      Prob > F =  0.1829
    Residual |  1.1997e+09     4   299930637      R-squared     =  0.3929
-------------+------------------------------      Adj R-squared =  0.2411
  Total |  1.9762e+09     5   395238397      Root MSE =   17319

------------------------------------------------------------------------------
 fulton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6661.057   4139.915     1.61   0.183    -4833.189     18155.3
  _cons |   314469.5   16122.65    19.50   0.000     269705.8    359233.1
------------------------------------------------------------------------------

. reg gallia year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.38
  Model |  69944011.2     1  69944011.2      Prob > F =  0.1979
    Residual |   117655449     4  29413862.2      R-squared     =  0.3728
-------------+------------------------------      Adj R-squared =  0.2160
  Total |   187599460     5    37519892      Root MSE =  5423.5

------------------------------------------------------------------------------
 gallia | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     1999.2   1296.454     1.54   0.198    -1600.332    5598.732
  _cons |   201691.8   5048.962    39.95   0.000     187673.6 215710
------------------------------------------------------------------------------

. reg geauga year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   15.79
```

```
  Model |  4.3065e+10     1  4.3065e+10      Prob > F =  0.0165
    Residual |  1.0907e+10     4  2.7267e+09      R-squared     =  0.7979
-------------+------------------------------      Adj R-squared =  0.7474
  Total |  5.3971e+10     5  1.0794e+10      Root MSE =   52218

------------------------------------------------------------------------------
 geauga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   -49606.8   12482.49    -3.97   0.016    -84263.74   -14949.86
  _cons |   482052.8    48612.3     9.92   0.001     347083.4    617022.2
------------------------------------------------------------------------------

. reg greene year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   11.23
  Model |  5.1971e+09     1  5.1971e+09      Prob > F =  0.0285
    Residual |  1.8514e+09     4   462854289      R-squared     =  0.7373
-------------+------------------------------      Adj R-squared =  0.6717
  Total |  7.0485e+09     5  1.4097e+09      Root MSE =   21514

------------------------------------------------------------------------------
 greene | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     -17233   5142.841    -3.35   0.029    -31511.82   -2954.183
  _cons |     256533   20028.49    12.81   0.000  200925 312141
------------------------------------------------------------------------------

. reg guernsey year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   37.45
  Model |  1.1246e+09     1  1.1246e+09      Prob > F =  0.0036
    Residual |   120131657     4  30032914.3      R-squared     =  0.9035
-------------+------------------------------      Adj R-squared =  0.8794
  Total |  1.2448e+09     5   248950483      Root MSE =  5480.2

------------------------------------------------------------------------------
    guernsey | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   8016.486   1310.025     6.12   0.004     4379.272     11653.7
  _cons |   135081.8   5101.816    26.48   0.000     120916.9    149246.7
------------------------------------------------------------------------------

. reg hamilton year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   44.69
  Model |  1.2963e+11     1  1.2963e+11      Prob > F =  0.0026
    Residual |  1.1603e+10     4  2.9007e+09      R-squared     =  0.9178
-------------+------------------------------      Adj R-squared =  0.8973
  Total |  1.4123e+11     5  2.8246e+10      Root MSE =   53858

------------------------------------------------------------------------------
    hamilton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   86065.17   12874.49     6.68   0.003     50319.86    121810.5
  _cons |    1540167   50138.93    30.72   0.000 1400959     1679375
------------------------------------------------------------------------------

. reg hancock year

 Source |  SS  df  MS    Number of obs =  6
```

```
-------------+------------------------------           F(  1,     4) =    1.55
  Model |   341294977     1   341294977       Prob > F =  0.2816
    Residual |   882739141     4   220684785       R-squared     =  0.2788
-------------+------------------------------           Adj R-squared =  0.0985
  Total |  1.2240e+09     5   244806823       Root MSE =   14855

------------------------------------------------------------------------------
     hancock | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   4416.171   3551.135     1.24   0.282     -5443.36     14275.7
  _cons |   313111.7   13829.68    22.64   0.000     274714.4    351509.1
------------------------------------------------------------------------------

. reg hardin year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  1,     4) =  125.16
  Model |   486262929     1   486262929       Prob > F =  0.0004
    Residual |  15541038.6     4  3885259.64       R-squared     =  0.9690
-------------+------------------------------           Adj R-squared =  0.9613
  Total |   501803968     5   100360794       Root MSE =  1971.1

------------------------------------------------------------------------------
 hardin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5271.286   471.1845    11.19   0.000     3963.068    6579.504
  _cons |     153509  1835    83.66   0.000     148414.2    158603.8
------------------------------------------------------------------------------

. reg harrison year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  1,     4) =   22.70
  Model |   279644113     1   279644113       Prob > F =  0.0089
    Residual |  49271988.3     4  12317997.1       R-squared     =  0.8502
-------------+------------------------------           Adj R-squared =  0.8127
  Total |   328916102     5  65783220.3       Root MSE =  3509.7

------------------------------------------------------------------------------
    harrison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3997.457   838.9789     4.76   0.009     1668.078    6326.836
  _cons |    94103.4   3267.353    28.80   0.000     85031.77 103175
------------------------------------------------------------------------------

. reg henry year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  1,     4) =    1.90
  Model |   202136833     1   202136833       Prob > F =  0.2405
    Residual |   426317904     4   106579476       R-squared     =  0.3216
-------------+------------------------------           Adj R-squared =  0.1521
  Total |   628454737     5   125690947       Root MSE =   10324

------------------------------------------------------------------------------
  henry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3398.629   2467.844     1.38   0.241    -3453.206    10250.46
  _cons |   303845.1   9610.873    31.61   0.000     277161.1    330529.2
------------------------------------------------------------------------------

. reg highland year
```

```
 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  155.84
  Model |   490526160     1   490526160      Prob > F =  0.0002
    Residual |  12590137.9     4  3147534.49      R-squared     =  0.9750
-------------+------------------------------      Adj R-squared =  0.9687
  Total |   503116298     5   100623260      Root MSE =  1774.1

------------------------------------------------------------------------------
    highland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5294.343    424.098    12.48   0.000     4116.858    6471.828
  _cons |   137619.8   1651.624    83.32   0.000     133034.2    142205.4
------------------------------------------------------------------------------

. reg hocking year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    3.97
  Model |  91282344.2     1  91282344.2      Prob > F =  0.1172
    Residual |  92040949.1     4  23010237.3      R-squared     =  0.4979
-------------+------------------------------      Adj R-squared =  0.3724
  Total |   183323293     5  36664658.7      Root MSE =  4796.9

------------------------------------------------------------------------------
     hocking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2283.886   1146.678     1.99   0.117    -899.8031    5467.575
  _cons |   90746.07    4465.67    20.32   0.000     78347.38    103144.8
------------------------------------------------------------------------------

. reg holmes year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   63.20
  Model |  4.9014e+09     1  4.9014e+09      Prob > F =  0.0014
    Residual |   310204502     4  77551125.4      R-squared     =  0.9405
-------------+------------------------------      Adj R-squared =  0.9256
  Total |  5.2116e+09     5  1.0423e+09      Root MSE =  8806.3

------------------------------------------------------------------------------
 holmes | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   16735.57   2105.111     7.95   0.001     10890.85     22580.3
  _cons |   256419.3    8198.23    31.28   0.000     233657.4    279181.3
------------------------------------------------------------------------------

. reg huron year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    1.38
  Model |   103622689     1   103622689      Prob > F =  0.3046
    Residual |   299413302     4  74853325.6      R-squared     =  0.2571
-------------+------------------------------      Adj R-squared =  0.0714
  Total |   403035991     5  80607198.3      Root MSE =  8651.8

------------------------------------------------------------------------------
  huron | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2433.371   2068.171     1.18   0.305    -3308.793    8175.536
  _cons |   283729.5    8054.37    35.23   0.000  261367    306092.1
------------------------------------------------------------------------------

. reg jackson year
```

```
 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.27
  Model |   130991472     1   130991472      Prob > F =  0.2060
    Residual |   230406593     4  57601648.2      R-squared     =  0.3625
-------------+------------------------------      Adj R-squared =  0.2031
  Total |   361398065     5    72279613      Root MSE =  7589.6

------------------------------------------------------------------------------
     jackson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2735.914   1814.255     1.51   0.206    -2301.266    7773.095
  _cons |   159807.1    7065.51    22.62   0.000     140190.1    179424.1
------------------------------------------------------------------------------

. reg jefferson year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   21.25
  Model |  5.6134e+09     1  5.6134e+09      Prob > F =  0.0100
    Residual |  1.0567e+09     4   264179493      R-squared     =  0.8416
-------------+------------------------------      Adj R-squared =  0.8020
  Total |  6.6701e+09     5  1.3340e+09      Root MSE =   16254

------------------------------------------------------------------------------
   jefferson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   17909.91   3885.353     4.61   0.010     7122.444    28697.38
  _cons |   145082.5   15131.28     9.59   0.001     103071.3    187093.6
------------------------------------------------------------------------------

. reg knox year

 Source |  SS   df  MS    Number of obs =  6
-------------+-----------------------------      F(  1,     4) =  588.72
  Model |   758819183     1   758819183      Prob > F =  0.0000
    Residual |  5155693.37     4  1288923.34      R-squared     =  0.9933
-------------+------------------------------      Adj R-squared =  0.9916
  Total |   763974876     5   152794975      Root MSE =  1135.3

------------------------------------------------------------------------------
   knox | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6584.914   271.3904    24.26   0.000     5831.414    7338.415
  _cons |   182834.8   1056.914   172.99   0.000     179900.3    185769.3
------------------------------------------------------------------------------

. reg lake year

 Source |  SS   df  MS    Number of obs =  6
-------------+-----------------------------      F(  1,     4) =    0.20
  Model |  1251833.16     1  1251833.16      Prob > F =  0.6768
    Residual |  24848997.7     4  6212249.42      R-squared     =  0.0480
-------------+------------------------------      Adj R-squared = -0.1900
  Total |  26100830.8     5  5220166.17      Root MSE =  2492.4

------------------------------------------------------------------------------
   lake | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -267.4571   595.8067    -0.45   0.677    -1921.682    1386.768
  _cons |   148024.9   2320.334    63.79   0.000     141582.7    154467.2
------------------------------------------------------------------------------
```

```
. reg lawrence year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.77
  Model |   484319770     1   484319770      Prob > F =  0.0741
    Residual |   335530336     4  83882583.9      R-squared     =  0.5907
-------------+------------------------------      Adj R-squared =  0.4884
  Total |   819850105     5   163970021      Root MSE =  9158.7

------------------------------------------------------------------------------
    lawrence | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -5260.743   2189.358    -2.40   0.074    -11339.38    817.8908
  _cons |   243804.9   8526.326    28.59   0.000     220132.1    267477.8
------------------------------------------------------------------------------

. reg licking year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    6.98
  Model |   248876573     1   248876573      Prob > F =  0.0574
    Residual |   142520894     4  35630223.6      R-squared     =  0.6359
-------------+------------------------------      Adj R-squared =  0.5448
  Total |   391397467     5  78279493.5      Root MSE =  5969.1

------------------------------------------------------------------------------
     licking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3771.143   1426.889     2.64   0.057    -190.5367    7732.822
  _cons |   304396.7   5556.935    54.78   0.000     288968.1    319825.2
------------------------------------------------------------------------------

. reg logan year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    7.94
  Model |  2.1357e+09     1  2.1357e+09      Prob > F =  0.0479
    Residual |  1.0760e+09     4   268996963      R-squared     =  0.6650
-------------+------------------------------      Adj R-squared =  0.5812
  Total |  3.2117e+09     5   642341977      Root MSE =   16401

------------------------------------------------------------------------------
  logan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   11047.23   3920.619     2.82   0.048     161.8445    21932.61
  _cons |   106140.2   15268.62     6.95   0.002     63747.72    148532.7
------------------------------------------------------------------------------

. reg lorain year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  100.16
  Model |  3.5302e+09     1  3.5302e+09      Prob > F =  0.0006
    Residual |   140988387     4  35247096.8      R-squared     =  0.9616
-------------+------------------------------      Adj R-squared =  0.9520
  Total |  3.6712e+09     5   734241590      Root MSE =  5936.9

------------------------------------------------------------------------------
 lorain | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   14203.06   1419.197    10.01   0.001     10262.73    18143.38
  _cons |   240165.1   5526.978    43.45   0.000     224819.8    255510.5
------------------------------------------------------------------------------
```

```
. reg lucas year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   31.79
  Model |  8.2714e+09     1  8.2714e+09      Prob > F =  0.0049
    Residual |  1.0408e+09     4   260204031      R-squared     =  0.8882
-------------+------------------------------      Adj R-squared =  0.8603
  Total |  9.3122e+09     5  1.8624e+09      Root MSE =   16131

------------------------------------------------------------------------------
  lucas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   21740.57   3856.009     5.64   0.005     11034.58    32446.57
  _cons |   734220.7 15017    48.89   0.000     692526.8    775914.5
------------------------------------------------------------------------------

. reg madison year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   62.28
  Model |  2.8075e+09     1  2.8075e+09      Prob > F =  0.0014
    Residual |   180305093     4  45076273.3      R-squared     =  0.9397
-------------+------------------------------      Adj R-squared =  0.9246
  Total |  2.9878e+09     5   597557465      Root MSE =  6713.9

------------------------------------------------------------------------------
     madison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year | 12666   1604.926     7.89   0.001     8210.011    17121.99
  _cons |   174853.3   6250.288    27.98   0.000     157499.8    192206.9
------------------------------------------------------------------------------

. reg mahoning year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   11.95
  Model |  3.4983e+11     1  3.4983e+11      Prob > F =  0.0259
    Residual |  1.1712e+11     4  2.9279e+10      R-squared     =  0.7492
-------------+------------------------------      Adj R-squared =  0.6865
  Total |  4.6694e+11     5  9.3389e+10      Root MSE =  1.7e+05

------------------------------------------------------------------------------
    mahoning | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   141386.6    40903.2     3.46   0.026     27821.11    254952.1
  _cons |    1063837   159295.1     6.68   0.003     621563.3     1506111
------------------------------------------------------------------------------

. reg marion year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   37.89
  Model |   475709719     1   475709719      Prob > F =  0.0035
    Residual |  50225856.4     4  12556464.1      R-squared     =  0.9045
-------------+------------------------------      Adj R-squared =  0.8806
  Total |   525935575     5   105187115      Root MSE =  3543.5

------------------------------------------------------------------------------
 marion | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5213.771   847.0609     6.16   0.004     2861.953     7565.59
  _cons |   129320.5   3298.828    39.20   0.000     120161.5    138479.5
```

```
------------------------------------------------------------------------------

. reg medina year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  122.13
  Model |  1.0140e+10     1  1.0140e+10      Prob > F =  0.0004
    Residual |   332101909     4  83025477.3      R-squared     =  0.9683
-------------+------------------------------      Adj R-squared =  0.9604
  Total |  1.0472e+10     5  2.0944e+09      Root MSE =  9111.8

------------------------------------------------------------------------------
 medina | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   24071.37   2178.144    11.05   0.000     18023.87    30118.87
  _cons |   330884.2   8482.654    39.01   0.000     307332.6    354435.8
------------------------------------------------------------------------------

. reg meigs year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   20.47
  Model |   146555054     1   146555054      Prob > F =  0.0106
    Residual |  28644231.1     4  7161057.78      R-squared     =  0.8365
-------------+------------------------------      Adj R-squared =  0.7956
  Total |   175199285     5  35039857.1      Root MSE =    2676

------------------------------------------------------------------------------
  meigs | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2893.886     639.69     4.52   0.011     1117.822     4669.95
  _cons |   99286.73   2491.235    39.85   0.000     92369.96    106203.5
------------------------------------------------------------------------------

. reg mercer year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   31.35
  Model |  2.5076e+10     1  2.5076e+10      Prob > F =  0.0050
    Residual |  3.1991e+09     4   799773977      R-squared     =  0.8869
-------------+------------------------------      Adj R-squared =  0.8586
  Total |  2.8275e+10     5  5.6549e+09      Root MSE =   28280

------------------------------------------------------------------------------
 mercer | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   37853.49   6760.279     5.60   0.005     19083.94    56623.03
  _cons |   422178.5    26327.5    16.04   0.000     349081.6    495275.3
------------------------------------------------------------------------------

. reg miami year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   24.71
  Model |  2.9111e+09     1  2.9111e+09      Prob > F =  0.0076
    Residual |   471311412     4   117827853      R-squared     =  0.8607
-------------+------------------------------      Adj R-squared =  0.8258
  Total |  3.3824e+09     5   676475423      Root MSE =   10855

------------------------------------------------------------------------------
  miami | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   12897.54   2594.806     4.97   0.008     5693.205    20101.88
```

```
 _cons |   274746.3   10105.32    27.19   0.000     246689.4    302803.1
------------------------------------------------------------------------------

. reg monroe year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   12.86
 Model |   278194919     1   278194919      Prob > F =  0.0230
   Residual |  86515880.7     4  21628970.2      R-squared     =  0.7628
-------------+------------------------------      Adj R-squared =  0.7035
 Total |   364710799     5  72942159.9      Root MSE =  4650.7

------------------------------------------------------------------------------
 monroe | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3987.086   1111.729     3.59   0.023     900.4314     7073.74
  _cons |   111691.5   4329.562    25.80   0.000     99670.74    123712.3
------------------------------------------------------------------------------

. reg montgomery year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   40.05
 Model |  3.0471e+10     1  3.0471e+10      Prob > F =  0.0032
   Residual |  3.0434e+09     4   760848338      R-squared     =  0.9092
-------------+------------------------------      Adj R-squared =  0.8865
 Total |  3.3515e+10     5  6.7030e+09      Root MSE =   27583

------------------------------------------------------------------------------
  montgomery | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   41727.97   6593.713     6.33   0.003     23420.89    60035.05
  _cons |   723583.9   25678.82    28.18   0.000     652288.1    794879.8
------------------------------------------------------------------------------

. reg morgan year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =  141.79
 Model |   203573598     1   203573598      Prob > F =  0.0003
   Residual |   5743089.1     4  1435772.28      R-squared     =  0.9726
-------------+------------------------------      Adj R-squared =  0.9657
 Total |   209316687     5  41863337.5      Root MSE =  1198.2

------------------------------------------------------------------------------
 morgan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3410.686   286.4335    11.91   0.000     2615.419    4205.953
  _cons |   77858.27   1115.498    69.80   0.000     74761.15    80955.39
------------------------------------------------------------------------------

. reg morrow year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    4.52
 Model |  84966409.2     1  84966409.2      Prob > F =  0.1007
   Residual |  75191685.7     4  18797921.4      R-squared     =  0.5305
-------------+------------------------------      Adj R-squared =  0.4131
 Total |   160158095     5    32031619      Root MSE =  4335.7

------------------------------------------------------------------------------
 morrow | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
   year |   2203.457    1036.42     2.13   0.101    -674.1068    5081.021
  _cons |   123672.7   4036.277    30.64   0.000     112466.2    134879.2
------------------------------------------------------------------------------

. reg muskingum year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.13
  Model |  1.1672e+09     1  1.1672e+09      Prob > F =  0.0862
    Residual |   909638126     4   227409531      R-squared     =  0.5620
-------------+------------------------------      Adj R-squared =  0.4525
  Total |  2.0768e+09     5   415357636      Root MSE =   15080

------------------------------------------------------------------------------
   muskingum | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   8166.657   3604.834     2.27   0.086    -1841.967    18175.28
  _cons |   244276.2   14038.81    17.40   0.000     205298.2    283254.2
------------------------------------------------------------------------------

. reg noble year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   54.72
  Model |   738861589     1   738861589      Prob > F =  0.0018
    Residual |  54005836.3     4  13501459.1      R-squared     =  0.9319
-------------+------------------------------      Adj R-squared =  0.9149
  Total |   792867426     5   158573485      Root MSE =  3674.4

------------------------------------------------------------------------------
  noble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6497.743   878.3575     7.40   0.002     4059.031    8936.454
  _cons |   103013.4   3420.711    30.11   0.000     93515.98    112510.8
------------------------------------------------------------------------------

. reg ottawa year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   13.92
  Model |   184450709     1   184450709      Prob > F =  0.0203
    Residual |  53011205.7     4  13252801.4      R-squared     =  0.7768
-------------+------------------------------      Adj R-squared =  0.7209
  Total |   237461915     5    47492383      Root MSE =  3640.4

------------------------------------------------------------------------------
 ottawa | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3246.543   870.2315     3.73   0.020     830.3927    5662.693
  _cons |   130430.9   3389.065    38.49   0.000     121021.4    139840.5
------------------------------------------------------------------------------

. reg paulding year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.95
  Model |   680197978     1   680197978      Prob > F =  0.0713
    Residual |   457463772     4   114365943      R-squared     =  0.5979
-------------+------------------------------      Adj R-squared =  0.4974
  Total |  1.1377e+09     5   227532350      Root MSE =   10694

------------------------------------------------------------------------------
    paulding | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
    year |   6234.457   2556.403     2.44   0.071    -863.2557    13332.17
   _cons |   122272.4    9955.76    12.28   0.000     94630.78 149914
------------------------------------------------------------------------------

. reg perry year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    9.88
  Model |  14361912.1     1  14361912.1      Prob > F =  0.0347
    Residual |   5815302.7     4  1453825.68      R-squared     =  0.7118
-------------+------------------------------      Adj R-squared =  0.6397
  Total |  20177214.8     5  4035442.97      Root MSE =  1205.7

------------------------------------------------------------------------------
  perry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    year |   905.9143   288.2286     3.14   0.035     105.6633    1706.165
   _cons |   102685.1   1122.489    91.48   0.000 99568.6    105801.7
------------------------------------------------------------------------------

. reg pickaway year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.05
  Model |  630610.514     1  630610.514      Prob > F =  0.8421
    Residual |  55839196.8     4  13959799.2      R-squared     =  0.0112
-------------+------------------------------      Adj R-squared = -0.2360
  Total |  56469807.3     5  11293961.5      Root MSE =  3736.3

------------------------------------------------------------------------------
    pickaway | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    year |  -189.8286   893.1421    -0.21   0.842    -2669.589    2289.931
   _cons |   125666.1   3478.289    36.13   0.000     116008.8    135323.3
------------------------------------------------------------------------------

. reg pike year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   82.42
  Model |   880017920     1   880017920      Prob > F =  0.0008
    Residual |  42709315.1     4  10677328.8      R-squared     =  0.9537
-------------+------------------------------      Adj R-squared =  0.9421
  Total |   922727235     5   184545447      Root MSE =  3267.6

------------------------------------------------------------------------------
    pike | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    year |   7091.314   781.1102     9.08   0.001     4922.605    9260.024
   _cons |   126897.1   3041.987    41.72   0.000     118451.2 135343
------------------------------------------------------------------------------

. reg portage year

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   73.82
  Model |  1.1864e+10     1  1.1864e+10      Prob > F =  0.0010
    Residual |   642828439     4   160707110      R-squared     =  0.9486
-------------+------------------------------      Adj R-squared =  0.9358
  Total |  1.2507e+10     5  2.5014e+09      Root MSE =   12677

------------------------------------------------------------------------------
```

```
    portage | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   26037.51    3030.39     8.59   0.001 17623.8    34451.23
  _cons |   464775.5   11801.67    39.38   0.000     432008.8   497542.2
------------------------------------------------------------------------------

. reg preble year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.39
  Model |   152273101     1   152273101      Prob > F =  0.1968
    Residual |   254503778     4  63625944.5      R-squared     =  0.3743
-------------+------------------------------      Adj R-squared =  0.2179
  Total |   406776879     5  81355375.8      Root MSE =  7976.6

------------------------------------------------------------------------------
 preble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     2949.8   1906.769     1.55   0.197     -2344.24     8243.84
  _cons |   256632.5   7425.799    34.56   0.000     236015.2    277249.9
------------------------------------------------------------------------------

. reg putnam year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    5.77
  Model |   379990381     1   379990381      Prob > F =  0.0742
    Residual |   263504818     4  65876204.5      R-squared     =  0.5905
-------------+------------------------------      Adj R-squared =  0.4881
  Total |   643495199     5   128699040      Root MSE =  8116.4

------------------------------------------------------------------------------
 putnam | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     4659.8   1940.194     2.40   0.074    -727.0434    10046.64
  _cons |   199341.5   7555.972    26.38   0.000     178362.8    220320.3
------------------------------------------------------------------------------

. reg richland year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.65
  Model |  12260794.5     1  12260794.5      Prob > F =  0.4661
    Residual |  75731832.8     4  18932958.2      R-squared     =  0.1393
-------------+------------------------------      Adj R-squared = -0.0758
  Total |  87992627.3     5  17598525.5      Root MSE =  4351.2

------------------------------------------------------------------------------
    richland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   837.0286   1040.136     0.80   0.466    -2050.853     3724.91
  _cons |   196594.7   4050.749    48.53   0.000     185348.1    207841.4
------------------------------------------------------------------------------

. reg ross year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    8.40
  Model |   391483181     1   391483181      Prob > F =  0.0442
    Residual |   186327430     4  46581857.6      R-squared     =  0.6775
-------------+------------------------------      Adj R-squared =  0.5969
  Total |   577810612     5   115562122      Root MSE =  6825.1
```

```
------------------------------------------------------------------------------
   ross | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   4729.743   1631.509     2.90   0.044     199.9487    9259.537
  _cons |   173096.4   6353.813    27.24   0.000     155455.4    190737.4
------------------------------------------------------------------------------

. reg sandusky year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    3.30
  Model |   146144411     1   146144411      Prob > F =  0.1435
    Residual |   177219555     4  44304888.7      R-squared     =  0.4520
-------------+------------------------------      Adj R-squared =  0.3149
  Total |   323363965     5  64672793.1      Root MSE =  6656.2

------------------------------------------------------------------------------
    sandusky | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2889.829   1591.134     1.82   0.144    -1527.868    7307.525
  _cons |   203954.9   6196.577    32.91   0.000     186750.5    221159.4
------------------------------------------------------------------------------

. reg scioto year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.27
  Model |  37758441.7     1  37758441.7      Prob > F =  0.2066
    Residual |  66613611.8     4  16653402.9      R-squared     =  0.3618
-------------+------------------------------      Adj R-squared =  0.2022
  Total |   104372054     5  20874410.7      Root MSE =  4080.9

------------------------------------------------------------------------------
 scioto | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   1468.886   975.5117     1.51   0.207    -1239.569     4177.34
  _cons |   265455.4   3799.072    69.87   0.000     254907.5    276003.3
------------------------------------------------------------------------------

. reg seneca year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.00
  Model |  98812.8571     1  98812.8571      Prob > F =  0.9639
    Residual |   170624579     4  42656144.8      R-squared     =  0.0006
-------------+------------------------------      Adj R-squared = -0.2493
  Total |   170723392     5  34144678.4      Root MSE =  6531.2

------------------------------------------------------------------------------
 seneca | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -75.14286   1561.248    -0.05   0.964    -4409.861    4259.575
  _cons |     227742   6080.186    37.46   0.000     210860.7    244623.3
------------------------------------------------------------------------------

. reg shelby year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    8.62
  Model |  1.6139e+09     1  1.6139e+09      Prob > F =  0.0426
    Residual |   748928060     4   187232015      R-squared     =  0.6830
-------------+------------------------------      Adj R-squared =  0.6038
  Total |  2.3629e+09     5   472572212      Root MSE =   13683
```

```
------------------------------------------------------------------------------
 shelby | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -9603.371   3270.928    -2.94   0.043    -18684.92   -521.8184
  _cons |   569175.5   12738.44    44.68   0.000     533807.9 604543
------------------------------------------------------------------------------

. reg stark year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   30.77
  Model |  3.9194e+09     1  3.9194e+09      Prob > F =  0.0052
    Residual |   509570014     4   127392504      R-squared     =  0.8849
-------------+------------------------------      Adj R-squared =  0.8562
  Total |  4.4290e+09     5   885800158      Root MSE =   11287

------------------------------------------------------------------------------
  stark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   14965.54   2698.068     5.55   0.005     7474.505    22456.58
  _cons |   688268.6   10507.47    65.50   0.000     659095.2 717442
------------------------------------------------------------------------------

. reg summit year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   49.21
  Model |  2.5354e+11     1  2.5354e+11      Prob > F =  0.0022
    Residual |  2.0610e+10     4  5.1524e+09      R-squared     =  0.9248
-------------+------------------------------      Adj R-squared =  0.9060
  Total |  2.7415e+11     5  5.4829e+10      Root MSE =   71780

------------------------------------------------------------------------------
 summit | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   120365.2   17158.78     7.01   0.002     72724.83    168005.6
  _cons |    1152755   66823.83    17.25   0.000     967222.5     1338288
------------------------------------------------------------------------------

. reg trumbull year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   68.63
  Model |  6.5611e+10     1  6.5611e+10      Prob > F =  0.0012
    Residual |  3.8243e+09     4   956069446      R-squared     =  0.9449
-------------+------------------------------      Adj R-squared =  0.9312
  Total |  6.9435e+10     5  1.3887e+10      Root MSE =   30920

------------------------------------------------------------------------------
    trumbull | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |    61230.8   7391.383     8.28   0.001     40709.03    81752.57
  _cons |    1172514    28785.3    40.73   0.000 1092593     1252434
------------------------------------------------------------------------------

. reg tuscarawas year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   37.24
  Model |  4.5762e+09     1  4.5762e+09      Prob > F =  0.0036
    Residual |   491562849     4   122890712      R-squared     =  0.9030
-------------+------------------------------      Adj R-squared =  0.8788
```

```
  Total |  5.0677e+09     5  1.0135e+09      Root MSE =   11086

------------------------------------------------------------------------------
  tuscarawas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   16170.83   2649.967     6.10   0.004 8813.34    23528.32
  _cons |   357601.9   10320.14    34.65   0.000     328948.6    386255.2
------------------------------------------------------------------------------

. reg union year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  1,     4) =   59.33
  Model |  2.2790e+09     1  2.2790e+09      Prob > F =  0.0015
    Residual |   153641760     4    38410440      R-squared     =  0.9368
-------------+------------------------------           Adj R-squared =  0.9211
  Total |  2.4326e+09     5   486523632      Root MSE =  6197.6

------------------------------------------------------------------------------
  union | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   11411.71   1481.514     7.70   0.002     7298.373    15525.06
  _cons |   238710.3   5769.666    41.37   0.000     222691.2    254729.5
------------------------------------------------------------------------------

. reg vanwert year

 Source |  SS  df  MS    Number of obs =  6
-------------+-----------------------------           F(  1,     4) =   45.98
  Model |   700775376     1   700775376      Prob > F =  0.0025
    Residual |  60966151.3     4  15241537.8      R-squared     =  0.9200
-------------+-----------------------------           Adj R-squared =  0.9000
  Total |   761741527     5   152348305      Root MSE =    3904

------------------------------------------------------------------------------
     vanwert | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6328.057   933.2444     6.78   0.002     3736.955    8919.159
  _cons |   140994.1   3634.465    38.79   0.000     130903.2 151085
------------------------------------------------------------------------------

. reg vinton year

 Source |  SS  df  MS    Number of obs =  6
-------------+-----------------------------           F(  1,     4) =   22.92
  Model |   400837072     1   400837072      Prob > F =  0.0087
    Residual |  69954138.7     4  17488534.7      R-squared     =  0.8514
-------------+-----------------------------           Adj R-squared =  0.8143
  Total |   470791211     5  94158242.2      Root MSE =  4181.9

------------------------------------------------------------------------------
 vinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   4785.914   999.6724     4.79   0.009     2010.379     7561.45
  _cons |   84277.47   3893.165    21.65   0.000     73468.31    95086.62
------------------------------------------------------------------------------

. reg warren year

 Source |  SS  df  MS    Number of obs =  6
-------------+-----------------------------           F(  1,     4) =    0.00
  Model |  390158.229     1  390158.229      Prob > F =  0.9748
    Residual |  1.3835e+09     4   345868125      R-squared     =  0.0003
```

```
-------------+------------------------------      Adj R-squared = -0.2496
  Total |  1.3839e+09     5   276772532      Root MSE =   18598

------------------------------------------------------------------------------
 warren | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   149.3143    4445.66     0.03   0.975    -12193.82    12492.45
  _cons |   241470.4   17313.36    13.95   0.000     193400.8 289540
------------------------------------------------------------------------------

. reg washington year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    1.56
  Model |  1.1516e+09     1  1.1516e+09      Prob > F =  0.2804
    Residual |  2.9612e+09     4   740290427      R-squared     =  0.2800
-------------+------------------------------      Adj R-squared =  0.1000
  Total |  4.1127e+09     5   822543378      Root MSE =   27208

------------------------------------------------------------------------------
  washington | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -8111.914   6504.023    -1.25   0.280    -26169.98    9946.147
  _cons |   577384.5   25329.53    22.79   0.000     507058.5    647710.6
------------------------------------------------------------------------------

. reg wayne year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    0.34
  Model |  1.0147e+09     1  1.0147e+09      Prob > F =  0.5921
    Residual |  1.2002e+10     4  3.0004e+09      R-squared     =  0.0780
-------------+------------------------------      Adj R-squared = -0.1526
  Total |  1.3016e+10     5  2.6033e+09      Root MSE =   54776

------------------------------------------------------------------------------
  wayne | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7614.771   13093.95     0.58   0.592    -28739.87    43969.41
  _cons |   775074.8   50993.62    15.20   0.000     633493.8    916655.8
------------------------------------------------------------------------------

. reg williams year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   32.86
  Model |  2.8780e+09     1  2.8780e+09      Prob > F =  0.0046
    Residual |   350358471     4  87589617.7      R-squared     =  0.8915
-------------+------------------------------      Adj R-squared =  0.8643
  Total |  3.2283e+09     5   645666675      Root MSE =  9358.9

------------------------------------------------------------------------------
    williams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   12824.03   2237.213     5.73   0.005 6612.53    19035.53
  _cons |   251525.1   8712.692    28.87   0.000     227334.8    275715.4
------------------------------------------------------------------------------

. reg wood year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =    2.73
  Model |   459966242     1   459966242      Prob > F =  0.1740
```

```
    Residual |   674681157     4   168670289      R-squared     =  0.4054
-------------+------------------------------      Adj R-squared =  0.2567
  Total |  1.1346e+09     5   226929480      Root MSE =   12987

------------------------------------------------------------------------------
   wood | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5126.771   3104.562     1.65   0.174    -3492.873    13746.42
  _cons |   631290.8   12090.53    52.21   0.000     597722.1    664859.5
------------------------------------------------------------------------------
```

```
. reg wyandot year

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  1,     4) =   22.66
  Model |   853542577     1   853542577      Prob > F =  0.0089
    Residual |   150667679     4  37666919.7      R-squared     =  0.8500
-------------+------------------------------      Adj R-squared =  0.8125
  Total |  1.0042e+09     5   200842051      Root MSE =  6137.3

------------------------------------------------------------------------------
     wyandot | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6983.829   1467.104     4.76   0.009     2910.494    11057.16
  _cons |   115287.3   5713.551    20.18   0.000     99423.91    131150.6
------------------------------------------------------------------------------
```

County Time Trend Squared Estimates

```
. reg adams year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   57.19
  Model |   501151260     2   250575630      Prob > F =  0.0041
    Residual |  13145107.3     3  4381702.42      R-squared     =  0.9744
-------------+------------------------------      Adj R-squared =  0.9574
  Total |   514296367     5   102859273      Root MSE =  2093.3

------------------------------------------------------------------------------
  adams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6590.932   2449.769     2.69   0.074    -1205.326    14387.19
  year2 |  -177.9821   342.5887    -0.52   0.639    -1268.252    912.2881
  _cons |   112490.3   3744.522    30.04   0.000     100573.6 124407
------------------------------------------------------------------------------
```

```
. reg allen year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.87
  Model |  2.5364e+09     2  1.2682e+09      Prob > F =  0.1142
    Residual |   780575097     3   260191699      R-squared     =  0.7647
-------------+------------------------------      Adj R-squared =  0.6078
  Total |  3.3170e+09     5   663400889      Root MSE =   16130

------------------------------------------------------------------------------
  allen | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year | -8952   18877.76    -0.47   0.668    -69029.45    51125.45
  year2 |  -438.5714   2639.966    -0.17   0.879    -8840.121    7962.979
  _cons |     406172   28855.04    14.08   0.001     314342.4    498001.6
------------------------------------------------------------------------------
```

```
. reg ashland year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    3.10
  Model |   666133293     2   333066646      Prob > F =  0.1862
    Residual |   322334869     3  107444956      R-squared     =  0.6739
-------------+------------------------------      Adj R-squared =  0.4565
  Total |   988468162     5   197693632      Root MSE =   10366

------------------------------------------------------------------------------
     ashland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -4056.218 12131    -0.33   0.760    -42662.48    34550.05
  year2 |   1410.268   1696.464     0.83   0.467    -3988.638    6809.173
  _cons |   315749.7   18542.49    17.03   0.000     256739.2    374760.2
------------------------------------------------------------------------------

. reg ashtabula year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   44.88
  Model |  1.6388e+09     2   819385407      Prob > F =  0.0058
    Residual |  54777239.1     3  18259079.7      R-squared     =  0.9677
-------------+------------------------------      Adj R-squared =  0.9461
  Total |  1.6935e+09     5   338709611      Root MSE =  4273.1

------------------------------------------------------------------------------
   ashtabula | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -33817.72   5000.842    -6.76   0.007    -49732.64   -17902.81
  year2 |   5577.304   699.3443     7.98   0.004     3351.678    7802.929
  _cons |   303892.1    7643.89    39.76   0.000     279565.8    328218.4
------------------------------------------------------------------------------

. reg athens year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    0.64
  Model |  6927254.16     2  3463627.08      Prob > F =  0.5868
    Residual |  16233757.8     3  5411252.61      R-squared     =  0.2991
-------------+------------------------------      Adj R-squared = -0.1682
  Total |    23161012     5   4632202.4      Root MSE =  2326.2

------------------------------------------------------------------------------
 athens | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -838.4679   2722.404    -0.31   0.778    -9502.372    7825.437
  year2 |   199.4464   380.7155     0.52   0.637     -1012.16    1411.053
  _cons |    99395.7   4161.251    23.89   0.000     86152.74    112638.7
------------------------------------------------------------------------------

. reg auglaize year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.34
  Model |   364761370     2   182380685      Prob > F =  0.1303
    Residual |   126148377     3  42049458.9      R-squared     =  0.7430
-------------+------------------------------      Adj R-squared =  0.5717
  Total |   490909747     5  98181949.4      Root MSE =  6484.6

------------------------------------------------------------------------------
    auglaize | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
   year |   16831.51   7588.988     2.22   0.113    -7320.037    40983.06
  year2 |  -1884.089   1061.285    -1.78   0.174     -5261.57    1493.392
  _cons |   212948.9   11599.93    18.36   0.000     176032.8 249865
------------------------------------------------------------------------------

. reg belmont year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   15.81
  Model |  5.8059e+09     2  2.9030e+09      Prob > F =  0.0255
    Residual |   550948848     3   183649616      R-squared     =  0.9133
-------------+------------------------------      Adj R-squared =  0.8556
  Total |  6.3569e+09     5  1.2714e+09      Root MSE =   13552

------------------------------------------------------------------------------
     belmont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -21897.15   15859.84    -1.38   0.261    -72370.23    28575.92
  year2 |   5466.875   2217.924     2.46   0.090    -1591.549     12525.3
  _cons |   354084.1   24242.09    14.61   0.001  276935    431233.2
------------------------------------------------------------------------------

. reg brown year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.85
  Model |   610170424     2   305085212      Prob > F =  0.2996
    Residual |   494727870     3   164909290      R-squared     =  0.5522
-------------+------------------------------      Adj R-squared =  0.2537
  Total |  1.1049e+09     5   220979659      Root MSE =   12842

------------------------------------------------------------------------------
  brown | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   13936.71   15028.87     0.93   0.422    -33891.85    61765.28
  year2 |  -1184.429   2101.717    -0.56   0.612    -7873.029    5504.172
  _cons |     139598   22971.93     6.08   0.009     66491.06    212704.9
------------------------------------------------------------------------------

. reg butler year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.73
  Model |  3.6787e+10     2  1.8393e+10      Prob > F =  0.3162
    Residual |  3.1862e+10     3  1.0621e+10      R-squared     =  0.5359
-------------+------------------------------      Adj R-squared =  0.2265
  Total |  6.8648e+10     5  1.3730e+10      Root MSE =  1.0e+05

------------------------------------------------------------------------------
 butler | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   216917.6   120608.1     1.80   0.170    -166911.3    600746.5
  year2 |  -28046.71   16866.48    -1.66   0.195    -81723.39    25629.97
  _cons |   646647.8     184352     3.51   0.039     59957.36     1233338
------------------------------------------------------------------------------

. reg carroll year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.29
  Model |    70016551     2  35008275.5      Prob > F =  0.1318
    Residual |  24464825.8     3  8154941.95      R-squared     =  0.7411
```

```
-------------+------------------------------           Adj R-squared =  0.5684
  Total |  94481376.8     5  18896275.4      Root MSE =  2855.7

------------------------------------------------------------------------------
     carroll | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6166.496   3342.059     1.85   0.162    -4469.427    16802.42
  year2 |   -626.875   467.3713    -1.34   0.272    -2114.259    860.5091
  _cons |   153619.7   5108.406    30.07   0.000     137362.5    169876.9
------------------------------------------------------------------------------

. reg champaign year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =   15.41
  Model |   283090570     2   141545285      Prob > F =  0.0264
    Residual |  27552363.9     3   9184121.3      R-squared     =  0.9113
-------------+------------------------------           Adj R-squared =  0.8522
  Total |   310642934     5  62128586.8      Root MSE =  3030.5

------------------------------------------------------------------------------
   champaign | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -3054.636   3546.684    -0.86   0.452    -14341.77    8232.495
  year2 |   973.8214   495.9871     1.96   0.144     -604.631    2552.274
  _cons |   125947.6    5421.18    23.23   0.000  108695    143200.2
------------------------------------------------------------------------------

. reg clark year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =    5.50
  Model |  2.3624e+10     2  1.1812e+10      Prob > F =  0.0993
    Residual |  6.4485e+09     3  2.1495e+09      R-squared     =  0.7856
-------------+------------------------------           Adj R-squared =  0.6426
  Total |  3.0072e+10     5  6.0144e+09      Root MSE =   46363

------------------------------------------------------------------------------
  clark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -64983.37   54259.05    -1.20   0.317    -237659.9    107693.1
  year2 |   4104.946   7587.874     0.54   0.626    -20043.06    28252.95
  _cons |   447341.1   82936.08     5.39   0.012     183401.5    711280.7
------------------------------------------------------------------------------

. reg clermont year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =    5.33
  Model |  3.9969e+09     2  1.9985e+09      Prob > F =  0.1028
    Residual |  1.1240e+09     3   374661362      R-squared     =  0.7805
-------------+------------------------------           Adj R-squared =  0.6342
  Total |  5.1209e+09     5  1.0242e+09      Root MSE =   19356

------------------------------------------------------------------------------
    clermont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   16316.91   22652.86     0.72   0.523    -55774.62    88408.43
  year2 |  -172.3214   3167.897    -0.05   0.960    -10253.98    9909.341
  _cons |   374209.2   34625.37    10.81   0.002     264015.8    484402.6
------------------------------------------------------------------------------

. reg clinton year year2
```

```
 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   22.27
  Model |   211215073     2   105607537      Prob > F =  0.0159
    Residual |  14228310.1     3  4742770.02      R-squared     =  0.9369
-------------+------------------------------      Adj R-squared =  0.8948
  Total |   225443383     5  45088676.7      Root MSE =  2177.8

------------------------------------------------------------------------------
     clinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   15103.89   2548.706     5.93   0.010     6992.766  23215
  year2 |  -1844.286   356.4246    -5.17   0.014    -2978.588   -709.9836
  _cons |   130884.4   3895.749    33.60   0.000     118486.4    143282.4
------------------------------------------------------------------------------

. reg columbiana year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   10.22
  Model |  5.4337e+09     2  2.7168e+09      Prob > F =  0.0458
    Residual |   797179491     3   265726497      R-squared     =  0.8721
-------------+------------------------------      Adj R-squared =  0.7868
  Total |  6.2308e+09     5  1.2462e+09      Root MSE =   16301

------------------------------------------------------------------------------
  columbiana | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -55210.38   19077.48    -2.89   0.063    -115923.5    5502.687
  year2 |   9451.589   2667.897     3.54   0.038     961.1506    17942.03
  _cons |   665478.9   29160.33    22.82   0.000     572677.7    758280.1
------------------------------------------------------------------------------

. reg coshocton year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    0.21
  Model |  39173759.1     2  19586879.5      Prob > F =  0.8213
    Residual |   279257810     3  93085936.8      R-squared     =  0.1230
-------------+------------------------------      Adj R-squared = -0.4616
  Total |   318431570     5  63686313.9      Root MSE =  9648.1

------------------------------------------------------------------------------
   coshocton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7123.461   11291.35     0.63   0.573    -28810.64    43057.56
  year2 |  -1023.911   1579.042    -0.65   0.563    -6049.127    4001.305
  _cons |   157045.7   17259.06     9.10   0.003     102119.7    211971.7
------------------------------------------------------------------------------

. reg crawford year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.47
  Model |  64378060.4     2  32189030.2      Prob > F =  0.0997
    Residual |  17639617.6     3  5879872.54      R-squared     =  0.7849
-------------+------------------------------      Adj R-squared =  0.6415
  Total |    82017678     5  16403535.6      Root MSE =  2424.8

------------------------------------------------------------------------------
    crawford | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5964.279   2837.838     2.10   0.126    -3066.989    14995.55
```

```
  year2 |  -609.3214   396.8584    -1.54   0.222    -1872.302    653.6591
  _cons |    90991.4   4337.694    20.98   0.000     77186.92    104795.9
------------------------------------------------------------------------------

. reg cuyahoga year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   62.41
  Model |  1.8274e+11     2  9.1372e+10      Prob > F =  0.0036
    Residual |  4.3920e+09     3  1.4640e+09      R-squared     =  0.9765
-------------+------------------------------      Adj R-squared =  0.9609
  Total |  1.8714e+11     5  3.7427e+10      Root MSE =   38262

------------------------------------------------------------------------------
    cuyahoga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   140849.5   44778.74     3.15   0.051    -1656.418    283355.4
  year2 |  -5569.321   6262.097    -0.89   0.439    -25498.11    14359.47
  _cons |    1031972   68445.23    15.08   0.001     814148.3     1249795
------------------------------------------------------------------------------

. reg darke year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   20.22
  Model |  3.9542e+09     2  1.9771e+09      Prob > F =  0.0181
    Residual |   293310580     3  97770193.4      R-squared     =  0.9309
-------------+------------------------------      Adj R-squared =  0.8849
  Total |  4.2475e+09     5   849493320      Root MSE =  9887.9

------------------------------------------------------------------------------
  darke | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   12672.69   11571.96     1.10   0.354    -24154.45    49499.83
  year2 |   335.8571   1618.284     0.21   0.849    -4814.246     5485.96
  _cons |   496239.6   17687.98    28.06   0.000     439948.6    552530.6
------------------------------------------------------------------------------

. reg defiance year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   50.00
  Model |  2.7785e+10     2  1.3892e+10      Prob > F =  0.0050
    Residual |   833541771     3   277847257      R-squared     =  0.9709
-------------+------------------------------      Adj R-squared =  0.9515
  Total |  2.8618e+10     5  5.7236e+09      Root MSE =   16669

------------------------------------------------------------------------------
    defiance | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -3317.104   19507.73    -0.17   0.876    -65399.41     58765.2
  year2 |   6025.554   2728.065     2.21   0.114    -2656.366    14707.47
  _cons |   166620.3   29817.97     5.59   0.011     71726.22    261514.4
------------------------------------------------------------------------------

. reg delaware year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    6.73
  Model |   143760388     2  71880193.9      Prob > F =  0.0778
    Residual |  32041465.6     3  10680488.5      R-squared     =  0.8177
-------------+------------------------------      Adj R-squared =  0.6962
  Total |   175801853     5  35160370.7      Root MSE =  3268.1
```

```
------------------------------------------------------------------------------
    delaware | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   4531.707   3824.716     1.18   0.321    -7640.247    16703.66
  year2 |  -241.0357   534.8687    -0.45   0.683    -1943.227    1461.155
  _cons |   151450.4   5846.158    25.91   0.000     132845.3    170055.5
------------------------------------------------------------------------------

. reg erie year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   20.91
  Model |  1.0676e+09     2   533821635      Prob > F =  0.0173
    Residual |  76575625.9     3  25525208.6      R-squared     =  0.9331
-------------+------------------------------      Adj R-squared =  0.8885
  Total |  1.1442e+09     5   228843779      Root MSE =  5052.2

------------------------------------------------------------------------------
   erie | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   8952.864   5912.734     1.51   0.227    -9864.093    27769.82
  year2 |  -163.6786   826.8682    -0.20   0.856    -2795.142    2467.785
  _cons |   129014.6   9037.736    14.28   0.001     100252.5    157776.7
------------------------------------------------------------------------------

. reg fairfield year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   10.64
  Model |   536299695     2   268149847      Prob > F =  0.0435
    Residual |  75631696.4     3  25210565.5      R-squared     =  0.8764
-------------+------------------------------      Adj R-squared =  0.7940
  Total |   611931391     5   122386278      Root MSE =    5021

------------------------------------------------------------------------------
   fairfield | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   8698.121   5876.178     1.48   0.235     -10002.5    27398.74
  year2 |  -457.5357    821.756    -0.56   0.617     -3072.73    2157.659
  _cons |   166382.2    8981.86    18.52   0.000     137797.9    194966.5
------------------------------------------------------------------------------

. reg fayette year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.00
  Model |   101719040     2    50859520      Prob > F =  0.1424
    Residual |  38130465.9     3  12710155.3      R-squared     =  0.7273
-------------+------------------------------      Adj R-squared =  0.5456
  Total |   139849506     5  27969901.2      Root MSE =  3565.1

------------------------------------------------------------------------------
     fayette | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7082.486   4172.334     1.70   0.188    -6195.744    20360.72
  year2 |  -699.8571   583.4814    -1.20   0.316    -2556.755    1157.041
  _cons |   127711.8   6377.499    20.03   0.000     107415.8    148007.8
------------------------------------------------------------------------------

. reg franklin year year2

 Source |  SS  df  MS    Number of obs =  6
```

```
-------------+------------------------------           F(  2,     3) =   26.88
  Model |  3.2029e+11     2  1.6014e+11      Prob > F =  0.0122
    Residual |  1.7876e+10     3  5.9585e+09      R-squared     =  0.9471
-------------+------------------------------           Adj R-squared =  0.9119
  Total |  3.3816e+11     5  6.7633e+10      Root MSE =   77192

------------------------------------------------------------------------------
    franklin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -141427.6   90338.66    -1.57   0.215    -428925.6    146070.3
  year2 |   37843.75   12633.44     3.00   0.058    -2361.491    78048.99
  _cons |    2337247   138084.5    16.93   0.000 1897801     2776694
------------------------------------------------------------------------------

. reg fulton year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =    1.00
  Model |   791568928     2   395784464      Prob > F =  0.4641
    Residual |  1.1846e+09     3   394874353      R-squared     =  0.4006
-------------+------------------------------           Adj R-squared =  0.0009
  Total |  1.9762e+09     5   395238397      Root MSE =   19871

------------------------------------------------------------------------------
 fulton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   11112.81    23255.9     0.48   0.665    -62897.84    85123.46
  year2 |  -635.9643   3252.229    -0.20   0.857    -10986.01    9714.079
  _cons |   308533.8   35547.12     8.68   0.003  195407    421660.6
------------------------------------------------------------------------------

. reg gallia year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =    1.01
  Model |  75272300.9     2  37636150.5      Prob > F =  0.4633
    Residual |   112327159     3  37442386.4      R-squared     =  0.4012
-------------+------------------------------           Adj R-squared =  0.0021
  Total |   187599460     5    37519892      Root MSE =    6119

------------------------------------------------------------------------------
 gallia | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |     4643.7   7161.194     0.65   0.563    -18146.41    27433.81
  year2 |  -377.7857   1001.459    -0.38   0.731    -3564.877    2809.305
  _cons |   198165.8   10946.03    18.10   0.000     163330.6 233001
------------------------------------------------------------------------------

. reg geauga year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------           F(  2,     3) =    8.33
  Model |  4.5737e+10     2  2.2868e+10      Prob > F =  0.0596
    Residual |  8.2350e+09     3  2.7450e+09      R-squared     =  0.8474
-------------+------------------------------           Adj R-squared =  0.7457
  Total |  5.3971e+10     5  1.0794e+10      Root MSE =   52393

------------------------------------------------------------------------------
 geauga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -108825.7   61316.02    -1.77   0.174    -303960.6    86309.26
  year2 |   8459.839   8574.758     0.99   0.397    -18828.87    35748.55
  _cons |   561011.3    93722.8     5.99   0.009     262743.5    859279.1
```

```
------------------------------------------------------------------------------

. reg greene year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.35
  Model |  5.5060e+09     2  2.7530e+09      Prob > F =  0.1024
    Residual |  1.5425e+09     3   514161630      R-squared     =  0.7812
-------------+------------------------------      Adj R-squared =  0.6353
  Total |  7.0485e+09     5  1.4097e+09      Root MSE =   22675

------------------------------------------------------------------------------
 greene | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2903.375    26537.1     0.11   0.920    -81549.53    87356.28
  year2 |  -2876.625    3711.09    -0.78   0.495    -14686.97    8933.719
  _cons |   229684.5   40562.51     5.66   0.011     100596.5    358772.5
------------------------------------------------------------------------------

. reg guernsey year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   48.68
  Model |  1.2075e+09     2   603772114      Prob > F =  0.0052
    Residual |  37208185.9     3  12402728.6      R-squared     =  0.9701
-------------+------------------------------      Adj R-squared =  0.9502
  Total |  1.2448e+09     5   248950483      Root MSE =  3521.8

------------------------------------------------------------------------------
    guernsey | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -2416.014   4121.566    -0.59   0.599    -15532.68    10700.65
  year2 |   1490.357   576.3818     2.59   0.081    -343.9469    3324.661
  _cons |   148991.8   6299.899    23.65   0.000     128942.7    169040.9
------------------------------------------------------------------------------

. reg hamilton year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   18.75
  Model |  1.3077e+11     2  6.5383e+10      Prob > F =  0.0202
    Residual |  1.0462e+10     3  3.4875e+09      R-squared     =  0.9259
-------------+------------------------------      Adj R-squared =  0.8765
  Total |  1.4123e+11     5  2.8246e+10      Root MSE =   59055

------------------------------------------------------------------------------
    hamilton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   124751.8   69112.72     1.81   0.169    -95195.72    344699.3
  year2 |  -5526.661   9665.091    -0.57   0.607    -36285.29    25231.97
  _cons |    1488585   105640.2    14.09   0.001 1152391     1824779
------------------------------------------------------------------------------

. reg hancock year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.99
  Model |   697852143     2   348926071      Prob > F =  0.2818
    Residual |   526181975     3   175393992      R-squared     =  0.5701
-------------+------------------------------      Adj R-squared =  0.2835
  Total |  1.2240e+09     5   244806823      Root MSE =   13244

------------------------------------------------------------------------------
```

```
    hancock | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   26049.05   15499.26     1.68   0.191    -23276.52    75374.62
  year2 |  -3090.411   2167.499    -1.43   0.249    -9988.361     3807.54
  _cons |   284267.9   23690.94    12.00   0.001     208872.7    359663.1
------------------------------------------------------------------------------

. reg hardin year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   52.87
  Model |   487960115     2   243980057      Prob > F =  0.0046
    Residual |  13843852.9     3  4614617.62      R-squared     =  0.9724
-------------+------------------------------      Adj R-squared =  0.9540
  Total |   501803968     5   100360794      Root MSE =  2148.2

------------------------------------------------------------------------------
 hardin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3778.786   2514.036     1.50   0.230   -4222    11779.57
  year2 |   213.2143   351.5762     0.61   0.587    -905.6581    1332.087
  _cons |     155499   3842.756    40.47   0.000     143269.6    167728.4
------------------------------------------------------------------------------

. reg harrison year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   11.33
  Model |   290450740     2   145225370      Prob > F =  0.0400
    Residual |  38465361.7     3  12821787.2      R-squared     =  0.8831
-------------+------------------------------      Adj R-squared =  0.8051
  Total |   328916102     5  65783220.3      Root MSE =  3580.8

------------------------------------------------------------------------------
    harrison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7763.582   4190.617     1.85   0.161    -5572.831  21100
  year2 |  -538.0179   586.0382    -0.92   0.426    -2403.053    1327.017
  _cons |    89081.9   6405.444    13.91   0.001     68696.92    109466.9
------------------------------------------------------------------------------

. reg henry year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    7.26
  Model |   520806263     2   260403131      Prob > F =  0.0709
    Residual |   107648475     3  35882824.9      R-squared     =  0.8287
-------------+------------------------------      Adj R-squared =  0.7145
  Total |   628454737     5   125690947      Root MSE =  5990.2

------------------------------------------------------------------------------
  henry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   23849.88   7010.468     3.40   0.042     1539.442    46160.32
  year2 |  -2921.607   980.3811    -2.98   0.059    -6041.617    198.4031
  _cons |   276576.8   10715.64    25.81   0.000     242474.8    310678.8
------------------------------------------------------------------------------

. reg highland year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   58.69
  Model |   490578510     2   245289255      Prob > F =  0.0039
```

```
    Residual |  12537787.8     3  4179262.61      R-squared     =  0.9751
-------------+------------------------------      Adj R-squared =  0.9585
  Total |   503116298     5   100623260      Root MSE =  2044.3

------------------------------------------------------------------------------
    highland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5556.468   2392.509     2.32   0.103    -2057.562     13170.5
  year2 |  -37.44643   334.5811    -0.11   0.918    -1102.233     1027.34
  _cons |   137270.3   3656.999    37.54   0.000     125632.1    148908.5
------------------------------------------------------------------------------

. reg hocking year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    2.56
  Model |   115603173     2  57801586.4      Prob > F =  0.2245
    Residual |  67720120.5     3  22573373.5      R-squared     =  0.6306
-------------+------------------------------      Adj R-squared =  0.3843
  Total |   183323293     5  36664658.7      Root MSE =  4751.1

------------------------------------------------------------------------------
     hocking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7933.761   5560.347     1.43   0.249    -9761.745    25629.27
  year2 |   -807.125   777.5885    -1.04   0.376    -3281.759    1667.509
  _cons |    83212.9   8499.106     9.79   0.002     56164.95    110260.8
------------------------------------------------------------------------------

. reg holmes year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   25.61
  Model |  4.9232e+09     2  2.4616e+09      Prob > F =  0.0130
    Residual |   288351001     3  96117000.4      R-squared     =  0.9447
-------------+------------------------------      Adj R-squared =  0.9078
  Total |  5.2116e+09     5  1.0423e+09      Root MSE =  9803.9

------------------------------------------------------------------------------
 holmes | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |    22091.2   11473.71     1.93   0.150    -14423.26    58605.65
  year2 |  -765.0893   1604.544    -0.48   0.666    -5871.465    4341.287
  _cons |   249278.5    17537.8    14.21   0.001     193465.4    305091.6
------------------------------------------------------------------------------

. reg huron year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.00
  Model |   293214151     2   146607075      Prob > F =  0.1422
    Residual |   109821840     3  36607280.1      R-squared     =  0.7275
-------------+------------------------------      Adj R-squared =  0.5459
  Total |   403035991     5  80607198.3      Root MSE =  6050.4

------------------------------------------------------------------------------
  huron | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year | 18208   7080.883     2.57   0.082    -4326.533    40742.53
  year2 |  -2253.518   990.2283    -2.28   0.107    -5404.866    897.8306
  _cons |   262696.7   10823.28    24.27   0.000     228252.2    297141.2
------------------------------------------------------------------------------
```

```
. reg jackson year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    3.56
  Model |   254300366     2   127150183      Prob > F =  0.1613
    Residual |   107097699     3    35699233      R-squared     =  0.7037
-------------+------------------------------      Adj R-squared =  0.5061
  Total |   361398065     5    72279613      Root MSE =  5974.9

------------------------------------------------------------------------------
     jackson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   15457.66    6992.51     2.21   0.114    -6795.624    37710.95
  year2 |  -1817.393   977.8699    -1.86   0.160    -4929.411    1294.625
  _cons |   142844.8    10688.2    13.36   0.001     108830.2    176859.4
------------------------------------------------------------------------------

. reg jefferson year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   38.41
  Model |  6.4194e+09     2  3.2097e+09      Prob > F =  0.0073
    Residual |   250674127     3  83558042.4      R-squared     =  0.9624
-------------+------------------------------      Adj R-squared =  0.9374
  Total |  6.6701e+09     5  1.3340e+09      Root MSE =    9141

------------------------------------------------------------------------------
   jefferson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -14615.96   10697.88    -1.37   0.265     -48661.4    19429.47
  year2 |   4646.554   1496.049     3.11   0.053    -114.5412    9407.648
  _cons |   188450.3   16351.93    11.52   0.001     136411.1    240489.5
------------------------------------------------------------------------------

. reg knox year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =  241.14
  Model |   759252050     2   379626025      Prob > F =  0.0005
    Residual |  4722825.51     3  1574275.17      R-squared     =  0.9938
-------------+------------------------------      Adj R-squared =  0.9897
  Total |   763974876     5   152794975      Root MSE =  1254.7

------------------------------------------------------------------------------
   knox | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7338.664   1468.399     5.00   0.015     2665.564    12011.76
  year2 |  -107.6786   205.3487    -0.52   0.636    -761.1898    545.8326
  _cons |   181829.8   2244.478    81.01   0.000     174686.9    188972.7
------------------------------------------------------------------------------

. reg lake year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    0.58
  Model |  7244381.92     2  3622190.96      Prob > F =  0.6141
    Residual |  18856448.9     3  6285482.97      R-squared     =  0.2776
-------------+------------------------------      Adj R-squared = -0.2041
  Total |  26100830.8     5  5220166.17      Root MSE =  2507.1

------------------------------------------------------------------------------
   lake | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
   year |   2537.043   2934.087     0.86   0.451    -6800.532    11874.62
  year2 |  -400.6429   410.3184    -0.98   0.401    -1706.459    905.1733
  _cons |   144285.6   4484.813    32.17   0.000     130012.9    158558.3
------------------------------------------------------------------------------

. reg lawrence year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   12.11
  Model |   729486103     2   364743052      Prob > F =  0.0366
    Residual |  90364001.9     3    30121334      R-squared     =  0.8898
-------------+------------------------------      Adj R-squared =  0.8163
  Total |   819850105     5   163970021      Root MSE =  5488.3

------------------------------------------------------------------------------
    lawrence | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -23198.99   6423.042    -3.61   0.036    -43639.98   -2758.006
  year2 |   2562.607   898.2324     2.85   0.065    -295.9692    5421.184
  _cons |   267722.6   9817.753    27.27   0.000     236478.1    298967.1
------------------------------------------------------------------------------

. reg licking year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    2.89
  Model |   257531375     2   128765687      Prob > F =  0.2000
    Residual |   133866092     3  44622030.8      R-squared     =  0.6580
-------------+------------------------------      Adj R-squared =  0.4300
  Total |   391397467     5  78279493.5      Root MSE =    6680

------------------------------------------------------------------------------
     licking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   400.7679   7817.688     0.05   0.962     -24478.6    25280.14
  year2 |   481.4821   1093.267     0.44   0.689    -2997.782    3960.746
  _cons |   308890.5    11949.5    25.85   0.000     270861.9    346919.1
------------------------------------------------------------------------------

. reg logan year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   13.93
  Model |  2.8995e+09     2  1.4498e+09      Prob > F =  0.0303
    Residual |   312191856     3   104063952      R-squared     =  0.9028
-------------+------------------------------      Adj R-squared =  0.8380
  Total |  3.2117e+09     5   642341977      Root MSE =   10201

------------------------------------------------------------------------------
  logan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -20614.77   11938.61    -1.73   0.183    -58608.76    17379.22
  year2 |   4523.143   1669.559     2.71   0.073     -790.139    9836.425
  _cons |   148356.2   18248.41     8.13   0.004 90281.6    206430.8
------------------------------------------------------------------------------

. reg lorain year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   37.68
  Model |  3.5307e+09     2  1.7653e+09      Prob > F =  0.0075
    Residual |   140542356     3  46847451.9      R-squared     =  0.9617
-------------+------------------------------      Adj R-squared =  0.9362
```

```
  Total |  3.6712e+09     5   734241590      Root MSE =  6844.5

------------------------------------------------------------------------------
 lorain | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   13437.93   8010.261     1.68   0.192    -12054.29    38930.16
  year2 |   109.3036   1120.198     0.10   0.928    -3455.665    3674.272
  _cons |   241185.3   12243.85    19.70   0.000     202219.9    280150.7
------------------------------------------------------------------------------

. reg lucas year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   14.57
  Model |  8.4428e+09     2  4.2214e+09      Prob > F =  0.0285
    Residual |   869398981     3   289799660      R-squared     =  0.9066
-------------+------------------------------      Adj R-squared =  0.8444
  Total |  9.3122e+09     5  1.8624e+09      Root MSE =   17024

------------------------------------------------------------------------------
  lucas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6741.071    19922.9     0.34   0.757     -56662.5    70144.64
  year2 |   2142.786   2786.125     0.77   0.498    -6723.907    11009.48
  _cons |     754220   30452.57    24.77   0.000     657306.3    851133.7
------------------------------------------------------------------------------

. reg madison year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   23.38
  Model |  2.8077e+09     2  1.4038e+09      Prob > F =  0.0148
    Residual |   180119725     3  60039908.4      R-squared     =  0.9397
-------------+------------------------------      Adj R-squared =  0.8995
  Total |  2.9878e+09     5   597557465      Root MSE =  7748.5

------------------------------------------------------------------------------
     madison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   12172.75   9068.254     1.34   0.272    -16686.48    41031.98
  year2 |   70.46429   1268.153     0.06   0.959    -3965.364    4106.293
  _cons |     175511   13861.01    12.66   0.001     131399.1    219622.9
------------------------------------------------------------------------------

. reg mahoning year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    8.48
  Model |  3.9676e+11     2  1.9838e+11      Prob > F =  0.0583
    Residual |  7.0180e+10     3  2.3393e+10      R-squared     =  0.8497
-------------+------------------------------      Adj R-squared =  0.7495
  Total |  4.6694e+11     5  9.3389e+10      Root MSE =  1.5e+05

------------------------------------------------------------------------------
    mahoning | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   389584.8   178998.5     2.18   0.118    -180068.3 959238
  year2 |  -35456.89    25032.1    -1.42   0.252    -115120.2    44206.43
  _cons |   732906.4   273602.9     2.68   0.075    -137820.2     1603633
------------------------------------------------------------------------------

. reg marion year year2
```

```
 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   14.86
  Model |   477726269     2   238863135      Prob > F =  0.0278
    Residual |  48209306.1     3  16069768.7      R-squared     =  0.9083
-------------+------------------------------      Adj R-squared =  0.8472
  Total |   525935575     5   105187115      Root MSE =  4008.7

------------------------------------------------------------------------------
 marion | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6840.646   4691.465     1.46   0.241    -8089.689    21770.98
  year2 |  -232.4107   656.0794    -0.35   0.747    -2320.348    1855.527
  _cons |   127151.3   7171.001    17.73   0.000  104330    149972.6
------------------------------------------------------------------------------

. reg medina year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   47.29
  Model |  1.0150e+10     2  5.0751e+09      Prob > F =  0.0054
    Residual |   321975057     3   107325019      R-squared     =  0.9693
-------------+------------------------------      Adj R-squared =  0.9488
  Total |  1.0472e+10     5  2.0944e+09      Root MSE =   10360

------------------------------------------------------------------------------
 medina | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   27717.12   12124.23     2.29   0.106    -10867.59    66301.83
  year2 |  -520.8214   1695.517    -0.31   0.779    -5916.713     4875.07
  _cons |   326023.2   18532.14    17.59   0.000     267045.7    385000.7
------------------------------------------------------------------------------

. reg meigs year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    9.05
  Model |   150286383     2  75143191.5      Prob > F =  0.0536
    Residual |  24912902.3     3  8304300.78      R-squared     =  0.8578
-------------+------------------------------      Adj R-squared =  0.7630
  Total |   175199285     5  35039857.1      Root MSE =  2881.7

------------------------------------------------------------------------------
  meigs | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   680.8857   3372.525     0.20   0.853    -10051.99    11413.77
  year2 |   316.1429   471.6319     0.67   0.551 -1184.8    1817.086
  _cons |   102237.4   5154.975    19.83   0.000     85831.97    118642.8
------------------------------------------------------------------------------

. reg mercer year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   13.60
  Model |  2.5465e+10     2  1.2733e+10      Prob > F =  0.0313
    Residual |  2.8092e+09     3   936395808      R-squared     =  0.9006
-------------+------------------------------      Adj R-squared =  0.8344
  Total |  2.8275e+10     5  5.6549e+09      Root MSE =   30601

------------------------------------------------------------------------------
 mercer | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   60475.49    35812.4     1.69   0.190    -53495.55    174446.5
  year2 |  -3231.714   5008.196    -0.65   0.565    -19170.03     12706.6
```

```
  _cons |   392015.8   54739.99     7.16   0.006     217808.7    566222.9
------------------------------------------------------------------------------

. reg miami year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  2,     3) =   10.56
  Model |  2.9617e+09     2  1.4809e+09      Prob > F =  0.0439
    Residual |   420675846     3   140225282       R-squared     =  0.8756
-------------+------------------------------          Adj R-squared =  0.7927
  Total |  3.3824e+09     5   676475423      Root MSE =   11842

------------------------------------------------------------------------------
  miami | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   21049.79   13858.52     1.52   0.226     -23054.2    65153.79
  year2 |  -1164.607   1938.049    -0.60   0.590    -7332.344     5003.13
  _cons |   263876.6   21183.03    12.46   0.001     196462.7    331290.5
------------------------------------------------------------------------------

. reg monroe year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  2,     3) =    5.71
  Model |   288816548     2   144408274      Prob > F =  0.0949
    Residual |  75894250.9     3  25298083.6       R-squared     =  0.7919
-------------+------------------------------          Adj R-squared =  0.6532
  Total |   364710799     5  72942159.9      Root MSE =  5029.7

------------------------------------------------------------------------------
 monroe | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7720.836   5886.369     1.31   0.281    -11012.22    26453.89
  year2 |  -533.3929   823.1812    -0.65   0.563    -3153.123    2086.337
  _cons |   106713.2   8997.437    11.86   0.001     78079.34    135347.1
------------------------------------------------------------------------------

. reg montgomery year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  2,     3) =   37.10
  Model |  3.2212e+10     2  1.6106e+10      Prob > F =  0.0077
    Residual |  1.3025e+09     3   434163345       R-squared     =  0.9611
-------------+------------------------------          Adj R-squared =  0.9352
  Total |  3.3515e+10     5  6.7030e+09      Root MSE =   20837

------------------------------------------------------------------------------
  montgomery | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -6073.029   24385.42    -0.25   0.819    -83678.32    71532.26
  year2 |   6828.714   3410.187     2.00   0.139    -4024.023    17681.45
  _cons |   787318.6   37273.62    21.12   0.000     668697.3    905939.9
------------------------------------------------------------------------------

. reg morgan year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------          F(  2,     3) =   54.30
  Model |   203690079     2   101845039      Prob > F =  0.0044
    Residual |  5626608.34     3  1875536.11       R-squared     =  0.9731
-------------+------------------------------          Adj R-squared =  0.9552
  Total |   209316687     5  41863337.5      Root MSE =  1369.5
```

```
------------------------------------------------------------------------------
 morgan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3019.686   1602.752     1.88   0.156    -2080.987    8120.359
  year2 |   55.85714   224.1374     0.25   0.819    -657.4481    769.1624
  _cons |    78379.6    2449.84    31.99   0.000     70583.12    86176.08
------------------------------------------------------------------------------

. reg morrow year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.89
  Model |   127642315     2  63821157.7      Prob > F =  0.0915
    Residual |  32515779.4     3  10838593.1      R-squared     =  0.7970
-------------+------------------------------      Adj R-squared =  0.6616
  Total |   160158095     5    32031619      Root MSE =  3292.2

------------------------------------------------------------------------------
 morrow | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   9687.582   3852.921     2.51   0.087    -2574.133     21949.3
  year2 |  -1069.161    538.813    -1.98   0.141    -2783.904    645.5828
  _cons |   113693.9    5889.27    19.31   0.000     94951.62    132436.2
------------------------------------------------------------------------------

. reg muskingum year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    7.36
  Model |  1.7253e+09     2   862625488      Prob > F =  0.0696
    Residual |   351537205     3   117179068      R-squared     =  0.8307
-------------+------------------------------      Adj R-squared =  0.7179
  Total |  2.0768e+09     5   415357636      Root MSE =   10825

------------------------------------------------------------------------------
   muskingum | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -18898.22    12668.6    -1.49   0.233    -59215.36    21418.93
  year2 |   3866.411   1771.645     2.18   0.117    -1771.754    9504.575
  _cons |   280362.7   19364.22    14.48   0.001     218737.1    341988.3
------------------------------------------------------------------------------

. reg noble year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   91.72
  Model |   780109836     2   390054918      Prob > F =  0.0020
    Residual |  12757589.1     3   4252529.7      R-squared     =  0.9839
-------------+------------------------------      Adj R-squared =  0.9732
  Total |   792867426     5   158573485      Root MSE =  2062.2

------------------------------------------------------------------------------
  noble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -860.1321   2413.389    -0.36   0.745    -8540.613    6820.349
  year2 |   1051.125   337.5012     3.11   0.053    -22.95438    2125.204
  _cons |   112823.9   3688.915    30.58   0.000     101084.1    124563.7
------------------------------------------------------------------------------

. reg ottawa year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.36
```

```
  Model |   185528509     2  92764254.7      Prob > F =  0.1023
    Residual |  51933405.4     3  17311135.1      R-squared     =  0.7813
-------------+------------------------------      Adj R-squared =  0.6355
  Total |   237461915     5    47492383      Root MSE =  4160.7

------------------------------------------------------------------------------
 ottawa | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   4435.918   4869.299     0.91   0.429    -11060.36     19932.2
  year2 |  -169.9107   680.9487    -0.25   0.819    -2336.993    1997.172
  _cons |   128845.1   7442.824    17.31   0.000     105158.7    152531.5
------------------------------------------------------------------------------

. reg paulding year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    7.88
  Model |   955781477     2   477890738      Prob > F =  0.0639
    Residual |   181880273     3  60626757.8      R-squared     =  0.8401
-------------+------------------------------      Adj R-squared =  0.7335
  Total |  1.1377e+09     5   227532350      Root MSE =  7786.3

------------------------------------------------------------------------------
    paulding | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   25252.96   9112.464     2.77   0.069    -3746.971    54252.89
  year2 |  -2716.929   1274.336    -2.13   0.123    -6772.433    1338.576
  _cons |    96914.4   13928.59     6.96   0.006     52587.41    141241.4
------------------------------------------------------------------------------

. reg perry year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   13.37
  Model |  18141449.3     2  9070724.66      Prob > F =  0.0320
    Residual |  2035765.51     3  678588.505      R-squared     =  0.8991
-------------+------------------------------      Adj R-squared =  0.8318
  Total |  20177214.8     5  4035442.97      Root MSE =  823.76

------------------------------------------------------------------------------
  perry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -1321.336   964.0663    -1.37   0.264    -4389.425    1746.754
  year2 |   318.1786   134.8202     2.36   0.099    -110.8794    747.2365
  _cons |   105654.8   1473.595    71.70   0.000     100965.2    110344.4
------------------------------------------------------------------------------

. reg pickaway year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    2.11
  Model |  33018244.8     2  16509122.4      Prob > F =  0.2676
    Residual |  23451562.5     3  7817187.51      R-squared     =  0.5847
-------------+------------------------------      Adj R-squared =  0.3078
  Total |  56469807.3     5  11293961.5      Root MSE =  2795.9

------------------------------------------------------------------------------
    pickaway | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   6330.046   3272.118     1.93   0.149    -4083.293    16743.39
  year2 |  -931.4107   457.5904    -2.04   0.135    -2387.668    524.8461
  _cons |   116972.9     5001.5    23.39   0.000     101055.9    132889.9
------------------------------------------------------------------------------
```

```
. reg pike year year2

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   34.37
  Model |   884139592     2   442069796      Prob > F =  0.0086
    Residual |  38587643.1     3  12862547.7      R-squared     =  0.9582
-------------+------------------------------      Adj R-squared =  0.9303
  Total |   922727235     5   184545447      Root MSE =  3586.4

------------------------------------------------------------------------------
   pike | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   9417.189   4197.273     2.24   0.111    -3940.405    22774.78
  year2 |  -332.2679   586.9689    -0.57   0.611    -2200.265    1535.729
  _cons |   123795.9   6415.618    19.30   0.000     103378.5    144213.3
------------------------------------------------------------------------------

. reg portage year year2

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   27.79
  Model |  1.1866e+10     2  5.9332e+09      Prob > F =  0.0116
    Residual |   640558009     3   213519336      R-squared     =  0.9488
-------------+------------------------------      Adj R-squared =  0.9146
  Total |  1.2507e+10     5  2.5014e+09      Root MSE =   14612

------------------------------------------------------------------------------
     portage | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   24311.26   17101.03     1.42   0.250    -30111.85    78734.37
  year2 |   246.6071   2391.499     0.10   0.924     -7364.21    7857.425
  _cons |   467077.2   26139.28    17.87   0.000     383890.3    550264.1
------------------------------------------------------------------------------

. reg preble year year2

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    0.90
  Model |   152273631     2  76136815.4      Prob > F =  0.4949
    Residual |   254503248     3    84834416      R-squared     =  0.3743
-------------+------------------------------      Adj R-squared = -0.0428
  Total |   406776879     5  81355375.8      Root MSE =  9210.6

------------------------------------------------------------------------------
 preble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   2923.425   10779.28     0.27   0.804    -31381.05     37227.9
  year2 |   3.767857   1507.432     0.00   0.998    -4793.553    4801.088
  _cons |   256667.7   16476.35    15.58   0.001     204232.6    309102.8
------------------------------------------------------------------------------

. reg putnam year year2

 Source |  SS   df   MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    2.29
  Model |   388969801     2   194484900      Prob > F =  0.2488
    Residual |   254525398     3  84841799.3      R-squared     =  0.6045
-------------+------------------------------      Adj R-squared =  0.3408
  Total |   643495199     5   128699040      Root MSE =    9211

------------------------------------------------------------------------------
 putnam | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
   year |     8092.8   10779.75     0.75   0.507    -26213.17    42398.77
  year2 |  -490.4286   1507.497    -0.33   0.766    -5287.958    4307.101
  _cons |   194764.2   16477.07    11.82   0.001     142326.8    247201.6
------------------------------------------------------------------------------

. reg richland year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.54
  Model |  44586364.5     2  22293182.3      Prob > F =  0.3465
    Residual |  43406262.8     3  14468754.3      R-squared     =  0.5067
-------------+------------------------------      Adj R-squared =  0.1778
  Total |  87992627.3     5  17598525.5      Root MSE =  3803.8

------------------------------------------------------------------------------
    richland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   7350.654   4451.632     1.65   0.197    -6816.426    21517.73
  year2 |  -930.5179   622.5399    -1.49   0.232    -2911.718    1050.682
  _cons |   187909.9   6804.411    27.62   0.000     166255.2    209564.6
------------------------------------------------------------------------------

. reg ross year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.64
  Model |   456342840     2   228171420      Prob > F =  0.0964
    Residual |   121467771     3  40489257.2      R-squared     =  0.7898
-------------+------------------------------      Adj R-squared =  0.6496
  Total |   577810612     5   115562122      Root MSE =  6363.1

------------------------------------------------------------------------------
   ross | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -4496.757   7446.867    -0.60   0.589    -28196.01     19202.5
  year2 |   1318.071   1041.409     1.27   0.295    -1996.158    4632.301
  _cons |   185398.4   11382.69    16.29   0.001     149173.6    221623.2
------------------------------------------------------------------------------

. reg sandusky year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.59
  Model |   166379506     2  83189752.8      Prob > F =  0.3383
    Residual |   156984460     3  52328153.3      R-squared     =  0.5145
-------------+------------------------------      Adj R-squared =  0.1909
  Total |   323363965     5  64672793.1      Root MSE =  7233.8

------------------------------------------------------------------------------
    sandusky | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   8043.329   8465.866     0.95   0.412    -18898.83    34985.49
  year2 |  -736.2143   1183.912    -0.62   0.578     -4503.95    3031.521
  _cons |   197083.6   12940.25    15.23   0.001     155901.9    238265.3
------------------------------------------------------------------------------

. reg scioto year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    2.00
  Model |  59668084.6     2  29834042.3      Prob > F =  0.2803
    Residual |  44703968.9     3    14901323      R-squared     =  0.5717
-------------+------------------------------      Adj R-squared =  0.2861
```

```
  Total |   104372054     5  20874410.7      Root MSE =  3860.2

-----------------------------------------------------------------------------
 scioto | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+---------------------------------------------------------------
   year |   6831.386   4517.686     1.51   0.228    -7545.909    21208.68
  year2 |  -766.0714   631.7773    -1.21   0.312    -2776.669    1244.526
  _cons |   258305.4   6905.377    37.41   0.000     236329.4    280281.4
-----------------------------------------------------------------------------

. reg seneca year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.59
  Model |  87737384.3     2  43868692.1      Prob > F =  0.3389
    Residual |  82986007.7     3  27662002.6      R-squared     =  0.5139
-------------+------------------------------      Adj R-squared =  0.1899
  Total |   170723392     5  34144678.4      Root MSE =  5259.5

-----------------------------------------------------------------------------
 seneca | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+---------------------------------------------------------------
   year |   10649.86   6155.247     1.73   0.182    -8938.886     30238.6
  year2 |  -1532.143   860.7825    -1.78   0.173    -4271.537    1207.251
  _cons |     213442   9408.422    22.69   0.000     183500.2    243383.8
-----------------------------------------------------------------------------

. reg shelby year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    4.48
  Model |  1.7704e+09     2   885200111      Prob > F =  0.1256
    Residual |   592460837     3   197486946      R-squared     =  0.7493
-------------+------------------------------      Adj R-squared =  0.5821
  Total |  2.3629e+09     5   472572212      Root MSE =   14053

-----------------------------------------------------------------------------
 shelby | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+---------------------------------------------------------------
   year |  -23933.87   16446.48    -1.46   0.242     -76273.9    28406.16
  year2 |   2047.214   2299.963     0.89   0.439    -5272.294    9366.722
  _cons |   588282.8   25138.78    23.40   0.000  508280    668285.6
-----------------------------------------------------------------------------

. reg stark year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   12.20
  Model |  3.9440e+09     2  1.9720e+09      Prob > F =  0.0362
    Residual |   485017260     3   161672420      R-squared     =  0.8905
-------------+------------------------------      Adj R-squared =  0.8175
  Total |  4.4290e+09     5   885800158      Root MSE =   12715

-----------------------------------------------------------------------------
  stark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+---------------------------------------------------------------
   year |   9288.793   14880.64     0.62   0.577    -38068.05    56645.63
  year2 |   810.9643   2080.988     0.39   0.723    -5811.668    7433.597
  _cons |   695837.6   22745.37    30.59   0.000     623451.7    768223.5
-----------------------------------------------------------------------------

. reg summit year year2
```

```
 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   19.32
  Model |  2.5439e+11     2  1.2720e+11      Prob > F =  0.0193
    Residual |  1.9752e+10     3  6.5839e+09      R-squared     =  0.9280
-------------+------------------------------      Adj R-squared =  0.8799
  Total |  2.7415e+11     5  5.4829e+10      Root MSE =   81141

------------------------------------------------------------------------------
 summit | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   153924.4   94960.72     1.62   0.203 -148283    456131.7
  year2 |  -4794.161   13279.81    -0.36   0.742    -47056.45    37468.13
  _cons |    1108010   145149.4     7.63   0.005     646079.4     1569940
------------------------------------------------------------------------------

. reg trumbull year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   28.96
  Model |  6.6016e+10     2  3.3008e+10      Prob > F =  0.0109
    Residual |  3.4193e+09     3  1.1398e+09      R-squared     =  0.9508
-------------+------------------------------      Adj R-squared =  0.9179
  Total |  6.9435e+10     5  1.3887e+10      Root MSE =   33760

------------------------------------------------------------------------------
    trumbull | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   84286.42   39510.29     2.13   0.123    -41452.97    210025.8
  year2 |  -3293.661    5525.33    -0.60   0.593    -20877.73     14290.4
  _cons |    1141773    60392.3    18.91   0.000     949577.4     1333968
------------------------------------------------------------------------------

. reg tuscarawas year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+-----------------------------      F(  2,     3) =   85.27
  Model |  4.9801e+09     2  2.4901e+09      Prob > F =  0.0023
    Residual |  87607862.5     3  29202620.8      R-squared     =  0.9827
-------------+------------------------------      Adj R-squared =  0.9712
  Total |  5.0677e+09     5  1.0135e+09      Root MSE =  5403.9

------------------------------------------------------------------------------
  tuscarawas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -6855.046   6324.331    -1.08   0.358    -26981.89     13271.8
  year2 |   3289.411   884.4281     3.72   0.034     474.7658    6104.056
  _cons |   388303.1   9666.871    40.17   0.000     357538.8    419067.4
------------------------------------------------------------------------------

. reg union year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+-----------------------------      F(  2,     3) =   33.00
  Model |  2.3269e+09     2  1.1634e+09      Prob > F =  0.0091
    Residual |   105753620     3  35251206.6      R-squared     =  0.9565
-------------+------------------------------      Adj R-squared =  0.9275
  Total |  2.4326e+09     5   486523632      Root MSE =  5937.3

------------------------------------------------------------------------------
  union | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   3483.714   6948.494     0.50   0.651    -18629.49    25596.92
  year2 |   1132.571   971.7143     1.17   0.328    -1959.857   4225
```

```
  _cons |     249281   10620.92    23.47   0.000     215480.5    283081.5
------------------------------------------------------------------------------

. reg vanwert year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   33.16
  Model |   728774888     2   364387444      Prob > F =  0.0090
    Residual |  32966639.3     3  10988879.8      R-squared     =  0.9567
-------------+------------------------------      Adj R-squared =  0.9279
  Total |   761741527     5   152348305      Root MSE =  3314.9

------------------------------------------------------------------------------
     vanwert | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   12390.18   3879.541     3.19   0.050     43.75028    24736.61
  year2 |  -866.0179   542.5357    -1.60   0.209    -2592.609    860.5729
  _cons |   132911.3   5929.959    22.41   0.000     114039.5    151783.1
------------------------------------------------------------------------------

. reg vinton year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   10.06
  Model |   409679697     2   204839849      Prob > F =  0.0468
    Residual |  61111513.5     3  20370504.5      R-squared     =  0.8702
-------------+------------------------------      Adj R-squared =  0.7837
  Total |   470791211     5  94158242.2      Root MSE =  4513.4

------------------------------------------------------------------------------
 vinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   1379.164   5282.075     0.26   0.811    -15430.76    18189.08
  year2 |   486.6786   738.6735     0.66   0.557     -1864.11    2837.467
  _cons |    88819.8   8073.761    11.00   0.002     63125.49    114514.1
------------------------------------------------------------------------------

. reg warren year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   10.11
  Model |  1.2051e+09     2   602543938      Prob > F =  0.0464
    Residual |   178774784     3  59591594.6      R-squared     =  0.8708
-------------+------------------------------      Adj R-squared =  0.7847
  Total |  1.3839e+09     5   276772532      Root MSE =  7719.6

------------------------------------------------------------------------------
 warren | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -39614.56   9034.335    -4.38   0.022    -68365.85   -10863.28
  year2 |   5680.554   1263.409     4.50   0.021     1659.821    9701.286
  _cons |   294488.9   13809.17    21.33   0.000  250542    338435.8
------------------------------------------------------------------------------

. reg washington year year2

 Source |  SS   df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   30.25
  Model |  3.9184e+09     2  1.9592e+09      Prob > F =  0.0103
    Residual |   194297978     3  64765992.6      R-squared     =  0.9528
-------------+------------------------------      Adj R-squared =  0.9213
  Total |  4.1127e+09     5   822543378      Root MSE =  8047.7
```

```
------------------------------------------------------------------------------
  washington | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   52150.09   9418.401     5.54   0.012     22176.53    82123.64
  year2 |  -8608.857   1317.119    -6.54   0.007    -12800.52   -4417.196
  _cons |   497035.2   14396.22    34.53   0.000  451220    542850.4
------------------------------------------------------------------------------

. reg wayne year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    5.63
  Model |  1.0279e+10     2  5.1395e+09      Prob > F =  0.0964
    Residual |  2.7373e+09     3   912424414      R-squared     =  0.7897
-------------+------------------------------      Adj R-squared =  0.6495
  Total |  1.3016e+10     5  2.6033e+09      Root MSE =   30206

------------------------------------------------------------------------------
  wayne | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   117884.6   35351.03     3.33   0.045 5381.88    230387.4
  year2 |  -15752.84   4943.677    -3.19   0.050    -31485.83   -19.85353
  _cons |   628048.3   54034.79    11.62   0.001     456085.5    800011.1
------------------------------------------------------------------------------

. reg williams year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   13.84
  Model |  2.9127e+09     2  1.4564e+09      Prob > F =  0.0306
    Residual |   315608176     3   105202725      R-squared     =  0.9022
-------------+------------------------------      Adj R-squared =  0.8371
  Total |  3.2283e+09     5   645666675      Root MSE =   10257

------------------------------------------------------------------------------
    williams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   19577.53   12003.76     1.63   0.201    -18623.78    57778.84
  year2 |  -964.7857   1678.669    -0.57   0.606     -6307.06    4377.489
  _cons |   242520.4   18347.99    13.22   0.001     184128.9    300911.9
------------------------------------------------------------------------------

. reg wood year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =    1.02
  Model |   460180767     2   230090383      Prob > F =  0.4583
    Residual |   674466633     3   224822211      R-squared     =  0.4056
-------------+------------------------------      Adj R-squared =  0.0093
  Total |  1.1346e+09     5   226929480      Root MSE =   14994

------------------------------------------------------------------------------
   wood | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |   5657.396   17547.82     0.32   0.768    -50187.61     61502.4
  year2 |  -75.80357   2453.981    -0.03   0.977    -7885.467     7733.86
  _cons |   630583.3   26822.21    23.51   0.000  545223    715943.6
------------------------------------------------------------------------------

. reg wyandot year year2

 Source |  SS  df  MS    Number of obs =  6
-------------+------------------------------      F(  2,     3) =   34.85
```

```
  Model |   962768265     2   481384132      Prob > F =  0.0084
    Residual |  41441990.8     3  13813996.9      R-squared     =  0.9587
-------------+------------------------------      Adj R-squared =  0.9312
  Total |  1.0042e+09     5   200842051      Root MSE =  3716.7

------------------------------------------------------------------------------
     wyandot | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   year |  -4989.421    4349.74    -1.15   0.335    -18832.24    8853.394
  year2 |   1710.464   608.2909     2.81   0.067    -225.3887    3646.317
  _cons |   131251.6   6648.668    19.74   0.000     110092.6    152410.6
------------------------------------------------------------------------------
```

County Lag Forecasts

```
. reg adams var2

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   15.08
  Model |   213474041     1   213474041      Prob > F =  0.0302
    Residual |  42460142.2     3  14153380.7      R-squared     =  0.8341
-------------+------------------------------      Adj R-squared =  0.7788
  Total |   255934183     4  63983545.7      Root MSE =  3762.1

------------------------------------------------------------------------------
  adams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   var2 |   .8451113   .2176063     3.88   0.030     .1525909    1.537632
  _cons |   25777.55   28377.82     0.91   0.431    -64533.34    116088.4
------------------------------------------------------------------------------

. reg allen var4

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.44
  Model |   736372349     1   736372349      Prob > F =  0.3159
    Residual |  1.5313e+09     3   510417310      R-squared     =  0.3247
-------------+------------------------------      Adj R-squared =  0.0996
  Total |  2.2676e+09     4   566906070      Root MSE =   22592

------------------------------------------------------------------------------
  allen | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   var4 |   .5269046   .4386781     1.20   0.316    -.8691648    1.922974
  _cons |   165793.8   163892.7     1.01   0.386    -355785.8    687373.5
------------------------------------------------------------------------------

. reg ashland var6

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.01
  Model |  1675188.99     1  1675188.99      Prob > F =  0.9401
    Residual |   753872224     3   251290741      R-squared     =  0.0022
-------------+------------------------------      Adj R-squared = -0.3304
  Total |   755547413     4   188886853      Root MSE =   15852

------------------------------------------------------------------------------
     ashland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   var6 |  -.1145754   1.403291    -0.08   0.940    -4.580473    4.351322
  _cons |   362115.8   445720.7     0.81   0.476     -1056366     1780598
------------------------------------------------------------------------------
```

```
. reg ashtabula var8

 Source |  SS   df   MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.78
  Model |   349057110     1   349057110      Prob > F =  0.4413
    Residual |  1.3366e+09     3   445519974      R-squared     =  0.2071
-------------+------------------------------      Adj R-squared = -0.0572
  Total |  1.6856e+09     4   421404258      Root MSE =   21107

------------------------------------------------------------------------------
   ashtabula | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   var8 |   1.064861   1.203034     0.89   0.441    -2.763732    4.893453
  _cons |  -10797.06     316927    -0.03   0.975     -1019400    997806.2
------------------------------------------------------------------------------

. reg athens var10

 Source |  SS   df   MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.27
  Model |    10294675     1    10294675      Prob > F =  0.1682
    Residual |  9443071.78     3  3147690.59      R-squared     =  0.5216
-------------+------------------------------      Adj R-squared =  0.3621
  Total |  19737746.8     4   4934436.7      Root MSE =  1774.2

------------------------------------------------------------------------------
 athens | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var10 |   -1.28434   .7101818    -1.81   0.168    -3.544455     .975776
  _cons |   226633.1   70124.29     3.23   0.048     3466.274    449799.9
------------------------------------------------------------------------------

. reg auglaize var12

 Source |  SS   df   MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.82
  Model |  65119793.7     1  65119793.7      Prob > F =  0.4314
    Residual |   237574272     3  79191423.8      R-squared     =  0.2151
-------------+------------------------------      Adj R-squared = -0.0465
  Total |   302694065     4  75673516.3      Root MSE =    8899

------------------------------------------------------------------------------
    auglaize | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var12 |   .3687857   .4066836     0.91   0.431    -.9254631    1.663035
  _cons |   156303.2   98761.51     1.58   0.212 -158000    470606.4
------------------------------------------------------------------------------

. reg belmont var14

 Source |  SS   df   MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    4.20
  Model |  3.3219e+09     1  3.3219e+09      Prob > F =  0.1328
    Residual |  2.3729e+09     3   790960991      R-squared     =  0.5833
-------------+------------------------------      Adj R-squared =  0.4444
  Total |  5.6948e+09     4  1.4237e+09      Root MSE =   28124

------------------------------------------------------------------------------
     belmont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var14 |   1.919005   .9363993     2.05   0.133    -1.061035    4.899046
  _cons |  -300596.9     325056    -0.92   0.423     -1335070    733876.3
```

```
------------------------------------------------------------------------------

. reg brown var16

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.01
  Model |  3321160.24     1  3321160.24      Prob > F =  0.9125
    Residual |   698185131     3   232728377      R-squared     =  0.0047
-------------+------------------------------      Adj R-squared = -0.3270
  Total |   701506291     4   175376573      Root MSE =   15255

------------------------------------------------------------------------------
  brown | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var16 |  -.0652739   .5464107    -0.12   0.912    -1.804197    1.673649
  _cons |   184988.1   91570.23     2.02   0.137    -106429.2    476405.5
------------------------------------------------------------------------------

. reg butler var18

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.05
  Model |   439324205     1   439324205      Prob > F =  0.8300
    Residual |  2.4046e+10     3  8.0154e+09      R-squared     =  0.0179
-------------+------------------------------      Adj R-squared = -0.3094
  Total |  2.4485e+10     4  6.1213e+09      Root MSE =   89529

------------------------------------------------------------------------------
 butler | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var18 |   -.080704   .3447181    -0.23   0.830    -1.177751    1.016343
  _cons |    1097472   338192.4     3.25   0.048     21192.62     2173751
------------------------------------------------------------------------------

. reg carroll var20

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.00
  Model |  10028.9479     1  10028.9479      Prob > F =  0.9638
    Residual |  12403175.9     3  4134391.95      R-squared     =  0.0008
-------------+------------------------------      Adj R-squared = -0.3323
  Total |  12413204.8     4   3103301.2      Root MSE =  2033.3

------------------------------------------------------------------------------
     carroll | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var20 |  -.0113779    .231015    -0.05   0.964    -.7465707    .7238149
  _cons |   169225.5   38114.88     4.44   0.021     47926.94 290524
------------------------------------------------------------------------------

. reg champaign var22

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    2.85
  Model |   136346627     1   136346627      Prob > F =  0.1897
    Residual |   143292040     3  47764013.4      R-squared     =  0.4876
-------------+------------------------------      Adj R-squared =  0.3168
  Total |   279638667     4  69909666.8      Root MSE =  6911.2

------------------------------------------------------------------------------
   champaign | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var22 |   1.136514   .6726713     1.69   0.190    -1.004227    3.277254
```

```
  _cons |  -13762.21    85761.7    -0.16   0.883    -286694.2    259169.8
------------------------------------------------------------------------------

. reg clark var24

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.28
  Model |  1.1813e+10     1  1.1813e+10      Prob > F =  0.1680
    Residual |  1.0819e+10     3  3.6064e+09      R-squared     =  0.5220
-------------+------------------------------      Adj R-squared =  0.3626
  Total |  2.2632e+10     4  5.6581e+09      Root MSE =   60053

------------------------------------------------------------------------------
  clark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var24 |   .6674239   .3687735     1.81   0.168     -.506178    1.841026
  _cons |   70827.51   111352.9     0.64   0.570 -283547 425202
------------------------------------------------------------------------------

. reg clermont var26

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.82
  Model |  1.6187e+09     1  1.6187e+09      Prob > F =  0.2706
    Residual |  2.6744e+09     3   891459299      R-squared     =  0.3770
-------------+------------------------------      Adj R-squared =  0.1694
  Total |  4.2930e+09     4  1.0733e+09      Root MSE =   29857

------------------------------------------------------------------------------
    clermont | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var26 |   .6722504   .4988904     1.35   0.271    -.9154416    2.259942
  _cons |   150576.2   210726.7     0.71   0.526    -520050.3    821202.7
------------------------------------------------------------------------------

. reg clinton var28

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.63
  Model |  21712036.5     1  21712036.5      Prob > F =  0.2917
    Residual |  39987088.7     3  13329029.6      R-squared     =  0.3519
-------------+------------------------------      Adj R-squared =  0.1359
  Total |  61699125.2     4  15424781.3      Root MSE =  3650.9

------------------------------------------------------------------------------
     clinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var28 |    .310634   .2433873     1.28   0.292    -.4639331    1.085201
  _cons |   109760.5   37919.91     2.89   0.063    -10917.59    230438.6
------------------------------------------------------------------------------

. reg columbiana var30

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.66
  Model |  1.0775e+09     1  1.0775e+09      Prob > F =  0.4755
    Residual |  4.8840e+09     3  1.6280e+09      R-squared     =  0.1807
-------------+------------------------------      Adj R-squared = -0.0923
  Total |  5.9615e+09     4  1.4904e+09      Root MSE =   40348

------------------------------------------------------------------------------
  columbiana | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
  var30 |   .5847802     .71881     0.81   0.475    -1.702794    2.872354
  _cons |   258534.7   435584.1     0.59   0.595     -1127688     1644758
------------------------------------------------------------------------------

. reg coshocton var32

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.37
  Model |  79795605.7     1  79795605.7      Prob > F =  0.3257
    Residual |   174170080     3  58056693.2      R-squared     =  0.3142
-------------+------------------------------      Adj R-squared =  0.0856
  Total |   253965685     4  63491421.3      Root MSE =  7619.5

------------------------------------------------------------------------------
   coshocton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var32 |  -.5060399   .4316398    -1.17   0.326     -1.87971    .8676305
  _cons |   251902.7   71720.94     3.51   0.039     23654.63    480150.7
------------------------------------------------------------------------------

. reg crawford var34

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.03
  Model |  8075770.44     1  8075770.44      Prob > F =  0.3842
    Residual |  23444504.8     3  7814834.92      R-squared     =  0.2562
-------------+------------------------------      Adj R-squared =  0.0083
  Total |  31520275.2     4   7880068.8      Root MSE =  2795.5

------------------------------------------------------------------------------
    crawford | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var34 |     .35149   .3457649     1.02   0.384    -.7488882    1.451868
  _cons |    68112.6    35248.7     1.93   0.149     -44064.5    180289.7
------------------------------------------------------------------------------

. reg cuyahoga var36

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   29.27
  Model |  7.9116e+10     1  7.9116e+10      Prob > F =  0.0124
    Residual |  8.1087e+09     3  2.7029e+09      R-squared     =  0.9070
-------------+------------------------------      Adj R-squared =  0.8760
  Total |  8.7225e+10     4  2.1806e+10      Root MSE =   51989

------------------------------------------------------------------------------
    cuyahoga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var36 |   .8724783   .1612639     5.41   0.012     .3592645    1.385692
  _cons |   287348.9   225008.8     1.28   0.291    -428729.4     1003427
------------------------------------------------------------------------------

. reg darke var38

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    6.57
  Model |  2.0599e+09     1  2.0599e+09      Prob > F =  0.0830
    Residual |   940745750     3   313581917      R-squared     =  0.6865
-------------+------------------------------      Adj R-squared =  0.5820
  Total |  3.0006e+09     4   750160646      Root MSE =   17708

------------------------------------------------------------------------------
  darke | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
  var38 |   .9401092   .3668015     2.56   0.083    -.2272168    2.107435
  _cons |   46642.95   197386.1     0.24   0.828    -581527.7    674813.6
------------------------------------------------------------------------------

. reg defiance var40

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   19.25
  Model |  1.8249e+10     1  1.8249e+10      Prob > F =  0.0219
    Residual |  2.8433e+09     3   947767764      R-squared     =  0.8652
-------------+------------------------------      Adj R-squared =  0.8203
  Total |  2.1092e+10     4  5.2730e+09      Root MSE =   30786

------------------------------------------------------------------------------
    defiance | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var40 |   1.353839   .3085338     4.39   0.022 .371947    2.335732
  _cons |  -37579.94   69700.22    -0.54   0.627    -259397.1    184237.3
------------------------------------------------------------------------------

. reg delaware var42

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.55
  Model |  29991809.3     1  29991809.3      Prob > F =  0.3017
    Residual |  58093883.9     3    19364628      R-squared     =  0.3405
-------------+------------------------------      Adj R-squared =  0.1206
  Total |  88085693.2     4  22021423.3      Root MSE =  4400.5

------------------------------------------------------------------------------
    delaware | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var42 |   .5721879   .4597713     1.24   0.302    -.8910097    2.035386
  _cons |   72682.38   74499.94     0.98   0.401    -164409.7    309774.5
------------------------------------------------------------------------------

. reg erie var44

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    4.69
  Model |   317658965     1   317658965      Prob > F =  0.1190
    Residual |   203289896     3  67763298.5      R-squared     =  0.6098
-------------+------------------------------      Adj R-squared =  0.4797
  Total |   520948861     4   130237215      Root MSE =  8231.8

------------------------------------------------------------------------------
   erie | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var44 |   .7344408   .3392138     2.17   0.119    -.3450889     1.81397
  _cons |   49640.95   52221.22     0.95   0.412    -116550.3    215832.2
------------------------------------------------------------------------------

. reg fairfield var46

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.06
  Model |   128876887     1   128876887      Prob > F =  0.1786
    Residual |   126420968     3  42140322.6      R-squared     =  0.5048
-------------+------------------------------      Adj R-squared =  0.3397
  Total |   255297855     4  63824463.7      Root MSE =  6491.6

------------------------------------------------------------------------------
```

```
   fairfield | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var46 |   .6441588   .3683447     1.75   0.179    -.5280783    1.816396
  _cons |    73058.8   68837.45     1.06   0.366    -146012.7    292130.3
------------------------------------------------------------------------------

. reg fayette var48

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    1.18
  Model |  29744037.9     1  29744037.9      Prob > F =  0.3575
    Residual |  75848289.3     3  25282763.1      R-squared     =  0.2817
-------------+------------------------------           Adj R-squared =  0.0422
  Total |   105592327     4  26398081.8      Root MSE =  5028.2

------------------------------------------------------------------------------
     fayette | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var48 |   .4694962   .4328569     1.08   0.357    -.9080477     1.84704
  _cons |   76529.62   61282.47     1.25   0.300    -118498.6    271557.8
------------------------------------------------------------------------------

. reg franklin var50

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =   11.25
  Model |  2.3114e+11     1  2.3114e+11      Prob > F =  0.0439
    Residual |  6.1644e+10     3  2.0548e+10      R-squared     =  0.7895
-------------+------------------------------           Adj R-squared =  0.7193
  Total |  2.9278e+11     4  7.3195e+10      Root MSE =  1.4e+05

------------------------------------------------------------------------------
    franklin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var50 |    2.05657   .6131909     3.35   0.044     .1051231    4.008018
  _cons |   -2314079    1423434    -1.63   0.202     -6844082     2215924
------------------------------------------------------------------------------

. reg fulton var52

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    0.37
  Model |   113219608     1   113219608      Prob > F =  0.5857
    Residual |   916710073     3   305570024      R-squared     =  0.1099
-------------+------------------------------           Adj R-squared = -0.1868
  Total |  1.0299e+09     4   257482420      Root MSE =   17481

------------------------------------------------------------------------------
 fulton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var52 |  -.3428413   .5632325    -0.61   0.586    -2.135299    1.449616
  _cons |   457213.3     187141     2.44   0.092 -138353     1052779
------------------------------------------------------------------------------

. reg gallia var54

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    0.09
  Model |  2861394.78     1  2861394.78      Prob > F =  0.7815
    Residual |    93366374     3  31122124.7      R-squared     =  0.0297
-------------+------------------------------           Adj R-squared = -0.2937
  Total |  96227768.8     4  24056942.2      Root MSE =  5578.7
```

```
------------------------------------------------------------------------------
 gallia | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var54 |  -.1627489   .5367398    -0.30   0.782    -1.870894    1.545397
  _cons |   244133.1   111165.6     2.20   0.116    -109645.4    597911.5
------------------------------------------------------------------------------

. reg geauga var56

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    4.93
  Model |  2.3481e+10     1  2.3481e+10      Prob > F =  0.1131
    Residual |  1.4301e+10     3  4.7669e+09      R-squared     =  0.6215
-------------+------------------------------      Adj R-squared =  0.4953
  Total |  3.7781e+10     4  9.4453e+09      Root MSE =   69043

------------------------------------------------------------------------------
 geauga | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var56 |   .6921063   .3118429     2.22   0.113     -.300317     1.68453
  _cons |    62840.1   104838.1     0.60   0.591    -270801.6    396481.8
------------------------------------------------------------------------------

. reg greene var58

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.05
  Model |  1.0728e+09     1  1.0728e+09      Prob > F =  0.3808
    Residual |  3.0630e+09     3  1.0210e+09      R-squared     =  0.2594
-------------+------------------------------      Adj R-squared =  0.0125
  Total |  4.1358e+09     4  1.0339e+09      Root MSE =   31953

------------------------------------------------------------------------------
 greene | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var58 |   .6406598   .6250165     1.03   0.381    -1.348422    2.629741
  _cons |   52865.87     131020     0.40   0.714    -364098.4    469830.1
------------------------------------------------------------------------------

. reg guernsey var60

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   13.61
  Model |   851281150     1   851281150      Prob > F =  0.0345
    Residual |   187680719     3  62560239.7      R-squared     =  0.8194
-------------+------------------------------      Adj R-squared =  0.7591
  Total |  1.0390e+09     4   259740467      Root MSE =  7909.5

------------------------------------------------------------------------------
    guernsey | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var60 |    1.30836   .3546826     3.69   0.035     .1796015    2.437118
  _cons |  -41155.88   56203.76    -0.73   0.517    -220021.3    137709.6
------------------------------------------------------------------------------

. reg hamilton var62

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    6.22
  Model |  5.6769e+10     1  5.6769e+10      Prob > F =  0.0882
    Residual |  2.7391e+10     3  9.1304e+09      R-squared     =  0.6745
-------------+------------------------------      Adj R-squared =  0.5660
  Total |  8.4160e+10     4  2.1040e+10      Root MSE =   95553
```

```
------------------------------------------------------------------------------
    hamilton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var62 |   .8218905   .3296125     2.49   0.088    -.2270836    1.870865
  _cons |     407470   594094.4     0.69   0.542     -1483204     2298144
------------------------------------------------------------------------------

. reg hardin var66

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   21.31
  Model |   310959636     1   310959636      Prob > F =  0.0191
    Residual |  43777167.6     3  14592389.2      R-squared     =  0.8766
-------------+------------------------------      Adj R-squared =  0.8355
  Total |   354736803     4  88684200.8      Root MSE =    3820

------------------------------------------------------------------------------
 hardin | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var66 |   1.044914    .226356     4.62   0.019     .3245488     1.76528
  _cons |  -2699.031   38353.11    -0.07   0.948    -124755.8    119357.7
------------------------------------------------------------------------------

. reg harrison var68

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    6.00
  Model |   134764234     1   134764234      Prob > F =  0.0917
    Residual |  67350123.6     3  22450041.2      R-squared     =  0.6668
-------------+------------------------------      Adj R-squared =  0.5557
  Total |   202114357     4  50528589.3      Root MSE =  4738.1

------------------------------------------------------------------------------
    harrison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var68 |   .6855909   .2798249     2.45   0.092    -.2049367    1.576119
  _cons |   36854.97   29990.58     1.23   0.307    -58588.44    132298.4
------------------------------------------------------------------------------

. reg henry var70

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.25
  Model |  2587043.67     1  2587043.67      Prob > F =  0.6500
    Residual |  30759845.1     3  10253281.7      R-squared     =  0.0776
-------------+------------------------------      Adj R-squared = -0.2299
  Total |  33346888.8     4   8336722.2      Root MSE =  3202.1

------------------------------------------------------------------------------
  henry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var70 |   .0644064   .1282209     0.50   0.650    -.3436497    .4724625
  _cons |   299884.3   40458.58     7.41   0.005  171127    428641.5
------------------------------------------------------------------------------

. reg highland var72

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   17.81
  Model |   249728103     1   249728103      Prob > F =  0.0243
    Residual |  42076715.3     3  14025571.8      R-squared     =  0.8558
-------------+------------------------------      Adj R-squared =  0.8077
```

```
  Total |   291804818     4  72951204.5      Root MSE =  3745.1

------------------------------------------------------------------------------
    highland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var72 |    .955506   .2264436     4.22   0.024     .2348615    1.676151
  _cons |   12245.05   34773.09     0.35   0.748    -98418.44    122908.5
------------------------------------------------------------------------------

. reg hocking var74

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.25
  Model |  8677220.86     1  8677220.86      Prob > F =  0.6541
    Residual |   105922578     3    35307526      R-squared     =  0.0757
-------------+------------------------------      Adj R-squared = -0.2324
  Total |   114599799     4  28649949.7      Root MSE =    5942

------------------------------------------------------------------------------
     hocking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var74 |   .2400101    .484142     0.50   0.654    -1.300746    1.780766
  _cons |   76805.23   47373.23     1.62   0.203    -73957.54 227568
------------------------------------------------------------------------------

. reg holmes var76

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    9.04
  Model |  1.8991e+09     1  1.8991e+09      Prob > F =  0.0574
    Residual |   630270736     3   210090245      R-squared     =  0.7508
-------------+------------------------------      Adj R-squared =  0.6678
  Total |  2.5294e+09     4   632340229      Root MSE =   14494

------------------------------------------------------------------------------
 holmes | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var76 |   .8013215   .2665244     3.01   0.057     -.046878    1.649521
  _cons |   78983.94   81900.22     0.96   0.406    -181659.1 339627
------------------------------------------------------------------------------

. reg huron var78

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.03
  Model |  625180.997     1  625180.997      Prob > F =  0.8801
    Residual |  69690528.2     3  23230176.1      R-squared     =  0.0089
-------------+------------------------------      Adj R-squared = -0.3215
  Total |  70315709.2     4  17578927.3      Root MSE =  4819.8

------------------------------------------------------------------------------
  huron | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var78 |   -.039732   .2421941    -0.16   0.880    -.8105016    .7310376
  _cons |   307168.9   70696.13     4.34   0.023     82182.27    532155.6
------------------------------------------------------------------------------

. reg jackson var80

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.49
  Model |  30499288.3     1  30499288.3      Prob > F =  0.5337
    Residual |   186098901     3  62032966.8      R-squared     =  0.1408
```

```
-------------+------------------------------          Adj R-squared = -0.1456
  Total |   216598189     4  54149547.2      Root MSE =  7876.1

------------------------------------------------------------------------------
     jackson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var80 |   .2942412   .4196333     0.70   0.534    -1.041219    1.629702
  _cons |   121902.6   70934.78     1.72   0.184    -103843.5    347648.8
------------------------------------------------------------------------------

. reg jefferson var82

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------          F(  1,     3) =   10.62
  Model |  4.2493e+09     1  4.2493e+09      Prob > F =  0.0472
    Residual |  1.2005e+09     3   400178092      R-squared     =  0.7797
-------------+------------------------------          Adj R-squared =  0.7063
  Total |  5.4499e+09     4  1.3625e+09      Root MSE =   20004

------------------------------------------------------------------------------
   jefferson | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var82 |   1.298865    .398593     3.26   0.047     .0303642    2.567366
  _cons |  -40437.67   78636.29    -0.51   0.643    -290693.4    209818.1
------------------------------------------------------------------------------

. reg knox var84

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------          F(  1,     3) =  113.02
  Model |   390628248     1   390628248      Prob > F =  0.0018
    Residual |  10368631.3     3  3456210.42      R-squared     =  0.9741
-------------+------------------------------          Adj R-squared =  0.9655
  Total |   400996879     4   100249220      Root MSE =  1859.1

------------------------------------------------------------------------------
   knox | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var84 |   .9686558   .0911145    10.63   0.002     .6786886    1.258623
  _cons |   13229.11    18467.4     0.72   0.526    -45542.39    72000.62
------------------------------------------------------------------------------

. reg lake var86

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------          F(  1,     3) =    2.01
  Model |  10106628.1     1  10106628.1      Prob > F =  0.2509
    Residual |  15054686.7     3   5018228.9      R-squared     =  0.4017
-------------+------------------------------          Adj R-squared =  0.2022
  Total |  25161314.8     4   6290328.7      Root MSE =  2240.1

------------------------------------------------------------------------------
   lake | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var86 |  -.7113538   .5012539    -1.42   0.251    -2.306567    .8838598
  _cons |   252219.5   73962.19     3.41   0.042     16838.82    487600.2
------------------------------------------------------------------------------

. reg lawrence var88

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------          F(  1,     3) =    0.99
  Model |  61821349.1     1  61821349.1      Prob > F =  0.3937
```

```
    Residual |   187915143     3    62638381      R-squared     =  0.2475
-------------+-----------------------------      Adj R-squared = -0.0033
  Total |   249736492     4    62434123      Root MSE =  7914.4

------------------------------------------------------------------------------
    lawrence | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var88 |   .2750352   .2768467     0.99   0.394    -.6060146    1.156085
  _cons |   158961.4    62580.6     2.54   0.085  -40198    358120.8
------------------------------------------------------------------------------

. reg licking var90

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =    0.06
  Model |  4329669.84     1  4329669.84      Prob > F =  0.8277
    Residual |   230604659     3  76868219.8      R-squared     =  0.0184
-------------+-----------------------------      Adj R-squared = -0.3088
  Total |   234934329     4  58733582.3      Root MSE =  8767.5

------------------------------------------------------------------------------
     licking | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var90 |  -.1955497   .8239543    -0.24   0.828     -2.81774    2.426641
  _cons |   381389.7     259205     1.47   0.238    -443516.3     1206296
------------------------------------------------------------------------------

. reg logan var92

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =   27.56
  Model |  2.5441e+09     1  2.5441e+09      Prob > F =  0.0135
    Residual |   276910444     3  92303481.3      R-squared     =  0.9018
-------------+-----------------------------      Adj R-squared =  0.8691
  Total |  2.8210e+09     4   705257104      Root MSE =  9607.5

------------------------------------------------------------------------------
  logan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var92 |    3.47791   .6624586     5.25   0.013     1.369671    5.586148
  _cons |  -320419.1   89404.83    -3.58   0.037    -604945.2   -35893.06
------------------------------------------------------------------------------

. reg lorain var94

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =   15.06
  Model |  2.0199e+09     1  2.0199e+09      Prob > F =  0.0303
    Residual |   402363776     3   134121259      R-squared     =  0.8339
-------------+-----------------------------      Adj R-squared =  0.7785
  Total |  2.4223e+09     4   605573578      Root MSE =   11581

------------------------------------------------------------------------------
 lorain | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var94 |   .9725153   .2505977     3.88   0.030     .1750017    1.770029
  _cons |   21376.92   71038.43     0.30   0.783    -204699.1    247452.9
------------------------------------------------------------------------------

. reg lucas var96

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =    3.31
```

```
  Model |  2.7610e+09     1  2.7610e+09      Prob > F =  0.1663
    Residual |  2.5011e+09     3   833687316      R-squared     =  0.5247
-------------+------------------------------      Adj R-squared =  0.3663
  Total |  5.2621e+09     4  1.3155e+09      Root MSE =   28874

------------------------------------------------------------------------------
  lucas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var96 |   .8216068   .4514701     1.82   0.166    -.6151724    2.258386
  _cons |   167013.2     360107     0.46   0.674    -979008.1     1313035
------------------------------------------------------------------------------

. reg madison var98

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   10.37
  Model |  1.6343e+09     1  1.6343e+09      Prob > F =  0.0486
    Residual |   472800141     3   157600047      R-squared     =  0.7756
-------------+------------------------------      Adj R-squared =  0.7008
  Total |  2.1071e+09     4   526764728      Root MSE =   12554

------------------------------------------------------------------------------
     madison | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  var98 |   .9548818   .2965291     3.22   0.049     .0111937     1.89857
  _cons |    21335.2   63371.87     0.34   0.759    -180342.4    223012.8
------------------------------------------------------------------------------

. reg mahoning var100

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    2.26
  Model |  1.1294e+11     1  1.1294e+11      Prob > F =  0.2302
    Residual |  1.5025e+11     3  5.0082e+10      R-squared     =  0.4291
-------------+------------------------------      Adj R-squared =  0.2388
  Total |  2.6319e+11     4  6.5797e+10      Root MSE =  2.2e+05

------------------------------------------------------------------------------
    mahoning | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var100 |   .5428694   .3615052     1.50   0.230    -.6076015     1.69334
  _cons |     823615   553501.6     1.49   0.233    -937874.1     2585104
------------------------------------------------------------------------------

. reg marion var102

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.23
  Model |   148377076     1   148377076      Prob > F =  0.1702
    Residual |   137879779     3  45959926.3      R-squared     =  0.5183
-------------+------------------------------      Adj R-squared =  0.3578
  Total |   286256855     4  71564213.7      Root MSE =  6779.4

------------------------------------------------------------------------------
 marion | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var102 |   .7226491   .4021923     1.80   0.170    -.5573062    2.002604
  _cons |   45806.49   58288.03     0.79   0.489 -139692 231305
------------------------------------------------------------------------------

. reg medina var104

 Source |  SS  df  MS    Number of obs =  5
```

```
-------------+------------------------------           F(  1,     3) =   22.90
  Model |  4.4597e+09     1  4.4597e+09      Prob > F =  0.0174
    Residual |   584236981     3   194745660      R-squared     =  0.8842
-------------+------------------------------           Adj R-squared =  0.8456
  Total |  5.0439e+09     4  1.2610e+09      Root MSE =   13955

------------------------------------------------------------------------------
 medina | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var104 |   .9069731   .1895289     4.79   0.017     .3038076    1.510139
  _cons |   63838.19   76475.79     0.83   0.465    -179541.9    307218.3
------------------------------------------------------------------------------

. reg meigs var106

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    2.56
  Model |  45157360.1     1  45157360.1      Prob > F =  0.2079
    Residual |  52908764.7     3  17636254.9      R-squared     =  0.4605
-------------+------------------------------           Adj R-squared =  0.2806
  Total |  98066124.8     4  24516531.2      Root MSE =  4199.6

------------------------------------------------------------------------------
  meigs | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var106 |   .9432847   .5894972     1.60   0.208    -.9327583    2.819328
  _cons |   9730.206   63327.23     0.15   0.888    -191805.3    211265.7
------------------------------------------------------------------------------

. reg mercer var108

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    5.09
  Model |  1.2061e+10     1  1.2061e+10      Prob > F =  0.1094
    Residual |  7.1119e+09     3  2.3706e+09      R-squared     =  0.6291
-------------+------------------------------           Adj R-squared =  0.5054
  Total |  1.9173e+10     4  4.7933e+09      Root MSE =   48689

------------------------------------------------------------------------------
 mercer | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var108 |   .7692567    .341041     2.26   0.109    -.3160879    1.854601
  _cons |   157880.6   184918.5     0.85   0.456    -430612.8    746373.9
------------------------------------------------------------------------------

. reg miami var110

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------           F(  1,     3) =    2.52
  Model |   905868763     1   905868763      Prob > F =  0.2108
    Residual |  1.0797e+09     3   359896713      R-squared     =  0.4562
-------------+------------------------------           Adj R-squared =  0.2750
  Total |  1.9856e+09     4   496389726      Root MSE =   18971

------------------------------------------------------------------------------
  miami | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var110 |   .6499972   .4097017     1.59   0.211    -.6538565    1.953851
  _cons |   122961.1   128706.3     0.96   0.410    -286639.6    532561.9
------------------------------------------------------------------------------

. reg monroe var112
```

```
 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.90
  Model |  38302755.7     1  38302755.7      Prob > F =  0.4120
    Residual |   127169865     3  42389955.2      R-squared     =  0.2315
-------------+------------------------------      Adj R-squared = -0.0247
  Total |   165472621     4  41368155.3      Root MSE =  6510.8

------------------------------------------------------------------------------
 monroe | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var112 |   .4362146   .4588985     0.95   0.412    -1.024205    1.896634
  _cons |   74432.73   56662.74     1.31   0.280    -105893.4    254758.9
------------------------------------------------------------------------------

. reg montgomery var114

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   12.99
  Model |  2.2312e+10     1  2.2312e+10      Prob > F =  0.0367
    Residual |  5.1538e+09     3  1.7179e+09      R-squared     =  0.8124
-------------+------------------------------      Adj R-squared =  0.7498
  Total |  2.7466e+10     4  6.8665e+09      Root MSE =   41448

------------------------------------------------------------------------------
  montgomery | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var114 |    1.22029   .3386045     3.60   0.037     .1426994    2.297881
  _cons |  -147043.2   286645.6    -0.51   0.643     -1059278    765191.1
------------------------------------------------------------------------------

. reg morgan var116

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =   15.88
  Model |  94763805.9     1  94763805.9      Prob > F =  0.0283
    Residual |  17899311.3     3  5966437.11      R-squared     =  0.8411
-------------+------------------------------      Adj R-squared =  0.7882
  Total |   112663117     4  28165779.3      Root MSE =  2442.6

------------------------------------------------------------------------------
 morgan | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var116 |   .9044979   .2269571     3.99   0.028 .182219    1.626777
  _cons |   11967.29   20008.97     0.60   0.592    -51710.17    75644.76
------------------------------------------------------------------------------

. reg morrow var118

 Source |  SS  df  MS    Number of obs =  5
-------------+-----------------------------      F(  1,     3) =    1.81
  Model |  37970337.4     1  37970337.4      Prob > F =  0.2714
    Residual |  63020385.4     3  21006795.1      R-squared     =  0.3760
-------------+------------------------------      Adj R-squared =  0.1680
  Total |   100990723     4  25247680.7      Root MSE =  4583.3

------------------------------------------------------------------------------
 morrow | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var118 |    .486919   .3621716     1.34   0.271    -.6656727    1.639511
  _cons |   68822.65   47622.62     1.45   0.244    -82733.77    220379.1
------------------------------------------------------------------------------

. reg muskingum var120
```

```
 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.20
  Model |   123418580     1   123418580      Prob > F =  0.6865
    Residual |  1.8695e+09     3   623170704      R-squared     =  0.0619
-------------+------------------------------      Adj R-squared = -0.2508
  Total |  1.9929e+09     4   498232673      Root MSE =   24963

------------------------------------------------------------------------------
   muskingum | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var120 |   .5101703    1.14638     0.45   0.686    -3.138121    4.158462
  _cons |   139055.4   304626.4     0.46   0.679    -830401.8     1108513
------------------------------------------------------------------------------

. reg noble var122

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   31.50
  Model |   584379316     1   584379316      Prob > F =  0.0112
    Residual |  55653097.1     3  18551032.4      R-squared     =  0.9130
-------------+------------------------------      Adj R-squared =  0.8841
  Total |   640032413     4   160008103      Root MSE =  4307.1

------------------------------------------------------------------------------
  noble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var122 |   1.286552   .2292261     5.61   0.011     .5570524    2.016052
  _cons |  -28852.32   28015.05    -1.03   0.379    -118008.7    60304.08
------------------------------------------------------------------------------

. reg ottawa var124

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.80
  Model |  18066582.6     1  18066582.6      Prob > F =  0.4367
    Residual |  67659800.2     3  22553266.7      R-squared     =  0.2107
-------------+------------------------------      Adj R-squared = -0.0523
  Total |  85726382.8     4  21431595.7      Root MSE =    4749

------------------------------------------------------------------------------
 ottawa | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var124 |   .4090215   .4569965     0.90   0.437    -1.045345    1.863388
  _cons |   86895.79   63885.22     1.36   0.267    -116415.5    290207.1
------------------------------------------------------------------------------

. reg paulding var126

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    2.55
  Model |   309411276     1   309411276      Prob > F =  0.2088
    Residual |   364384569     3   121461523      R-squared     =  0.4592
-------------+------------------------------      Adj R-squared =  0.2789
  Total |   673795845     4   168448961      Root MSE =   11021

------------------------------------------------------------------------------
    paulding | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var126 |   .5264458   .3298412     1.60   0.209    -.5232562    1.576148
  _cons | 72611   47506.65     1.53   0.224    -78576.36    223798.4
------------------------------------------------------------------------------
```

```
. reg perry var128

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.59
  Model |  6214626.53     1  6214626.53      Prob > F =  0.2970
    Residual |  11759900.3     3  3919966.76      R-squared     =  0.3457
-------------+------------------------------      Adj R-squared =  0.1277
  Total |  17974526.8     4   4493631.7      Root MSE =  1979.9

------------------------------------------------------------------------------
  perry | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var128 |   1.280169   1.016719     1.26   0.297    -1.955485    4.515822
  _cons |  -28440.45   106877.9    -0.27   0.807    -368573.7    311692.8
------------------------------------------------------------------------------

. reg pickaway var130

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.18
  Model |  2153030.98     1  2153030.98      Prob > F =  0.6981
    Residual |  35406872.2     3  11802290.7      R-squared     =  0.0573
-------------+------------------------------      Adj R-squared = -0.2569
  Total |  37559903.2     4   9389975.8      Root MSE =  3435.4

------------------------------------------------------------------------------
    pickaway | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var130 |  -.2052576   .4805707    -0.43   0.698    -1.734648    1.324133
  _cons |     151540   60294.96     2.51   0.087    -40345.53    343425.4
------------------------------------------------------------------------------

. reg pike var132

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   12.85
  Model |   395574061     1   395574061      Prob > F =  0.0372
    Residual |    92370932     3  30790310.7      R-squared     =  0.8107
-------------+------------------------------      Adj R-squared =  0.7476
  Total |   487944993     4   121986248      Root MSE =  5548.9

------------------------------------------------------------------------------
   pike | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var132 |   .7819427   .2181565     3.58   0.037     .0876715    1.476214
  _cons |   39260.61   32531.33     1.21   0.314    -64268.62    142789.8
------------------------------------------------------------------------------

. reg portage var134

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    6.98
  Model |  4.7315e+09     1  4.7315e+09      Prob > F =  0.0775
    Residual |  2.0322e+09     3   677391807      R-squared     =  0.6995
-------------+------------------------------      Adj R-squared =  0.5994
  Total |  6.7636e+09     4  1.6909e+09      Root MSE =   26027

------------------------------------------------------------------------------
     portage | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var134 |   .8133101    .307736     2.64   0.077    -.1660433    1.792664
  _cons |   128483.7   167366.7     0.77   0.499    -404151.7    661119.2
------------------------------------------------------------------------------
```

```
. reg preble var136

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.00
  Model |  72825.0349     1  72825.0349      Prob > F =  0.9816
    Residual |   347249844     3   115749948      R-squared     =  0.0002
-------------+------------------------------      Adj R-squared = -0.3331
  Total |   347322669     4  86830667.3      Root MSE =   10759

------------------------------------------------------------------------------
 preble | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var136 |  -.0134676   .5369204    -0.03   0.982    -1.722188    1.695253
  _cons |   271954.2   143190.6     1.90   0.154 -183742    727650.5
------------------------------------------------------------------------------

. reg putnam var138

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.19
  Model |  12232505.6     1  12232505.6      Prob > F =  0.6896
    Residual |   189363049     3  63121016.4      R-squared     =  0.0607
-------------+------------------------------      Adj R-squared = -0.2524
  Total |   201595555     4  50398888.7      Root MSE =  7944.9

------------------------------------------------------------------------------
 putnam | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var138 |  -.1833898   .4165858    -0.44   0.690    -1.509152    1.142372
  _cons |   258476.9   88636.13     2.92   0.062     -23602.8    540556.6
------------------------------------------------------------------------------

. reg richland var140

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.12
  Model |   2898931.7     1   2898931.7      Prob > F =  0.7522
    Residual |  72672215.1     3  24224071.7      R-squared     =  0.0384
-------------+------------------------------      Adj R-squared = -0.2822
  Total |  75571146.8     4  18892786.7      Root MSE =  4921.8

------------------------------------------------------------------------------
    richland | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var140 |   .1833487    .530008     0.35   0.752    -1.503373    1.870071
  _cons |   163540.9   105900.7     1.54   0.220    -173482.3    500564.1
------------------------------------------------------------------------------

. reg ross var142

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.48
  Model |  64304095.9     1  64304095.9      Prob > F =  0.5368
    Residual |   398880953     3   132960318      R-squared     =  0.1388
-------------+------------------------------      Adj R-squared = -0.1482
  Total |   463185049     4   115796262      Root MSE =   11531

------------------------------------------------------------------------------
   ross | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var142 |   1.062896   1.528384     0.70   0.537    -3.801105    5.926898
  _cons |  -5544.636   283537.1    -0.02   0.986    -907886.4    896797.1
```

```
------------------------------------------------------------------------------

. reg sandusky var144

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.50
  Model |   7824729.9     1   7824729.9      Prob > F =  0.5295
    Residual |  46713954.9     3  15571318.3      R-squared     =  0.1435
-------------+------------------------------      Adj R-squared = -0.1420
  Total |  54538684.8     4  13634671.2      Root MSE =  3946.1

------------------------------------------------------------------------------
    sandusky | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var144 |  -.1772132   .2499909    -0.71   0.530    -.9727958    .6183693
  _cons |     254720   53151.52     4.79   0.017     85568.16    423871.9
------------------------------------------------------------------------------

. reg scioto var146

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.00
  Model |    535.7694     1    535.7694      Prob > F =  0.9959
    Residual |  51933065.4     3  17311021.8      R-squared     =  0.0000
-------------+------------------------------      Adj R-squared = -0.3333
  Total |  51933601.2     4  12983400.3      Root MSE =  4160.7

------------------------------------------------------------------------------
 scioto | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var146 |  -.0024309   .4369554    -0.01   0.996    -1.393018    1.388156
  _cons |   272574.7   117957.9     2.31   0.104    -102820.1    647969.6
------------------------------------------------------------------------------

. reg seneca var148

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.01
  Model |  237091.673     1  237091.673      Prob > F =  0.9363
    Residual |  94528777.1     3  31509592.4      R-squared     =  0.0025
-------------+------------------------------      Adj R-squared = -0.3300
  Total |  94765868.8     4  23691467.2      Root MSE =  5613.3

------------------------------------------------------------------------------
 seneca | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var148 |   .0376097   .4335735     0.09   0.936    -1.342215    1.417434
  _cons |   220502.7   98800.28     2.23   0.112     -93923.9    534929.3
------------------------------------------------------------------------------

. reg shelby var150

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    1.32
  Model |   550000223     1   550000223      Prob > F =  0.3343
    Residual |  1.2527e+09     3   417570774      R-squared     =  0.3051
-------------+------------------------------      Adj R-squared =  0.0735
  Total |  1.8027e+09     4   450678136      Root MSE =   20435

------------------------------------------------------------------------------
 shelby | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var150 |   .5048524    .439894     1.15   0.334    -.8950867    1.904792
```

```
 _cons |   259542.4   236917.3     1.10   0.353    -494434.3     1013519
------------------------------------------------------------------------------

. reg stark var152

Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.94
 Model |  1.4988e+09     1  1.4988e+09      Prob > F =  0.1415
   Residual |  1.1423e+09     3   380755511      R-squared     =  0.5675
-------------+------------------------------      Adj R-squared =  0.4233
 Total |  2.6410e+09     4   660262198      Root MSE =   19513

------------------------------------------------------------------------------
 stark | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
var152 |   .9587354   .4832285     1.98   0.142    -.5791135    2.496584
 _cons |   47542.22   353342.9     0.13   0.901     -1076953     1172037
------------------------------------------------------------------------------

. reg summit var154

Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   12.15
 Model |  1.5573e+11     1  1.5573e+11      Prob > F =  0.0399
   Residual |  3.8462e+10     3  1.2821e+10      R-squared     =  0.8019
-------------+------------------------------      Adj R-squared =  0.7359
 Total |  1.9419e+11     4  4.8548e+10      Root MSE =  1.1e+05

------------------------------------------------------------------------------
summit | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
var154 |   .8799471    .252477     3.49   0.040     .0764527    1.683442
 _cons |     284005   388267.1     0.73   0.517    -951634.1     1519644
------------------------------------------------------------------------------

. reg trumbull var156

Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    7.10
 Model |  2.4878e+10     1  2.4878e+10      Prob > F =  0.0760
   Residual |  1.0505e+10     3  3.5016e+09      R-squared     =  0.7031
-------------+------------------------------      Adj R-squared =  0.6041
 Total |  3.5383e+10     4  8.8457e+09      Root MSE =   59175

------------------------------------------------------------------------------
   trumbull | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
var156 |    .780132   .2926825     2.67   0.076    -.1513144    1.711578
 _cons |   362678.7   397749.3     0.91   0.429    -903137.3     1628495
------------------------------------------------------------------------------

. reg tuscarawas var158

Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   49.23
 Model |  3.6872e+09     1  3.6872e+09      Prob > F =  0.0059
   Residual |   224704154     3  74901384.7      R-squared     =  0.9426
-------------+------------------------------      Adj R-squared =  0.9234
 Total |  3.9119e+09     4   977986121      Root MSE =  8654.6

------------------------------------------------------------------------------
 tuscarawas | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
 var158 |   1.611634   .2296998     7.02   0.006     .8806266    2.342641
  _cons |  -229359.5   92689.45    -2.47   0.090    -524338.7    65619.75
------------------------------------------------------------------------------

. reg union var160

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   11.17
  Model |  1.4129e+09     1  1.4129e+09      Prob > F =  0.0443
    Residual |   379324599     3   126441533      R-squared     =  0.7884
-------------+------------------------------      Adj R-squared =  0.7178
  Total |  1.7923e+09     4   448066920      Root MSE =   11245

------------------------------------------------------------------------------
  union | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var160 |   1.186735   .3550064     3.34   0.044     .0569459    2.316523
  _cons |   -39222.3   96603.53    -0.41   0.712    -346657.8    268213.2
------------------------------------------------------------------------------

. reg vanwert var162

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   11.95
  Model |   281707857     1   281707857      Prob > F =  0.0407
    Residual |  70738467.2     3  23579489.1      R-squared     =  0.7993
-------------+------------------------------      Adj R-squared =  0.7324
  Total |   352446324     4    88111581      Root MSE =  4855.9

------------------------------------------------------------------------------
     vanwert | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var162 |   .7428284   .2149098     3.46   0.041     .0588895    1.426767
  _cons |   47798.78    34507.4     1.39   0.260    -62019.15    157616.7
------------------------------------------------------------------------------

. reg vinton var164

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    3.38
  Model |   142873541     1   142873541      Prob > F =  0.1632
    Residual |   126700569     3  42233522.9      R-squared     =  0.5300
-------------+------------------------------      Adj R-squared =  0.3733
  Total |   269574110     4  67393527.5      Root MSE =  6498.7

------------------------------------------------------------------------------
 vinton | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var164 |   .9904556   .5385026     1.84   0.163    -.7232999    2.704211
  _cons |    6814.83   52711.27     0.13   0.905 -160936    174565.6
------------------------------------------------------------------------------

. reg warren var166

 Source |  SS   df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.17
  Model |  53248514.4     1  53248514.4      Prob > F =  0.7071
    Residual |   935045742     3   311681914      R-squared     =  0.0539
-------------+------------------------------      Adj R-squared = -0.2615
  Total |   988294257     4   247073564      Root MSE =   17655

------------------------------------------------------------------------------
 warren | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
 var166 |    -.27002    .653278    -0.41   0.707    -2.349042    1.809002
  _cons |   302444.5   155240.5     1.95   0.147    -191600.1 796489
------------------------------------------------------------------------------

. reg washington var168

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.91
  Model |   921072709     1   921072709      Prob > F =  0.4109
    Residual |  3.0420e+09     3  1.0140e+09      R-squared     =  0.2324
-------------+------------------------------      Adj R-squared = -0.0234
  Total |  3.9631e+09     4   990769773      Root MSE =   31843

------------------------------------------------------------------------------
  washington | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var168 |   .7210154   .7565141     0.95   0.411     -1.68655    3.128581
  _cons |   149024.8   422243.7     0.35   0.747     -1194743     1492793
------------------------------------------------------------------------------

. reg wayne var170

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.00
  Model |  593166.247     1  593166.247      Prob > F =  0.9824
    Residual |  3.0902e+09     3  1.0301e+09      R-squared     =  0.0002
-------------+------------------------------      Adj R-squared = -0.3331
  Total |  3.0908e+09     4   772706632      Root MSE =   32095

------------------------------------------------------------------------------
  wayne | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var170 |   .0068376   .2849391     0.02   0.982    -.8999657     .913641
  _cons |   814411.2   229835.6     3.54   0.038     82971.68     1545851
------------------------------------------------------------------------------

. reg williams var172

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    4.00
  Model |   796850620     1   796850620      Prob > F =  0.1394
    Residual |   597927214     3   199309071      R-squared     =  0.5713
-------------+------------------------------      Adj R-squared =  0.4284
  Total |  1.3948e+09     4   348694459      Root MSE =   14118

------------------------------------------------------------------------------
    williams | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var172 |   .5741064   .2871227     2.00   0.139     -.339646    1.487859
  _cons |     137041   83851.25     1.63   0.201    -129811.1    403893.1
------------------------------------------------------------------------------

. reg wood var174

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =    0.10
  Model |  24432237.1     1  24432237.1      Prob > F =  0.7704
    Residual |   718580414     3   239526805      R-squared     =  0.0329
-------------+------------------------------      Adj R-squared = -0.2895
  Total |   743012651     4   185753163      Root MSE =   15477

------------------------------------------------------------------------------
```

```
   wood | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var174 |  -.1556757   .4874345    -0.32   0.770     -1.70691    1.395559
  _cons |     753598   315534.3     2.39   0.097 -250573     1757769
------------------------------------------------------------------------------

. reg wyandot var176

 Source |  SS  df  MS    Number of obs =  5
-------------+------------------------------      F(  1,     3) =   30.45
  Model |   698524946     1   698524946      Prob > F =  0.0117
    Residual |  68813549.1     3  22937849.7      R-squared     =  0.9103
-------------+------------------------------      Adj R-squared =  0.8804
  Total |   767338495     4   191834624      Root MSE =  4789.3

------------------------------------------------------------------------------
     wyandot | Coef.   Std. Err. t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 var176 |   1.819024   .3296278     5.52   0.012     .7700013    2.868047
  _cons |    -102280   44415.95    -2.30   0.105    -243631.4    39071.35
------------------------------------------------------------------------------
```