Indiana Business Review

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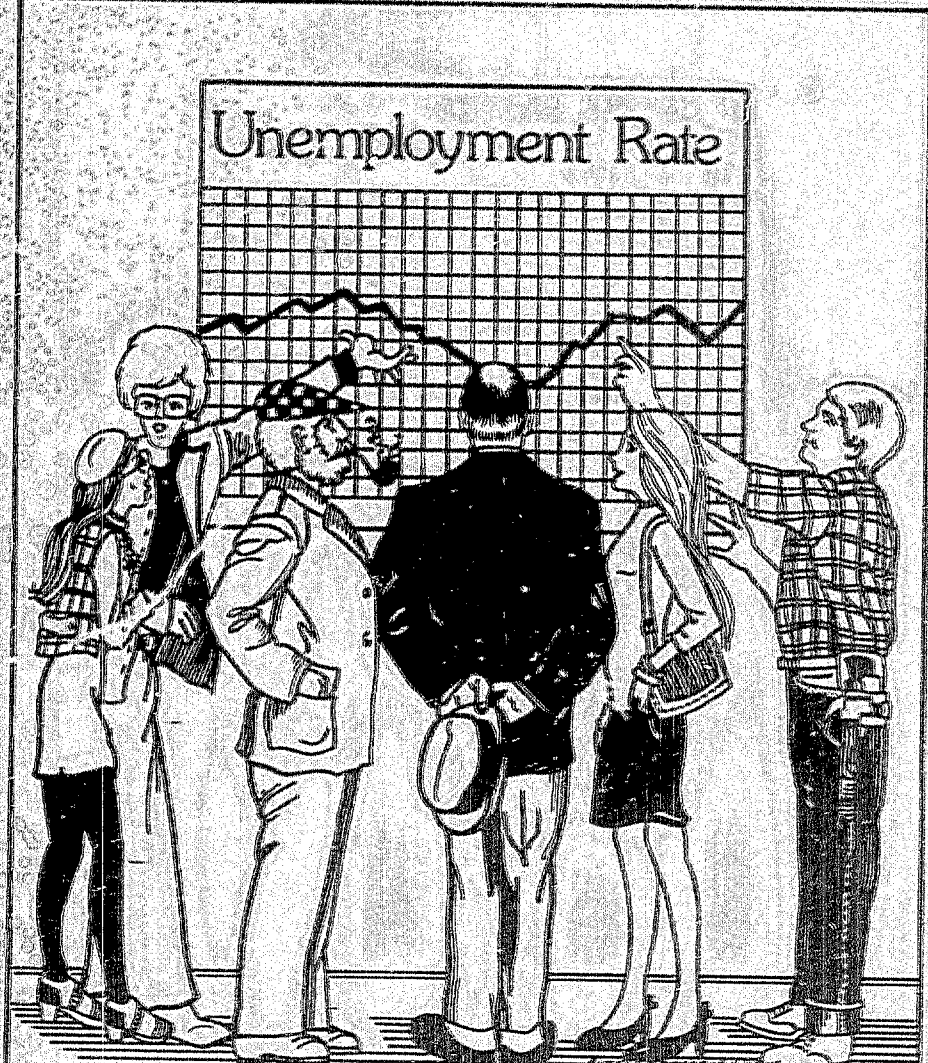

Behind the Unemployment Rates

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Behind the Unemployment Rates

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Every month the economic news includes the latest release of unemployment rate information. These data are provided for each Indiana county by the Indiana Department of Employment and Training Services (IDETS) and for each state by the U.S. Department of Labor (DoL). As a nation we have an intuitive response to these numbers: Higher unemployment rates are bad, lower rates are good. Television news anchors have learned to smile when the numbers go down and frown with concern when the numbers rise.

Unemployment rate numbers are unambiguous as far as most of us are concerned. An increase in the unemployment rate indicates . . . what? Does it tell us that more people are unemployed, walking the streets in black-and-white photographs from the 1930s, looking for jobs, struggling with a sense of despair, hope evaporating, life itself becoming tenuous? Does a decline in the unemployment rate mean that more people are working, factory whistles are heard again in the early morning hours, lunch buckets are being filled in homes where the light bill has been paid, and Gramps can now have that operation?

These are the images, the TV concepts that correspond to the monthly announcements. Unfortunately, they may have nothing to do with reality.

The unemployment rate is a ratio. It is the number of persons believed to be unemployed and seeking employment divided by the number of persons believed to be in the labor force in a given city, county, state, or country. The labor force is the sum of the number of persons believed to be unemployed plus the number of persons believed to be employed.

It may be noted that these numbers are beliefs. IDETS and DoL go about determining them through surveys, estimates, and statistical procedures too complex to go into here. Let us, for the sake of this article, assume that the procedures are perfect. It is a harmless fantasy already accepted by virtually every American politician who is ready to offer a vocal but nonetheless visceral response to the numbers.

What happens when the unemployment rate rises? Let's begin each case below from a base position of 5% unemployment—five persons unemployed and seeking employment plus 95 persons at work—a 5% unemployment rate (5/(5+95)).

Case I. Normally our imagination is set in motion this way. We think of a person holding a job; then one day a pink slip is handed out with the paycheck. A person who had a job is now without one. The numerator of our ratio goes up, the denominator remains unchanged, so the unemployment rate rises.

Thus, with our friend getting a pink slip, we have six unemployed persons, but no change in the labor force; the unemployment rate is then 6% (6/(6+94)). That is the standard scenario.

But it could happen this way:

Case II. A person who had not been in the market for employment (a retired person, a homemaker, a student, or a person who just moved to this community) now seeks employment and does not find it. The number of unemployed persons rises (to 6) and the labor force rises (to 101) so the unemployment rate goes to 5.9% (6/(6+95)).

Note that no one has lost a job. The number of persons employed remains the same. But the unemployment rate has risen. Are the social and economic implications equal? That cannot be determined without much more information, but the question is worth asking.

There is another way, however, for the unemployment rate to rise.

Case III. Someone who was working yesterday decides to retire today. He is not replaced (as in the case of a self-employed person). No one has lost a job. The number of workers has declined and the number of unemployed persons remains unchanged. We still have 5 persons looking for work, but there are only 94 persons now working. Hence the labor force has shrunk and the unemployment rate has gone up to 5.1% (5/(5+94)).

Is society worse off? There is less output in the marketplace, but there may be more production out of the marketplace (volunteer work, at-home production) or more valuable leisure. Should we grimace at the news that the unemployment rate has risen?

On the downside there are similar cases.

Case IV. Starting from the same 5% rate, assume that one unemployed person gets a job. This is the standard, imagined case. The unemployment rate falls to 4% (4/(4+96)). Rejoice!

But now think of this:

Case V. An unemployed person decides to stop looking for a job. This person becomes a "discouraged worker." She retires, or just drops out to do her own thing outside the marketplace. Or the disenchanted, dispirited soul leaves town; this too would decrease the labor force. The unemployment rate declines in this case to just over 4% (4/(4+95)), but not everyone would agree that society is better off.

And for symmetry:

Case VI. A person who was making wonderful cupcakes as a hobby and distributing them to the local food bank for the needy decides to start selling them in the marketplace. It is possible that no more cupcakes will be produced than before and that only the wealthy will now purchase them. But the unemployment rate goes down and that means we are better off, even if the poor have fewer cupcakes. The number of persons unemployed remains the same (five), but the labor force rises by one to 101 so the unemployment rate is now 4.95% (5/(5+96)).

Thus we see that the rise or fall of the unemployment rate is ambiguous in its meaning and social significance. Now let's look at what has actually been happening in America and Indiana this past year. As these words are written the latest data refer to March, so we will use those numbers, recognizing that each month brings a new story.

Unemployment Rates in the Past Year Across the U.S.

From March 1990 to March 1991 the national unemployment rate rose from 5.4% to 7.1%. Six states (North Dakota, Wyoming, Utah, Arizona, Hawaii, and Louisiana) had declines in unemployment rates, but the other 44 states and the District of Columbia all had increasing rates (see **Figure 1**).

Nationally, the number of persons unemployed rose by 2,107,000 (31.5%). This was accompanied by a decrease of 1,453,000 in employment and a growth of 654,000 in the labor force. Since all these numbers must add up, the decline in employment and the growth in the labor force will be seen to equal the increase in unemployment. Only 17 of the 50 states followed this pattern. Indiana was one of them with a small (500-person) increase in the labor force and a 37,300 decline in employment, giving rise to an increase of 37,800 in the number unemployed.

What story can we tell about this pattern? We could say the decline in employment was so severe it caused people who were not in the labor force to enter the labor market looking for work. Alas, with hard times, they too fell into the vat of the unem-

Figure 1
Labor Force Components in U.S. Unemployment Rates: Changes from March 1990-March 1991

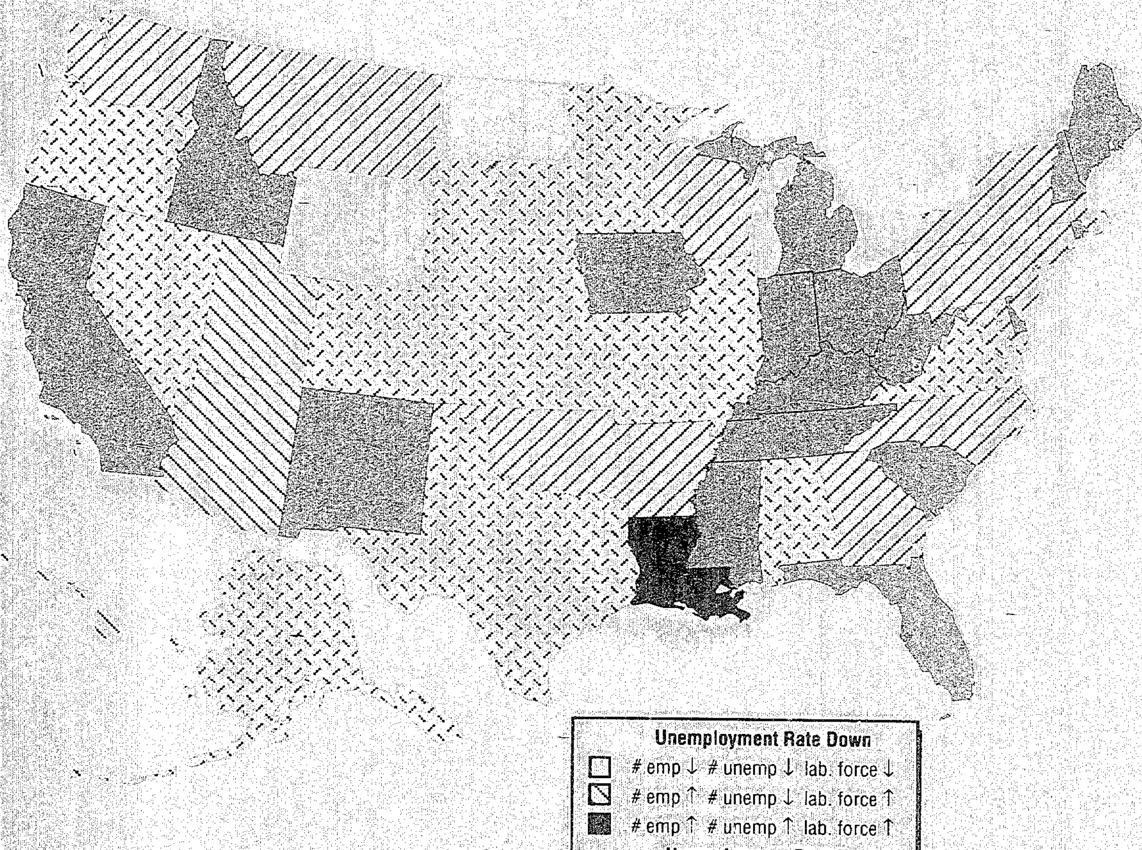
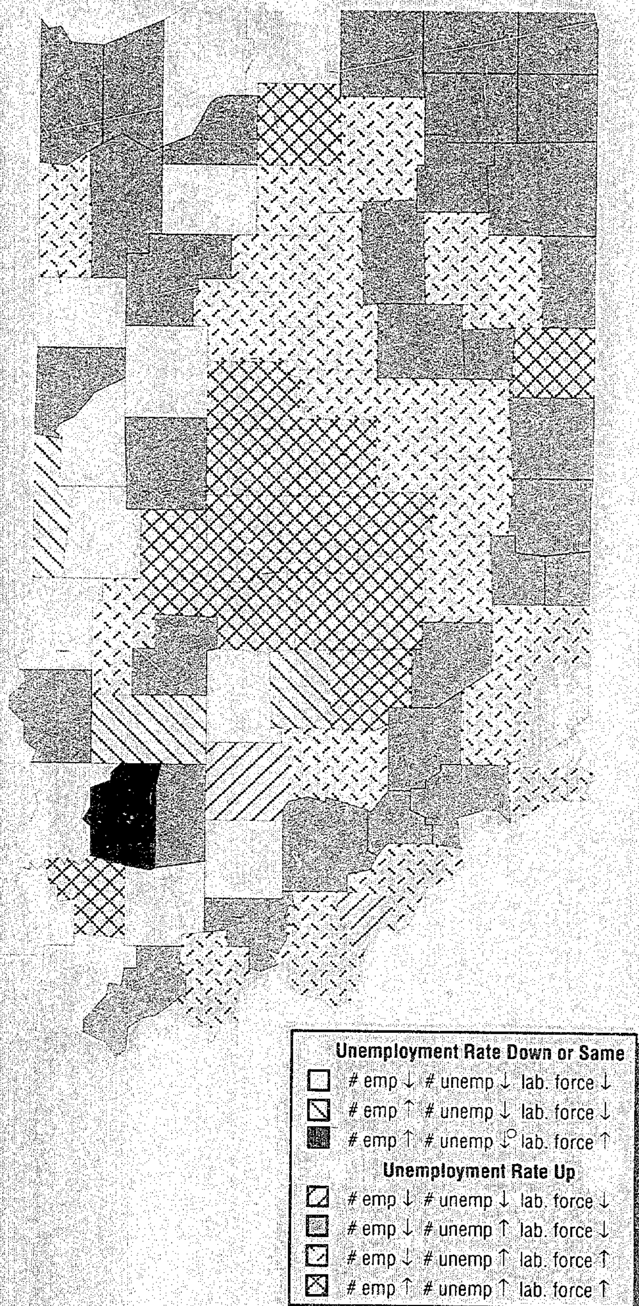


Figure 2
Labor Force Components for Indiana Unemployment Rates:
Changes from March 1990–March 1991



ployed. Drawn into the labor market to offset the family financial woes, these labor market entrants or reentrants were gobbled up by the prevailing unemployment.

This story makes good theater. Look at Florida for a great example. The labor force grows by 64,800, employment drops by 63,000; hence, more than half the increase in unemployment is composed of those entering the labor force.

But that story is good for only 17 states. There must be other stories as well. In 14 states, plus the District of Columbia, a far uglier story can be constructed. These states had increases in the number unemployed, with decreases in the number of employed and decreases in the labor force. Therefore, we can say (without foundation) that the loss of jobs was so traumatic that folks just dropped out of the labor force rather than beat their heads against the wall of unemployment. Perhaps they even moved out of state to look for El Dorado elsewhere.

Thirteen states had growth in both employment and the labor force. The sad story that leads to a rise in unemployment rate for these states is that the employment growth was not sufficient to accommodate the growth in the labor force. Hence the number of unemployed persons grew. For example, in Illinois the labor force growth was 92,200, but only 18,300 jobs were added. So we can say there was a marginal unemployment rate of 79% (the added number of unemployed persons divided by the addition to the labor force). Other stories can be told about the remaining states, but let's move on to Indiana.

Indiana's County Experience: March 1990 to March 1991

The statewide unemployment rate rose from 6% to 7.3%. However, 20 Indiana counties had unemployment rates in March 1991 that were less than their rates for March a year earlier. Two counties (Dubois and Vigo) were unchanged (see **Figure 2**).

Let's look at some of these stories. Howard County led the state in the rise of unemployment rate with a jump of 8%. Neighboring Tipton rose by 7.1% and Miami by 5.8%. They were among the 70 counties with higher rates in March 1991 than in March 1990. Dearborn County had the greatest decline (1.8%). Of the 70 counties with increased unemployment rates, 68 actually had an increase in the number unemployed, only 56 had a decline in employment, and 34 saw a decline in the labor force.

Of the 20 counties where the unemployment rate declined, employment grew in only four counties, but the labor force dropped in 18. To be specific: In Tippecanoe and LaPorte counties the number of persons in the labor force declined, the number employed declined, and the number unemployed declined. In each

Figure 3
Unemployment Rate Matrix

		In 1991		
		Employed	Unemployed	Not in labor force
In 1990	Employed			
	Unemployed			
	Not in labor force			

case the loss of jobs was more than offset by a decline in the labor force, leading to a drop in the unemployment rate. What can we see here? Did these two counties have massive out-migration in the past year?

In total, 54 of Indiana's 92 counties had labor force declines in the past year. This would suggest that significant numbers of persons were becoming discouraged about employment opportunities in the state. If they had stayed in the labor force, what would our unemployment rate have been?

Confusion Arising from Inadequate Data

From all these numbers we can learn that employment rose, or the number of persons in the labor force fell, or the number of persons unemployed changed. But these are aggregate changes about which we need to fabricate an approximation of reality. We do not know if the increase in the number of unemployed persons is the result of a decrease in employment. For example, consider Daviess County. Employment rose from March 1990 to March 1991 by 500 and the labor force rose by the same number. Hence, we can conclude, since we have no knowledge, that every new labor force entrant found a job, driving down the unemployment rate. The marginal unemployment rate was zero. What a triumph of economic development!

Another triumph was in Brown County. The number unemployed fell by 30 persons and the number employed rose by 30 persons. The labor force remained unchanged and the unemployment rate fell by one half of one percentage point.

But poor Spencer County tells a different story. Employment fell by 830 persons and 820 dropped out of the labor force. Only 10 of those 830 became unemployed. Can this actually be true?

It should be obvious that we do not know anything about the changes in employment status from these inadequate numbers. IDETS and DoL need to exploit and publicize other resources before we can tell stories or conduct useful analysis.

Labor force transition is the key information missing in today's economic development environment. What we have now are the absolute levels of employment and unemployment. From these data we construct net changes. That does not tell us about the transition, the gross flows that are more significant for analytic and policy purposes.

What we need to do is fill in the matrix shown in **Figure 3** for each county. We need to know how many of those unemployed in 1991 were employed last year. How many are still unemployed from a year ago? Are today's unemployed those who were not in the labor market a year ago? Clearly the policies to deal with unemployment will be different in each case. Previously employed persons have skills that can be sharpened or redirected. Long-term unemployed persons may need extensive counseling and significant skill augmentation. New entrants may only need a few pointers—or they may require a major orientation to the job market. But knowing only how many unemployed there are in a county is of limited use. The absence of transition data leaves us telling each other stories or giving quaint recitals about the data - as if we understood the underlying phenomena.

The unemployment data we use each month are weak. IDETS tells us not to take the county unemployment rates as economic indicators. That is like the weatherman telling you not to pay any attention to the thermometer. The methodological problems associated with the small area data are the result of extremely limited funding for a vital purpose. The U.S. Department of Labor has been starved for funds and IDETS has seen its basic statistical resources diminished steadily over time.

How can policymakers function without knowledge of the labor force? Easy, when they don't ask the right questions and when seeming to do something is more important than actually doing something.

"Labor force quality" and "readiness" have become catch phrases suggesting a concern for the conditions of labor. Many jobs are created to deal with problems about which little is known. If government and business leaders are sincere in this concern, let them invest effectively in labor market information. Let them support a base of data on which policy can be founded. Efforts in this direction over the past two decades have been unsuccessful. For a start, perhaps, let them provide each county with these transition matrices. Then we might actually know something about what is happening in our labor markets.

Economies of Scale in Indiana's Local Court System

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One of the primary functions of local government in Indiana is operating the system of local courts. Indiana's local courts disposed of 1.3 million cases in 1988, and state, county, and municipal governments spent $81 million on their operation. This article examines the determinants of local court operating costs, looking particularly at the effect of alternate forms of court organization on costs.

Two trends in Indiana court organization appear likely to affect operating costs. First, multi-county court districts were split into their component counties during the 1970s and 1980s. In 1970 there were eight two-county circuit courts; in 1988 only two remained. One of two joint county courts was dissolved in 1989. There is only one two-county superior court. Second, in 1975 the state legislature mandated that city and town courts be abolished, with their functions assigned to county courts. But this mandate was rescinded in the 1980s, and 73 city and town courts still exist. More may be established.

If courts are subject to economies of scale—meaning that the average cost per case declines as courts dispose of more cases—then moves to split multi-county courts and establish more city and town courts will increase the cost of disposing of state cases. But if courts are subject to diseconomies of scale, then moves toward smaller courts would decrease average costs per case and save money. While policymakers may consider many factors in decisions about court organization, certainly one must be the effect on costs. This article uses 1988 data on Indiana's local courts to estimate the effects of cases disposed and the number of courts in each county.

Organization of Local Courts in Indiana

There are four main classes of local courts in Indiana: circuit courts, superior courts, county courts, and city and town courts. The uses and functions of these courts vary by county. All counties are served by a circuit court, but only 53 have superior courts, and 40 have county courts. There are 49 city and 24 town courts in 40 counties. In 20 counties, circuit courts have special small claims and misdemeanor dockets; in the others, county or superior courts handle these cases. Marion County has a municipal court and small claims courts, and St. Joseph County has a probate court (Division of State Court Administration 1989; Indiana State Chamber of Commerce 1988).

Indiana is divided into 90 circuit courts with a judge in each circuit. Circuits generally follow county borders, but as of 1988 there were two joint county circuits, one including Dearborn and Ohio counties, and the other including Jefferson and Switzerland counties. As case loads have increased, joint county circuits have been split into single county circuits. Since 1970, six joint county circuits have been split into 12 single county circuits (Indiana State Chamber of Commerce 1970, 1980). Circuit courts are courts of general jurisdiction and have jurisdiction over appeals from city and town courts.

As of 1988, 129 superior court judges served in 53 Indiana counties. In some counties, several judges staff a single unified court; in others, each judge heads a court in a county system. There is one joint county superior court, serving Ohio and Switzerland counties. Superior court jurisdiction varies, but most are courts of general jurisdiction, with jurisdiction over city and town court appeals. Superior courts are created by the General Assembly to meet local needs.

In 1975 the General Assembly passed legislation creating county courts. Since then there have been efforts to restructure county courts into superior courts with small claims and misdemeanor divisions. As of 1988 there were 42 county courts, but four shared judges in joint county courts. The four were Fulton and Pulaski counties and Greene and Sullivan counties. In 1989 the Greene-Sullivan joint county court became two separate superior courts. County courts have jurisdiction over small civil and property cases, minor felonies, misdemeanors, and violations of local ordinances.

The 1975 local court reorganization legislation would have abolished city and town courts by the end of 1979 and assigned their functions to county courts. Amendments since then have permitted the continued existence of these courts. Currently, second- and third-class cities or towns may pass ordinances to establish city or town courts, and courts existing at the start of 1986 may continue to operate until abolished by local ordinance. City and town courts have jurisdiction over municipal ordinance violations, misdemeanors, and infractions.

Circuit, superior, and county courts are funded through county general fund appropriations. City and town courts are funded through municipal appropriations. The bulk of judges' salaries are paid by the state. In 1988 the state spent $15 million on local judges' salaries, counties spent $62 million on court operations, and municipalities spent $4 million on court operations. Courts generate revenue through fees, costs, and fines. In 1988 the state received $31 million, the counties received $31 million, and the cities and towns $5 million in court revenues. One of the attractions of establishing and retaining city and town courts is the revenue they earn (*Indianapolis Star* 1990).

A Cobb-Douglas Cost Function

A simple way to measure the determinants of costs is to estimate a Cobb-Douglas cost function (Wallis 1980).[1] In logarithmic form, the cost function is:

$$(1)\quad \log(COST) = a_0 + a_1\log(CASES) + a_2(WAGE1) + a_3\log(WAGE2) + a_4\log(PRICE) + a_5(COURTS),$$

where CASES is the number of cases processed by a county's courts; WAGE1 and WAGE2 are the wages paid to two classes of employees hired by the courts; PRICE is an index of the price of non-labor inputs purchased (supplies, capital); and COURTS is the number of courts within the county's borders.

Costs ought to be higher when more cases are processed, so a_1 is expected to be greater than zero. The coefficient a_1 shows *how much* more expensive it is to dispose of more cases, however, because it is a "cost-quantity elasticity," the percentage increase in costs caused by a 1% rise in cases processed. If a_1 is greater than one, a 1% increase in cases causes a more than 1% rise in costs, and the average cost per case rises as more cases are processed. This is known as "diseconomies of scale." It implies that courts disposing of a smaller number of cases are more efficient. If a_1 is positive but less than one, a 1% increase in cases causes a less than 1% rise in costs, and the average cost per case falls as more cases are processed. This is known as "economies of scale," and implies that courts disposing of a larger number of cases are more efficient. Clearly this coefficient will help answer one of the policy questions—whether it is more expensive to process cases in larger or smaller courts.

The coefficients on the wage and price variables should also be positive, because courts that must pay higher prices will find disposing of cases more costly. These variables are included to control for differing cost environments, to better isolate the influence of the number of cases disposed.

It is useful to add a variable not usually seen in Cobb-Douglas cost functions—COURTS, the number of courts in a county. Counties may have superior, circuit, county, city, and town courts within their borders. If the coefficient on COURTS is positive, then more courts increase costs; if it is negative, more courts decrease costs. The coefficient a_5 shows the percentage rise or fall in costs caused by the addition of one more court in a county. This coefficient will help answer another policy question—whether the addition of a town or city court to dispose of cases formerly handled by countywide courts increases or decreases costs.

A restriction is usually imposed on the Cobb-Douglas cost function estimates. Because the sum of payments to employees and purchases of non-labor inputs must equal total costs, equal percent rises in each of the prices will result in an identical percent rise in total costs. Unit changes in logarithms are equivalent to percentage changes. If each of the three log factor prices rises by one, for the log of costs to rise by one the coefficients on the factor prices must sum to one, $a_2+a_3+a_4=1$. Substituting $1-a_3-a_4$ for a_2 in equation (1) and rearranging terms yields the following equation:

$$(2)\quad \log(COST) - \log(WAGE1) = a_0 + a_1\log(CASES) + a_3(\log(WAGE2) - \log(WAGE1)) + a_4(\log(PRICE) - \log(WAGE1)) + a_5(COURTS)$$

This forces factor price coefficients to satisfy the summation requirement but changes little else: the coefficients still represent the same ideas. Coefficient a_2 is not explicitly estimated, but because $a_2=1-a_3-a_4$, it can easily be derived.

Data

Data on the Indiana court system are published in the *Indiana Judicial Report* by the Division of State Court Administration (1989). Total costs are measured as total expenditures by a county's courts on personnel, supplies, services, and capital outlays. This is the variable COST in the second equation above. Total county and municipal costs statewide amounted to just over $66 million in 1988. Of this total, $48.5 million went for salaried personnel, $7 million for non-salaried personnel, $1.5 million for supplies, $6.4 million for services, and $2.6 million for capital outlays.[2]

Total cases disposed of by a county's courts (CASES in the second equation) is a measure of court output. This is a good measure of the scale of the courts' operations—better than most public sector output measures—but of course it does not measure the quality of justice dispensed. Indiana courts disposed of 1.3 million cases in 1988, and county totals ranged from 702 in Switzerland to 273,000 in Marion. Cases disposed of include both criminal and civil trial cases and routine misdemeanor and traffic violations, many of which are processed without a court appearance. This helps account for the huge volume of cases disposed of in the state's largest counties.

Total costs will depend not only on the scale of a court system's operations, but also on the wages and prices the court must pay for personnel, supplies, and other inputs. Courts paying higher wages and prices will probably have higher total costs, all else equal. Statewide, salaried personnel costs made up 74% of total costs in 1988. Personnel included judges, court reporters, probation officers, bailiffs, administrators, secretaries, law clerks, court clerks, public defenders, and others. However, the reported numbers of employees in individual job titles are suspect, because county job descriptions do not necessarily follow the job titles in the *Report*. This may be especially true in small counties with few employees, where a single employee may perform the duties of several job titles. The *Report* job title under which counties list these "jacks of all trades" may be arbitrary.

To address this problem, court employees are divided into two categories, primary and secondary. All 92 counties employ at least one judge, one court reporter, and one probation officer—the primary employees. Counties had 1,694 primary employees in 1988. Every county had at least one other employee, but none of these other job titles were represented in every county. These are secondary employees, since some counties operate their court systems without employees in these job titles. A total of 1,671 secondary employees were employed in 1988.

The *Report* lists total salaries paid to personnel by job title. County salary payments are summed by primary and secondary categories and divided by the number of employees in each category to get the average salary per employee. These variables are labeled WAGE1 and WAGE2 in the second equation. On average, statewide primary employees were paid \$12,630, and secondary employees \$9,317. The primary average wage is low even though the state's 361 relatively highly paid judges are included. This is because state funds are used to pay a minimum of 83% of each judge's salary, and the cost totals here include only county payments (Indiana State Chamber of Commerce 1988). Of total costs statewide, 40% go to primary employee salaries and 34% to secondary employee salaries.

Table 1
Local Court Reg[illegible]

Dependent Variable	*I. All Counties (n=92)*	*II. Small Counties, Less than 10,000 Cases (n=63)*	*III. Large Counties, More than 10,000 Cases (n=29)*
log(COST)-log(CASES)	0.727*	0.486*	0.985*
	-16.35	-6.36	-9.46
log(WAGE2)-log(WAGE1)	0.142*	0.151*	0.024
	-3.29	-3.81	-0.08
log(PRICE)-log(WAGE1)	0.682*	0.473*	1.147*
	-5.59	-3.85	-3.17
COURTS	0.036*	0.088*	0.007
	-3.08	-3.06	-0.46
Constant (a_0)	3.199*	3.131*	5.183
	-3.15	-3.18	-1.63
R^2	0.903	0.69	0.905
F	202.07	32.23	56.84

*Coefficient significantly different from zero at 5% confidence level. T-statistics in parentheses beneath coefficients.

Other costs make up the remainder. Included are payments to non-salaried personnel, including per diem payments for jurors, medical and psychiatric services, and pauper attorney fees, which comprise almost half of non-salaried personnel payments. Other expenses are supplies, services (including rentals, lodging, and meals for jurors), and capital outlays (including law books). Of the \$17.5 million in other costs, 25% were on items with prices unlikely to vary by county, including supplies, law books, and other capital outlays. Twelve percent of other costs were items likely to vary with rental prices in each county, including the category called rentals, and lodging for jurors. Sixty-three percent of other costs were items with prices likely to vary with county service sector wages, including payments to non-salaried personnel.

Although total costs for the other cost category are known, there is no measure of input quantity akin to numbers of employees. To derive a price index for other costs, measures of wages and prices in each county are used, weighted by shares in other costs. The other cost price index is derived as follows:

$$\text{PRICE} = (.25 \times \text{CONSTANT}) + (.12 \times \text{RENT}) + (.63 \times \text{SERVICE}) \quad (3)$$

CONSTANT equals one for each county. RENT is the average monthly rent paid by county residents in 1980, divided by the state average so the statewide mean value will be 1. It is tabulated by the decennial U.S. Census and is available from the Indiana Business Research Center (1985). SERVICE is the average annual wage of service sector employees in 1986, again divided by the state average. It is available in the Indiana volume of U.S. Bureau of the Census, *County Business Patterns* (1988). The resulting index PRICE averages 1 for the state, with a minimum of 0.71 in Union County and a maximum of 1.39 in Lake County. This implies that other court prices are about 29% lower than the state average in Union, and 39% higher than the state average in Lake County.

The final measure tested for its influence on costs is the number of courts in each county (COURTS in the second equation). This figure is derived from the *Report* by counting the number of circuit, superior, county, city, and town courts in the county. Joint county courts are counted as one-half court in each county.

Estimation Results

Local court regression results are reported in **Table 1**. Regression I, using all 92 counties, has an R-squared statistic of .903, implying that 90% of the variation in costs is explained by the equation. The coefficient on CASES indicates economies of scale. Interpreted as a "cost-quantity elasticity," the coefficient implies that a

10% rise in the number of cases causes a 7.27% rise in total costs. The reported t-statistic implies that the coefficient is significantly greater than zero, meaning there is little doubt that more cases cause higher costs. But the t-statistic testing whether the CASES coefficient is less than one is 6.14, also significant. There is little doubt that costs rise less than proportionately with the number of cases.

The coefficients on the factor price variables are also positive and significant. As expected, higher wages and prices paid by courts imply higher total costs. The missing factor price coefficient (a_2 in the second equation) is also positive at .177, calculated from the restriction that the factor price coefficients must sum to one.

The coefficient on COURTS (the number of courts in a county) is positive and significantly greater than zero. Each additional court in a county increases costs 3.6%, given the number of cases to be disposed of. This is consistent with the economies of scale result, implying that increasing the number of courts, each disposing of a smaller share of total cases, tends to increase total costs.

An interesting question is whether economies of scale "run out" as the number of cases becomes large. Could even the very largest county court systems decrease average costs by becoming larger still? To answer this question, counties are divided into two groups: those with fewer than 10,000 cases disposed of in 1988, and those with more. Sixty-three of 92 counties had fewer than 10,000 cases. Regression II shows economies of scale greater than those estimated for all 92 counties—a 10% rise in the number of cases raises costs by only 4.86%. Adding an additional court to dispose of the same number of cases raises costs 8.8%. Twenty-nine of 92 counties processed more than 10,000 cases. Regression III shows that there appears to be no economies of scale for the largest counties. A 10% rise in cases processed increases costs 9.85%, and the CASES coefficient is not significantly less than one. The coefficient on COURTS is not significantly different from zero, implying that adding a court to dispose of a given number of cases does not increase costs. Economies of scale, then, appear to run out, since no further economies are available after courts reach the 10,000-case level.

Implications

These results imply that the smallest two-thirds of Indiana counties are operating courts too small to exploit economies of scale. Moves to break up multi-county circuit, superior, and county courts likely increase court operating costs. Although the increasing volume of cases probably justifies employing more judges, it would be less costly to hire more judges in multi-county districts than to create a new county district for each new judge.

Small counties could likely reduce costs by combining into multi-county court districts. As an example, consider Fayette and Union, two small counties in east central Indiana. Fayette had a single county circuit and superior courts that in 1988 disposed of 3,572 cases at a cost of $208,000. Union had only a circuit court that disposed of 1,760 cases at a cost of $62,000. A single superior and circuit court district including both Fayette and Union counties would have disposed of a combined 5,332 cases. Assume that courts would pay the higher of the two counties' wages and prices—in this case those of Fayette County. Regression II, which applies to counties with less than 10,000 cases, implies that the two counties combined could have disposed of their cases for $245,000, a $25,000 saving over their actual costs—about 9%. The regression equation does not reveal the source of these savings. Among the possibilities are elimination of duplication, increased efficiency from specialization of personnel, and using personnel and facilities at capacity.

The second implication of the cost results is that fewer courts within a county are less costly than more courts. The move to eliminate town and city courts, whatever its other merits, is likely to save money. For example, Fountain County in west central Indiana operates a circuit court that disposed of 2,086 cases in 1988 for $86,000. Attica City court disposed of 2,088 cases at a cost of $24,000. The regression results for small counties imply that combining these two courts into one would reduce total costs by about $10,000, or 9%.

This cost disadvantage does not appear likely to discourage cities or towns from creating their own courts, nor is it likely to encourage elimination of existing courts. The average city or town court raises more revenue in fines and fees than it costs to operate. When a town court is created, total court costs in the county rise, but enough revenue is shifted from the county to the town to make the move worthwhile for the town. The county's net expense from court operation increases by more than the net revenue received by the town.

Bigger appears to be cheaper for Indiana's local court system, but this does not necessarily imply that bigger is better. There may be good reasons to have small single-county circuit and superior court districts, or towns with their own courts. Perhaps judges with more intimate local connections produce better decisions or are more responsive to local concerns, or perhaps citizens find smaller courts less intimidating. If so, the citizens of Indiana may wish to continue using small local courts. These results show the price they must pay.

Notes

1. The Cobb-Douglas cost function is a special case of the more complex translog cost function. Cost estimates using the translog function showed similar economies of scale and court organization results.

2. Many cost studies ignore capital outlays, which often include huge expenditures for construction, because the services derived from newly built structures last for the life of the building, whereas the costs of construction are tabulated in the first year. In this case, however, half of the capital outlays went for law books, which is likely a recurring expenditure since laws are updated each year. The remaining portion of capital amounts to less than 2% of total cost, so it seems unlikely to cause problems with the estimates.

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The Life-Cycle Consumption Function and the Accumulation of Liquid Wealth in Indiana, 1982-1989

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There is a broad consensus among economists that consumers are a key driving force in modern market economies. In this regard, the decisions consumers make with respect to spending and saving have serious implications for economic growth. The principal decisions consumers make, in addition to how much of their current or expected income they wish to spend on current consumer goods and services, concern accumulation of liquid assets, such as bank deposits or savings and loan deposits, and the accumulation of competing forms of wealth—namely, physical assets such as homes or human capital.

In his Nobel Prize acceptance address, Franco Modigliani stated the following: "The size of saving over short periods of time, like a year, will be swayed by the extent to which current income departs from average life resources" (Modigliani 1986). The principal variable studied by Modigliani is the wealth-income ratio. His findings are well known—in a stationary state the dissaving of the retired from wealth accumulated earlier just offsets the accumulation of the active population.

The proposition we shall test, among others, is the hypothesis that the rate of saving is low or negative in the low age groups as well as in the high age groups. This hypothesis has been challenged in several empirical studies, but continues to be defended by Modigliani.

To test the common thread in the various versions of the life cycle hypothesis, we obtained data from 92 counties in Indiana from 1982 to 1989. We analyzed 42 demographic and economic explanatory variables, and measured the accumulation of liquid wealth separately in banks, savings and loans, and credit unions, as well as total accumulation of liquid wealth in all depository institutions. This framework made it possible to measure not only total accumulation of wealth as a proportion of total wage and proprietors' income, but also preferences with respect to type of liquid holdings over the life cycle.

We tested the life cycle thesis by measuring accumulation of wealth at two tails of the age distribution: the impact on accumulation of liquid wealth of changes in the number of heads of households below 30 and over 55 years of age. We did not directly include family size, which plays an important role in life cycle theory, because of the obvious correlation of family size with the tails of the age distribution.

We introduced a dummy variable to differentiate between urban and rural counties. Urban counties were defined as counties with an industrial labor force exceeding 20,000. This was done for two reasons. First, physical forms of wealth may be preferred to liquid wealth in rural counties. Second, researchers have found that the age-wealth profile tends to be different for blue-collar cohorts who mostly reside in urban counties (Burbridge and Robb 1985).

To account for substitution of competing liquid assets for deposits, we included a composite of interest and stock yields. We assumed the traditional inverse relationship between deposits and the return on alternative assets. This situation is somewhat mitigated by the income effect due to capital gains and the downward pressure on consumption of intertemporal substitution. Both effects were noted by Modigliani.

The more complex substitution phenomenon is between deposits and the accumulation of physical wealth, notably housing and human capital. Clearly these variables are correlated with the proportion of young households in the age distribution. We used both education and housing as well as the proportion of young households in one model and subsequently omitted housing and human capital in another model.

Some economists (Hayashi 1985a, 1985b) observed differential life cycle behavior by wealthy as compared to average households. We used the median value of homes as a proxy for wealth to measure the Hayashi effect.

Many tests of the life cycle thesis are based on panel data of limited size—under 1,000 usable data points. We have compiled county data over almost a decade. This approach may eliminate technical problems researchers have encountered with panel data (Hall 1986). Aggregated county-wide data may offset extreme interpersonal differences.

Finally, by analyzing accumulation of liquid assets in banks, savings and loans, and credit unions, we can measure the preferences of Indiana residents with respect to financial institutions by age groups, income, urban or rural residence, education, and wealth.

Source of Data

The data were obtained from the Indiana University *STATIS*. Most of the data were available on a yearly basis. Data not available annually were estimated by a smoothing function that estimated missing values. Data on bond rates and returns on stocks were obtained from the Survey of Current Business; other financial data were obtained from the annual SHESHUNOFF Volumes.

Computational Method

The Model assumes contemporaneous correlation of errors across equations. We used SAS ITSUR (iterative seemingly unrelated or joint generalized least squares) in ETS, Version 6. ITSUR is most effective for large samples such as the present data set (2,185 degrees of freedom). We assume all explanatory variables are additive in their impact on the dependent variables. Owing to the fact that total deposits is the sum of bank, savings and loan, and credit union deposits, the model is constrained by an "identity." The definitions of the variables are given in **Figure 1**.

Figure 1
Definition of Variables

Dependent Variables:

LBA	Logarithm of deposits in commercial banks in county, i, at time, t.
LSL	Logarithm of deposits in saving and loans in county, i, at time, t.
LCU	Logarithm of deposits in credit unions in county, i, at time, t.
LTOT	Logarithm of deposits in all financial institutions in county, i, at time, t.

Explanatory Variables:

LWealth	Logarithm of median value of homes in county, i, at time, t.
LIncome	Logarithm of total personal and proprietors' income in county, i, at time, t.
LSenior	Logarithm of proportion of population over 55 years of age in county, i, at time, t.
LHomes	Logarithm of dollar value of private single family dwelling permits in county, i, at time, t.
LEducation	Logarithm of proportion of population with a bachelors degree in county, i, at time, t.
Urban	Dummy variable which is 1 if county, i, is urban; zero otherwise.
LInterest	Logarithm of basket of yields on Treasuries (SCB-114), corporate bonds (SCB-116), and return on stocks (SCB-19), converted to an index and averaged.
LJunior	Logarithm of proportion of population under 30 in county, i, at time, t.

Note: Proportions are entered as integers, not as decimals. Direct transaction deposits were excluded because such deposits may reflect loan activity unrelated to accumulation of liquid wealth. SCB stands for Survey of Current Business.

Table 1
Iterative Generalized Least Squares Partial Regression Coefficients for Log Variables

EQ1: Degrees of Freedom = 2176 System Weighted R^2 = .8267
EQ2(*): Degrees of Freedom = 2185 System Weighted R^2 = .8246

Explanatory Variables and T-Statistics (in Parentheses)

Dependent Variable	*LWealth*	*LIncome*	*LSenior*	*LHomes*	*LEducation*	*Urban*	*LInterest*	*LJuniors*
LBA: Banks	0.2944	0.4431	0.7704	-0.0123	-0.1875	0.2089	-0.0349	-0.0245
	(2.816)	(12.045)	(7.015)	(-1.350)	(-3.183)	(3.867)	(-7.764)	(-0.205)
LBA: Banks*	0.0749	0.4301	0.6228			0.1795	-0.034	-.2669
	(0.923)	(11.718)	(6.302)			(3.335)	(-7.669)	(-2.802)
LSL: S&Ls	1.101	-0.1871	0.6392	-0.1809	0.4566	-1.882	0.0466	1.419
	(1.022)	(-0.492)	(0.565)	(-1.927)	(0.752)	(-3.377)	(1.005)	(1.152)
LSL: S&Ls*	0.6644	-0.2852	1.1577			-1.856	0.0659	1.809
	(0.799)	(-.759)	(1.144)			(-3.368)	(1.45)	(1.855)
LCU: Credit Unions	-3.907	3.598	-5.271	-0.0826	1.330	-0.2901	-0.0268	1.226
	(-3.516)	(9.173)	(-4.515)	(-0.853)	(2.124)	(-0.505)	(-0.560)	(0.966)
LCU: Credit Unions*	-3.133	3.592	-4.096			-0.1182	0.0157	2.785
	(-3.650)	(9.258)	(-3.921)			(-0.208)	(-.335)	(2.765)
LTOT: Total Dep.	0.2197	0.4209	0.6795	-0.0205	-0.1120	0.1387	-0.0332	0.0634
	(2.530)	(13.734)	(7.448)	(-2.706)	(-2.289)	(3.089)	(-8.879)	(0.639)
LTOT: Total Dep.*	0.028	0.4041	0.6012			0.1182	-0.0313	-0.0939
	(0.417)	(13.247)	(7.319)			(2.642)	(-8.487)	(-1.185)

Identity: LTOT = LBA + LSL + LCU.

Results

The partial regression coefficients and the t-scores for each variable are given in **Table 1**.

1. If we disregard accumulation of physical wealth—LHomes—and accumulation of human capital—LEducation—there is dissaving at the lower end of the age distribution. LJunior is negative and statistically significant for banks.

2. Accumulation of liquid assets at the top end of the age distribution continues over all age groups—LSenior is positive and statistically significant for total deposits and for bank deposits. On the other hand, LSenior is not statistically significant for S&Ls and is negative and statistically significant for credit unions. This finding supports the hypothesis of T.B. Burbridge (1985). The authors claim that white-collar households continue to accumulate past age 55, whereas blue-collar households dissave past age 55. Owing to the fact that the bulk of deposits in credit unions are held by blue-collar households, the Burbridge-Robb hypothesis tends to be confirmed.

3. Physical and human capital are clearly substitutes for wealth and liquid assets, even though this relationship affects different financial institutions differentially. LHomes is statistically significant, and negative as expected, for S&Ls. It is negative though not significant for banks and credit unions. LEducation is negative and statistically significant for banks. However, it is statistically significant and is positive for credit unions. This may be due to the aforementioned blue-collar appeal of credit unions.

4. Returns on alternative assets demonstrate the traditional inverse relationship overall; however, the effects on credit unions and S&Ls are not statistically significant, possibly because of a concentration of blue-collar depositors who are less likely to switch from liquid deposits to alternative assets when yields rise.

5. Other things being equal, urban populations tend to favor banks over S&Ls or credit unions. The dummy variable Urban is positive and significant for banks and overall; however, Urban is negative and statistically significant for S&Ls. Urban is not significant for credit unions. There is no hypothesis in the literature supporting this finding. However, there may be ethnic preferences at work relative to type of institution on account of a concentration of minorities in urban counties.

6. The most interesting finding is the negative coefficient for LIncome for savings and loans. This unusual result suggests a possible shifting of funds from S&Ls to other financial institutions in Indiana in the aftermath of the adverse publicity meted out to S&Ls by the media.

7. The Hayashi version of the Life Cycle theory, which suggests that absence of liquidity constraints

may modify the saving function of the wealthy, is only partially confirmed. Wealth (proxied by the log of the median value of homes) is statistically significant for banks and overall in the first version. LWealth is negative and significant for credit unions, only, in the second version (marked by an asterisk), suggesting that the market share of credit unions declines in wealthier counties.

8. The relative value of the coefficients is important in the present partial log-log specification. Clearly, income, age, and urban vs. rural account for the bulk of the proportional changes in deposits. Significantly, the sum of the partial elasticities for income and age—LIncome and LSenior—exceed unity for banks.

Table 2 gives a more detailed view of the relationship between the ratio of liquid wealth over income and individual percentiles of the age distribution.

Conclusions

The Indiana data support the contention that if we allow for the accumulation of wealth in the form of physical assets and in human capital at the lower end of the age distribution, and for the bequest motive at the upper end of the age distribution, then the wealth-age accumulation curve is considerably flatter than the typical humped distribution that, following Modigliani, appears in textbooks. This is particularly true for white-collar households. Thus, if the ratio of white-collar to blue-collar populations rises, as expected, the wealth-age curve in Indiana may flatten out. This has clear implications for the consumption function. By focusing on different financial institutions, with different concentrations of depositors, we can separate big savers from small savers more effectively than was accomplished by other authors (Hayashi 1985b).

Moreover, as the white collar population ages, the wealth-age profile will become increasingly right-skewed, which may stimulate economic growth by raising the saving ratio. One may also suggest that banks are likely to gain deposits at the expense of other financial institutions.

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Table 2
First Order Correlation Coefficients

2185 degrees of freedom

	Total Deposits Over Income	*Bank Deposits Over Income*	*Savings and Loans Deposits Over Income*	*Credit Union Deposits Over Income*
PC 15	-0.294	-0.328	0.005	0.197
PC 20	-0.180	-0.208	-0.017	0.184
PC 30	-0.239	-0.240	-0.032	0.055
PC 40	-0.207	-0.254	-0.116	0.033
PC 50	0.123	0.129	0.080	0.055
PC 55	0.115	0.112	0.050	-0.134
PC 60	0.192	0.193	0.062	-0.103
PC 65	0.144	0.140	0.008	-0.141
PC 70	0.273	0.298	0.030	-0.199
PC 75	0.381	0.405	0.016	-0.162
PC 80	0.429	0.464	0.023	-0.174
PC 85	0.437	0.466	0.001	---

NOTE: PC 85 is the proportion of the population between 80 years and 85 years, etc.

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