

# WCER

Reporting on the economic status and opportunities of Wabash County.

## The Wabash County Economic Report



January 2014

### Beyond Domestic Product

The ultimate purpose of an economy is to make people happy. If it were possible, economists would monitor the rise and fall of happiness to determine the health of an economy. Though researchers have made some headway towards creating consistent and sensible measures of happiness, they have not developed these to the point of implementation on a broad basis. In this issue we will look at a more traditional way to add in benefits missed in the standard measures.

The proxy for happiness used since the 1930s is Gross Domestic Product (GDP). GDP is the value of all final goods and services sold in the economy. The use of the word “final” means that none of the intermediate goods – like steel for cars or flour sold to bakeries – is

included. Only the price of the end product counts.

Simon Kuznets creation of the National Income and Product Accounts – the tables of numbers that are the building blocks of GDP – stands as one of the great accomplishments of the economics profession providing policy-makers, businesses, and the public a tool for making better decisions.

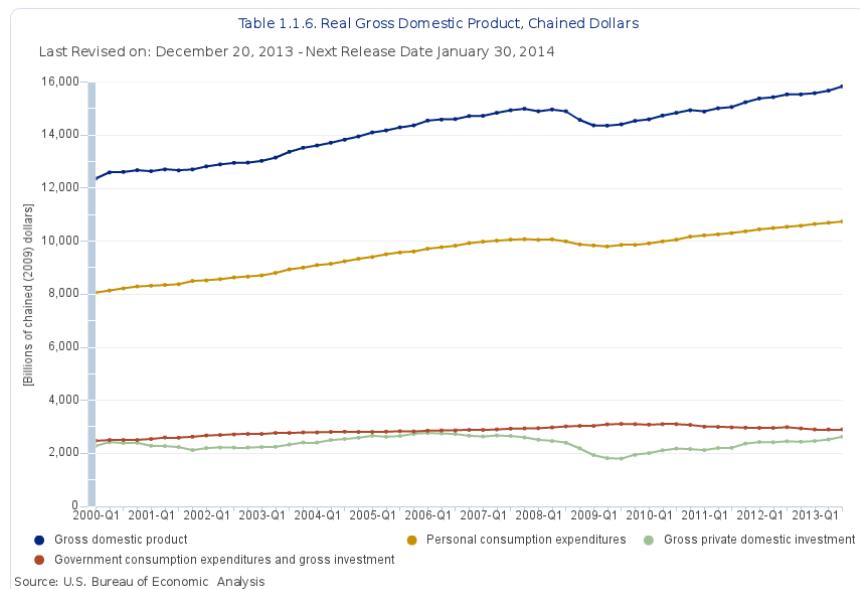
Each month government economists must collect extensive survey data to generate an accurate estimate of GDP. A similar exercise could be done at the county level to create a measure of Wabash County's domestic product. Two requirements are necessary for such an endeavor to be feasible. The numbers must be easy to gather, and they must be verifiable.

The only numbers that meet these criteria are market prices and quantities. An additional feature of these that appeals to economists is that the results are entirely in dollars. With adjustments for inflation the

dollar provides a constant yardstick that makes comparisons possible from one time period to the next.

The trend over time is phenomenal. When looking at the growth in GDP from year to year since the beginning of the industrial revolution there is a near continuous rise. Though the gains have periodically shifted between the wealthy and the poor, the average seems to have an inexorable drive upward. The per capita income of 1910 in the U.S. would just exceed today's poverty line. The trend for recent years, despite the recession, is evident in the first graph.

Every economist would agree that GDP has a high correlation with happiness levels. The bulk of benefits from the economic activities in our lives are captured; however, it is worthwhile to note some of the shortcomings of GDP.



The only place dollars are used is in the market place. So GDP captures the size of the market in an economy but nothing more. Studies estimate that a true measure of all economic activity might be 30% higher than the reported levels of GDP.

Besides activities outside the market other inconsistencies and deviations from the level of benefits people are experiencing occur when using GDP.

One basic problem is that the market is an ever shifting portion of all economic activities. For example, the percentage of meals eaten in restaurants continues to rise. Though the economic activity is the same – people eating meals – the GDP appears higher because of the shift to buying dinner out instead of slaving over a stove. Fortunately these distortions are most problematic when comparing two disparate time periods. Human behavior shifts only slightly from year to year.

A more pressing problem concerns large fluctuations in important aggregates such as unemployment. As people become unemployed, they shift away from market activities and perform tasks at home. The reported GDP is depressed more than the actual decline in productivity. The opposite also occurs. Sudden affluence, say a rapid rise in housing valuations, may cause a jump in GDP that is not warranted.

Another problem with GDP that economists fail to consider concerns consumer surplus. When a rational person purchases an item, we know that they value it at least as much as the money they are giving up. Otherwise, they are not rational. Since GDP calculations rely

on prices, there is an implicit assumption that every item is valued at the price and no more. But this is not so.

Imagine buying more than one bottle of wine. Let us work through the thought process. After observing the price of \$10, you decide that you prefer the wine to the money and place the bottle in your shopping cart. Given diminishing returns – something every economist believes in – the next bottle would be worth less to you. But if this lower valuation is still above the \$10, you put the second bottle in your cart. This process continues until the value of one more bottle of wine to you equals the \$10 price.

If the last bottle's value equals the price, then the previous bottle must have been worth more, and the one before it even more, and so on. Consumer surplus amounts to the sum of the differences between valuations and price. These are clearly benefits to the person, but the market does not record them.

An accurate measure of the benefits from market

Unfortunately, economists have no choice but to ignore these benefits. In essence we assume that consumer surplus is zero. In the discussion that follows we also will be forced to make this same assumption.

## Personal Income

For our purposes GDP has another disadvantage. Though it excludes much, it also includes too much. For instance trade. Moving from GDP to measures of the local domestic product would require calculating the net flow of goods and services into and out of the county. Is this really germane to assessing the well-being of residents? We think not.

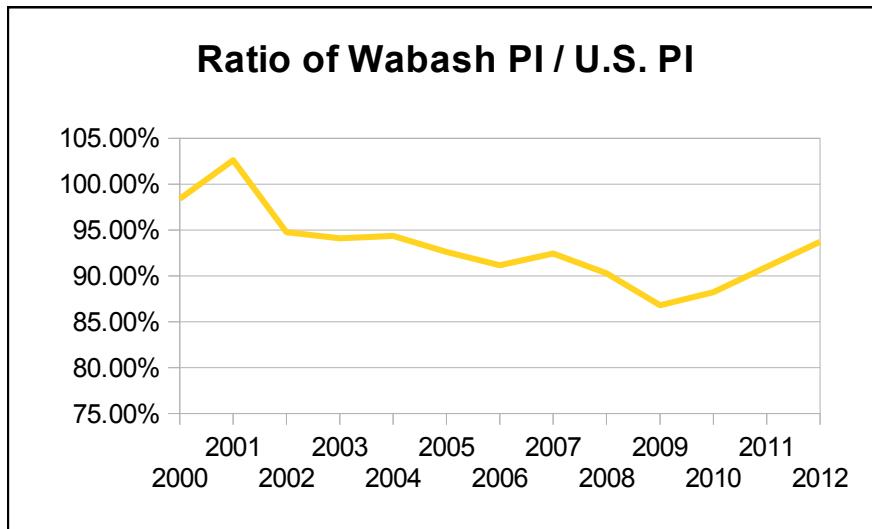
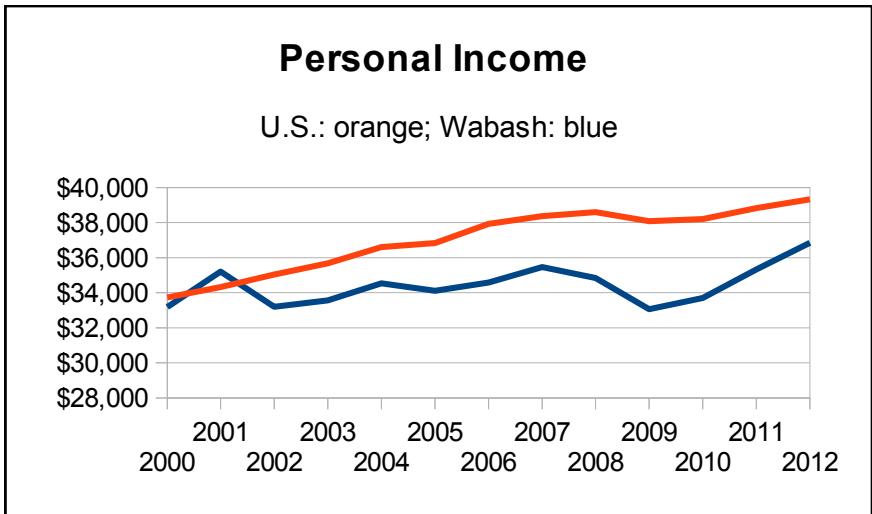
To circumvent such problems, we instead look at Personal Income (PI) which is the largest component of GDP. The capacity of a person to participate in the market place is determined by the resources they have

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
PI Wabash	\$33,183	\$35,206	\$33,201	\$33,565	\$34,541	\$34,106	\$34,575	\$35,463	\$34,849	\$33,055	\$33,695	\$35,327	\$36,851
PI US	\$33,724	\$34,315	\$35,039	\$35,671	\$36,612	\$36,830	\$37,935	\$38,373	\$38,599	\$38,082	\$38,197	\$38,825	\$39,320
Ratio	98.4%	102.6%	94.8%	94.1%	94.3%	92.6%	91.1%	92.4%	90.3%	86.8%	88.2%	91.0%	93.7%

activities should include all the consumer surplus. However, without knowing the shape of the demand curve for every possible price, this cannot be calculated.

available. PI captures this. It is not a silly assumption to claim that most people most of the time choose to spend their money in a way that makes them happiest. Still

adhering to the assumption that consumer surplus is zero, we can assert that PI measures the stream of benefits people derive from market activities.



There are three series of numbers in the table on the previous page and displayed in the two graphs to the left. The first line tracks the PI of Wabash County since the turn of the century. The second line presents the U.S. numbers. Both series are adjusted to account for inflation. Except for the recession the U.S. numbers continually climbed, though their rise was below long term historical rates.

Wabash showed greater volatility, but whenever observing a small portion of a large economy that is to be expected. The main feature is that despite the two downturns – 2002 and the recession – the level of personal income in 2012 was 17% higher than what it was in 2000. (At the time this was written, 2013 was not available, but in all likelihood it is even higher.)

The third line of the table and the lower graph to the left captures the ratio of Wabash PI over the U.S. PI. In essence what percentage is Wabash's PI of the national average. What every economist knows, rural areas are growing the slowest, and large urban areas are growing fastest. For Wabash this is not the whole story.

At the turn of the century the U.S. and Wabash County had overlapping levels of personal income. Though it has not regained that level, the county is bucking the trend of many rural areas by climbing towards parity. The climb has been sustained over three years. If the trend persists, residents in the county will enjoy personal incomes comparable to the rest of the country in just over two years.

Though in a rural and small urban area like

Wabash County there is a much smaller array of activities, goods, and services available, there is a sense in which Wabash residents are better off than the numbers would suggest. Currently Wabash is approximately 6% below the U.S. PI.

Given that housing prices are below national levels, and the prices of other goods and services are equal or below more urbanized markets, the consumer in Wabash County enjoys more purchasing power than the PI ratio indicates.

From a national perspective Wabash County is perceived as a poor county, but the national calculations are based on the fact there are no variations in prices between different locales. If Wabash County is more realistically 4% below national levels, the average resident is \$900 per year less well off than the typical American. Though not trivial, this is very roughly equivalent of one less restaurant meal a month for a family of three.

## Benefits from Improved Health

Neither GDP or PI capture all the benefits people derive from an economy. In this and the next issue we will look at some of the benefits missing from the standard numbers. We start with health.

Health is an essential component for enjoying all other activities of life. Someone with perfect health partakes of the full value of life. On the other hand zero health is equivalent to being dead. So in one respect

health is everything. But then again it is not. Everyone takes risks by engaging in less healthy behaviors, and taking risks is a trade-off between health and the other activities. In fact people trade away perfect health every time they slice into that succulent steak.

Disentangling health from all other elements of what makes life worth living is not our objective in assessing its value to Wabash County. We have a more modest goal that in many ways is more interesting. We ask, "How much do the benefits from improved health grow each year in Wabash County?" Surprisingly we can answer this.

To an economist, health care is an investment as opposed to consumption. Consumption serves to benefit you immediately, whereas investment involves combining time, effort, and resources to produce a stream of benefits for the future.

For instance, no one consumes surgery. Surgery is an investment that generates an enhanced life for the years ahead. Only when the surgery is expected to make for a better life in the future would anyone elect to go through the ordeal.

Typically people think of investments generating something that can be sold in a market, and therefore, the benefits or returns can be measured. However, improved health provides no such measure. No one sells their improved health to someone else. There are no market transactions.

Another way that health benefits are tricky is that much of health care is investment to counter

depreciation. A standard investment produces more than you put in. Instead most health benefits make up for what you have lost. Take a sinus infection. When you have one your total stock of healthiness has diminished or depreciated. After receiving an antibiotic from the doctor, your health returns to normal. The benefit is normal health minus bad health. Measuring the benefit requires knowing how bad your condition would be without treatment.

Health economics as a field has existed since the early 1960s. In the intervening half century, a number of techniques have been developed to overcome these problems and assess the dollar values of benefits from health.

Below we calculate the average annual gains people enjoy because of both advances in health care and changes in behavior as people live longer and healthier lives. When people think of the sources of better health they think of medical treatment. In fact most of the gains over the last century can be attributed to better nutrition, public sanitation, and healthier life-styles. We need to include the impact of both.

The advances in medicine have improved the quality of life for those receiving major medical treatment. Those who are sick experience faster and better recoveries. On the other hand changes in the environment and behavior principally affect people by extended lives.

So the problem breaks into two parts: measuring enhanced quality of life and increased length of life. To

perform either calculation requires establishing the value of life. Once we have this number we can proceed to measure benefits in dollars.

Most non-economists are put off by the suggestion that life has a dollar value. This is understandable because in a very real sense we are asking, “What is the price of grandma?” However, economists argue people behave in ways that put implicit values on a person's life.

Here we will use two of the most common approaches: income earned and cost-effectiveness.

The first involves measuring a person's value by the income they can generate. This is the market value of a faceless worker; in other words what he or she produces. As you might imagine this is a conservative figure. The benefits derived from living longer go well beyond income, and others find their lives enhanced by someone's existence. These positive contributions are entirely missed in this approach. However, income measures are the most common approach used in cost-benefit studies.

Many countries use cost-benefit analyses to determine net gains from particular medical treatments. The most frequently used number for benefits is \$50,000 for one additional year of life. The basis of this number is the earned income approach.

Now to the second approach: cost-effectiveness. A treatment involves both a cost and a health outcome. If one converts the health outcome to additional years of perfect health (more on this in a moment), one can establish what it costs to achieve that additional year. If

the society is providing that care, the economist presumes society values that additional year of life at that dollar amount.

The benchmark used by many studies is to look at the nearly one million people receiving renal dialysis. Stephanos Zenios, et al. calculated that a year of life is implicitly worth \$129,000. In other words, we as a society are willing to pay that to treat people with kidney failure. As our upper estimate we use this number.

Let us start with life expectancy. As health improves, life expectancy rises. Though the U.S. lags other industrialized nations (for instance, Canada's average life expectancy is over four years greater), life expectancy still continues to grow year after year.

In the table below are the life expectancies for the U.S., Indiana, and Wabash County for 1990 and 2009.

Wabash County is close to the national levels and well above the state levels. This is especially impressive given the county is older on average. Older generations have lower life expectancies than the young. Therefore, a larger percentage of elderly usually tends to reduce the average life expectancy number.

The growth rate in life expectancy per year over the intervening nineteen years appears in the next column. Note the lower rates for women. This is to be expected. Growth rates are always higher for the younger. Take an extreme case of an infant and a retiree. A \$1000 of improved nutrition for the infant has much

Life Expectancy, Growth Rates, and Dollars					
	1990	2009	Growth rate	Dollars/Year (County)	Dollars/Capita
U.S. male	71.8	76.2	0.32%		\$160 to \$420
U.S. female	78.8	81.3	0.17%		\$80 to \$220
Indiana male		71.9			
Indiana female		77.7			
Wabash County male	72.7	75.1	0.17%	\$2.6 to \$6.7 million	\$90 to \$220
Wabash County female	79.5	81.0	0.10%	\$1.5 to \$3.8 million	\$50 to \$130

greater life time impact than the same amount of improved nutrition for a sixty-five year old. This same logic works at all age levels. So as health inputs grow the on average older women reap lower gains than the men.

The other benefit of improved health is the quality of life. Of course economists want to measure these benefits in dollars, and health economists have expended a lot of effort in refining techniques to do just that. How do health economists proceed? They convert a gain in quality to an equivalent number of additional years at perfect or normal health.

A consensus embraces using Quality Adjusted Life Years (QALY) as the most appropriate way to measure benefits. Start with a given treatment, say dialysis for renal failure. A QALY measures the healthiness of the treated individual on a scale of 0 to 1 where 0 is death and 1 is perfect health. Assessments performed by thousands of patients concerning the quality of their lives before, during, and after treatment allow researchers to establish what percentage of normal is the patient's life. For instance, renal dialysis patients have consistently generated a QALY of 0.5.

Multiply the QALY by the number of years life has been extended, and you have an equivalent of additional normal years. The dialysis patient who lives an additional three years is said to have lived the equivalent of 1.5 additional years of perfect health.

Medical advances, particularly those for the most expensive kinds of disease, have pushed the QALY

upward. Using data gathered over the last forty years, it is estimated that the QALY is growing on average by 1% per year for the diseases associated with major medical expenses. Approximately 10% of the population suffers from one of these diseases in any given year.

Wabash County – Gains in Health per Year			
	Life Expectancy	QALY increase	Total
Male			
Low estimate	\$90	\$50	\$140
High estimate	\$220	\$130	\$350
Female			
Low estimate	\$50	\$50	\$100
High estimate	\$130	\$130	\$260

We can take the 1% increase of the QALY for the 10% receiving major medical treatment and calculate the increase in benefits.

In the table above the increases in the quality of life are added to the increased life expectancy values to give totals. The low estimates are based on the \$50,000 per year of life, and the high estimates are based on the \$129,000 value.

In our opinion the higher numbers better reflect reality. They are based on what we actually spend as a society, as opposed to rather naively suggesting that all there is to life is income. Accepting those larger values implies each Wabash County resident receives in the

neighborhood of \$300 of *additional* benefits each year from improved health. This is to say that the stream of health benefits should be added to PI. This we have not done since health is inextricably enmeshed with the enjoyment of all other goods and services. What we have done is to say that the stream of benefits from improved health is growing at the rate of \$300 per year.

## Banking Deposits

Past issues of the Wabash County Economic Report contained data on the labor market – employment levels, unemployment levels, and earnings – as well the housing market. To enhance the picture of the economy, this issue includes a new index from the banking sector.

Banking deposits correlate with economic activity which in turn correlates with the overall economic health of the region. Most transactions in a market result in at least some portion of that money passing through the banking system. For the merchant, an increase in sales results in more cash, checks, and revenues from credit cards going into the firm's bank account. Pay raises and new hires likewise increase the total deposits at banks.

Increases in sales and payroll represent a rise in economic activity that in most situations implies improved economic well-being. (An exception is when these rise due to a catastrophe such as extensive damage caused by a tornado. Economic activity is up due to repairs, but well-being is down.)

As in all of our economic indicators, bank deposits

levels only provide a partial picture. The trends in this index are what is important. When looking at a small segment of an economy, such as a county of 30,000 people, large fluctuations are to be expected.

We have created an index that monitors the rise and fall of demand deposits, in essence checking accounts. The index is set such that January 2010 equals one hundred. If the deposits are 2% higher for a

Banking Deposits Index			
Jan-10	100.00	Aug-11	102.84
Feb-10	100.45	Sep-11	103.31
Mar-10	100.66	Oct-11	102.25
Apr-10	101.12	Nov-11	101.80
May-10	101.08	Dec-11	102.99
Jun-10	100.54	Jan-12	101.97
Jul-10	100.98	Feb-12	102.41
Aug-10	100.63	Mar-12	101.73
Sep-10	100.87	Apr-12	100.91
Oct-10	101.13	May-12	100.96
Nov-10	101.79	Jun-12	102.53
Dec-10	101.06	Jul-12	97.87
Jan-11	100.61	Aug-12	98.95
Feb-11	100.97	Sep-12	94.01
Mar-11	101.78	Oct-12	91.56
Apr-11	102.00	Nov-12	98.86
May-11	102.99	Dec-12	98.86
Jun-11	103.05	Jan-13	80.81
Jul-11	102.79	Feb-13	97.36
		Mar-13	100.13

particular month, then the index rises by that percentage to 102. Except for two months, the index rose by a maximum of slightly more than 3% and never fell by more than 6%. The ending level of the index clocked in at a mere 0.13% higher than the January 2010 level. The actual index numbers are in the table on the previous page.

This is astounding. We would never expect such stability in the numbers. Yet it happened. The lack of volatility is surprising for a long list of reasons. Since we will be tracking this index for the foreseeable future, it is worth taking some time describing the different factors that generate fluctuations.

One source of variation stems from the fact that months are not identical. March is 11% longer than February. With same amount of economic activity in the two months, the March numbers should be 11% larger. But they are not.

Another reason is weekdays differ from weekends generating different levels of activity and deposits. The number of weekdays in a month varies, and the impact is significant.

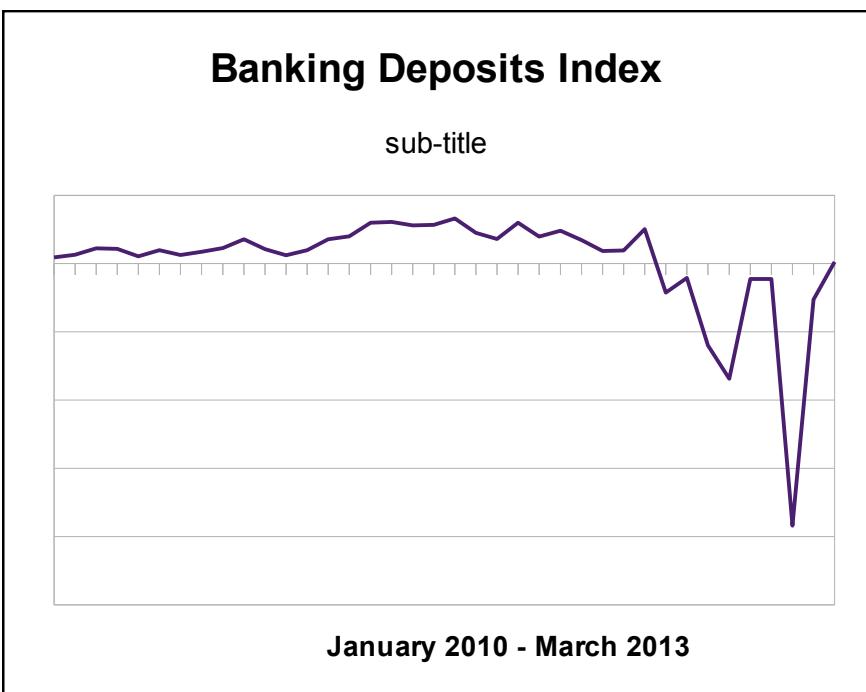
Shopping habits shift from one month to the next. Though shopping activity for the U.S. as a whole is extraordinarily stable, it is not for any particular small piece of the economy. A month with better weather may lead to more people deciding to head for their favorite stores. Sales go up and bank deposits go up though economic well-being has not changed.

The number of stores putting items on sale

influences purchasing levels. More bargains this month probably depresses the number of transactions next month. The resulting fluctuation does not reflect a shift in the fundamental economic climate of the county.

Timing issues enter into the calculations. Many workers are paid on a two week basis. Depending on which days of the month they pay, some firms will reward workers two times and others three. The percentage of firms in each category moves as we cycle through a calendar filled with mostly four and half week months.

More predictable variations occur due to seasonal activities. Construction can generate large deposits and



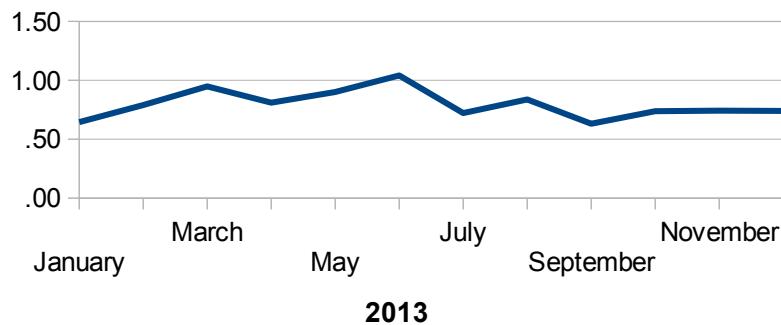
peaks in the better weather months of summer. Though the percentage of annual sales that occur during the Christmas season has declined in recent decades, it is still significantly higher than any other time of year.

All these factors suggest month to month comparisons will tell us little about the economic status of the region. However, despite all the reasons given to expect there to be a high levels of volatility, a trend in the numbers is extremely useful in assessing the rises and falls in the health of the economy.

Given the earlier discussion of the rise in PI, it is quite interesting that these numbers do not reflect that rise. It suggests that with the rise in PI there is not an increase in purchasing occurring. One explanation is that people are paying off debt instead of shopping, but this is only speculation.

### Prices / Assessed Values

sub-title



## Housing Update

We have featured housing in previous issues and discussed the workings of the price to assessed value ratio. (All our previous issues are available on line. See the web address at the end of this issue.)

In this issue we provide an update of the numbers for 2013. For reasons discussed before, the rise and fall of the numbers can be viewed as shifts in demand. Other than a seasonal effect – summer numbers should be higher – the market shows tremendous stability.

Though improving economic times would typically drive housing prices up, the nature of the housing market in Wabash counters this effect.

Population is decreasing gradually, and the stock of houses is constant. This puts a downward pressure on prices. The rise in personal income provides upward pressure. The numbers suggest that these are exactly offsetting.

Our July issue will address longer term trends and feature some more in-depth analysis.

## **Impact of Federal Government Policies**

The Federal budget dominated the economic news throughout the Fall as spending and tax changes occurred with the end of fiscal 2013 on September 30. Congress continues to debate whether and how to change the budget. What is the impact on Wabash County?

Specific changes affect people differently, but without detailed knowledge of the characteristics of the population these are hard to assess. What we can look at is the overall impact of the change in the Federal budget.

The numbers that follow are based on those provided by the Congressional Budget Office (CBO). The CBO is Congress' bipartisan agency for forecasting and calculating the impacts of current policies and possible new policies Congress is considering. As it serves both parties, the CBO has no political agenda. Their only mission is to be as accurate as possible in assessing the outcome of different policy alternatives. They have a long track record of successes.

According to the CBO, if Congress were to restore spending and tax levels to their pre-October levels unemployment in the U.S. would fall by 800,000 in one year's time. For a county the size of Wabash this translates to 80 additional jobs. That is a 5% reduction in the total level of unemployment in the county.

Eighty jobs might not seem like a lot, but as you might expect, economists have estimated the economic impact of such changes. When someone earns more income, they pay taxes, save some, and spend the rest.

What they spend is income for others. The recipient of the spent money goes through the same cycle of paying taxes, saving, and spending the rest. This happens over and over with ever decreasing amounts. When the process has exhausted itself, it is possible to add up all the increases in income and compare this to the initial amount earned by the first person.

The ratio of the total increase over the starting amount is called the multiplier. The typical number used for the multiplier is 3.2. Thus if you increase Mary's income by \$1, the economy-wide increase in income is \$3.20. Using the 3.2 multiplier, the additional eighty jobs translates to \$2.4 million or \$250 per county resident.

Wabash County would not realize this gain in a year, because poorer regions lag or adjust more slowly than the average. So though the ultimate increase in jobs would remain 80, the time necessary to realize this gain would be longer than one year.

## **Summary**

In this issue we evaluated the health of Wabash County from three perspectives: personal income, bank deposits, and housing prices. The latter two suggested an economy that is holding its own but not expanding. However, the most important of these three is personal income. If incomes are rising, this must in time translate to a stronger economy. According to the PI numbers, the county is growing faster than the U.S. economy. That is

an outstanding fact. Having said that, growth in the county is volatile. A look at the graph of Wabash County's PI shows the ups and downs that occur. But a three year trend suggests something fundamental is changing. We will watch and report on these trends as the information becomes available.

Health care is 17% of the U.S. economy. Debate must continue on finding policies that address the ever increasing portion of our resources going to this sector. However, it is important to acknowledge the benefits that improved health provide. In this issue we have tried to provide a partial picture of that important sector.

In the next issue we will catch up on the inflation and employment numbers. As part of our efforts to assess benefits beyond personal income and GDP, we will have features on parks and libraries.

## **Contributors**

James Harry will be a junior economics major at Manchester University this Fall. He joined the WCER team in the Fall of 2012.

Vasin "Thew" Pasda is a first year economics major at Manchester University. He began this year as an intern on the WCER team.

Alex Pierce is a senior economics and history major. He joined the WCER team this Fall.

Taylor Price is a junior economics and accounting major. He joined the WCER team this Fall.

Allison Weber will be a sophomore this Fall at Manchester University. She became a WCER intern in the Fall of 2012.

Matt Hendryx is Visiting Associate Professor of Economics at Manchester University and Director of the Wabash County Economic Report. He supervises the interns working on the WCER.

This report is available both in hard copy and as a .pdf on our website, [www.manchester.edu/WCER](http://www.manchester.edu/WCER). Click the "Current" button for this issue, and you can find our previous issues under "Archive".

Our contributors are available for presentations to local groups. If you have questions about this or would like a free hard copy of the report, please contact Matt Hendryx at [mnhendryx@manchester.edu](mailto:mnhendryx@manchester.edu).

We are open to suggestions for topics that you would like to see covered in future reports.

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