

Appalachian Highlands Economic Update

MACROECONOMICS

FINANCIAL MARKETS

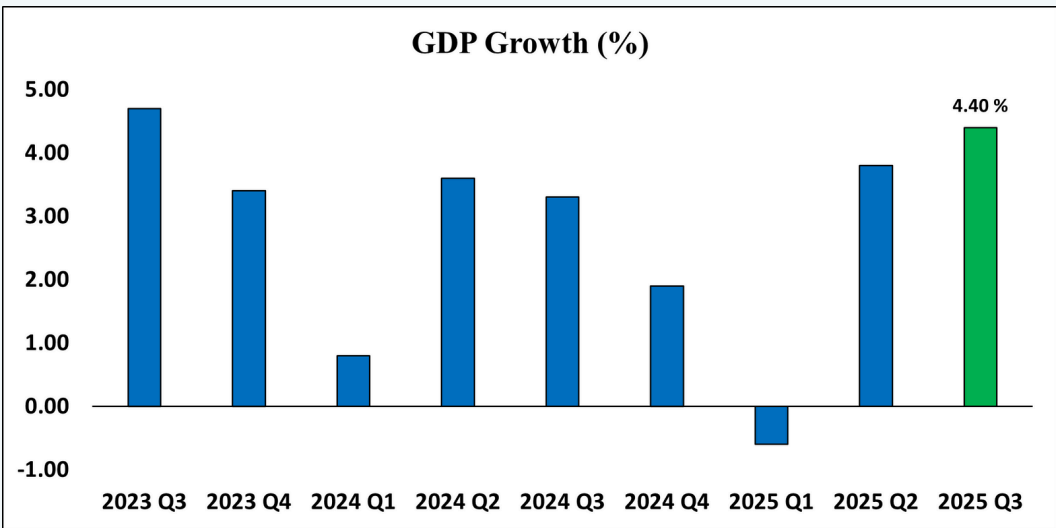
LABOR & EMPLOYMENT

HOUSING MARKET



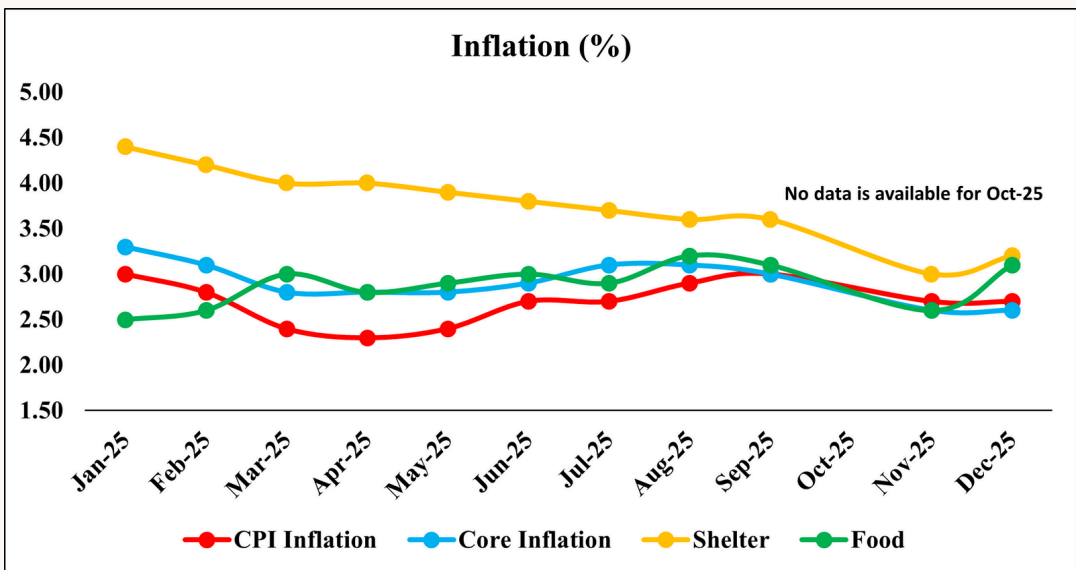
Macroeconomics

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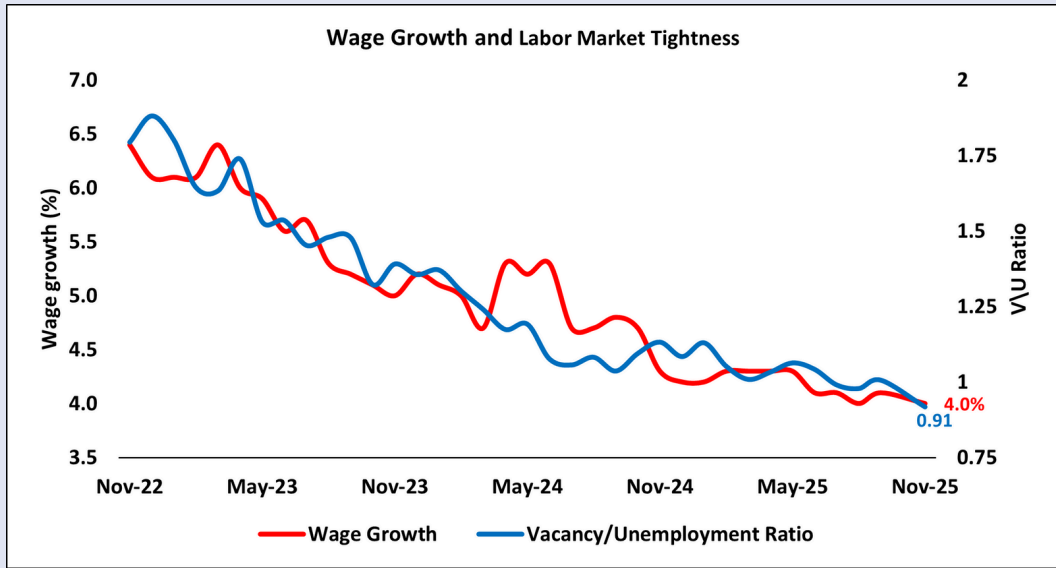
Growth Picks Up

Economic growth strengthened in the third quarter, with real GDP growth increasing from 3.8 percent to 4.4 percent, reflecting continued momentum in the U.S. economy. Growth was driven primarily by resilient consumer spending and gains in business investment, particularly in services and intellectual property products. In addition to this, rapidly falling imports boosted the headline number along with increased government spending and net exports. In contrast, housing and other interest-sensitive sectors remained subdued due to elevated borrowing costs. Despite the stronger headline figure, several high-frequency indicators suggest that growth momentum may ease in coming quarters as tighter financial conditions continue to restrain demand. Overall, the economy continues to expand at a solid pace, though growth remains uneven across sectors.



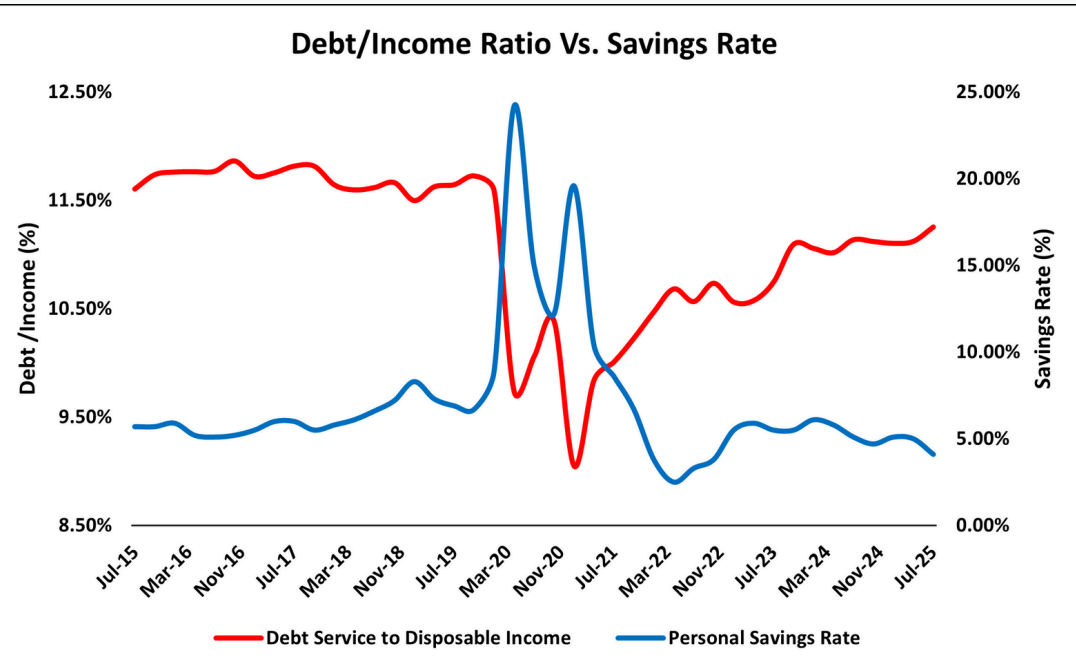
Inflation Remains Sticky

Inflation pressures in the U.S. have moderated relative to the peak levels seen between 2021-2023, with the Consumer Price Index (CPI) rising by 2.7 percent over the 12 months ending December 2025. On a month-over-month basis, the CPI increased 0.3 percent in December, with food and shelter costs continuing to be the largest contributors to price increases. Core inflation (excluding food and energy) also rose but remains below earlier peaks. Recent analyses suggest that shelter and tariff-related uncertainties could keep core price pressures “sticky,” even as overall inflation trends slowly toward the Federal Reserve’s 2 percent target. The Personal Consumption Expenditures (PCE) price index, another key inflation gauge used by the Fed, also shows inflation running in a range similar to CPI trends, indicating that price stability progress has been gradual. With headline inflation now lower than many forecasts from mid-2025, policymakers continue to weigh whether further monetary accommodation is appropriate amid persistent sectoral price pressures.



Labor Market Softens Further

The U.S. labor market remains in a transition phase, reflecting an ongoing cooling from the rapid post-pandemic pace. According to the Bureau of Labor Statistics, total nonfarm payroll employment grew by just 50,000 in December 2025, and the unemployment rate held at 4.4 percent. Job growth in 2025, totaling roughly 584,000, was markedly weaker than in 2024, making it the slowest annual increase outside recession periods in decades. Payroll gains were concentrated in sectors such as health care and social assistance, while construction and retail saw job losses. In addition to this, the vacancy to unemployment ratio (V/U ratio) has dipped below one, indicating that the economy has more unemployed individuals than job vacancies. Wage growth has also slowed relative to peak years, and broader measures of labor market dynamics point to a “cooling but not collapsing” environment, where demand and supply are gradually rebalancing.



Household Balance Sheet

Recent data show that U.S. households are entering 2026 with thinner financial buffers, even as near-term debt repayment remains manageable. The personal savings rate has declined steadily from its pandemic peak above 20 percent in 2020 and now stands near 4 percent, well below its long-run average of roughly 7-8 percent. This sustained decline reflects the drawdown of excess pandemic-era savings and higher living costs. At the same time, the household debt service ratio remains slightly low by historical standards, at approximately 11 percent of disposable personal income, compared with peaks above 13 percent prior to the 2008 financial crisis. This helps explain why rising household debt has not yet resulted in widespread financial stress or a sharp slowdown in consumption. However, the combination of low savings and low, but slowly rising, debt service costs is notable. With wage growth easing toward 3-3½ percent and credit card interest rates exceeding 20 percent, households appear increasingly reliant on income continuity and credit access to sustain spending. As a result, while household balance sheets remain supportive of economic growth in the near term, reduced savings and rising leverage increase vulnerability if labor market conditions soften or borrowing costs remain elevated.



Summary

Looking ahead, the U.S. economy is expected to continue expanding, though at a more moderate pace. While recent data show stronger GDP growth, most forecasts anticipate a gradual moderation towards the end of the year as restrictive financial conditions weigh on demand and labor market momentum eases. Inflation is expected to trend lower over time, but progress toward the 2 percent target may be uneven, particularly as recent tariff actions could place upward pressure on goods prices and input costs. In this environment, the Federal Reserve is likely to maintain a cautious, data-dependent stance, seeking clearer evidence of sustained disinflation before adjusting policy. Despite these headwinds, underlying economic fundamentals remain supportive of continued expansion, even as the economy has become much more sensitive to policy decisions and external developments.

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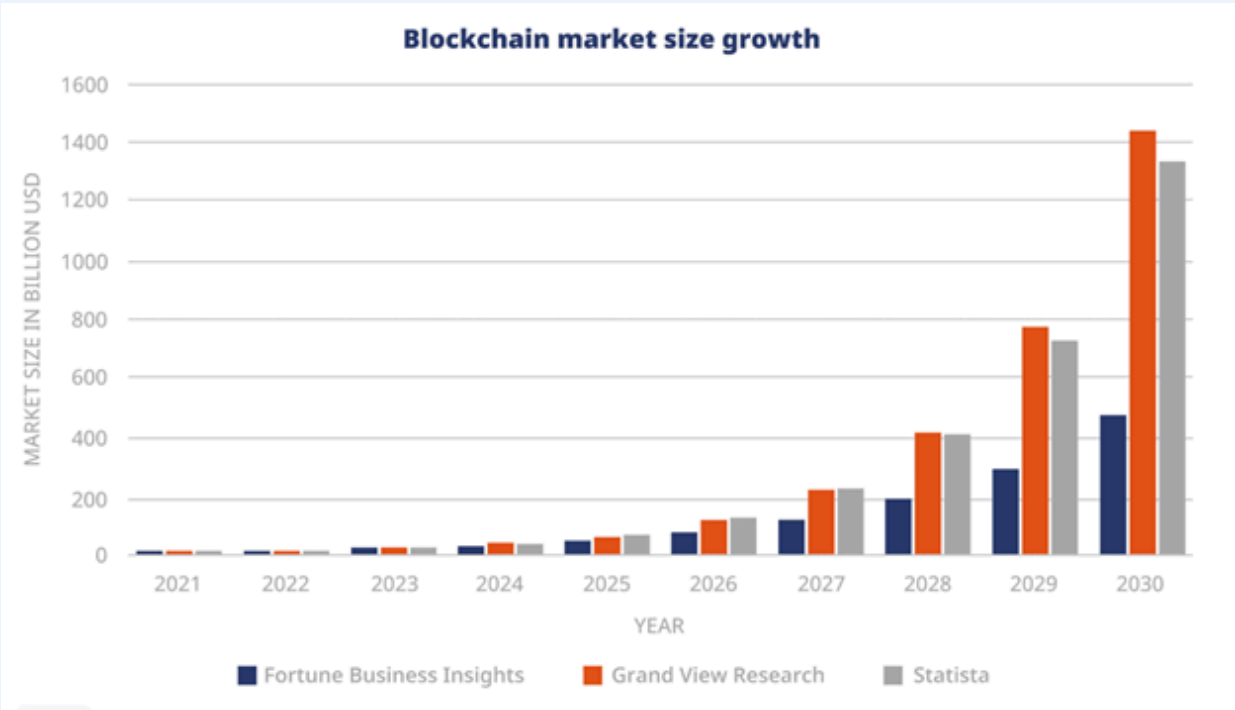
Kevin R. Kilgore | Associate Director, Center for the Study of Finance

Blockchain – The Assassin of Financial Privacy?

A while back, I was asked (by a researching professor at another university) to give my impressions of blockchain technology from the perspective of a financial professional. There is a lot of talk and mystique around blockchain, most of it connected to bitcoin and other so-called “cryptocurrencies.” Blockchain and Bitcoin are not the same thing, by any stretch. Blockchain technology is a way of connecting information in encrypted parts called blocks. That being said, it occurred to me that most people have never deeply considered the implications of widespread use of blockchain technology in the financial system. The financial sector already leads in the use of blockchain technology, according to ElectrolQ.

To the layman, blockchain technology seems complex. Simply put, it is a series of encrypted connectors, called “hashes,” which link (chronologically) blocks of data - ergo the name, “blockchain.” How it is linked together is more complex. It is a de-centralized network of nodes (computers), much like TOR (The Onion Router) which is used to access the deep internet. These nodes store the entire blockchain record. Each financial transaction is included in a block, with a timestamp and a reference to the previous block. The public transparency of all financial transactions, along with cryptographic hashing are meant to engender trust among users. (It also ensures that the same “coin” cannot be simultaneously spent twice.) The devil, as they say, is in the details. I do not like the devil, so no more details.

The concept of the blockchain became popularized through the advent of bitcoin because of the necessity of a cryptographic way of spending this barter type “currency.” Blockchain technology and Bitcoin are inextricably linked in the minds of most casual observers. Anonymity necessitated the absence of financial intermediary verification. The fact is that blockchain technology does not necessarily have to anonymize the user, or be used for financial transactions, for that matter. Bitcoin is just one use, albeit a popularly publicized one. It would appear that blockchain tech is here to stay. (See the projection graph below.)



One of the tenets of the early, cult-like promotion of bitcoin, in its rise to prominence, was that the blockchain eliminated the need for those evil banks. You know, those financial intermediaries that take a fee for their services. There would be free, peer-to-peer payments. What bitcoin users found is that blockchain transactions wound up being way too slow. To affect a transaction, a block in the chain must be completed based upon bitcoin mining abilities that slow the process. Mining is the performance of complex mathematical calculations, in order to form the blocks in the chain. For their efforts, the miners receive a small portion of a bitcoin for completing a block. The obvious limitations of blockchain technology, in reference to commercial transactions, should be one of great concern to those who believe so-called cryptocurrencies could be used to affect commerce.

Eventually, companies like Blockstream (formed by some of the early promoters of Bitcoin) offered to complete your transaction for you – for a fee. Now there are dozens of Bitcoin “wallets” which are basically fintech apps that assist with crypto transactions - but at least there are no financial intermediaries. (Over in the English department they call that sarcasm.) In a normal transaction, a customer uses cash or a merchant services based medium (like a credit or debit card.) Either way, the seller is immediately assured of payment.

Financial intermediaries play a vital role in economic growth and stability. The vast majority of bitcoin owners are familiar with purchasing it in its raw form, or as a part of some ETF or other fund, and owning it as a presumed investment; however, most have never tried to initiate a normal commercial transaction using the supposed currency. In banks and other intermediaries, systems are in place to ensure their relative safety, honesty and soundness. Unlike anonymous digital transactions, banks and credit unions reward relationship profitability. This means you may not pay any fees or, in fact, you may be financially rewarded for transacting business. Most ordinary people want safety and protection, with regard to their hard-earned money. These preferences are in stark contrast with the features blockchain transactions offer. The growing ownership of Bitcoin should not be taken as a sign of willingness to adopt blockchain as a medium of barter.

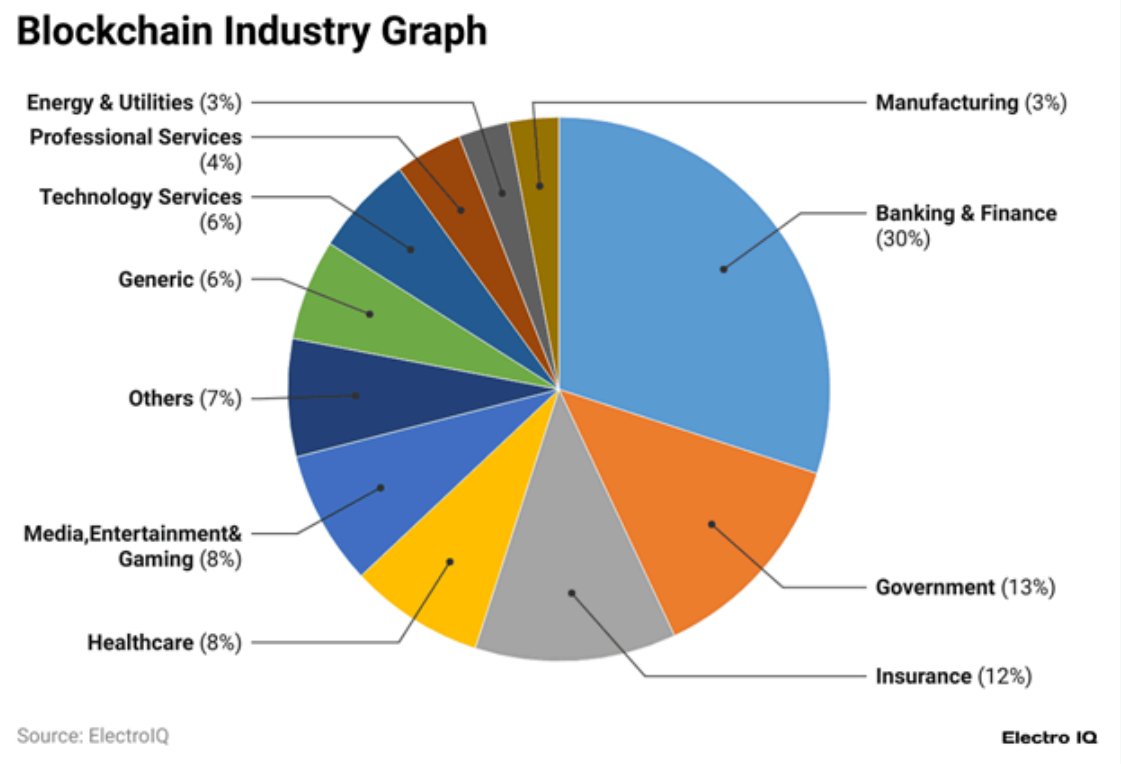
For those who would think blockchains are impenetrable, owing to encryption, you should think again. There are any number of ways the Bitcoin blockchain could conceivably be breached. Experts could go into nauseatingly boring detail but unless you work in computer security (or spend all night in a gaming chair trolling the deep internet) you probably do not care how any of these things work. I will just parrot, in condensed form, what I have learned. Some of the existing methodologies for breaching an open blockchain include “man in the middle attacks,” “51% attacks” or breaching a node somewhere in the chain – among other things. Your author cannot even imagine what vulnerabilities might be concocted by the advent of quantum computing. These possibilities would not present such horrifying concerns if there was some certified record of ownership. Most people want to know their money can be claimed. Financial intermediaries, such as banks and credit unions, provide that assurance.

Digital transactions are nothing new to most consumers. In fact, only about 4% (or less) of U.S. money is represented by paper currency or coins. The differentiation between US currency and cryptocurrency is financial intermediation versus blockchain transactions. The rise of blockchain technology may have materialized to service anonymous transactions; however, present mediums of bitcoin exchange have become considerably less shady and, in some cases, not at all anonymous. Blockchain technology is proving that it can be used as a competent ledger of transactions, but it is doubtful that very many merchants are comfortable waiting around until a new block in the chain is formed in order to verify payment or to rely upon the creditworthiness and credibility of some random wallet app. As far as Bitcoin is concerned, this problem has yet to be solved. If the size of the blocks was unlimited or formation was faster, this would not be as much of an issue.

This leads us to the next, arguably dubious, step in the evolution of blockchain technology – central bank digital currencies (CDBCs.) Essentially, these are digital versions of official “fiat” currencies - presumably using blockchain technology to make real time, direct payments. China actually launched a CBDC – the digital yuan (or e-CNY.) Unlike the Bitcoin movement, which attempted to preserve the anonymity of the user, the PRC’s digital currency allowed it to track virtually every move the people made. The blockchain (absent anonymized, digital money) creates a permanent record of every aspect of every transaction.

The Federal Reserve Bank has discussed this possibility and has, for the moment, tabled it. The purported reasoning for considering it was to create a “safe, efficient payment system.” A white paper (available at the New York Federal Reserve) suggests that a CBDC could supplant our existing dollars. Congress has taken up consideration of the issue, which means we should not have to worry about it for quite some time.

Not a day goes by that most of us do not transfer money via Zelle or Venmo (or some other service), or pay a bill by way of an ACH portal or simply purchase lunch with a card. The general idea of digital transactions is not foreign to most of us; however, the reality of using blockchain tech as the primary transactional tool could foment harsh and Orwellian urges, in the wrong hands. Look at the evidence of government overreach in the past or the attitude of the IRS and other existing federal agencies when it comes to disregarding the Constitution. Citizens, politicians and bureaucrats are often willing to cede privacy and constitutional rights in the name of security or order. A government run digital currency could easily decimate the concept of financial privacy. Trading information security for electronic convenience is a slippery slope. Here is hoping we do not slide down it.





Data Centers: Look Before You Leap

Jon L. Smith, Ph.D. | Director, Bureau for Business & Economic Research

The explosion of artificial intelligence (AI) and its increasing importance in the global economy is a major development that will transform the way that we work and live our everyday lives. AI requires data centers which are giant warehouse like facilities filled with computers, servers and other equipment to processes the vast amounts of data AI requires. Many Tennessee communities have enthusiastically welcomed data centers as part of their local economic development strategies (Nashville, Memphis and Chattanooga). Currently, there are thirty-nine data centers and twenty-four “providers” in the state and there has been an increasing push in many communities to recruit data centers to stimulate local economic development.

Data center developers promise that the creation of a local data center will bring new high paying jobs, new investment and substantial state and local tax returns. Given these desirable economic impacts, it would seem that it would be a good idea for a local community to jump on the AI train and reap the benefits. After all, what could possibly go wrong with a huge warehouse like facility that not only generates the stuff of artificial intelligence but also high paying jobs, and local tax benefits? Well, a lot can go wrong, especially if you don’t understand the downside of these centers.

First, consider the claims about the creation of new jobs. As it turns out, the majority of the jobs cited in local data center economic impact assessments are associated with the construction of the data centers. It’s true that construction employment does give the local economy a boost, but the impact is temporary. It goes away once the center is constructed. The number of jobs that stay in the local economy, the jobs associated with continuing center operations, tend to be somewhat modest and vary with the size of the facility. The typical data center will employ from 50 to 200 permanent new employees (although large “hypercenters” with over 100,000 square feet can have larger operational staffs of around 500). However, number of these jobs will not be “high tech”. Rather, they will be associated with the maintenance and security of the facility. Don’t get me wrong, 100 or more new, high paying technical jobs would be a boon to any local community. It’s just not the “total” numbers frequently cited in data center impact studies.

Second, there are indirect costs often not mentioned in site selector’s data center “pitches”. Data centers require enormous amounts of electricity to power their thousands of computers. This places a strain on the local energy grids. This increase in electricity demand can result in rate increases for local users. In order to ameliorate this, there has been a move by some data centers to go “off grid”, that is to develop independent power sources using coal, natural gas or diesel generators. Third, data centers require millions of water daily to cool their “computer farms”. Large data centers use from 300,000 to 5,000,000 gallons of water per day, about as much as a small city. A large, new data center can place considerable stress on local water utility system. There are also environmental concerns relating to how the water used by the data centers is discharged.

Fourth, while your home computer seems to barely make a whisper, a thousand of them in one place and their associated cooling fans create quite a ruckus. Inside of a large data center, operating noise can exceed 90 decibels, a level loud enough to cause hearing damage. Homeowners living near data centers frequently complain about a constant 50 decibel “hum” emanating from the facility next door (imagine a thousand 6 year-olds standing next door blowing on a one note harmonica day and night). Economic impact studies tend to ignore this impact.

Is this a suggestion that data centers should never be welcomed in order to stimulate local economic development? No. Data centers are here to stay, at least until some new technology is developed. They do bring jobs to local communities. They may attract users to locate nearby bring more jobs. The point is that before committing to develop a data center, community leaders should take a long, hard look at what it costs a community to bring one of the facilities to the region, just like the city of Bristol, Tennessee has decided to do.

After considerable discussion, the City of Bristol Tennessee’s City Council passed a two-year moratorium on allowing data processing centers to locate within the city. As reported by HEREBristol.com, “The moratorium aims to provide the council with an opportunity to conduct thorough research regarding the establishment of data centers, allowing time to adequately assess and potentially revise zoning regulations.” This decision not only speaks highly of the Council’s willingness to respond to citizen’s concerns but also to their city planning committee’s decision to “engage in comprehensive research surrounding data centers”. Hats off to you Bristol. May other communities follow your example.



Housing Market

Joseph Newhard, Ph.D. | Associate Professor of Economics

It is difficult to assess the local housing market one month at a time because the median home sold price in Johnson City is highly volatile from month to month. In the past year or so it ranged from \$245,000 in November 2024 to \$361,400 in September 2025 with several ups and downs along the way. For instance, in August 2025 it had fallen to \$275,500. Rising \$86,000 in one month represents random variation in the types of houses sold rather than a general market trend and shows how misleading it can be to report prices for only the most recent month. A burst of new construction houses, which tend to be larger and concentrated in the \$350,000 to \$400,000 range, also increases median prices while smaller existing homes remain off the market.

Traditionally, one of the fundamentals driving home prices is local incomes. The median household income in Johnson City in 2025 was \$55,400. However, this includes college students because the Census considers them to be residents of where they live most of the time. Consequently, the Jonesborough median household income of \$63,155 may better represent what the typical family earns in Johnson City. This allows for a budget of around \$200,000 following common guidelines.

A recent look at Zillow revealed 74 listings for new construction homes in a rectangular map area from Jonesborough to Johnson City and from the mountain to Boone Lake. (This number changes as you zoom in or out or slide the map in any direction). These are all single-family homes as the closest new townhomes that are available are in Kingsport. Only 33 of these 74 listings are below \$400,000. Only 2 are below \$300,000 with the cheapest at \$271,000.

Johnson City Listing Count by Price Band: New and Used Homes Combined				
	Price Band	Total	New	Used
>	\$400k	114	41	73
	\$300k to \$400k	69	31	38
	\$250k to \$300k	20	2	18
	\$225k to \$250k	6	0	6
	\$200k to \$225k	13	0	13
<	\$200k	28	0	28

The same map area showed 245 homes of all types that are not new construction but removing lots and apartments takes it to 176. Of these, 103 are below \$400k, 65 are below \$300k, 47 are below \$250k, 41 are below \$225k, and 28 are below \$200k. Of the latter, some of these homes are under 1000 sqft and some could be described as fixer uppers, but the ones not flipped or converted into rentals provide opportunities for a few local median income families to buy homes. However, at around 6% for a 30-year fixed rate mortgage, it's now very difficult for a typical family to make a life for themselves in Johnson City if they aren't resigned to a lifetime of renting. Investors and deeper-pocketed transplants, including beneficiaries of the inexplicable Johnson City Remote Work Program, get first dibs.

The South has lost its advantage as the most affordable region for housing in the United States. That title has been taken by the Midwest. Zillow listings for Columbus and Pittsburgh reveal a good number of homes that on average are larger and cheaper than what the Johnson City market offers.

A recent report by United Van Lines finds that Oregon now has the highest ratio of inbound vs outbound moves. Tennessee ranks 15th while nearby neighbors North Carolina ranks 7th and South Carolina ranks 3rd. New Jersey is the top state residents are fleeing followed by New York and California. Among Southern states, only Mississippi (6) and Louisiana (20) make that list. It also includes several Midwestern states despite lower prices.

Nationally and in Tennessee, housing has not been a lucrative investment for several years relative to other asset classes. While the S&P 500 has doubled since late 2022 and silver has quadrupled, the median listing price of homes has stagnated and is down after adjusting for inflation. In Tennessee, prices doubled from 2016 to 2022 with no further gains since then. If Covid had never occurred and the Fed had not suddenly flooded the economy with \$5 trillion, it does look like home prices have converged back to where the pre-Covid trend would have led us: a new economy where moving forward, incomes will no longer support home ownership for the majority of workers