

# Four Corners Economic Quarterly

## 2007Q1

Office of Business and Economic Research, School of Business  
Fort Lewis College, Durango Colorado

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## A Glance at La Plata County's Economy

By: Dr. Deborah Walker

There is no reason to believe that La Plata County's economy will take a nose dive in the near future. When looking at the local data available for 2006, the local economy fares very well. According to the Bureau of Labor Statistics the annual average pay in La Plata County in 2005 was \$32,163, compared to the state average of \$41,601 (or a little over 75 percent).

The latest unemployment rate available (November 2006) is 2.9 percent (compared to an annual average of 3.9 percent for 2005). Although this considered very low, which is typically seen as a good thing, it also indicates that some local employers might have trouble finding workers; and that might put upward pressure on local wages. Those industries that pay the highest average wage in the County are mining (including oil and gas extraction), followed by transportation and warehousing, information, and wholesale trade.

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Major employers in La Plata County include firms in the service, retail, government and construction industries. These industries, which include tourist activity, continue to drive the local economy (along with oil and gas extraction). The 2006 data for retail sales, passengers both using the Durango-La Plata County Airport and the Durango-Silverton Railroad, visitors to Mesa Verde and lodger's tax revenue all show increases over 2005. Employment growth does seem to be slowing slightly, decreasing a little from 2005. Industries which have seen growth in employment over the past few years have been local government, construction and information.

Agriculture still remains an important contributor to the local economy. Unadjusted average alfalfa hay prices increased in 2006 (about 5.6 percent over 2005), while calf prices fell slightly (about 1 percent). Industrial kilowatt hours used in the County stayed about constant from year to year. This is an indicator of industrial activity, including compression of natural gas through pipelines. Natural gas extraction remains an important part of the local economy. Energy prices can be very volatile, showing a large increase in the first quarter of 2006 of almost 26 percent (adjusted for inflation), an increase of 6 percent in

the second quarter and then a decrease of almost 10 percent in the third quarter. Fourth quarter data is not yet available.

Other contributors to the local economy are Fort Lewis College, the construction industry, and the real estate industry. Residential real estate prices continued to increase in the first three quarters of 2006, but price increases are flattening out. Fort Lewis enrollment did not increase as hoped, and the construction building permit values, although showing a slight decrease in the third quarter of 2006, continue to remain strong. With the proposed development at Three Springs, expect construction to remain strong.

Finally, bank deposits, which are an important indicator of the ability of financial institutions to make loans to local investors, continue to increase in La Plata County.

According to the Federal Deposit Insurance Corporation, the first six months of 2006 showed a 16.7 percent increase in deposits over the first half of 2005 (second six month data is not yet available).

## Hedging Natural Gas Prices

By: Dr. Luke Miller

### Natural Gas Industry

U.S. natural gas markets have undergone a remarkable transformation in recent years. After decades of rigid regulation, the natural gas industry is now free to compete on the wholesale level and, in a growing number of states, at the retail level. The result has been a substantial increase in the production of natural gas, far-reaching changes in the structure of the industry, and the growth of a large and fluid market in natural gas futures and options to cope with pricing uncertainties (NYME, 2003).

Natural gas is sold as a commodity, much like pork bellies, corn, copper, and oil. The basic characteristic of a commodity is that it is essentially the same product no matter where it is located. Natural gas, after processing, fits this description. Commodity markets are inherently volatile, meaning the price of commodities can change often, and at times drastically -- indeed natural gas is one of the most volatile commodities currently on the market.

Natural gas is an attractive fuel: it burns cleanly, produces little pollution, and has abundant reserves. The Energy Department's study puts recoverable reserves and resources of natural gas in the lower 48 states at 1,310 trillion cubic feet, more than a 69-year supply at current production levels. Most of these reserves are recoverable at prices below \$3.50 per 1,000 cubic feet.

The deregulation that began in 1978 has addressed two important factors that were inhibiting the growth of the industry: the lack of incentive to drill for new supplies, and the lack of reliable, readily accessible transportation. Additionally, the 1990 amendments to the Clean Air Act have led utilities and industries to use more natural gas in place of the high-sulfur boiler fuels that contribute to acid rain. The nation's rising demand for electricity has also increased the importance of natural gas. Utilities are responding by building or contracting for

new combined-cycle and cogeneration facilities, most of which are fueled by natural gas.

Most U.S. gas demand is met by domestic production. About 15% of U.S. natural gas consumption was met by imports, virtually all arriving by pipeline from Canada. The low level of U.S. imports is typical of the natural gas markets worldwide. While nearly 50% of world oil production crosses a country's borders, only 16% of the world's gas production does so. Natural gas accounts for 25% of primary energy consumption in the United States. End-users are generally grouped as residential, commercial, industrial, and power generators; each has its own risk profile.

The residential and commercial groups have fairly stable base load demands and large, variable heating demands. This heating demand is the main force that drives the natural gas market during the winter; approximately 43% of the natural gas consumed throughout the year is actually used in the four-month period of December through March. Over the short term, residential and commercial heating demand is weather sensitive, varying primarily in response to the severity of the winter temperatures.

Many manufacturers consume natural gas, both as a feedstock and as a fuel for their manufacturing process. Generally, there is no other fuel that can be used for these purposes, or else the potential substitutes

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are costly, so this portion of industrial demand is not sensitive to residual fuel oil prices. However, both processing demand and boiler fuel demand are sensitive to changing levels of industrial activity — especially in the glass, food, paper, chemical, petroleum refining, primary metals, fabricated metals, and machinery industries.

For most electric utilities, air conditioning use is the major variable in market demand for electricity, and more and more power producers depend upon gas to meet peak demand. Since electricity demand peaks in the summer in most of the country, consumption of gas by electric power producers is counter-seasonal, helping to some extent to smooth out the highly seasonal demand pattern set by residential and commercial heating users.

**La Plata County and Natural Gas**

La Plata County sits on one of the largest natural gas reserves in the country. As such, the natural gas industry in La Plata County provides a substantial amount of tax revenue, providing the local community with many amenities that would not be possible otherwise (Walker and Sonora, 2005). Consider: Direct spending by the natural gas industry in La Plata County for the year 2003 was approximately \$215.7 million.

- Each dollar spent by the natural gas industry in La Plata County generates approximately \$1.43 in additional sales (or output), or an additional \$308.4 million dollars spent on productivity in La Plata County in 2003. This represents over 22% of the total personal income (or output) of La Plata County.
- Direct earnings spent in La Plata County increased by \$42.6 million in 2003 because of natural gas operations. Total household earnings that can be attributed to the natural gas industry in La Plata County in 2003 equaled \$78.5 million.
- Direct employment by the natural gas industry in 2003 was about 305 jobs which generates an additional 623 related jobs in La Plata County. This is approximately 4.2% of the total employment in the County.

- In 2003 the natural gas industry paid average salary was approximately \$84,000, as compared with the average annual wage in La Plata County in 2003 of over \$28,000.
- In 2003/2004 the natural gas industry accounted for about 48%/62% of all La Plata tax revenues, if natural gas prices continue, this share should grow.
- The natural gas industry generated an additional \$6.2 million in sales tax revenue for La Plata County in 2003 or about 62% of the total sales tax revenue.

**Hedging Natural Gas**

Derivatives are financial instruments that 'derive' their value from an underlying asset; in this case the price of natural gas. Derivatives can range from being quite simple, to being exceedingly complex. Basic types of derivatives include futures, options, and financial swaps. Natural gas futures are traded on the New York Mercantile Exchange (NYMEX) in units of 10,000 million British thermal units (mmBtu) up to 36 months in advance. Consider the plot of natural gas prices since 1998 below. Prices have been as low as \$2 and as high as \$16 per mmBtu.



The price of natural gas is set by market forces; the buying and selling of the commodity by market players, based on supply and demand. There are two distinct markets for natural gas: the spot market and the futures market. Essentially, the spot market is the daily market, where natural gas is bought and sold 'right now'. To get the price of natural gas on a specific day, it is the spot market price that is most informative.

The futures market consists of buying and selling natural gas under contract at least one month, and up to 36 months, in advance. For example, under a simplified futures contract, one could enter into an agreement today, for delivery of the physical gas in two months. There is a significant market for natural gas derivatives and financial instruments in the United States. It has been estimated that the value of trading that occurs on the financial market is 10 to 12 times greater than the value of physical natural gas trading.

Trading financial derivatives can help to mitigate, or 'hedge' risk. A hedging strategy is created to reduce the risk of losing money. For example, purchasing homeowner's insurance is a common hedging activity. Similarly, a marketer who plans on selling natural gas in the spot market for the next month may be worried about falling prices, and can use a variety of financial instruments to hedge against the possibility of natural gas being worth less in the future. Futures and options markets provide a forum for commercial interests in a commodity to hedge against price risk by transferring that risk to those more willing and able to bear it, or to those commercial interests with inverse risk profiles.

Thus, the futures market allows industry marketers to lock in a purchase price for gas they have committed to deliver, or to lock in a selling price, including a profit margin, for gas they have committed to buy. Pricing in a volatile market makes it difficult to maintain flexibility when planning. Without futures, market participants must accept fixed-price contracts, which can prove disadvantageous. The futures market provides flexibility in forward planning. This flexibility is further enhanced by the options market which provides participants with, among other things, the ability to set price floors or ceilings, hedging against adverse price movements while retaining the ability to participate in favorable ones.

Financial natural gas markets may also be used by market participants who wish to speculate about price movements or related events that may come about in the future. The main difference between speculation and hedging is that the objective of hedging is to reduce risk, whereas the objective of speculation is to take on risk in the hope of earning a financial return. Speculators hope to forecast future events or price movements correctly, and profit through these forecasts using financial derivatives.

**Consider the following examples where futures and options could be used to hedge risk (i.e. lessen the probability of losing money):**

- Fixing short-term fuel costs: End users may sometimes look for extra protection against seasonal price spikes or may want to lock in their near-term fuel costs for some other reason.
- Locking in an attractive spot price: The end-user who finds the current natural gas spot price attractive can use the futures market to lock in that price for at least 36 months. Or the end-user can purchase call options to set a ceiling purchase price for gas.
- Hedging storage gas: End-users who have put gas into storage can hedge against falling prices by selling futures, buying puts, or even selling calls against their stored gas.
- Protecting against sharp price spikes caused by occasional pipeline congestion which results in shortages or delivery slowdowns.
- When abnormal weather, concerns about storage levels, or other factors cause natural gas spot prices to strengthen, that strength will frequently be reflected in prices paid for futures contracts deliverable some months ahead. This presents opportunities to lock in attractive forward selling prices.
- Producers can earn additional revenue in flat markets by selling call options on their reserves.
- Protecting against increasing or decreasing electricity prices.
- In general, financial institutions are more willing to lend against hedged reserves than unhedged reserves and, in some cases, hedging is a prerequisite for borrowing. Either the sale of futures or a put options purchase is considered a suitable instrument for hedging gas still in the ground.

In general, the natural gas futures market provides investors with many attractive opportunities. Demand for gas is highly seasonal, but the seasonal impact on pricing is unpredictable. Variables include the severity of the winter weather, inventory levels, producers' needs to generate cash to cover their expenses, unexpected changes in demand for gas-generated electricity, transportation prices and constraints, and the cost of natural gas versus the cost of other fuels.

## Futures Example:

Assume you are in the business of selling natural gas or in the case of La Plata County your tax income is dependent upon the price of natural gas. Assume it is year 2005 and future prices of natural gas are \$12 per mmBtu. You could short future contracts at \$12 in 2005 for up to 36 months. Consider the price of natural gas today of \$7 per mmBtu. What does this all really mean?

You have a contract to sell your natural gas for \$12, no matter the price today. This future contract allows you to either physically deliver your natural gas at \$12 or you could simply cash-in on your financial contract. Your short future position has a current value of \$5 per mmBtu today (\$12 - \$7). You could close out your futures contract and pocket \$5 per mmBtu and then sell your natural gas at \$7 per mmBtu; for an effective selling price of \$12 per mmBtu. In other words, if you correctly hedged your natural gas exposure in 2005 your gross profit today would be 71% higher versus selling only at the spot price.

Let's consider the opposite scenario today where the spot price of natural gas is \$16 per mmBtu. Your future contract would be worth negative \$4 (\$12 - \$16), however, you could sell your natural gas at \$16 per mmBtu, for an effective selling price of \$12 per mmBtu. In other words, the spot price is \$16 and you effectively sold the natural gas for \$12.

Thus, hedging is a practice to lock in a particular selling price or profit margin. If you are happy with the currently quoted "profit margin" for your business, then futures are an instrument to guarantee it. To put things in perspective, La Plata County produces approximately 525 million mmBtu each year. At an average selling price of \$12 per mmBtu this equates to \$6.3 billion in gross sales versus \$3.7 billion in gross sales at \$7 per mmBtu.

### References:

NYME, Risk Management with Natural Gas Futures and Options, 2003.

Walker, D. and R. Sonora, "The Economic Impact of the Natural Gas Industry in La Plata County", *Economic Impact Study*, 2004.

## The National, State, and Local Economy

By: Dr. Robert J. Sonora

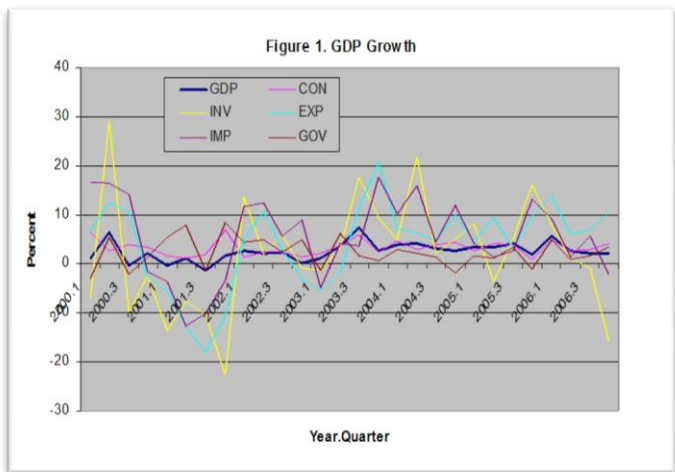
Despite some earlier concerns about the national and state economies, many of the indicators are pointing up. Still there are still some niggling concerns including potentially rising fuel prices, though as reported earlier this week, experts don't believe gas prices will rise above \$3 per gallon, a volatile stock market, and continuing real estate woes.

Overall, the national economy appears to be a pretty good shape, despite weathering a sharp decline in the stock market and uncertainty in the Middle East. Output in the fourth quarter of 2006 grew at an annual rate of 2.2%, led by household consumption growth and a surprisingly strong growth in net exports. This was offset by a decline in domestic investment, in part due to declining residential sales.

During the last quarter of 2006, US gross domestic product (GDP) grew at relatively sound 2.2%. Most of the growth can be attributed to steady growth by US household purchases, which grew at 4.2%, about one percentage points above the six year mean. This is particularly important to the overall health of the economy as household consumption accounts for almost 70% of total US GDP growth can also be attributed

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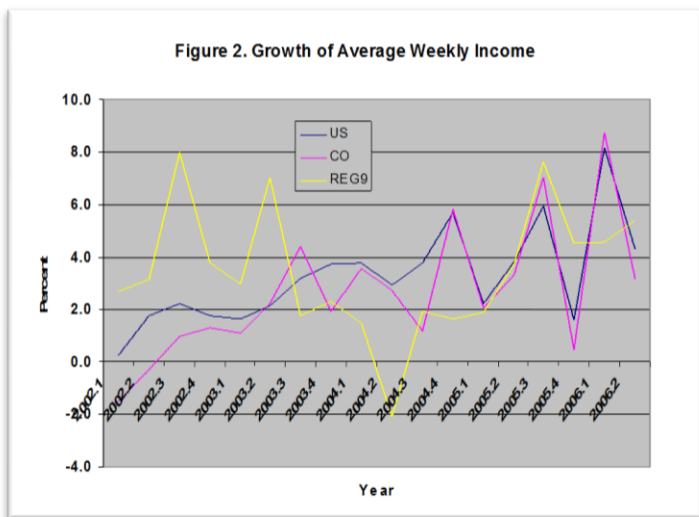
to a decline in imports (-2.2%) and growth in exports (10.5%), though the US is still has a considerable trade deficit. Defense spending rose 12% in the last quarter, which offset a decline of 10.2% in the non-defense sectors. Finally, firm and household investment fell by about 15.5%, driven by a steep decline in residential investment - as is well documented. Figure 1 illustrates the growth of GDP and its components over the past six years.



Source: Bureau of Labor Statistics

Nationwide seasonally adjusted average weekly earnings were up 3.8% from February 2006 to February this year, real (adjusted for inflation) average earnings were up 1.5%. On the other hand, weekly hours have fallen, but not significantly.

Figure 2 shows the annual growth rate of average weekly income for the US, Colorado and the five Region 9 counties. As can be seen Region 9 was performing nicely before growth rates declined beginning in 2002 in the aftermath of the Missionary Ridge fire, and shrank in the second half of 2004. Since the fourth quarter of 2004 the economy has average weekly income has recovered nicely, with weekly income growing at 5% in the second quarter of 2006, ahead of the state and national average.



Source: Bureau of Labor Statistics

Income continues to rise, with average weekly income rising about four% from the second quarter 2005 to 2006 to about \$785 per week. Total county and state income continue to grow, with Archuleta county experiencing about 8% annual growth from 1994-2004, with county GDP increasing to about \$251 million up from \$101 million (not

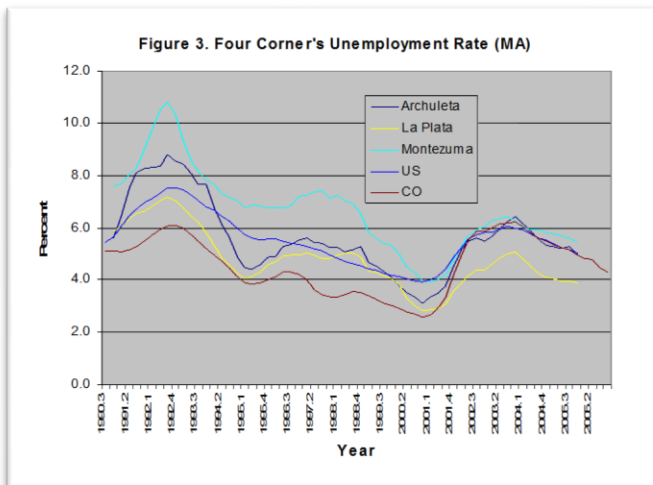
adjusted for inflation), compared to a 6% annual growth in Colorado, see Table 1 below

Table 1. Total Annual Income (millions of dollars)

Year	CO	ARC	DOL	LPC	MON	SJC	DRO
1994	85,671.30	101.3	27.2	770.3	369	10.4	770.3
1995	92,703.70	110.3	28.6	830.8	392.8	10.4	830.8
1996	100,232.90	123.9	28.7	894.6	410.8	10.7	894.6
1997	107,873.30	140.5	33.5	961.9	440.6	11.1	961.9
1998	118,492.90	155.5	35.8	1,040.30	485	12.4	1,040.30
1999	128,859.60	175.5	39.5	1,091.40	508.5	13.2	1,091.40
2000	144,393.70	192.3	37.3	1,210.80	537.2	13.6	1,210.80
2001	152,699.60	207.8	42.2	1,280.30	547.1	14.6	1,280.30
2002	153,066.20	220.5	39.8	1,298.70	556.1	15.5	1,298.70
2003	157,035.40	236.7	43.8	1,370.80	587.6	16.4	1,370.80
2004	166,187.80	251.2	45.1	1,486.60	616	15.2	1,486.60
Annual Growth Rate	6.02	8.26	4.61	5.98	4.66	3.41	5.98

Source: Bureau of Economic Analysis

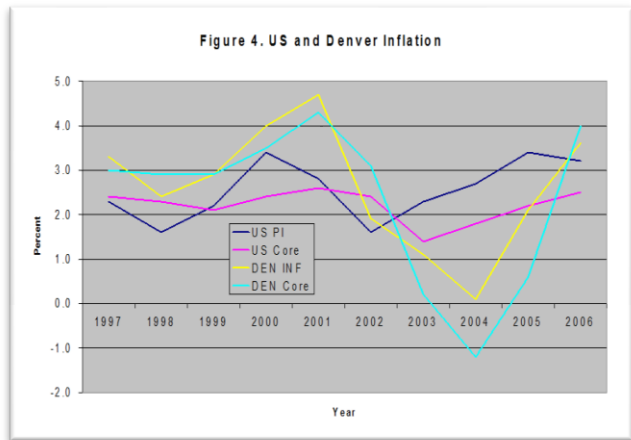
Figure 3 illustrates the unemployment rates of the US, Colorado, and the three largest Region 9 counties from the second quarter of 1990 through 2006. San Juan and Dolores counties are not included because of their large degree of volatility, but are available on request. The data is 'smoothed' to remove seasonal fluctuations. La Plata continues to have the lowest unemployment rate while Archuleta and Montezuma are more on par with the rest of Colorado and the US. In January of this year the unemployment rates in Region 9 were: Archuleta - 4.8%; Dolores - 6.8%; La Plata - 3.5%; Montezuma - 5.2%; and San Juan - 6.8%. Statewide and nationwide unemployment averaged 4.6%.



Source: Bureau of Labor Statistics

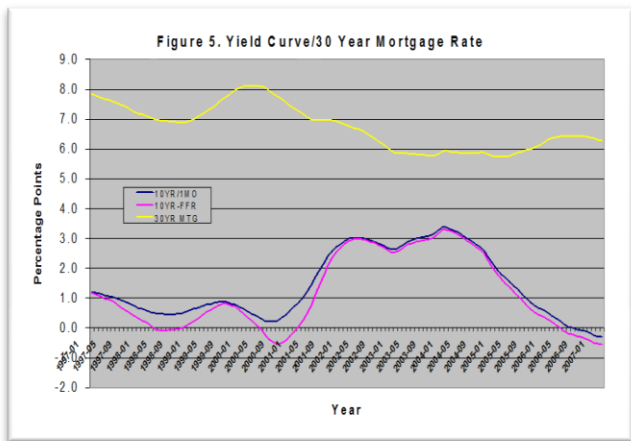
Inflation remains low, about 2.4% in February. Once concern, however, is the relatively high rate of core inflation, which removes the volatile food and energy markets. Core inflation hit about 4% in February, see Figure 4. Fed watchers do not believe the Central Bank will raise the short term interest rate during this week's policy meeting, but with the summer driving season kicking in, there may be some temptation for

them to raise rates at the next meeting – given they still believe inflation risk to be present. Indeed statement from the most recent meeting of the Federal Open Market Committee (FOMC) on March 21, the body which decides US monetary policy, read that inflationary pressures are “somewhat elevated” which leaves, once again, the door open for future Federal Funds Rate (FFR) increases.<sup>1</sup> Denver’s inflation, and core inflation remain high, indeed in 2006 core inflation was 0.4% higher than the overall Denver rate, most likely due to a relatively high inflation rate in housing prices.



Source: Bureau of Labor Statistics

Moreover, many are still a bit nervous over the shape of the “yield curve”, which maps the relationship between short and long term bond rates. Figure 5 illustrates the interest rate differentials for the between 30 year and one month rates (in blue) and the 30 year and FFR (pink). Generally speaking the yield curve should slope upwards, which is represented in the graphs below as a positive interest rate differential. As can be seen in the last quarter of 2006 the yield curve has been “inverted”, which often hints at a recession – we can see the curve inverting as the economy heads towards the 2001 recession.

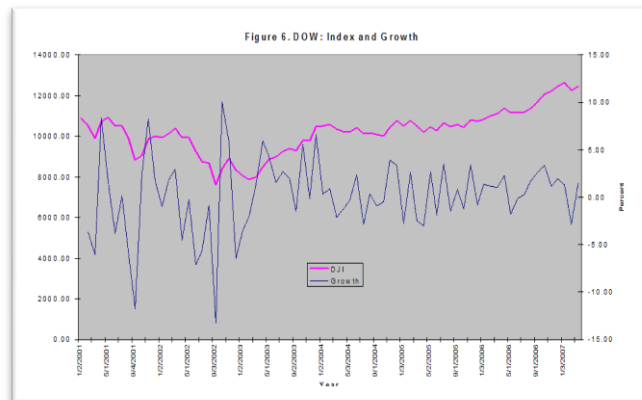


Source: Federal Reserve Bank of St. Louis

Taking together, inflationary pressures (illustrated by the shape of the yield curve) and continued vigilance by the Fed may not be good news for the housing market, particularly those which hold short term adjustable rate mortgages (ARMs), which have been driven up by short term interest rates, and households borrowing in the ‘sub-prime’ market. In December of 2006, Colorado earned the dubious distinction of being number one in terms of foreclosures with one foreclosure per

376 households, up almost 300% from the previous year. The nation as a whole saw one foreclosure per 1,055 households, up 35%. There appears to be considerably less foreclosures in Region 9 than in the rest of the state, Greeley experienced the highest rate in the state. Housing prices continue to grow, good for homeowners but more difficult for first time home buyers, as second home buyers continue to purchase housing here.

Nervousness in these markets may be partly responsible for the recent drop in global stock markets. Some analysts seemed to believe that the economic miracles of China and India might be in question, but that seems specious and disingenuous. More likely it is continued uncertainty in the Middle East and the decline in the dollar (though good for exports, see above). Though decomposing all of these interconnected variables is difficult.



**Durango Price Index:**

The inflation rates that the majority of us are familiar with are the national average. The closest inflation rate to be used here in La Plata County is found in the Denver-Boulder-Greeley metropolitan statistical area (MSA). The Office of Economic Analysis and Business Research will be compiling data to be used in the calculation of a Durango Micropolitan SA (mSA). The index will be calculated using a basket of common goods and services the average household would buy during the course of a month.

Our basket will contain housing and utilities, food, local services (restaurants, insurance, etc.), gas, clothing, etc. It will not include big ticket items (durable goods) as these are generally not purchased by the average household every month, and will only be calculated using goods and services purchased in Durango.

The index will start using Denver-Boulder-Greeley expenditure weights which will, over time, morph into Durango specific expenditure weights. A caveat: this is not to be assumed to be in any way comparable to the CPI calculated in Denver. Their basket is extensive, including large ticket items, updates for durable goods. Rather this is to be a general bench mark for how a frequently purchased basket will change from month to month.

<sup>1</sup> The FFR is the market rate at which banks borrow from each other in the Federal Funds market. Generally speaking these are very short term loans, less than two weeks.



The *Four Corners Economic Quarterly* is a newsletter on economic indicators of Southwest Colorado published by the Office of Economic Analysis and Business Research in the Fort Lewis College School of Business Administration and Region 9 Development District of Southwest Colorado, Inc.

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