



The Durable Goods Report

Manufacturing Data Release of 5/4/2010 (March Preliminary)

Retail Data Release of 5/14/2010 (April Advanced)

Source Data: US Census Bureau

John E. Layden, Prevel Technology

By the Numbers:

Prevel Technology - Durable Goods & Retail Summary			
	Mar-10	Feb-10	Mar-09
New Orders-Durable	178,672	179,678	157,963
12 month moving average	168,834		189,992
% Change from Prior Year	-11.1%		
Unshipped Orders - Durable	721,687	722,535	759,101
% Change from Prior Year	-4.9%		
Value of Shipments - Durable	182,800	180,220	173,884
12 month moving average	175,979		197,795
% Change from Prior Year	-11.0%		
Inventory - Durables	305,191	304,198	328,422
% Change from Prior Year	-7.1%		
Retail Sales (Apr data)	326,950	325,440	300,117
12 month moving average	313,259		317,403
% Change from Prior Year	-1.3%		
Inv to shipments ratio - Durable	1.67	1.69	1.89
Growth Index - Durable New Ord	1.057	1.051	0.839
Growth Index - Durable Shipmts	1.030	1.031	0.889
Growth Index - Retail (Apr)	1.033	1.029	0.951
1. Preliminary release data (~5 wks after the end of the period).			
2. Seasonally Adjusted, millions			
3. Prevel Growth Index = 3MMA / 12MMA			
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Monthly Rate of Change				
	This period	Last period	Change	Comments
GDP Q1 vs. Q4	14,601.4	14,453.8	1.0%	
Industrial Production (Mar)	2787.8	2780.2	0.3%	
Capacity Utilization % (Mar)	73.2	73.0	0.2	
Manufacturing %	70.0	69.4	0.6	
Durable Goods %	64.1	63.2	0.9	
Autos and Parts %	54.4	53.1	1.3	
Machinery %	62.9	62.1	0.8	
Durable Goods (\$ Mil Seasonally adjusted) Mar Data				
New orders	178,672	179,678	-0.6%	
Shipments	182,800	180,220	1.4%	
Inventory	305,191	304,198	0.3%	
Unshipped Orders	721,687	722,535	-0.1%	828 bil 9/2008
Total Retail (\$ Mil SA) Apr data	326,950	325,440	0.5%	
Autos and Parts	62,868	62,531	0.5%	
Gasoline	36,300	36,134	0.5%	
Core retail	227,782	226,775	0.4%	
Employment (000's SA) Apr Data				
Non-Farm	130,161	129,871	290.0	138 mil 1/2008
Goods Producing	17,968	17,903	65.0	
Manufacturing	11,635	11,591	44.0	13.7 mil 1/2008
Durable Goods Mfg	7,086	7,042	44.0	9.1 mil 6/2006
Housing (000s of Units SA) Mar Data				
Single family starts	536	531	0.9%	
Single family sales (new)	411	324	26.9%	
Single family for sale (new)	228	236	-3.4%	570 in 8/2006

Global warming: The greatest threat to US manufacturing in since the great depression is the cap and trade legislation introduced last week. The following discussion is necessarily long. But stick with me on this one.

There are three key updates:

- There is no greenhouse effect operating on Venus or anywhere else
- Cap and Trade legislation and EPA regulation aim at CO₂ regulation
- Felony investigation of academic fraud on global warming data

Venus: The final leg of the global warming stool collapsed unexpectedly two weeks ago. The European Space Agency reported on data collected from its Venus Express probe, and a funny thing happened. The greenhouse effect was cancelled.

First some background. The entire global warming debate began about 1970 when Dr. Carl Sagan presented the hypothesis that the extreme surface temperatures on Venus were a result of a runaway greenhouse effect caused by the 96.5% concentration of CO₂ in the atmosphere. He may not have been the first to present the idea, but he made it popular. From there the entire “impending crisis” theme was built. Venus was the example of where we were headed by burning fossil fuels.

We’ve just had our crisis cancelled. The measurements of atmospheric temperatures on Venus showed that the lapse rate of temperature with altitude is -10.4 K/Km. The temperature drops 10 degrees Kelvin (or Celsius) per kilometer of altitude. The value on Earth is -9.7. Importantly, the rate of change is consistent with Boyle’s law (You remember that one, don’t you? $PV=nRT$). This all means that the only thing that influences temperature is atmospheric density. Greenhouse effects are not in play. Surface temperature on Venus is a result of the density of the almost pure CO₂ atmosphere, 92 times denser than Earth’s.

The expected temperature inversion (reversal of the lapse rate at higher altitude) that would signal the presence of a greenhouse effect is completely missing. It was also shown to be missing on Earth in work published by NASA about 3 years ago. The surface temperatures and lapse rate for Venus, Earth, and Mars have now been shown to be a result of the same simple mechanism. Only density matters.

The more important point is that there is no longer any example of a greenhouse effect anywhere in nature, absent a physical barrier that blocks both radiation and convection (as in a real greenhouse). The atmospheric greenhouse effect should now be filed in the same bin with unicorns and Collateralized Debt Obligations.

Cap and Trade: The political death of a theory takes a little longer. This past week the Kerry-Lieberman Cap and Trade legislation was introduced in the US Senate. At about the same time the EPA issued their first draft rules for regulating greenhouse gas emissions. All this happened in spite of the following scientific observations and conclusions:

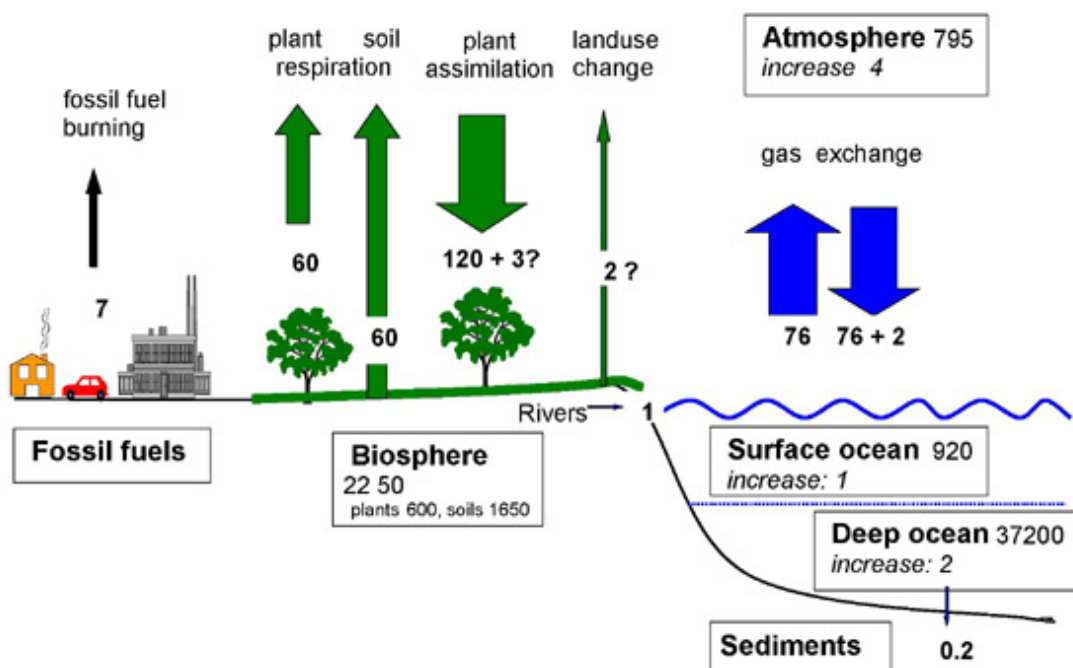
- The Earth has not warmed in 15 years. In the past decade the Earth has cooled at a rate of 6 to 8 degrees F per century, compared to a warming of 0.7 degrees in the past century.
- We're headed into an ice age comparable to 1650-1850 according to the only scientists to have correctly predicted the past two reversals in climate. Check it at: <http://www.spaceandscience.net/id16.html>
- There is no "tipping point" or "runaway greenhouse effect".
 - o The Earth's CO2 concentration has been as high as 8,000 ppm in the past 600 million years and temperatures both increased and decreased.
 - o CO2 concentrations may have been as high as 300,000 ppm (30%) about a billion years ago based on sediment analysis and we had ice ages.
 - o Venus has no greenhouse effect of any kind in spite of an atmosphere that is 96.5% CO2.
 - o No one has ever detected a greenhouse effect outside the laboratory (or outside an actual greenhouse).
- The excess heat energy buildup in the Earth's biosphere is missing.
 - o Ocean heat energy in the top 1000 meters of the ocean is constant.
 - o Same for the atmosphere
- The signature CO2 buildup in the atmosphere from human activity is missing
 - o Proportion of human/natural CO2 is constant
 - o Human contribution to CO2 is trivial.
 - o Additional CO2 is helpful to plant growth and productivity. If we had the ability to increase it, we should. Unfortunately we do not.

If you can't produce a greenhouse effect on Venus with 965,000 ppm CO2, how could we do it on Earth at 388 ppm?

The following chart shows the actual values for the atmospheric CO2 cycle. It's a carbon balance shown in units of peta grams of carbon. It shows the amount of carbon emitted, stored, or absorbed at various points in the cycle. It puts in perspective just how irrelevant the human contribution really is.

The global atmospheric CO₂ Cycle (2000-2005)

Units: PgC (10^{15} gC) and PgC per year



Just so the dear readers don't get the idea that all this is the Democrats run amok once more, we have concrete proof that this particular form of stupidity is non-denominational.

Consider the following:

- Senator Lindsay Graham (R-SC) has withdrawn his support for cap and trade because the Democrats want to push immigration reform. He says it is no longer about climate change because there is no support for that. But he will still vote for the bill. (My careful and studied response: Huh?)
- President George Bush said climate change was real, but differed on how to deal with it. He wanted free market solutions (would that have been like cap and trade?)
- The congressional legislation for ethanol mandates and subsidies was pushed by Sen. Charles Grassley (R-IA) and signed by President George W. Bush.

Fraud investigation: Eighteen months ago we published our first warning about potential intentional falsification of climate data. The risk for manufacturers was in the potential of alignment with government and academic initiatives that would later be discredited. In the past six months the entire house of cards has collapsed. In Virginia the Attorney

General has launched a criminal investigation into the clear and intentional distortion of historical temperature records. The question is whether the falsification was used to obtain government grants in support of global warming research and whether this satisfies the legal definition of criminal fraud. There will be more of this litigation, and some manufacturers who attempted to capitalize on the movement may get swept into the mess.

We are now faced with a profound disconnect between the climate change reality and political reality. While it may take a long time for the political class to catch up with objective reality, customers, shareholders, and employees tend to catch on more quickly. Make sure that the green initiatives in your company are based on actual productivity improvements or cost reduction.

Each company will need to make their own call on political involvement. Supporting cap and trade is an exercise in alligator appeasement in the hope he will eat you last. Opposing it will put your company at risk of political retaliation.

The decision on pursuing government subsidized green initiatives is more difficult. Windmills are a classic example. Even the socialist government in Spain now recognizes economic damage done by their windmill initiatives. For every job created, there were 2.2 jobs destroyed. And it is now clear that windmills will never make a meaningful contribution to energy supply. In fact the information has been available for a long time. Check out the current status of the rusted windmills in Hawaii installed in the early 70s. They couldn't cover the cost of maintenance, even with subsidies.

There is nothing illegal about pursuing most of these projects. But there are serious questions of corporate governance.

Things that make you go Hmmmm?

- How can shipping drugs to Canada and back reduce the cost? Can we do it twice?
- The median age of those killed in the Toyota throttle incidents is 62 years. The median age of Toyota drivers is much lower. Are older people less able to deal with the crisis? Or is the crisis caused by pilot error by older drivers? Or have those clever Japanese engineers learned how to write software that can discriminate by age?
- Sea ice extent in the Arctic hit a decadal record high in March. Near record in April. How did I miss the New York Times coverage?
- Three Northern California cities are facing economic collapse due to the falling prices for marijuana. It seems that the legalization of medical marijuana has resulted in the DEA cutting way back on their enforcement raids. This benign neglect and the increase in legal production are flooding the market and killing prices. Illegal growers are now facing bankruptcy. So are their communities.
- A recent study predicted that the melting of floating sea ice would result in sea level increases. Think about it. If 100% of the floating sea ice were to melt, how

much would the sea level increase? Zero! If the ice is floating, the sea level effects already exist. By the way, the rate of increase predicted was 1 inch increase in the next 526 years. This came from a PhD?

- Where is all the oil? On April 20th we were told that the on-shore crisis was only 48 hours away. We may yet see the colossal mess predicted. But it has been much slower to develop than originally predicted. The tar balls on the Key West beaches are not from the BP spill.
- The natural seepage of oil from the seabed into the Gulf of Mexico is estimated at 5,000 to 20,000 barrels per day. If drilling were ceased the seepage would increase by an estimated 2x to 5x (as it did in the Santa Barbara Channel).
- Worldwide seepage of oil into the oceans is 63% natural, 4% from tankers, 1% from offshore drilling. If we stop drilling and import more will there be a 400% increase in our contribution to the oil in the oceans?
- There's an entry in the log of Christopher Columbus noting the presence of globs of what sounded like oil in the mid Atlantic. Where were the regulators?
- How does a congressional hearing help stop the oil leak? Should there be a moratorium on the finger pointing until 1) the problem is solved, and 2) the analysis is complete and we have some clue about the actual causes?
- The president decries the finger pointing by the oil companies while...(wait for it) pointing his finger at the oil companies.

Summary and Analysis

Overview of the US Economy

Global Economy: The original intent of this report was to clear up miscommunication on the durable goods numbers. It expanded to cover other factors influencing manufacturers. Now we need to watch international banking. It's been a little like stepping into quicksand.

Europe has been in crisis for almost a month on the issues of Greek sovereign debt. This may sound like a minor matter. It is not. The recession of 1929 was at first aggravated by the government attempts to stimulate demand, but it turned into a depression in 1933 with defaults on sovereign debt in Europe. If the house of cards of European Democratic Socialism results in a collapse of the banking system we will be in new territory where the only precedent did not end well. The efforts of the EU to navigate this mess (supported in part by the US Federal Reserve Bank) have shown some modest success, but a victory is far from clear. The critical factor is that several economies have continued to spend beyond their means, and importantly have expanded the non-productive class within the population. Government employment and transfer payments have grown to a high percentage of GDP. The productive class has endured increases in taxes and has shrunk as a result. This group is the ultimate source

Gross Domestic Product				
Year	Qtr	GDP \$b (SAAR)	Chg from Prior Pd	Chg from Prior Year
2007	4	14,031.2	0.6%	4.9%
2008	1	14,373.9	2.4%	6.4%
2008	2	14,497.8	0.9%	5.5%
2008	3	14,546.7	0.3%	4.3%
2008	4	14,347.3	-1.4%	2.3%
2009	1	14,178.0	-1.2%	-1.4%
2009	2	14,151.2	-0.2%	-2.4%
2009	3	14,242.1	0.6%	-2.1%
2009	4	14,453.8	1.5%	0.7%
2010	1	14,601.4	1.0%	3.0%

of wealth creation and tax revenue. Without a correction to this problem the bailouts will be wasted. Germany may set the example for fiscal prudence, but rest of the EU, including the UK must take note.

The recent decline in the Euro will make our exports to Europe more expensive, and imports less expensive. If you were planning a trip to Greece, now would be a good time to save some money. As long as you

aren't too bothered by tear gas.

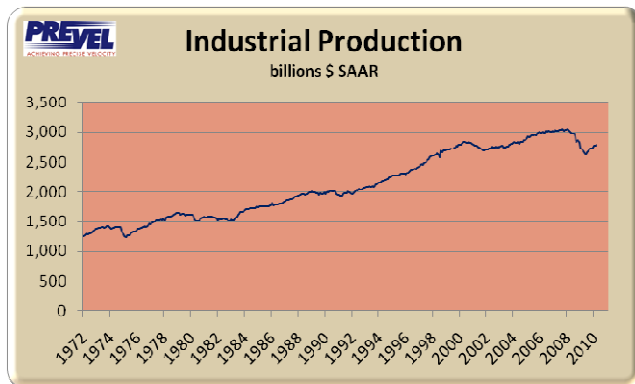
US GDP: The US GDP for Q2 came in at 1% above Q2 (reported as 3.7% annualized rate) and 3% above the prior year Q2. The growth provided further evidence that the recession is slowly coming to an end. The growth rate was lower than the 1.5% Q4 rate of growth. But Q4 was artificially inflated by government stimulus payments. This is now the third consecutive month of positive growth in GDP.

The improvement is much smaller than traditional recoveries, and is currently inadequate to produce enough hiring. The lurking problems in Europe and in the US

real estate sector remain major threats. In addition the increases in regulation and taxes (current and projected) have kept small business on the sidelines in terms of hiring and investment.

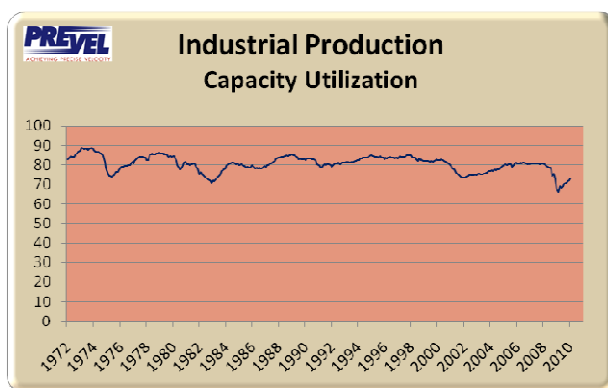
Industrial Production				
Year	Mo	Ind Prod - Value of Prod	Chg from Prior Pd	Chg from Prior Year
2008	10	2,880.7	1.5%	-4.6%
2008	11	2,854.2	-0.9%	-5.8%
2008	12	2,825.0	-1.0%	-7.0%
2009	1	2,733.6	-3.2%	-10.3%
2009	2	2,723.3	-0.4%	-10.4%
2009	3	2,695.0	-1.0%	-10.6%
2009	4	2,678.5	-0.6%	-10.5%
2009	5	2,640.9	-1.4%	-11.4%
2009	6	2,632.3	-0.3%	-11.7%
2009	7	2,668.2	1.4%	-10.5%
2009	8	2,693.3	0.9%	-8.1%
2009	9	2,721.2	1.0%	-4.1%
2009	10	2,729.7	0.3%	-5.2%
2009	11	2,730.3	0.0%	-4.3%
2009	12	2,753.4	0.8%	-2.5%
2010	1	2,777.9	0.9%	1.6%
2010	2	2,780.2	0.1%	2.1%
2010	3	2,787.8	0.3%	3.4%

Industrial Production increased by 0.3% in March and stood 3.4% above the same period prior year. This was the third consecutive month of increase after 22 consecutive negative comparisons to the prior year. This indicator of the economy is more significant to manufacturers (vs. GDP) because it is less influenced by government "stimulus" which has gone



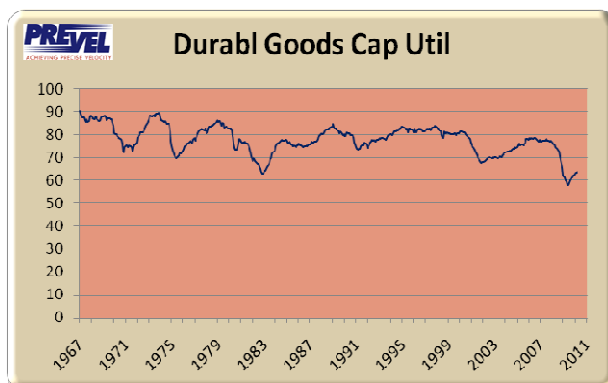
disproportionately to government and non-industrial projects.

Before you get too excited, check the chart. We're still in a deep hole by historical standards. Celebrate with a beer. Save the Champaign.

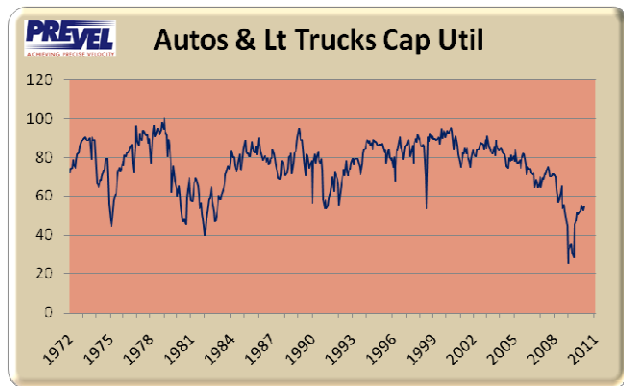


Capacity utilization for Industrial production remains low and the rate of improvement has stalled at 73.2%, well below the nominal of 80% and essentially flat from last month.

Durable goods capacity utilization shows improvement from the low of 57.9% in mid-2008 to the current level of 64.1%. The last time the durable sector saw 80% was in mid 2000. The supply-chain-induced recession of 2000-2003 triggered a decline in utilization due to a delayed response to order declines, and a further delayed response



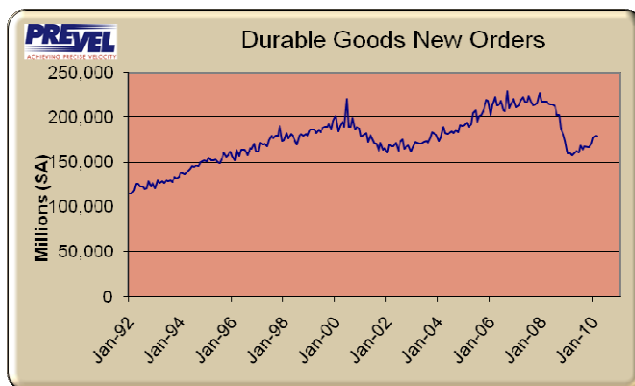
in cutting back expansion projects. The combined result was a decade where average utilization was 74%. Today we stand 10 points below even that weak benchmark. This recovery only warrants a one-beer celebration.



Autos and light trucks capacity utilization shows a similar trend. The March value of 54.4% is clearly better than the 25% bottom during the bankruptcy process, but still grim by historical standards.

After the recovery from the recession of 2000-2003 the auto industry peaked at 90.7% in January of 2003. Since that time utilization followed a path of steady decline. The average utilization from 2003 to current has been 68%. The last time the industry saw 80% was in September of 2005.

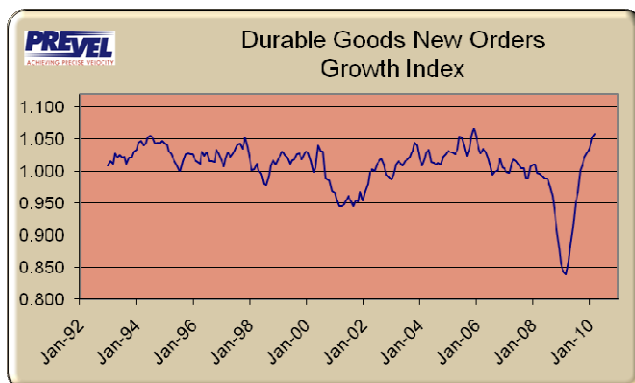
Durable Goods New Orders: New orders declined 0.6%. This may not be a serious concern, since the normal pattern contains a lot of noise. Four of the past six months have been positive. The 12 month moving average is only down 11% from the same



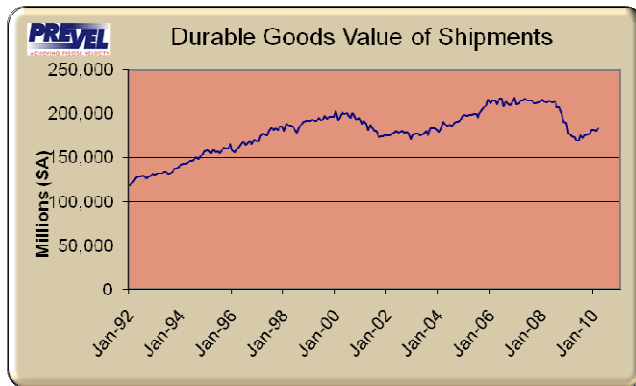
measurement last year. It still looks like a trend of steady improvement after a steep and deep decline. Returning to anything like the levels of 2008 is well in the future. Maybe a single light beer is appropriate.

Construction machinery and machine tool manufacturers both saw healthy jumps in March orders. This seems to be coming from Asia, since there is no obvious support visible in the US or Europe. If this is accurate it may prove fragile. China has begun to take steps to curb the growth in their real estate sector. Some are predicting a crash.

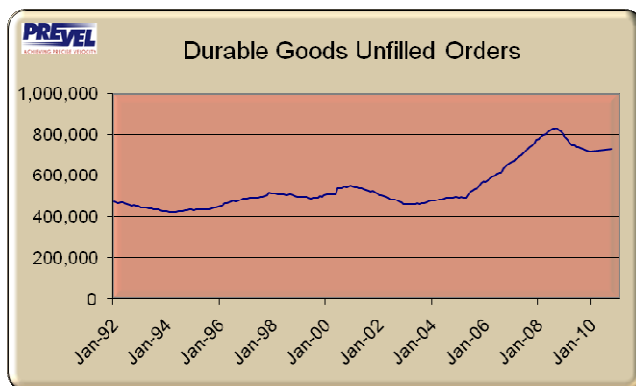
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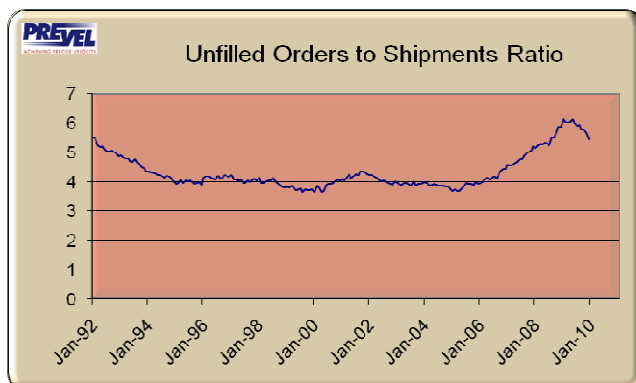
New Order Growth Index continued to climb to 1.057. Values above 1.05 have only been achieved twice before in the past 18 years. It probably has legs absent another shock.



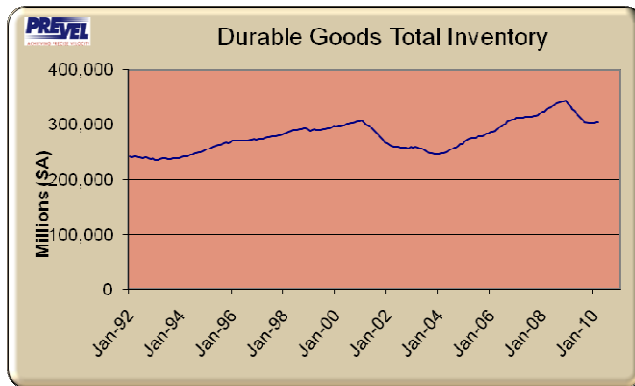
Durable Goods Shipments increased by 1.4%. The pattern looks similar to new orders. The ratio of booked orders to shipments is about 98% which is the normal balance point (shipments include freight cost, orders do not). No major adjustments in production rates would be expected across the sector, but sub-sectors might see different effects.



The **Unfilled Order Backlog** for durable goods remained steady at \$722 billion. This is still much higher than the traditional levels.

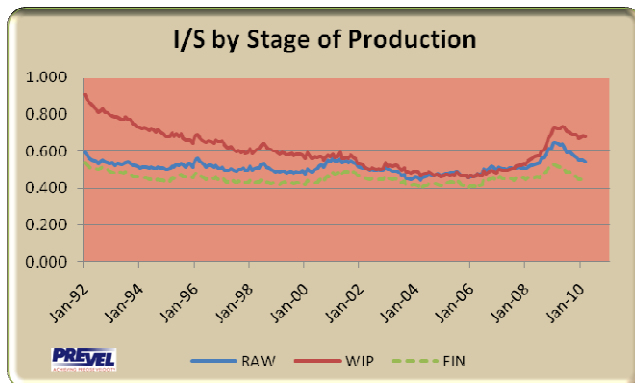


The unfilled orders to shipments ratio (an approximation for order lead time) improved slightly to 5.4 months. This is still well above the normal level of about 4 months.



no unusual trends. But the expansion of WIP inventory (red line) across the board during this downturn points clearly to the need to overhaul the flow processes on the factory floor.

The combined view presented by the unfilled orders to shipments ratio, and by the



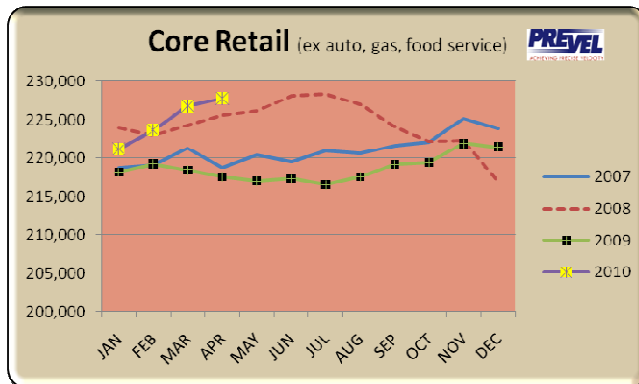
Durable Goods Inventories increased by 0.3% in March while the inventory to shipments ratio improved by about 1%. Inventories continue to be well controlled, but at higher than normal ratio to shipments. With the gradual improvement in sector shipments, expect inventories to grow slowly as well. The internal components of inventory (Raw, WIP, Finished) showed

inventory to shipments ratio by stage of production describes a modest failure of the current methods used to manage the factory floor. Almost every sub-sector displays this same pattern. Longer lead times coupled with increased WIP inventory indicates that the current floor processes are not scalable. This is the typical reaction of systems based on the Toyota Production System which

assume level loading of the factory. What we've seen in the past 18 months is the opposite. Ultimate productivity occurs when velocity is maintained when scaled rapidly in response to changes in customer demand.



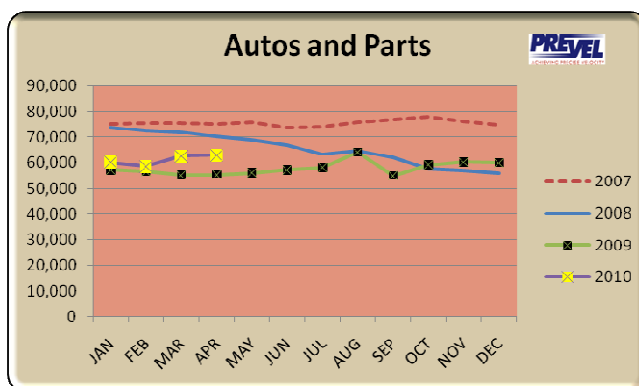
Retail Sales increased again in April, but at a slower pace. To avoid the risk of distortions from gas prices, we've been focused on Core Retail. This month it shows a similar pattern.



Core Retail (excluding food service, autos, and gas) showed an even stronger picture. This measure is the only gauge of consumer sentiment that matters. It's what people actually do and it's setting records. This year saw the highest April sales on record and only a fraction of a point behind the all time record set in the summer of 2008.

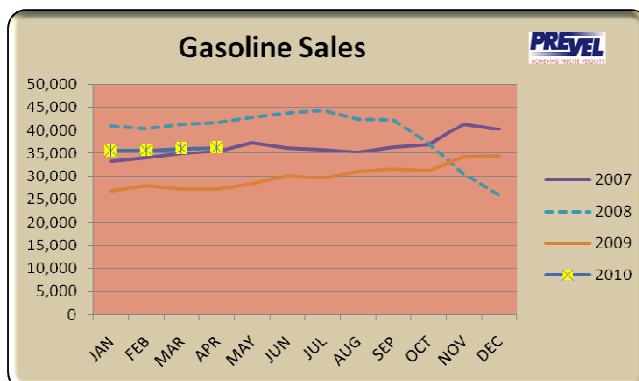
Consumers have been coming back

strong. Food service never experienced a downturn of significance, and is currently setting records. Retail is now leading the way out of the recession.

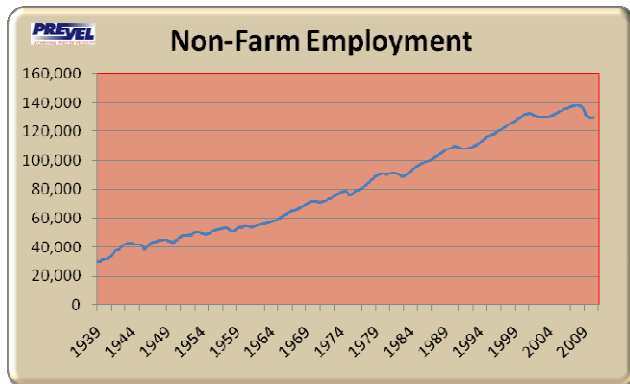


Autos and Parts added a slight positive momentum to the retail numbers. While well below the levels of 2007, the current improvement is a welcome bit of positive news in the battered sector. To put it in full perspective, check the capacity utilization numbers above. Auto manufacturers will remain under serious pressure for an extended period due to excess assembly capacity. Auto

suppliers need to take note. Initiatives to improve productivity are needed now. Don't forget the prime directive: There is no prize for being the first one in or the last one in. The only prize goes to the last one standing. Get aggressive about productivity now.



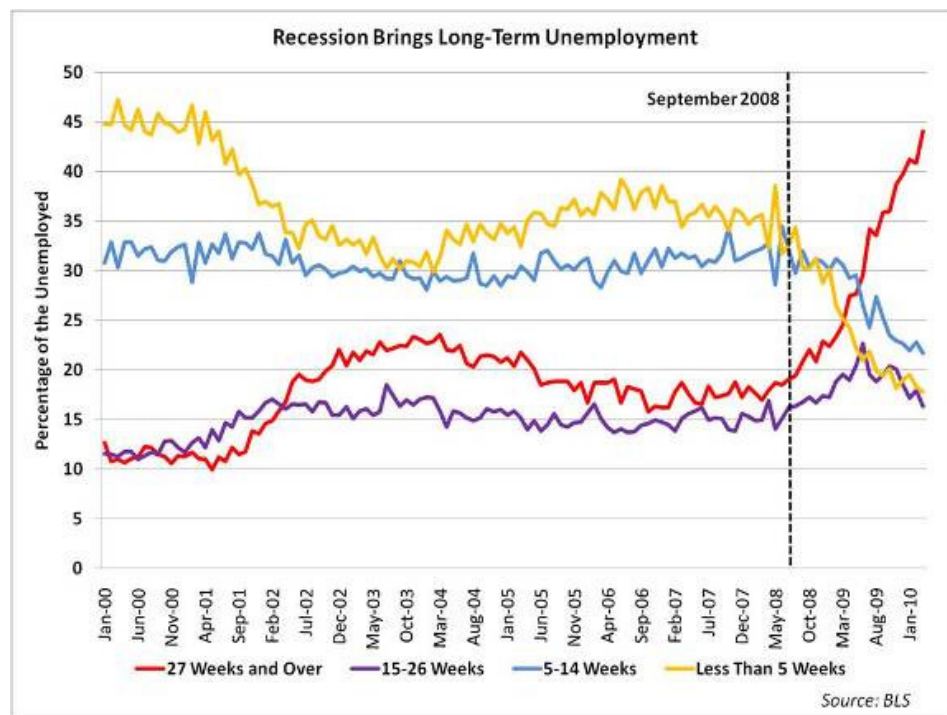
Gasoline Sales have increased to 2007 levels with prices approaching \$3 per gallon. This is counter to the signals from the buildup of crude inventories. Prices will drop soon. Or oil execs will need to find somewhere else to put the stuff.

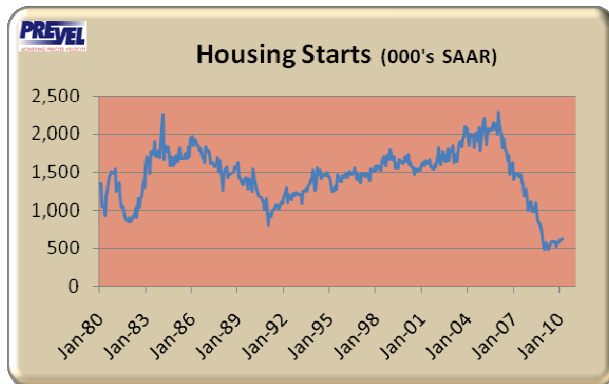


Employment in April grew by 290,000 jobs. This rate of growth is insufficient to cover the growth in the labor pool. The unemployment rate grew from 9.7% to 9.9% (actually 9.98% which should properly be rounded to 10%). The explanation was that discouraged workers were coming back into the workforce. The U6 measure of unemployment which includes

discouraged and underemployed workers also increased, which suggests that the official explanation is political rather than factual.

The good news on the employment front is that durable goods employment increased by 44,000. This will begin to drive employment throughout the economy. The bad news is that small business is still on the sidelines. Small business and especially small manufacturing firms drive job growth in the economy. These are the same people who are being hit with the regulation and tax initiatives coming from congress. Not a good mix. Hiring new employees is broadly viewed as an absolute last resort. As a result we see long term unemployment surging to 45% of total unemployed.

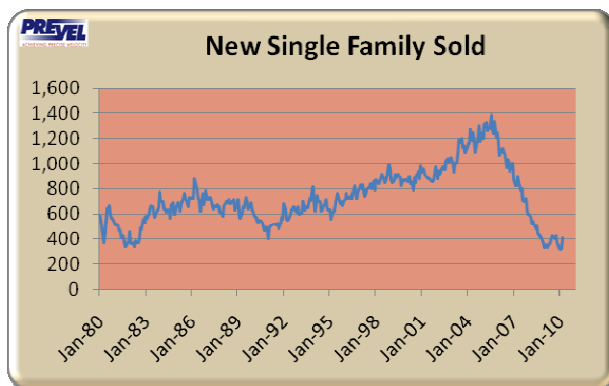




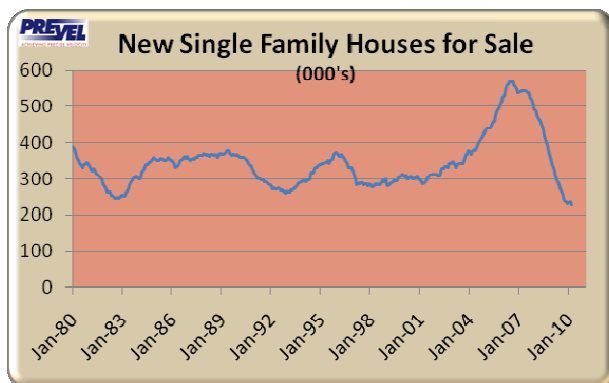
The **Housing Industry** continued to lag the rest of the economy for March. There was an uptick in single family sales and another decline in the inventory of unsold single family homes. The unsold inventory remains at a record low. Single family housing starts remains at about half what would be considered “normal.” The uptick in sales was probably related to the pending expiration in government

assistance to first time buyers, so expect a reset on that one next month.

It isn't clear what it's going to take to get housing going again. All of the numbers suggest that it should have started already, but the buyers are still wary. Maybe they're just unqualified for the tighter lending standards. But I continue to hear from bankers that they aren't rejecting a higher percentage. They just aren't seeing as many applications.

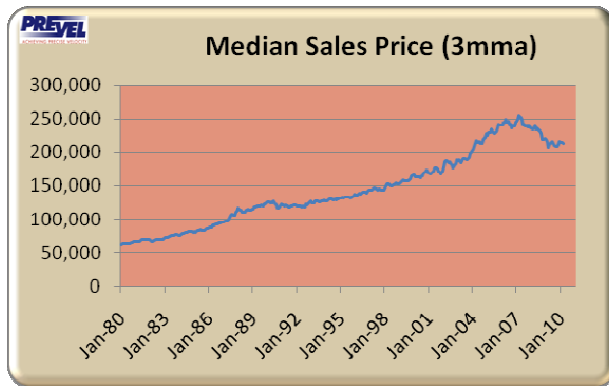


Health Care remains the topic of heated debate and analysis within manufacturing companies. CAT and AT&T have been analyzing the possibility of dropping health care completely and paying the penalty. This move would result in a cost reduction of 80% of direct health care expense. It isn't clear how this would be accomplished within union contracts.



The necessary outcome is higher costs, reduced availability, reduced coverage, or rationing. It could be all of the above.

Small and mid-sized manufacturers must now begin to think of the health insurance benefit in terms other than the benevolent care of employees. At current and



projected levels of cost it requires aggressive cost benefit analysis.

One solution would be a return to the “major medical” plans of 40 years ago. Get away from first dollar coverage of anything that sounds medical. Fixed-company-contribution plans have grown slowly in the last 20 year, but will be getting new attention soon.

What is completely clear is that all of the claims made for the health care bill were incorrect.

About Prevel and The Durable Goods Report

Prevel Technology delivers business process transformation, measurement strategies, and information tools in support of high performance organizations. Our focus is on manufacturing and telecom, and through our business partners we support health care and other demanding business environments.

The goal of the Prevel Durable Goods Report is to offer context for the published monthly statistics on durable goods manufacturing in the US. The analysis is historical in nature, and includes no forecasts beyond what may be obvious from the current state. The analysis of historical patterns provides a necessary framework for understanding plausible scenarios. Since a high percentage of durable goods go through retail, this analysis offers a leading indicator of future durable goods activity.

Prevel uses source data from the US Census Bureau, Bureau of Labor Statistics, and the Federal Reserve. Rig count data source is the Baker Hughes Corp. For data sourced from the US government, the preliminary publication is used, available about 5 weeks after the end of the period. An earlier publication (advanced release) is available about 3 weeks after the end of the period, but is often subject to substantial revisions, and is not considered adequately reliable for growth trend analysis.

A similar analysis is available for many industry sub-sectors. Contact Prevel for details about this subscription based service.

Technical Note: The "Prevel Growth Index" is measured as the ratio of the 3 month moving average divided by the 12 month moving average. This removes some of the natural noise in the industry data, but also results in a slight response lag. An index value greater than 1.000 is a sign of recent growth.

About the Author:

John Layden serves as CEO of Prevel Technology, a management and technology consulting firm serving manufacturing, distribution, and their supporting technologies. Prevel has developed a suite of extremely high-performance real-time applications systems in support of their client industries.

Prior to launching Prevel, Layden's career included 22 years' in manufacturing and another 18 years in enterprise software. Most recently he has served as VP of Supply Chain Management for SAP and VP of Supply Chain Market Development for Frontstep, Inc. He served as President of Pritsker Corporation, an early innovator in

discrete event simulation and Advanced Planning and Scheduling fields. He negotiated the Pritsker acquisition by Frontstep. He was a founder and CEO of Automated Technology Associates, Inc., a leader in the development of real-time quality control systems and factory management applications.

Layden has authored over 40 articles and papers on both the theory and practice of manufacturing and supply chain operations. He was described by one editor as one of the “founding fathers” of the Advanced Planning and Scheduling (APS) industry. He also authored the supply chain chapter in Maynard’s Industrial Engineers Handbook. He speaks worldwide on the subject of world class operating strategies. He has been the keynote speaker at numerous conferences including the Automation Hall of Fame Awards.

As a software company CEO, Layden delivered to market the first real-time advanced planning and scheduling system; the first real-time SPC system; and the first real-time, fourth-normal-form database system. He is the originator of the Return on Capacity modeling process for analysis and improvement of supply chain profitability and delivery performance.

As a key partner to Motorola, Layden developed the quality control concepts that became the Six Sigma Initiative. He introduced the same concepts to GE and the Cadillac Division of General Motors. These initiatives contributed to the Malcom Baldrige awards won by Motorola and Cadillac, and to the highly publicized Six Sigma program at GE. He introduced the Six Sigma concepts to software development and delivered the only application software release to meet these exacting quality standards. Layden holds three patents and is the only American to hold a Japanese patent in quality control.

Prior to his tenure in manufacturing software, Layden spent 20 years as an engineer, operating executive and board member with three Fortune 200 manufacturing companies. The advisory services of Prevel retain the practical, no-nonsense approach familiar to world class operating executives. His operating roles included plant manager, director of business planning, and VP of Supply Chain Management.

Layden currently serves on 3 boards, and advises several high-tech startup companies.

Mr. Layden holds a BS degree from Purdue University in Electrical Engineering and an MBA from the University of Wisconsin-Milwaukee (Executive Program). He is active with the Purdue University President’s Council, and has served as a guest lecturer in the MBA programs of Villanova University, Columbia University, New York University, Ball State University, and others. He can be reached at jlayden@preveltech.com or 317-842-6417.



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