

INEFFICIENCY IN THE FINANCIAL SYSTEM

Date: 08 October 2008

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I heard some people to say that now is the moment to invest, is only necessary to have well-taken care of where investing. Thus, I take six important companies which are suffering the financial crisis: AIG (American International Group), C (Citigroup), JPM (JP Morgan), AMD, INTC (Intel) and GM (General Motors), and I applied some statistics.

Most of those companies belong to the Dow Jones Industrial Average; most of them are also important Banks affected by the crisis. In the case of AIG, the US Federal Reserve helped it with \$85bn. However, the curious thing I found is that the financial companies starting to present a cluster of inefficiency since 2004 arriving to a minimum in 2006 and 2007. How is possible that the US government did not do anything in order to revert the situation. Of course, now is the market which wildly tries to take to the financial sector to efficiency levels.

The last month, Nobel prize laureate and former chief economist of the World Bank asserted that the crisis in the world financial markets should be less serious than that of the 1929. He highlighted that the America's financial system failed in its two crucial responsibilities: *Managing Risk and Allocating Capital*. Well, after doing some calculations I agree with Stiglitz.

The present work is organized as follows. The section 2 presents a performance analysis on the six stocks, taking the S&P 500 index as benchmark. Section 3 presents an analysis of the evolution of the informational efficiency for these assets. Finally, section 4 draws some conclusions.

2) Performance of the six stocks

As mentioned before I wondered if it is possible to invest in any of the important US stocks. I collected daily data from 09 July 1986 to 07 October 2008 (yesterday) for AIG, C, JPM, AMD, INTC, GM and S&P 500. Table I shows some statistics applied to these stocks.

Table I: Performance of the six stocks from 09 July 1986 to 07 October 2008

	PERFORMANCE STATISTICS*						
	INTC	AMD	GM	AIG	C	JPM	S&P500
Total Cumulative Return	3905.00%	-51.07%	-35.60%	-25.64%	737.02%	518.55%	310.28%
Annualized Rate of Return	18.26%	-3.20%	-1.98%	-1.34%	10.14%	8.63%	6.62%
Best Day	27.12%	26.89%	18.11%	43.12%	24.02%	16.75%	9.10%
Worst Day	-22.02%	-37.93%	-21.04%	-60.79%	-22.90%	-27.71%	-20.47%
% of Positive Days	51.03%	49.04%	48.75%	48.65%	49.96%	50.23%	53.44%
Average Daily Gain	2.05%	2.79%	1.64%	1.41%	1.64%	1.62%	0.72%
% of Negative Days	48.97%	50.96%	51.25%	51.35%	50.04%	49.77%	46.56%
Average Daily Loss	-1.92%	-2.56%	-1.52%	-1.28%	-1.51%	-1.51%	-0.76%
Excess Kurtosis	5.99	8.59	6.70	138.82	10.82	9.84	26.98
Skewness	-0.11	-0.12	0.14	-3.19	0.05	0.09	-1.39

	RISK STATISTICS						
	INTC	AMD	GM	AIG	C	JPM	S&P 500
Maximum Drawdown	-82.24%	-93.26%	-88.49%	-97.89%	-72.90%	-74.01%	-49.15%
Maximum Drawdown Period (in days)	525	574	2122	1952	433	638	637
Time to Recovery (in days)	N/A	N/A	N/A	N/A	N/A	1084	1166

Annualized Standard Deviation	44.07%	61.89%	35.76%	38.64%	37.00%	36.94%	17.46%
Annualized Downside Deviation	42.43%	57.57%	33.78%	40.35%	34.76%	34.76%	18.56%
Daily Modified VaR $\alpha=-5\%$	-4.18%	-5.77%	-3.27%	1.09%	-3.21%	-3.23%	-1.56%

	RISK ADJUSTED PERFORMANCE						
	INTC	AMD	GM	AIG	C	JPM	S&P 500
Sharpe Ratio	0.35	-0.10	-0.14	-0.11	0.19	0.15	0.21
Sortino Ratio	0.36	-0.11	-0.15	-0.11	0.21	0.16	0.20
Omega Ratio	1.10	1.04	1.02	1.03	1.08	1.07	1.08
Calmar Ratio	0.22	-0.03	-0.02	-0.01	0.14	0.12	0.13

* The whole period goes from 09/07/1986 to 07/10/2008

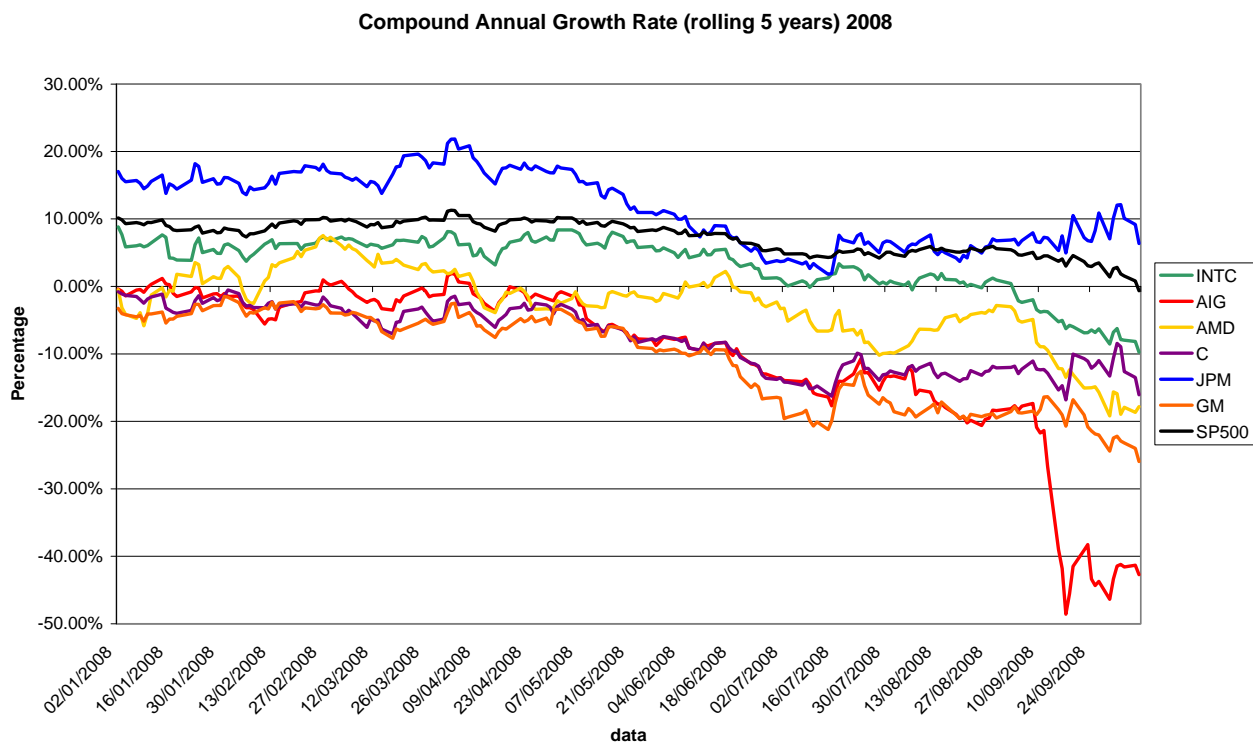
MAR=3% annual

Note that the S&P 500 index cumulated 310.28% since 1986 until now, with an annualized return of 6.6%. Intel presents the largest cumulated return with 3.905% and an annualized return of 18.26%. Citigroup and JP Morgan also present positive annualized returns of 10.14% and 8.63% respectively. However, AMD, GM and AIG presented a negative cumulated result in the whole period.

The risk statistics show the S&P 500 as the less risky, presenting a Maximum Drawdown of 49.15%, an annualized standard deviation of 17.46% and a Modified Value at Risk of -1.56%. On the other hand, AIG and AMD present maximum draw downs over the 90% arriving to these levels after more than 1900 days. Note also, that only the S&P 500 and JPM have recovered from the maximum drawdown.

When analysing the risk adjusted performance for the whole period (1986-2008), INTC seems to be the best investment with Sharpe, Sortino, Omega and Calmar ratios over the values of S&P 500.

The following figure presents the compound growth annual returns (CGAR) rolling 5 years, we just show the evolution in the present year.



Note that in the last 5 years, JPM is the only asset presenting a positive annualized return (6.63% at 08 October 2008). Note that the worst returns are obtained by AIG, GM, AMD and C.

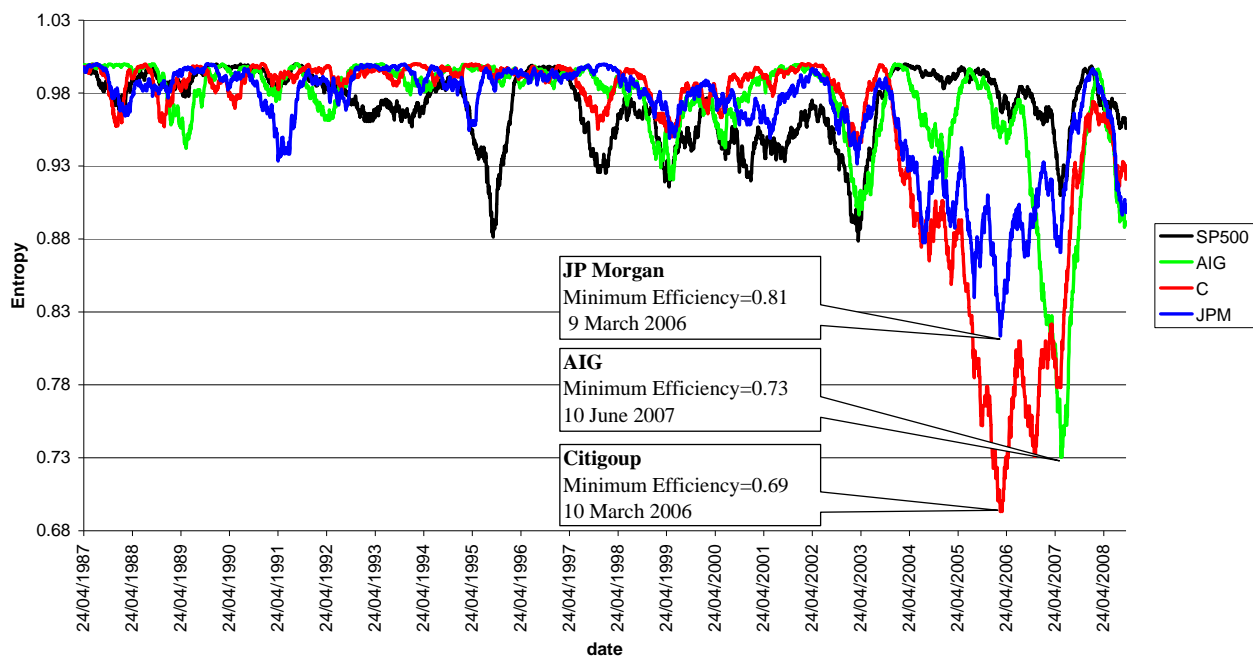
From this analysis we could conclude that INTC is the best option among the assets, when considering all the period. However, note that in the last 5 years it presents a negative annualized return of -9.74%. JPM should be the best option among the stocks but it is riskier than the S&P 500. I have to advise that I just wanted to illustrate the performance of some assets. However, I recommend (of course) to invest in a portfolio, maybe one similar to the proposed by Faber (2007) where we put a part in stocks, part in real state, part in bonds and part in commodities, changing to cash when there is a clear negative trend in any of the components. It was explained also in the work presented in this site on 15 July of 2008 and writing with Stefano Marmi.

3) The Financial Banks were not Informational Efficient

Some economist believed that the Efficient Market Hypothesis is the clearest law in social sciences. In its weak version it says that prediction in prices is impossible and the formation of patterns in the prices should not appear when there is perfect information. If there is a deviation from efficiency, the market will find the way to come back to efficiency levels. In recent articles I propose a measure of these efficiency in order to check is a particular asset or market is efficient or not (see Risso (2008a) (2008b)).

It was amazing the result when I applied this measure to these assets. The following figure shows the evolution of the efficiency for the S&P 500, AIG, C and JPM (the three financial assets in the group) for the period 27 April 1987 to 07 October 2008, taking a rolling time-window of 200 days.

Evolution of the Informational Efficiency (rolling 200 days)



The incredible results is that since 2004 these financial assets present a cluster of inefficiency, arriving to a minimum of 0.69 (Citigroup on 10 March 2006), 0.73 (AIG on 10 June 2007), 0.81 (JP Morgan on 9 March 2006). Note that in no period the inefficiency is greater than this, nor in October 1987, nor in 2001 after the dotcom bubble. This efficiency is also less than the efficiency of the S&P 500 index.

Table II presents the average daily efficiency for the stocks and the S&P 500 from 1995 to 2005.

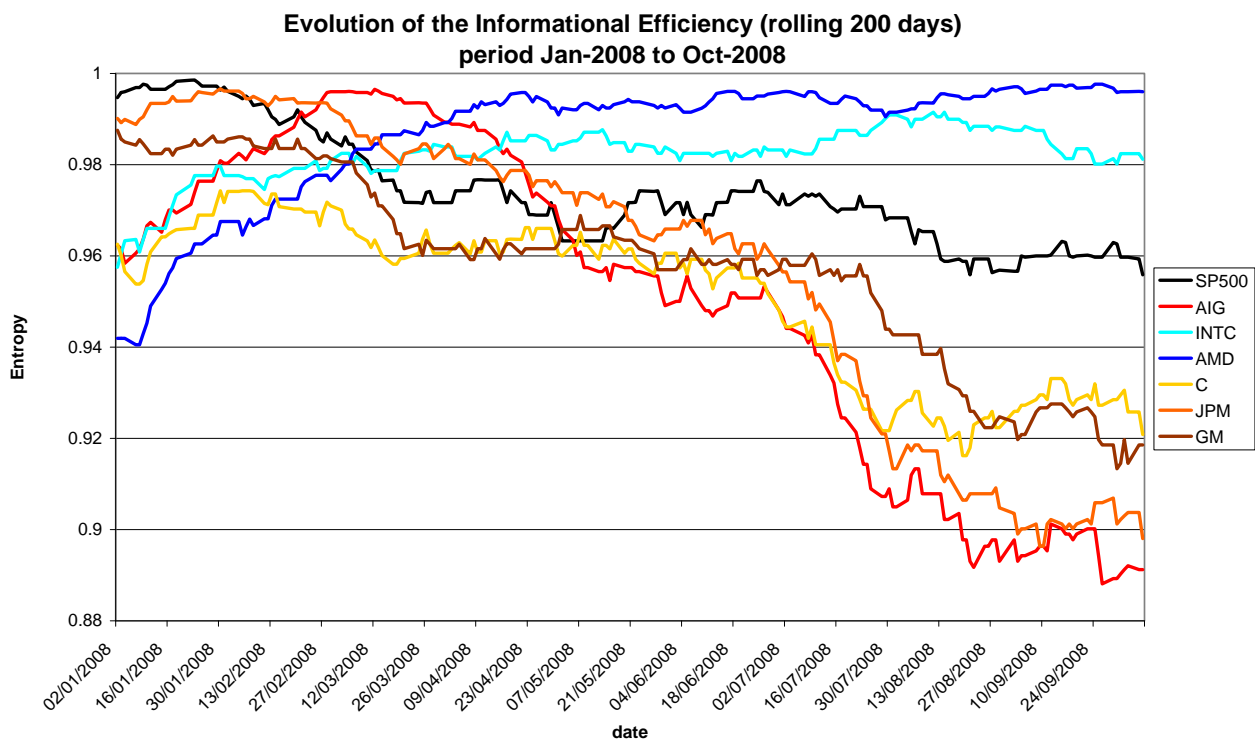
Table II: Average Daily Efficiency from 1995 to 2008

Year	SP500	AIG	C	JPM	GM	INTC	AMD
1995	0.940	0.996	0.996	0.982	0.998	0.979	0.973

1996	0.990	0.992	0.994	0.993	0.998	0.988	0.981
1997	0.968	0.993	0.983	0.995	0.999	0.996	0.986
1998	0.961	0.979	0.987	0.988	0.996	0.998	0.991
1999	0.944	0.953	0.970	0.971	0.986	0.989	0.997
2000	0.952	0.966	0.981	0.975	0.979	0.975	0.973
2001	0.944	0.992	0.992	0.970	0.964	0.954	0.941
2002	0.956	0.986	0.993	0.982	0.990	0.967	0.973
2003	0.941	0.941	0.975	0.967	0.980	0.981	0.988
2004	0.995	0.972	0.904	0.925	0.985	0.972	0.993
2005	0.992	0.975	0.831	0.896	0.985	0.909	0.951
2006	0.976	0.946	0.750	0.874	0.979	0.894	0.986
2007	0.959	0.834	0.857	0.932	0.995	0.927	0.937
2008	0.974	0.950	0.951	0.958	0.958	0.982	0.987

Note that AIG, C and JPM have been clearly inefficient in the last years presenting minimum efficiency in 2006 and 2007. Note that the efficiency of AIG, C and JPM is around 0.95 in 2008 when the S&P 500 presents a level of 0.97 and 0.98 for the technological assets like AMD and INTC.

The following figure shows the evolution of the efficiency in the 2008. Notice that daily efficiency of technological assets such as AMD and INTC has grown in this year. However, efficiency of AIG, C and JPM have tended to decrease, even under the S&P 500 levels.



4) Conclusions

I analysed the performance of some assets affected by the present financial crisis (AMD, INTC, JPM, AIG, C, GM) and the S&P 500 index. INTC, JPM and C presented a positive annualized return in the period 1986-2008 greater than the return of S&P 500. In the whole period INTC seems to be the best option according to Sharpe, Sortino, Omega and Calmar ratios. However, in the last five years, INTC has presented a negative return and only JPM shows a positive return.

When I analysed the informational efficiency of these assets I found something interesting, the biggest financial companies Citigroup, JP Morgan and AIG have presented a cluster of inefficiency since 2004.

These levels of inefficiency are the largest in the whole period from 1986 to 2006. I wonder why the US Government did not act in the period 2005-2007 to revert the tendency. I think that the present crisis is the wild response of the market to revert an inefficiency indicated in the past.

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