Loonies Under Your Bed: Misdirected Attention and the Diluted Value of Stock Market Reports

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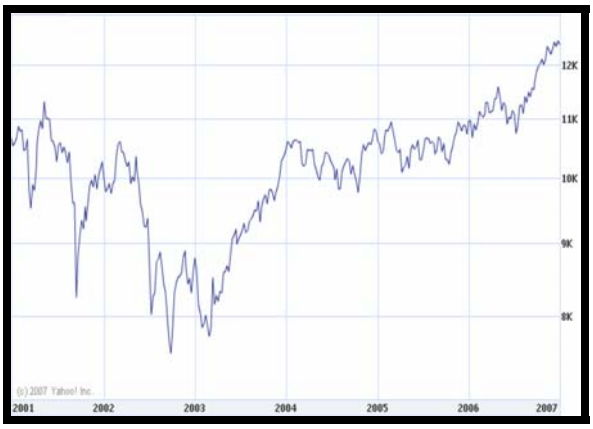
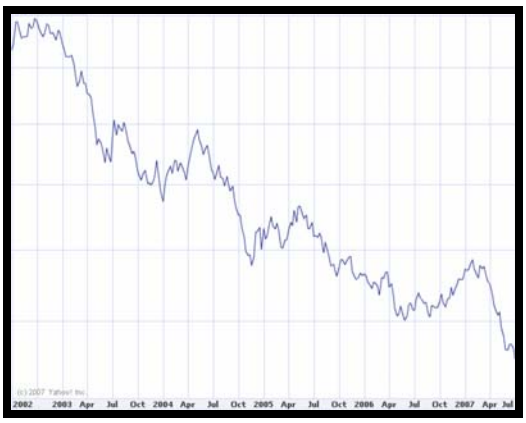


Dow Jones Industrial Average



US Dollar-Canadian Dollar Exchange Rate

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Abstract

Many people pay attention to media reports of the US stock market's performance. Using a data-based thought experiment, we cast the market's recent highs and lows in an unusually unattractive light. The result matters because the economic and political factors that make it relevant are likely to continue. Using research in economics and psychology, we explain why so many investors and media reports are blind to the unattractive interpretation. To mitigate the blindness' harmful consequences, we propose an alternate way of presenting stock market information. The alternative is easy to implement and can help citizens draw important inferences from the attention they already pay to financial reports. The word "loonies" refers to Canadian dollars, which play a key role in our analysis. Loonies are not causal of any of the key relationships in our analysis, but provide a useful device for making a broader point about key US asset values.

On October 3, 2006, the Dow Jones Industrial Average (henceforth, the DJIA) reached an all-time high of 11727.34. Sixteen days later, it closed over 12,000 for the first time and nine months after that it closed over 14,000. One month after reaching 14,000, it was back under 13,000. These outcomes are part of a series of highly visible fluctuations recorded by the DJIA in late 2006 and throughout 2007.

Several factors fuel growing interest in these numbers. One set of factors are regulatory and technical changes that decreased transactions costs associated with many forms of investment. These changes have increased the number of people who participate in the market. Another set of factors is related to retirement income and has significant public policy implications. There is, for example, the move amongst public and private employers from defined-benefit retirement plans (e.g., pensions) to defined contribution retirement plans (e.g., IRAs, 401(k)s and 403(b)s). As Poterba et al (2006) explain, participation in defined benefit plans has dropped significantly over the past two decades while participation in defined contribution plans has skyrocketed. A related factor is growing concerns about Social Security and Medicare. As the 2007 Annual Report of the Social Security Administration states:

> "The financial condition of the Social Security and Medicare programs remains problematic; we believe their currently projected long run growth rates are not sustainable under current financing arrangements. Social Security's current annual surpluses of tax income over expenditures will soon begin to decline and then turn into rapidly growing deficits as the baby boom generation retires…. Medicare's financial status is even worse…The longer we wait to address these challenges, the more limited will be the options available, the greater will be the required adjustments, and the more severe the potential detrimental economic impact on our nation."

Many people question whether the federal government has the will to sustain Social Security at current levels for future generations or whether substantial benefit cuts are on

the horizon.[1] Where many Americans in recent generations looked forward to post-work guarantees of income, current and future generations have reasons to think differently. For increasing numbers of people, future financial well being will come from ownership of stock-related instruments.

As a result, people want to know what the market's highs and lows mean to them. Reports are plentiful. As Robert Shiller (2001: 60) notes, "Nothing beats the stock market for sheer frequency of interesting news items." Scores of publications, websites, and television channels provide significant space to market news. These outlets report on the DJIA frequently and give the index special attention when it achieves record highs.

Should reports of stock market records lead stockholders to rejoice or should they also prompt a more sobering inference? We address this question by drawing attention to seldom examines attributes of most stock market reports.

We argue that selective attention causes, and media reports reinforce, an attentional blindness. These forces focus people's attention on the changing number of DJIA "points" but not on the changing value of a DJIA "point." Hence, people see DJIA points as a metric of constant value. In reality, the value of these points has fallen precipitously in recent years. We further contend that the current gap between perception and reality can punish those who fail to see it. People who are coming to rely on the stock market for post-work income are particularly vulnerable.

[1] The report advises that "Social Security could be brought into actuarial balance over the next 75 years in various ways, including an immediate increase of 16 percent in payroll tax revenues or an immediate reduction in benefits of 13 percent or some combination of the two. Ensuring that the system is solvent on a sustainable basis beyond the next 75 years would require larger changes. To the extent that changes are delayed or phased in gradually, larger adjustments in scheduled benefits and revenues would be required that would be spread over fewer generations."

Our effort to understand this gap begins with a thought experiment. The experiment casts the stock market records in an unusual light. "DJIA points" are shown to have lost considerable value relative to other meaningful financial benchmarks. Drawing on insights from economics, we argue that since the economic factors that caused the negative result are likely to continue, downward pressure on the value of a DJIA point will continue as well. A subsequent content analysis confirms that current methods of reporting stock market information ignore fluctuations in the value of DJIA points. Specifically, the recent dilution in the value of a DJIA point has gone largely unreported by the media and is unseen by many investors.

In showing that recent variations in the nominal aspect of the DJIA (i.e., fluctuations in the number of points) are decreasingly informative about real asset values (due to the drop in the value of a DJIA point), we follow arguments about the difference between nominal and real asset values that academic economists have made for years (e.g., Fisher 1928, Shafir et al 1997). Given the length of time for which such real-nominal problems have been known, one could claim this scholarship's implications should be widely understood in the DJIA context. Our work shows that *they are not*. Or goal, therefore, is to argue that the lingering problem relating to public understanding of the value of stock market indices is not with the scholarship itself, but in how its implications are conveyed to the public. Current ways of presenting this information are clearly failing to reach many market observers and reporters.

In the paper's final section, we use research on selective attention to argue that an alternative means of presenting stock market information can help people adapt to the attentional blindness. The change entails a commitment to presentations that make

objectively relevant variations in the value of a DJIA point easier to see. We conclude that such changes would be simple to implement, can be easily understood by a large audience, and can help people avoid critical errors when evaluating financial plans.

Loonies Under Your Bed

This section describes a thought experiment that puts recent stock market news in an unusual light. The experiment can begin on any day in the years 2001 through 2005. For the sake of example, we focus on January 2, 2001, the first day in our database. Later, we will show that what we find to be true about this day is true for many others.

On the start date of the experiment, a subject is given the number of US dollars (USD) that matches the closing point total of the DJIA. On January 2, 2001, this amount is $10,646.15. With this money, she can do one of two things.

Option 1. Use her USD to buy "one share of that day's DJIA." On January 2, 2001, such a purchase will result in her owning approximately 6.5 shares of each of the DJIA's 30 components. The reason that "one share of the January 2, 2001 DJIA" gives her so many shares of stock is that the reported DJIA point total is the sum of the components' listed closing prices adjusted by a divisor. The DJIA divisor is adjusted after any significant change in a DJIA component or in the index itself. Its purpose is to reduce the impact of such events on daily movements of the DJIA's point total. On January 2, 2001, the divisor was 0.15369402, which meant that the summed cost of one share of each DJIA component was 1636.25 USD. So for 10646.15 USD, the subject can purchase 6.506432 shares of each component. To simplify the example, we assume that she pays no commissions or other transaction costs when acquiring or selling the stocks, she

collects any dividends that accrue to the stocks that she holds, and she benefits from splits or similar passive benefits of stock ownership.

Option 2. Go to a bank and exchange 10,646.15 USD for the number of Canadian dollars (CAD) that have the same worth on that day. Again, to keep the example simple, we will assume that she does not pay any fees for the exchange. On January 2, 2001, the CAD-USD exchange rate was 1.4963, so she can obtain 15,929.83 CAD.

There is one additional rule. Whichever option she chooses, she must put the assets under her bed and keep them there until a pre-specified "cash out" date. Until that date, she must be a completely passive investor. For the purpose of the example, we focus on a "cash out" date of December 27, 2006 – the date on which the DJIA achieved its highest point total of any year up to and including 2006. Later, we examine the consequences for all possible "cash out" dates ranging from one year after the start date to December 31, 2006 – the last day in our database.

So, if she buys the stocks, she cannot change her investments if something better comes along and she cannot sell any of her holdings in order to buy a good or service. If a company she owns offers a choice about how to handle a dividend or proceeds from a spin-off, she experiences the consequence that comes from being passive (i.e., not responding).[2] This implies that dividends can be accumulated but not invested. In short, she must put the stock certificates and any passive gains under her bed where, for the purpose of the example, we will assume they are safe.

[2] For simplicity, and to be consistent with the thought experiment's set-up, we assume that the investor receives the cash value of proceeds from a spinoff rather than shares of the new company. In effect, proceeds from a spinoff are treated in the same way as dividends.

If she takes the Canadian dollars, parallel rules apply. She cannot put the money in a bank and collect interest. She cannot reinvest it, spend it, or otherwise exchange it. The currency must go under her bed, where it will be safe.

Before choosing, note that this assumption introduces a bias that favors Option 1. Option 1 allows the subject to own shares of firms that hold assets in interest bearing accounts. Gains from the accounts can raise the firms' share prices or be transferred to investors through dividends. So, choosing Option 1 can provide interest income to the subject in a way that Option 2 cannot. We accept the asymmetry because it follows from our core assumption of investor passivity.

What should the subject do? Should she purchase multiple shares of thirty widely-owned icons of American industry or obtain a currency that is rarely held by Americans or discussed in stock market news?

Before answering this question, we introduce a simplification. Instead of talking about US dollars and Canadian dollars, which can get confusing to people who are accustomed to thinking about "dollars" without respect to nation of origin, we will refer to the Canadian currency by its distinct nickname. In Canada, the dollar is nicknamed "the loonie." This nickname is so given because the dollar coin has loons (geese) engraved on its front.

Now, consider the subject's fate if she chooses Option 1. We begin by saying a few words about how to think about the value of a stock. When the DJIA or other stock indices are discussed on news programs and financial publications, the typical metric of evaluation is "points" (e.g., "the Dow is up 10 points" or "the S&P is down two points.") With such language so common, people forget where DJIA points come from. On any

given day, there is a strict linear relationship between USD and DJIA points.[3] When a report says that the DJIA went up 35 points, it means that it costs 35 USD more to buy "one share of that day's DJIA" at the end of the trading day than it did at the beginning.

On December 27, 2006, the DJIA closed at 12510.57 USD, its highest close of the year. This amount is 1864.42 points greater than the January 2, 2001 close. However, if the subject bought "one share of the DJIA" on January 2, 2001, the value of her holdings is different than 12510.57 USD. The reason is that DJIA components do not remain constant over time. Some stocks that were part of the DJIA in 2001 were not part of it in 2006. Decisions about DJIA components are made by the editors of *The Wall Street Journal*, which is owned by Dow Jones and Company. From time to time the editors replace companies that go out of existence or are not performing well with other large firms that have strong growth prospects. In the time period of our study, one set of replacements was made. On April 8, 2004, American International Group, Pfizer, and Verizon replaced the original American Telephone and Telegraph, Eastman Kodak, and International Paper on the DJIA.[4]

So on December 27, 2006, the value of the subject's "share of the DJIA" was 9903.57 USD. But, the subject's investment is worth more than this. When we add passive gains (dividends received, additional shares gained from splits, and revenues coming from spinoffs), the USD value of her assets is 14023.49.[5]

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[3] The exception is at the moments when the divisor is changed. At such moments, which occur several times per year, there is a discrete jump from one linear dollar-points correspondence to another.

[4] At the time, American Telephone and Telegraph was the residual of a once larger entity. It shrank after agreeing to breakup as part of an antitrust settlement with the US Department of Justice. Several splinter companies became known as "baby bells." One "baby bell," SBC Communications, bought the remains of its former parent company in 2005 and renamed the merged entity AT&T. AT&T is now part of the DJIA.

[5] If on 1/2/01, the subject purchased 6.506432 shares of DJIA stock, the summed listing price of one share of each of the original 30 stocks on 12/27/06 was 1522.12 USD. Adding revenues accruing to shareholders from splits and spinoffs (412.28) and dividends (221.07) and multiplying by 6.506432 yields a cumulative

So if she sells the stocks on December 27, 2006, she realizes a gain of 3377.34 USD. But she has to pay taxes on this gain. Since she held the assets for more than a year, the tax rate on her capital gains and dividends is 15% (assuming that the subject's total income is in the middle to upper ranges). After paying taxes, she has 13516.89 USD – *a gain of 2870.74 USD*.

Now, consider the subject's fate if she chooses Option 2, loonies under the bed. While she may rue the fact that she was not allowed to collect interest on the CAD, *she is better off than if she chose the stocks*. At December 27, 2006's exchange rate of 1.161, she can exchange her 15929.83 CAD for 13720.79 USD – *for a gain of 3074.64* USD. Since the loonies were simply held under a bed, this gain is not taxable.

Loonies under a bed provided a better return than investing in the most widely-reported stock market index soon after the collapse of the dot-com stock bubble and selling when it achieved its record high point total of 2006. But to generate this example, we chose a specific ending date. Does the same result emerge on other "cash out" dates?

Figure 1 shows how the subject would have fared, using the calculation detailed above, after buying her assets on January 2, 2001 and selling them on any day from January 2, 2002 to December 31, 2006. When the loonie line is above the DJIA line, it means that putting loonies-under-the-bed on the noted "cash out" date provides a greater return than holding a share of the DJIA.

[Figure 1 about here.]

Figure 1 reveals that the loonie line is consistently north of the post-tax DJIA line. That is, for the subject making a choice on January 2, 2001, loonies under the bed provided a

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value on 12/27/2006 of 14023.49 USD. To simplify the calculation, we assume that the investor takes the cash value of newly offered shares in the case of spinoffs. Dividend information is from Bloomberg LP as available on its website on July 17, 2007.

greater return on investment than did "one share of the DJIA" on every possible "cash out" date in 2002 through 2006. Even without taxes, the same is true for almost every "cash out" date in this range.

Figure 2 extends this analysis further. There are nearly 800,000 pairs of "cash in" and "cash out" dates that occur within the years 2001-2006 and are at least one year apart. The figure depicts results of the though experiments for every conceivable pair.

Using one year as the shortest holding period simplifies our presentation of post-tax consequences and biases the next result in favor of Option 1 (as returns from assets held for periods of less than a year can be taxed at substantially higher rates). We also assumed that the proceeds from the sale of "one share of the DJIA" would be taxed under the investment-friendly tax code revisions of May 2003 even if the "cash out" date in our analysis occurred before the change. Had we allowed shorter holding periods or calculated returns using the earlier tax rates, the post-tax returns for Option 1 would be no better and, in some cases, substantially worse.

Returning to Figure 2, red pixels depict holding periods in which loonies outperform the DJIA share. Green pixels depict the opposite. In 97% of all the holding periods (756,237/775,929) loonies under a bed outperform "one share of the DJIA."[6]

If, by some means, the subject could avoid the taxman when her "cash out" date arrived, she would be better off with loonies under a bed on 62% (480,423/779,529) of the possible holding periods. In reality, however, she must pay taxes. Hence, measured multiple, and making several assumptions that favor Option 1, we find that placing loonies—a currency to which few Americans pay attention—under a bed provided

[6] The reason that more than 3 percent of the figure appears to be red is that this image is made of far less than 800,000 pixels. All pixel-reducing coloration algorithms that we could have used produce a bias, we chose an algorithm that has a bias towards green pixels.

greater investment returns to investors than would buying a share of the nation's most widely-reported stock index.

[Figure 2 about here.]

But what does this result mean to Americans?[7] The answer is that many hold most of their assets in USD-denominated terms. Those assets include stocks. When the news reports that a stock or index has reached an all-time high, it means that the ratio of the value of the index to the value of a "point" is at its highest level ever. Reports focus attention on changing attributes of the stocks and/or the index's changing "point" totals. They rarely, if ever, provide any indication that the meaning of these points are changing because of their relation to USD.

This relationship between DJIA points and USD makes the thought experiment's outcome relevant to many Americans. The experiment's outcome was driven by a fall in the value of the USD relative to the CAD. But the fall against the loonie was not an isolated incident. As Figure 3 shows, from the beginning of 2001 to the end of 2006, the USD fell against not only the loonie, but also against other important benchmarks such as an ounce of gold, a barrel of oil, and the Euro.

[Figure 3 Here]

So, at the same time that the DJIA was reported as hitting record highs, the value of the USD relative to other focal financial metrics declined sharply. Viewed from this

[7] Consider an alternate interpretation of this result. On January 2, 2001, let the subject purchase "one share of the DJIA" for the USD equivalent of 15,929.83 CAD. Her post-tax revenue from selling these assets on December 27, 2006 would be the USD equivalent of 15,693.11 CAD. *This is 236.72 CAD less than her original investment*. Measured in CAD terms, the DJIA investor *is worse off financially* despite selling on the highest DJIA closing date of 2006. Indeed, on any day that the loonie line is north of the DJIA line in Figure 1, DJIA investors lost value when in CAD terms.

perspective, the meaning of DJIA "point" increases and record highs is diluted. The point metric does not provide the same information that it did before the USD's fall.

Next, we argue that the thought experiment's findings have continuing relevance because the economic and political factors that contributed to the USD's recent fall are continuing. To simplify the argument, we focus on the USD's relation to CAD – as its decline against that currency is symptomatic of a more general decline. Following this explanation, we show that press reports of stock market changes fail to link assessments of the DJIA's value to changes in the meaning of the point metric. We then argue that an alternative means of presenting stock market information can help Americans better use such news.

Do Falling Dollars Still Matter?

A possible counterargument to our thought experiment is that our observed five-year decline in the value of USD relative to other benchmarks is part of a short-run cyclical phenomenon and that eventually the USD's value will revert to historical averages. The problem for retirees and other investors is that the evidence suggests that while the USD could come back, the speed and force with which it would do so is likely to be different than in the past. This section examines such differences.

The value of USD at any moment depends on many factors. We categorize these factors in terms of supply and demand. When USD value falls relative to other items, it is because demand or supply for USD change. The US government largely controls supply by affecting the number of USD in circulation. A broader set of entities determines demand. It is these demand-oriented factors upon which we focus our brief explanation.

People and organizations choose whether or not to accept USD in exchange for goods, services, or other assets. They do so when they perceive a USD's present or future purchasing power as high relative to other assets they can accept. Demand drops when factors lead people to lose confidence in the USD's future purchasing power.

Patterns in international trade and US fiscal and monetary policy can affect these beliefs. Amongst the factors that are known to cause a decline in demand are:

- large and continuing trade deficits,[8]
- the emergence of assets that provide greater perceived value to investors than USD and can substitute for them in financial transactions, [9]
- and increases in the *perceived potential* that the US government will attempt to monetize its debt (i.e., pay off future debts by printing more money which can dilute the value of USD in circulation).

Indeed, these three factors help explain why the USD fell against the CAD.

First, consider trade. Since 2001, the US and Canada have had very different trade balances. As Table 1 shows, the US has run large and continuing trade deficits, while Canada has not. While trade deficits in the US are nothing new, their magnitude has increased sharply in recent years. In 1990, the US trade deficit was about 1% of GDP. In 2001, it was 3.3% of GDP. By 2006, it was 5.4% of GDP. Meanwhile, Canada has had a positive balance of trade throughout the thought experiment's era.

[Table 1 about here.]

[8] Many reports refer to the current-account deficit rather than the trade deficit. While the two factors are related, they are not identical. The current account incorporates the trade balance as well as net factor income and net transfer payments. We focus on the trade deficit because it is easier to describe and because its changes account for much of the deterioration in the current account balance. Also see Ferguson (2005).

[9] Comparative rate-of-return is also discussed in this context, but is not included as its effect in recent years is difficult to determine. While low US interest rates during 2001-2006 put downward pressure on USD demand, high US productivity growth (relative to much of the rest of the world) was a countervailing force. As Greenspan (2005) remarked, "Greater rates of productivity growth in the United States, compared with still-subdued rates abroad, have apparently engendered comparable differences in risk-adjusted rates of return and hence in the demand for US-based investment assets."

Sustained trade deficits place downward pressure on the value of a currency. To see how, note that when a country experiences trade deficits with its trading partners, the monetary value of the country's exports is lower than the monetary value of its imports. So as US trade deficits continue, Americans' need for foreign currency increases relative to foreigners' demand for USD. All else constant, this puts downward pressure on the value of the USD relative what it would be in the absence of such effects. Since the same pressure is not being applied to the Canadian currency, we can expect the USD to fall in value relative to the loonie (also see Dodge 2002).

The second factor is the emergence of a substitute for USD. For several generations, the USD has acted as the world's reserve currency. It has long been considered a "safe haven" for assets. Many commodities traded on the global market, most notably oil, are denominated in USD. The CAD has never played these roles. Therefore, the emergence of an alternate reserve currency would put downward pressure on demand for the incumbent reserve currency (USD), while it would not put the same pressure on non-incumbents (e.g., CAD).

For periods of time so long that they cover the entire lifetimes of most Americans, the USD's preeminent status as the world's reserve currency has been unchallenged. But reserve currency status is not an American birthright. If another currency gains a status that induces individuals and governments to substitute it for USD as a reserve, then demand for USD will decrease relative to demand for the alternate currency, which can put further downward pressure on the USD's value.

Over the period of our thought experiment, the credibility of Euro-as-reserve-currency has increased. In the first quarter of 2001, for example, 72.3% of the world's

reserve currency was held in USD according to International Monetary Fund estimates.[10] By the fourth quarter of 2006, this amount fell to 64.6%. Taking up the slack was the Euro. In the first quarter of 2001, 17.7% of the world's reserve was Euro-denominated. By the fourth quarter of 2006, this amount grew to 25.9%. From 2001 to 2006, the 7.7 percentage point fall in the USD share of the world's reserve currency was more than matched by the Euro's 8.2 percentage point increase.

Can this trend continue? The requirements of a reserve currency are that it be used by a large economy with deep and open financial markets, low inflation, and confidence in its value. The Euro has increasingly satisfied these requirements. The Euro-zone economy (the economies of the 12 European Union members that adopted the Euro instead of their own national currencies in 1999 and 2001) is large. In 2006, its economy was approximately 4/5 the size of the US economy and accounted for over 22% of Gross World Product.[11] Moreover, the Eurozone also has increasingly deep and liquid financial markets (Chinn and Frankel 2006). As for confidence, it is noteworthy that the Euro-zone economy ran trade surpluses in five of the six years between 2001 and 2006 (see Table 1). So the Euro does not face the same trade-deficit-driven pressures on demand as does the USD. Moreover, since 2001, the value of the USD relative to the Euro has declined dramatically. The Euro appreciated from 0.9423 USD on January 2, 2001 to 1.3159 USD on December 27, 2006. For these and other reasons, the Euro is an increasingly credible reserve currency whose rise could depress demand for USD in the future.

[10] Among reserves whose denomination is determined; see http://www.imf.org/external/np/sta/cofer/eng/cofer.pdf.

[11] http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=Yearlies_new_economy&root=Yearlies_new_economy/B/B1/B11/daa10000.

A third factor with potential to reduce demand for USD would be a perception among investors that a threat of monetization exists following substantial increases in government debt. In January of 2001, the debt of the US government was approximately $5.7 trillion USD, or 54.7% of GDP. In December of 2006, the debt grew to approximately $8.7 trillion USD, or 66.1% of GDP. In nominal terms, this is an increase of 52%. Over the same period, Canada's government ran several budget surpluses and reduced its federal debt. On March 31, 2001 the federal debt in Canada was approximately $520B CDN, or 52.3% of GDP. Five years later, it was less than $482B CDN, or 33.5% of GDP.[12]

How the US chooses to deal with its debt will affect the future value of the USD. It has four options: decrease spending, increase tax revenue, default, or monetize the debt. The first two options—decrease spending and increase tax revenue—are possible, though neither political party shows signs of being able to achieve either outcome in the short term (absent phenomenal economic growth that floods the tax coffers). The likelihood of the third option—default—is effectively zero. While governments around the world do default on debts, such a move would damage America's credibility, pull the rug out from under world financial markets, and likely destroy the USD.

What remains is the fourth option: debt monetization. The threat of monetization comes from the fact that most of the instruments that the U.S. government uses to fund the debt are stated in USD terms. Therefore, it is possible for the U.S. government to pay

[12] Sources: http://www.whitehouse.gov/omb/budget/fy2007/pdf/hist.pdf, Table 7.1 and Statistics Canada, http://www.fin.gc.ca/purl/fiscmon-e.html for debt and http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&Accessible=1&ArrayId=T920&ResultTemplate=CII\SNA___&RootDir=CII/&Interactive=1&OutFmt=HTML2D&Array_Retr=1&Dim=-#HERE for GDP.

back some or all of its debt by simply having the Federal Reserve expand the money supply (i.e., print money, in effect) and use the new currency to repay old loans.

Raising this point is not to say that the US will pursue such a strategy. In fact, doing so is not a necessary condition for decreasing USD demand. If enough investors come to believe that monetization will happen at some point in the foreseeable future, or if they come to believe that enough others will believe it, then belief changes would be sufficient to put downward pressure on demand.

In fact, many people believe that as the US federal debt grows, particularly in relation to GDP, and as massive looming obligations from entitlement programs such as Social Security put greater upward pressure on government spending, incentives to monetize will increase. To the extent that promising higher taxes or reduced government spending continues to decrease the likelihood of winning election to federal office for many people, politicians may gain an incentive to deal with their situation through forms of indirect taxation that are less noticeable to voters (Sausgruber and Tyran 2005). Monetization, which indirectly taxes USD holders, is one such means of relieving debt-fueled pressure. Acknowledging this possibility, Chinn and Frankel (2006:22) write:

> "[An important] negative for the dollar is the fact that the United States is now a large-scale debtor country. Even if the Federal Reserve never succumbs to the temptations or pressures to inflate away the US debt, the continuing US current account deficit is always a possible source of downward pressure on the value of the dollar. Such fears work to make the dollar unattractive."

If a sufficient number of investors perceive even a slight increase in the probability of monetization, and if there exist credible substitutes for USD in world markets (such as the Euro), then the result would be additional downward pressure on demand for USD. All else constant, such fears would further reduce the USD's value.

To recap, for most Americans, the following has been true for most of their lifetimes: the US economy had either trade surpluses or deficits that were mild in comparison to GDP, USD were the world's reserve currency, and the US government engaged in massive deficit spending on only the rarest of occasions. In recent years, conditions have changed. Trade deficits are large and continue to grow. The Euro is emerging as a credible reserve currency. Government debts are growing with respect to GDP and massive obligations due to entitlement programs are on the horizon. As a result, many of the factors that put downward pressure on demand for USD in the period of the thought experiment are likely to continue. A 2004 essay in *The Economist* states matters more starkly:

> "The euro area, unlike America, is a net creditor. Never before has the guardian of the world's main reserve currency been its biggest net debtor. And a debtor may be tempted to use devaluation to reduce its external deficit—hardly a desirable property for a reserve currency. Those bearish on the dollar are asking why investors will want to hold the assets of a country that has, by its own actions, jeopardised its reserve-currency position…"
>
> The issue is not whether America can afford to take on more debt, but whether the rising debt burden will make investors less willing to finance future deficits at current exchange and interest rates….
>
> Despite its recent drop, the dollar is far from cheap….Yet America's current-account deficit is much bigger today than in the 1980s, so the dollar is likely to fall more sharply. Some economists reckon that it needs to fall by at least another 30%. That would imply a rate of over $1.80 [USD] for one euro, compared with today's $1.33."

Although some Americans will benefit from a weaker USD (e.g., those who sell to foreigners or hold assets whose values are not tied to the USD), others will experience declines in purchasing power as political and economic forces join to dilute the value of USD. The latter group includes many Americans whose paychecks, bank accounts, and retirement assets are USD-based. And for both groups there is additional bad news.

Americans do not have to travel to other countries to be affected by the USD's fall. Given the increase in globalization, the global market comes to them through a range of purchases that they make at home. As USD fall in value, sellers in international markets will prefer to exchange their goods and raw materials for assets that hold their value better than do USD. In the extreme, Americans may not have as easy access to foreign-produced goods such as oil if producing nations decide that they would rather hold Euros than USD. All else constant, such events will put upward pressure on the number of USD needed to purchase many goods. For people who cannot easily diversify their holdings to include assets whose values are not tightly bound to USD (including the poor and retirees who follow financial advice to convert other assets in their IRAs and 401(k)s to money market accounts as a retirement date approaches), declining purchasing power for broad and vulnerable populations is a likely result of falling USD.

How the News Fuels a Blindness: A Content Analysis

If many people would benefit from thinking about stock market reports in ways that reflect the changing value of DJIA points, then what they see on the news is not so helpful. Although news outlets produce many stories about the rise of the DJIA and the fall of the USD, the two topics are rarely connected.

July 12, 2007 was the kind of day on which we would most expect to see such a connection. On this day the USD hit another record low against the Euro and approached a multi-decade low against the loonie. On the same day, the DJIA hit another record high.

On July 14, the *New York Times* published a story that discussed the day's events.[14] It read,

> "Wall Street ended a record-setting week yesterday by surging again, sending the Standard & Poor's 500-stock index past a trading high set in March 2000 and thrusting the Dow Jones industrial average past 13,900 for the first time. Both the S.& P. and the Dow logged record closes for the second straight day. The blue-chip index gained 295.57 points for the week.. .
>
> In a week in which the Dow swung more than 450 points and rose 283 points in Thursday's session alone, investors grappled with unease over soured subprime loans and the broader economy before casting off such concerns and bidding stocks higher amid signs the consumer might yet again pull through and give Wall Street reason to climb…
>
> The dollar was… still trading at a record low versus the euro and 26-year low against the British pound…"

That this article does not link the DJIA's record high to the USD's lows is not an anomaly. As evidence, we report results of a content analysis of *New York Times* articles that appeared in the final quarter of 2006. We selected the final quarter of 2006 because the DJIA achieved 21 record-high closes during this period.[15] We selected *The New York Times* because of its wide circulation and our belief that its reporting of the stock market is relatively sophisticated.

The sample of articles we analyzed met the following criteria: they were published in the two days following a DJIA high (e.g., for the October 5, 2006 high we included articles that were published on October 6 and October 7) and included the word

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[14] http://www.nytimes.com/2007/07/14/business/14markets.html. On July 13 and 14, 2007, the New York Times published four articles about the DJIA. Of these four articles, only the article cited in the text also mentioned the declining value of the USD.

[15] The search was conducted using Lexis-Nexis. The dates of the DJIA records in the last quarter of 2006:October 3, 2006 (11727.34); October 5, 2006 (11866.69); October 10, 2006 (11867.17); October 12, 2006 (11947.7); October 13, 2006 (11960.51); October 16, 2006 (11980.6); October 18, 2006 (11992.68); October 19, 2006 (12011.73); October 23, 2006 (12116.91); October 24, 2006 (12127.88); October 25, 2006 (12134.68); October 26, 2006 (12163.66); November 8, 2006 (12176.54); November 14, 2006 (12218.01); November 15, 2006 (12251.71); November 16, 2006 (12305.82); November 17, 2006 (12342.56); December 14, 2006 (12416.76); December 15, 2006 (12445.52); December 19, 2006 (12471.32); and December 27, 2006 (12510.57).

"Dow" in their headline, lead paragraph or key terms. Fifty articles published over a total of 32 days met these criteria.[16]

Our analysis first considered graphics. Since graphics are often more striking than text, we analyzed the content of the graphics in all of the articles. Of the 50 articles that fit our criteria, 46 featured accompanying graphics, of which 28 focused on the changes in the number of DJIA points (the other graphics included different content such as photographs of traders). Of the 28 "point total" graphics, none provided visual stimuli that would induce any manner of thinking about changes in the value of a DJIA point.

We next analyzed text. Ten of the DJIA articles mentioned the value of the USD in the context of exchange rates. Only one article connected stock index increases to the USD's decline -- an October 7 column by Floyd Norris. The article compares recent returns from many national stock indices. The returns are stated in USD equivalents. Many nations' main stock indices are shown to outperform the DJIA. Norris (2006) points out that his finding is based, in part, on the USD's decline.

> "Most European markets are shown as being higher than they were in early 2000, but most or all of those increases reflect the fact that the moves are based on dollar performance. The CAC 40 in France, for example, is shown as being up 13 percent, but it is down almost 10 percent in euros. The gain came solely from the dollar's weakness."

This article, which explains that nominal gains can be deceptive if one does not understand the underlying metric, is the *sole exception* to the rule. In all other cases,

[16] We excluded the "Inside" and "Today in Business" features, as they simply tease inside content by providing verbatim quotes from full articles. We coded each article for the following characteristics: (1) Did the article have a graphic? (2) What did this graphic show? (3) Did the article mention the exchange rate? If so, where did this appear? (4) Did the article mention the trade deficit? If so, where in this article did this appear? (5) Did the article explain how changes in the dollar/trade deficit affect the DJIA? (6) Did the article mention the Dow being a "dollar-weighted" index? Three coders (Grafstrom, Krupnikov, and McGovern) performed the analysis. Two coders analyzed each article independently. Overall, the inter-coder reliability was 0.88.

Times readers are not provided with graphics or text that would cause them to ask whether the USD's fall dilutes the implications of the DJIA record highs.

What is the consequence of such reports? We argue that these presentations reinforce an attentional blindness that limits the value of the reports to their audiences and can inhibit effective decision making. Using findings from economics and psychology, we next contend that simple and easy-to-implement changes in such presentations can increase the informative value of these reports.

Selective Attention and Alternate Reporting Strategies

We use the term "attentional blindness" to describe situations in which people fail to pay attention to objectively relevant details. This blindness results from a person's tendency to allocate attention selectively. Selective attention means paying attention only to a subset of available information. Such selectivity can facilitate efficient decision making and ease an individual's cognitive load. It can also lead people to ignore details that are relevant to them.

In this section, we are interested in the attentional blindness that occurs when individuals focus exclusively on fluctuations in the total number of points while ignoring the underlying value of the points. Hence, we draw upon established properties of selective attention to explain why economic news reports reinforce this blindness by leading individuals to focus on fluctuations of the DJIA point total while ignoring the underlying value of a DJIA point. These properties suggest alternative presentation styles that would help people understand the personal relevance of changes in the value of DJIA points and USD.

Many economists recognize selective allocation of attention as a reasonable and efficient foundation for decision making. Scholars such as Simon (1955) argued that people cannot pay attention to every piece of information available to them. To save cognitive effort, people pay attention to some attributes of incoming information and ignore others. Such selectivity is efficient when limited amounts of information are sufficient for making effective choices (Simon 1955, 106-107). Building from such ideas, others have examined how individuals direct their attention. Hirshleifer and Teoh (2003) argue that people pay attention to information that is most salient. Gabaix et al (2006) provide a more conditional argument suggesting that people pay attention to informational details that are relevant to the decision they are making and that vary across the alternatives from which they can choose.

This work operationalizes relevance and variability as objective characteristics of information. While it explains why people should pay attention to objectively salient information, it does not examine why people nevertheless fail to attend to such details. A number of psychologists have examined such questions in greater depth.

Tversky (1977) and Einhorn and Hogarth (1981), for example, explain the allocation of attention through *diagnosticity*. Information is diagnostic when it allows people to distinguish between alternatives (Skov and Sherman 1986). While similar to the notions of salience and relevance highlighted above, there is an important difference between these concepts and diagnosticity. Where the economists' work operationalizes salience/relevance with objective determinants, diagnosticity is determined through a more subjective process. Diagnosticity is the product of a person's motivation for seeking information, their beliefs about the information's content, and the context in which the

information is presented (Einhorn and Hogarth 1981, Medin, Goldstone and Gentner 1993). 'Context' refers to the mode of presentation, the order of presentation, and the other information the individual is receiving at the same time. An important consideration is that changes in context can make certain details appear more or less diagnostic, even though their objective relevance remains constant. So, if people are already attending to a particular piece of information (e.g., reports about the total number of DJIA points), then changing the information context may make objectively relevant details, such as the value of a DJIA point, more diagnostic.

To this end, Einhorn and Hogarth (1981) argue that diagnosticity is a function of available information. So, if a person finds a detail diagnostic when it is presented in one manner, he may not find it to be diagnostic when the information is presented in a different manner (e.g., when other available information changes). Skov and Sherman (1986) have shown that details that appear more variable are perceived to be more diagnostic than details that appear constant. So, when interpreting DJIA reports people are more likely to focus on attributes whose presentation highlights their variability. These ideas provide a basis for thinking that alternate – and easy to implement -- presentations of stock market information can redirect attention.

Experimental research shows that presentational alterations in related domains can have such effects. Bettman and Kakkar (1977), for example, showed that subjects relied on brand names when available information was categorized by brand, yet relied on objectively relevant product attributes when information was categorized by these attributes. Jarvenpaa (1989) and Lurie and Mason (2007) describe work that shows similar result with graphic presentations. Jarvenpaa (1989: 299) finds that for many

consumer decision contexts, “the graphical format mattered more than the task demands…” Such work suggests that presentation can have substantial effects on what informational details people will perceive as diagnostic.

Our content analysis shows that current news reports reinforce a particular pattern of selective attention that affects how people perceive DJIA points. Figure 4 shows a typical graphical presentation of this information. In it, the numerical value of the index stands out as a variable factor, thus increasing its diagnosticity. Such presentations direct all attention to changes in the number of DJIA points and no attention to objectively relevant changes in the meaning of a DJIA point.

[Figures 4 and 5 about here.]

An alternate presentational strategy makes variations in the value of DJIA points diagnostic. Consider the top two panels of Figure 5. There, the DJIA’s value is shown with respect to more than one currency. In this presentation, the DJIA is no longer the lone source of observable variation. This presentation adds diagnosticity to changes in the value of a DJIA point. It allows inferences such as “at time T, the DJIA was up xx% against the dollar but was down yy% against the Euro or zz% against the Canadian dollar.” The bottom two panels of the figure show the DJIA against gold and oil. These figures could be helpful to more specialized audiences. In general, presentations that show the value of the DJIA with respect to other meaningful measures of value can provide people with a basis for questioning whether the value of the oft-presented point metric should be so casually ignored.

If the subject in our thought experiment had seen presentations such as this, we believe that she would be more likely to make the optimal choice than if she saw only

traditional DJIA presentations. More generally, we contend that in an era where people have greater choice over how and where to store their wealth, such presentations may help them to draw more useful conclusions about the relative value of various assets. If the presentation is sufficiently clear and its implication sufficiently distinct, people who now are blind to the changing value of DJIA points will have a basis for drawing more accurate conclusions about the personal relevance of stock market reports. This kind of presentation might also help people understand the broader personal consequences of the falling USD (as Figure 3 does), causing them to pause and consider the likely future value of their assets in more productive ways.

Conclusion

In the last quarter of 2006 and the first seven months of 2007, the DJIA achieved a series of record highs. Technological and regulatory changes along with the shift to defined contribution retirement plans and concerns about the future of Social Security increased the interest in such numbers. But selective attention and the manner in which stock market data is reported leads people to focus on variations in the DJIA's point total while ignoring objectively relevant changes in the meaning of the points themselves. This attentional blindness can lead people to draw incorrect inferences about the value of their assets and lead them to make self-defeating financial choices. As an increasing number of Americans now bear greater risks in planning for their financial futures (Hacker 2006), it is important to try to reduce such negative consequences when possible. To that end, we contend that small changes in the emphasis and content of stock market reports can lead people to pay more attention to the changing meaning of DJIA points which can, in turn, improve their decisions.

To the questions, "Should reports of stock market records lead people to rejoice at news of a strong economy?" and "Should the reports also prompt a more sobering inference?" the answer is yes to both. Measured in points, the DJIA's value, as well as that of the Standard & Poor's 500, soared to new heights during the period of our study. But in both cases, the USD fell precipitously against many relevant measures and the value of stock index "points" were dragged down as well. The meaning of the record highs is therefore diluted.

While it is true that dilution of an evaluative metric often suggests inflation, inflation cannot be the whole story here, for if people had simply changed their USD for loonies or Euros, domestic price increases would not have affected them so much. Focusing solely on inflation ignores the point that Americans need not hold USD. They can hold assets whose value is tied to other currencies. To the extent that inflation affects the implications of the DJIA's recent records for retirees and other stockholders, it only makes the results look worse than our analysis has already done.[17]

We contend that citizens who react as though "points" are of constant value are prone to make suboptimal choices when evaluating government fiscal policy and making decisions about personal finance. A counterargument is that our observed five-year decline in the value of USD relative to other benchmarks is part of a longer-run cyclical phenomenon and that eventually the USD's value will revert to historical averages. The

[17] Inflation is posited to have its own effects on stock market valuations. Modligiani and Cohn (1979) contend that investors who fail to adjust long-term expectations about expected growth to variations in inflation will undervalue stocks when inflation is high and undervalue them when inflation is low. A recent, rigorous cross-sectional analysis by Cohen, Polk, and Vuolteenaho (2005) provides further empirical support for this contention.

problem for retirees and other investors is that the evidence suggests that any such reversion will be different than in the past.

We and our parents, and perhaps their parents, grew up in a world where the US played a very distinct role in the world economy. The evidence suggests that era will soon end, if it hasn't ended already. The change matters because people can make a basic set of assumptions about financial planning if they can safely assume that the USD will serve as the world's reserve currency over the long-run and that the nation's government and economy will act in ways that reinforce that status. If those premises are not true, their assumptions may have to change.

The economic evidence that we have presented suggests that the validity of long-standing foundational assumptions about the US's role in the world economy and the USD's position as the sole reserve currency is disintegrating. Investor expectations should change as well. People who see the USD, and related metrics such as DJIA points, as the steady basis upon which values in a turbulent and uncertain economic world revolve should rethink such views. In ways that were not true for their parents or grandparents, they are likely to benefit by adjusting fundamental assumptions about the extent to which USDs are a "safe haven," or DJIA points constitute a credible measure of value, as they plan their own financial futures.

Such changes in perspective can come from slight alterations in the presentation of financial reports to which many people already attend. Focusing on the psychology-economics interaction reveals conditions under which people can adapt to the blindness that currently characterizes most stock market perceptions and is reinforced by many news reports. Altering the presentation of existing reports can make objectively relevant,

but currently "hidden," attributes of stock market reports increasingly diagnostic to readers. One alteration that would be easy to implement is to regularly report the value of the stock indices in terms of other focal assets such as the Euro. Such presentations would be easy for citizens to comprehend and lead at least some citizens to make more accurate inferences about the meaning of "record highs" and related financial news. The correction, in turn, can lead them to make better choices regarding personal finance and ask better questions about the extent to which their plans are affected by government fiscal policies. People who have such knowledge are less likely to be negatively affected by knowable threats to their financial futures.

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Table 1. Balance of Trade with Respect to Rest of World for the United States, Canada and the Euro-12 Denoted in Millions of Respective Currency

	2001	**2002**	**2003**	**2004**	**2005**	**2006**
USA (deficit as % of GDP)	-333,404 (-3.3%)	-396,054 (-3.8%)	-451,494 (-4.1%)	-555,735 (-4.8%)	-666,314 (-5.3%)	-721,882 (-5.4%)
Canada (surplus as % of GDP)	+70,659 (6.4%)	+57,311 (5.0%)	+56,412 (4.6%)	+65,759 (5.1%)	+63,501 (4.6%)	+51,302 (3.6%)
Euro-12 (balance as % of GDP)	+47,386 (0.7%)	+99,006 (1.4%)	+69,565 (0.9%)	+71,498 (0.9%)	+16,127 (0.2%)	-9195.4 (0.1%)

Table 2. Outcome of Content Analysis

	Yes	No	Total Number of applicable articles:
GRAPHICS			
Does the article have a graphic?	47	3	50
If so, does the graphic have DJIA content?	28	19	47
If so, does the graphic show fluctuations in the DJIA as a function of exchange rates?	**0**	**28**	**28**
FOCAL CONTENT			
Does the article mention the exchange rate?	10	40	50
If so, does it link a USD exchange rate to the DJIA?	1	9	10
Percentage of all articles linking a USD exchange rate to DJIA.	**1**	**49**	**50**
OTHER CONTENT			
Does the article mention the trade deficit?	1	49	50
If so, does it link the trade deficit to the DJIA?	1	0	1
Does the article mention inflation?	30	20	50
If so, does it link inflation to the DJIA?	4	26	30

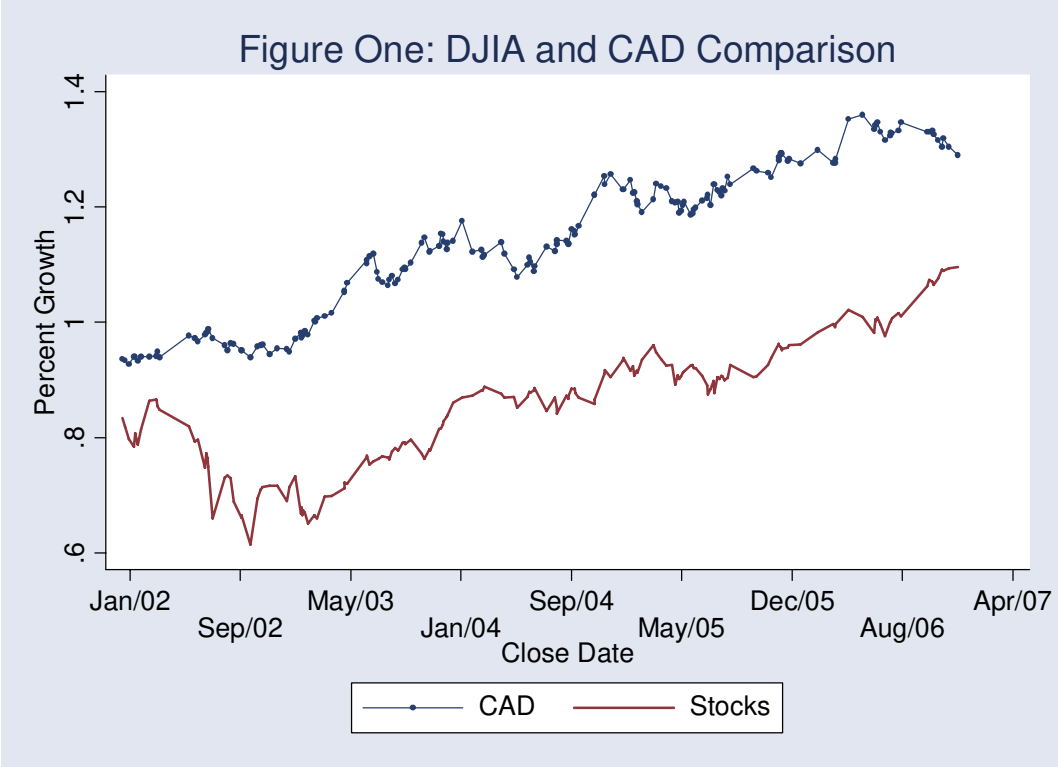


Figure 1.a. Returns from Loonies Under a Bed and One Share of the DJIA Assuming a Purchase Date of January 2, 2001.

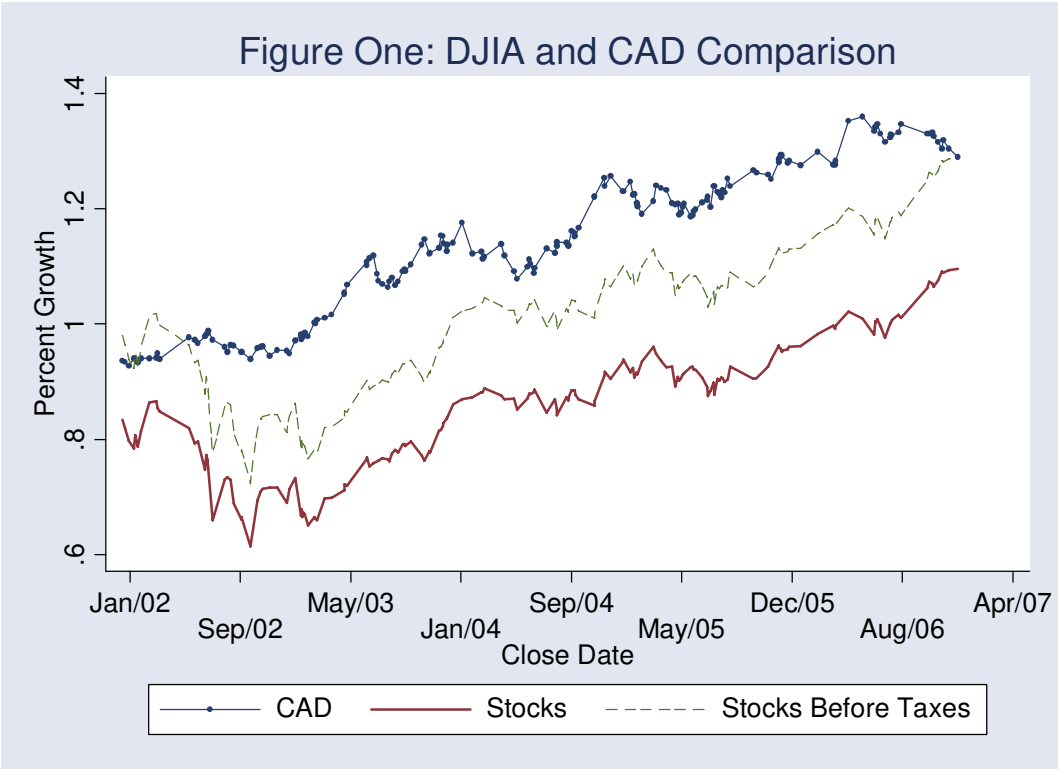
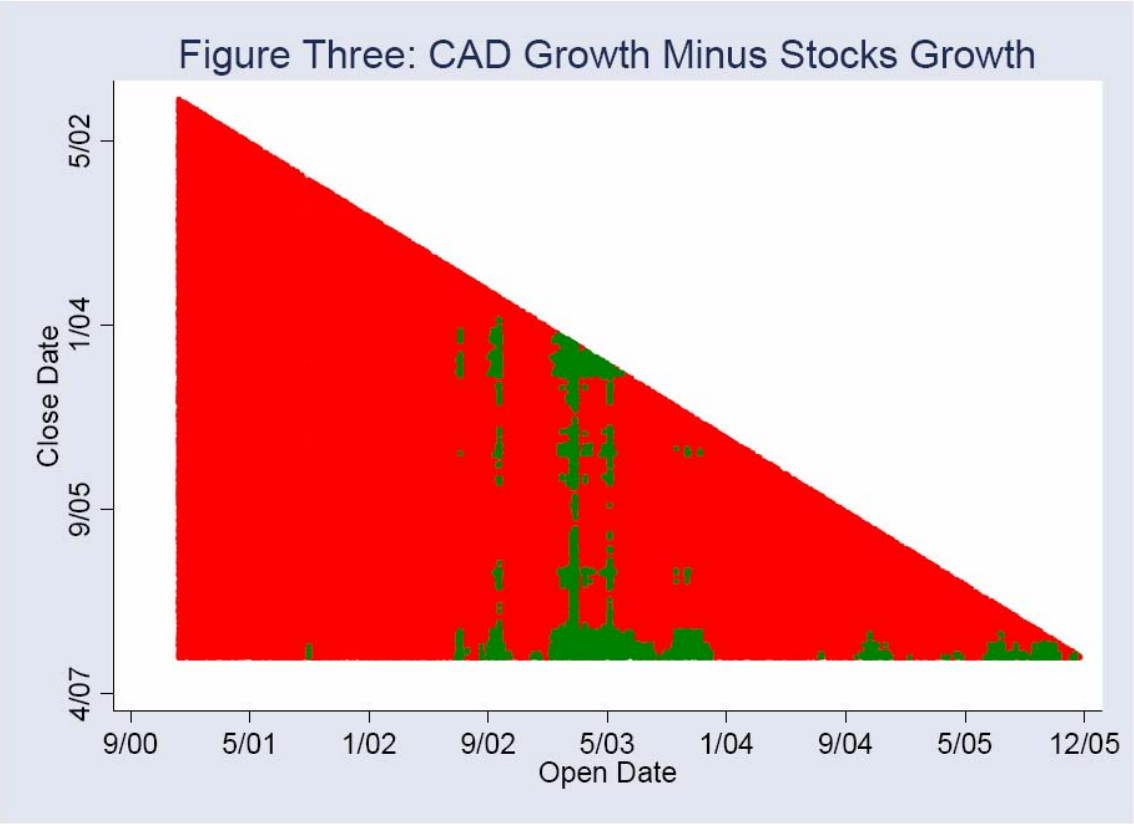


Figure 1.b. The Same Figure Also Showing Pre-Tax Returns on Stocks.

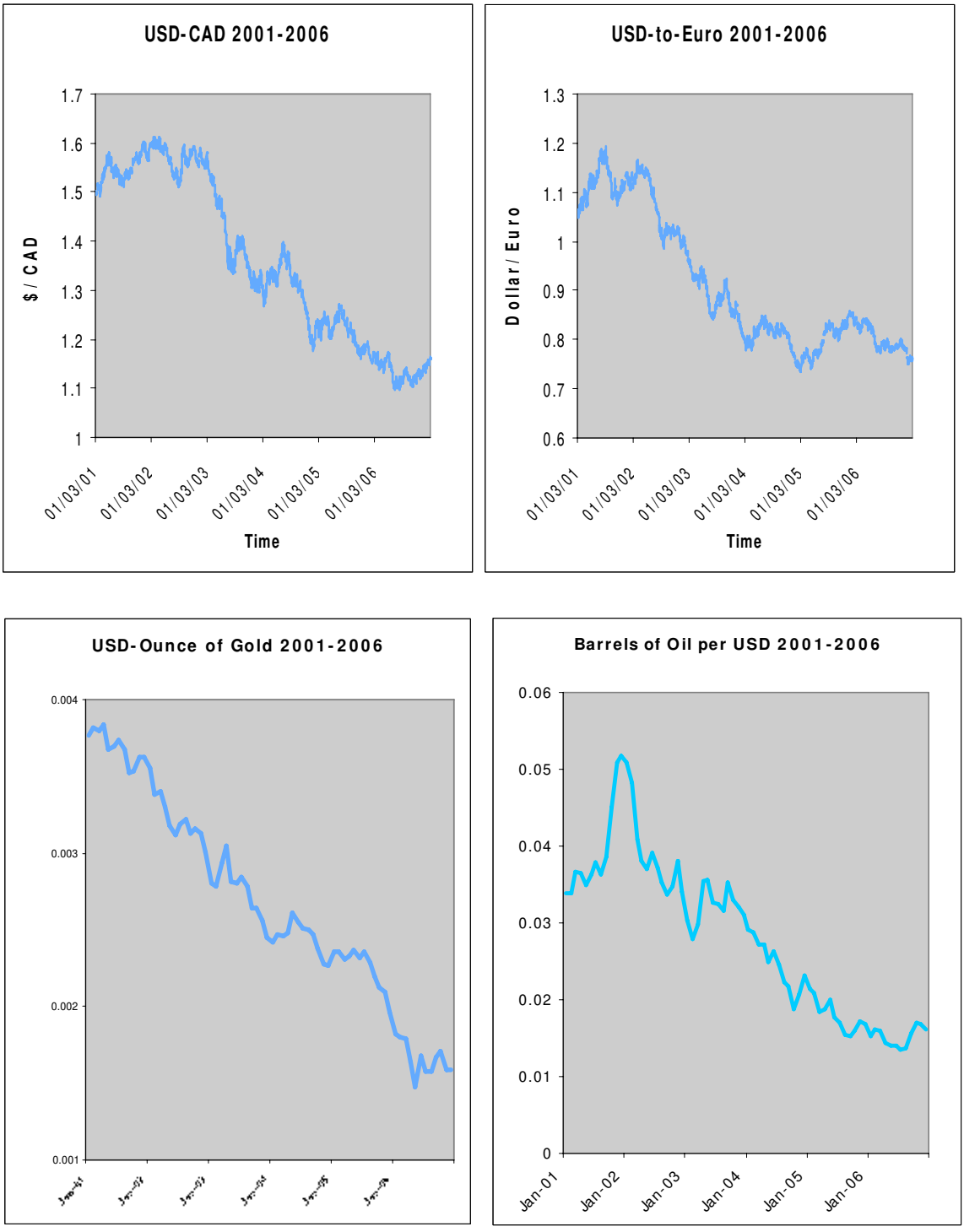


RED pixels: CAD return beats "one share of the DJIA" return.

Green pixels: "one share of the DJIA" return beats CAD return.

Horizontal axis includes all purchase dates 1/2/01 to 12/31/05 (left-to-right).
Vertical axis contains all "cash in" dates 1/1/02 to 12/31/06 (top-to-bottom).
Post-tax returns compared.

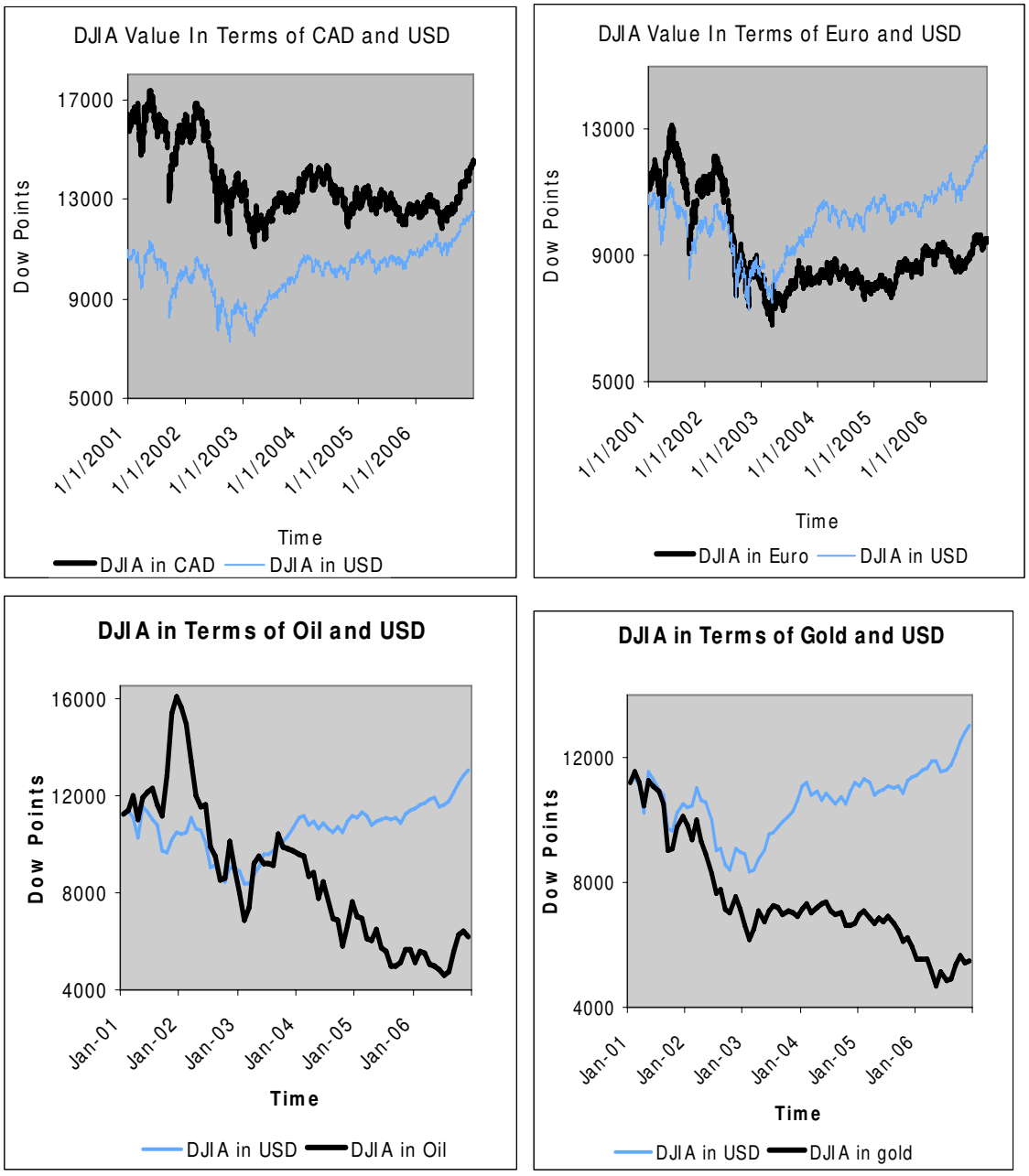
Figure 2. Returns from Options 1 and 2 for all possible holding periods of one year or greater, 2001-2006.



CAD and Euro comparisons use daily closing prices. Oil comparison uses the monthly spot oil price for West Texas intermediate crude and the average monthly closing price for the DJIA. Gold comparison uses the monthly average London Gold Fix the associated DJIA statistic.

Figure 3. Decline of USD relative to CAD, Euro, Gold and Oil

Figure 4. A common presentation of the DJIA's value. Source: Yahoo! Finance



DJIA-Oil and DJIA-Gold values are computed as follows. We begin by taking the number of USD that equals the average DJIA closing point total for January 2001. This is 11216.88 USD. Then, using published monthly spot prices, we compute the amount of Gold (42.25 Troy ounces) and Oil (379.2 barrels) that the same number of USD can buy on that day. These amounts become the bases for the respective panels. The panels then show the amount of gold or oil that a subsequent day's reported DJIA point total can purchase relative to the amount that the DJIA could buy in January of 2001.

CAD and Euro comparisons use daily closing prices. Oil comparison uses the monthly spot oil price for West Texas intermediate crude and the average monthly closing price for the DJIA. Gold comparison uses the monthly average London Gold Fix the associated DJIA statistic.

Figure 5. DJIA value relative to CAD, Euro, Oil and Gold, 2001-2006.