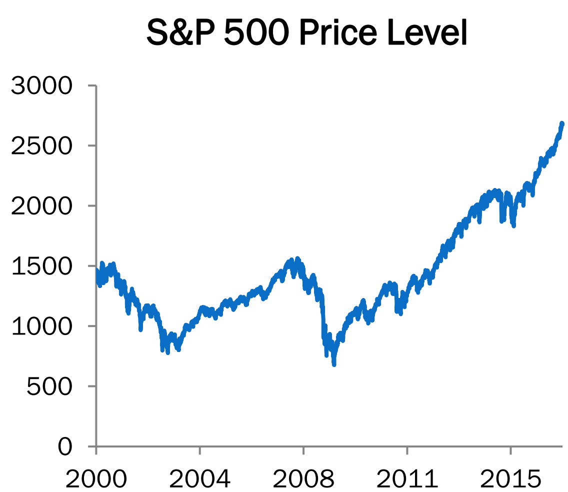
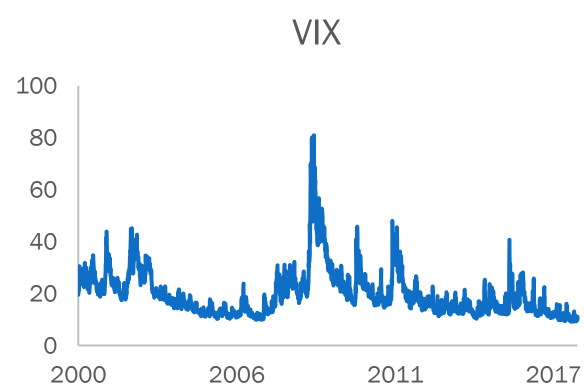
The Economy and Markets:

The U.S. stock market continued its remarkable run this past quarter. The S&P 500 closed Dec 29 (the last trading day of the year) at a value of 2,673.61, which is 6.12% higher than its value of 2,519.36 on Sept 29. The S&P 500 concluded the year up a remarkable 19.4%, and the best quarter of the year was this past quarter. This latest increase can likely be attributed to the passage of the recent tax reform. Stock prices reflect expected firm profitability, and the tax changes were directly designed to give a profit increase to corporations in the form of a dramatically lower corporate income tax rate.

Markets at a Glance (Dec 29, 2017)	
S&P 500	2,673.61
Dow Jones	24,719.22
10 yr. U.S. Treasury	2.41%
3mo U.S. Treasury	1.39%
GDP Growth (last quarter)	3.2%
Unemployment Rate	4.1%

At Madison Financial Research, there are two broad risk metrics that we tend to keep an eye on (bearing in mind that no one metric, or even two metrics, can alone tell the entire story), both of which we have discussed in detail in past newsletters.[1] The first is the VIX risk measure. The VIX measure comes from the price of options traded on the S&P 500, and is a market-derived measure of the expected variability of price movements in that index. The VIX ended the quarter at a level of 11.04, up from 9.51 last quarter. However, this increase is a bit deceptive. An hour before market close on Dec 29, the VIX was just slightly above 10. A late selloff in the day coincided with a spike in the VIX. It could be that the selloff sparks a trend of higher risk, but the selloff could also simply have been end-of-the-year maneuvering that will be quickly reversed. The VIX measure effectively reports how much the value of the overall market tends to "move around." One thing to always keep in mind with the VIX is that it is subject to change quickly. However, since the VIX is derived from the options market (the details are well beyond our scope here), one direct implication of the (still very) low VIX is that "insurance" on the broad market, in the form of put options, is comparatively cheap to acquire right

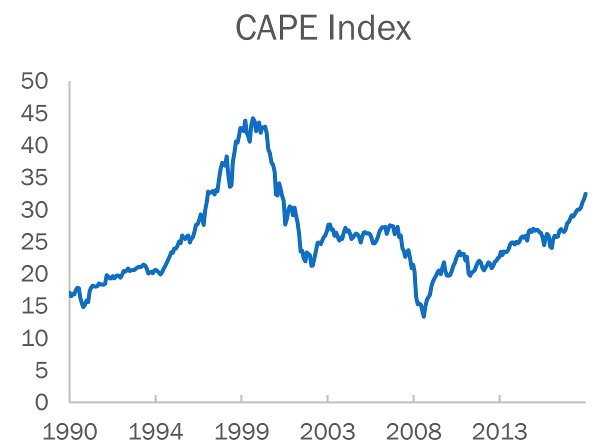




[1] All past newsletters, and some other useful resources, may be downloaded at http://www.madisonfinancialresearch.com/Resources.html.

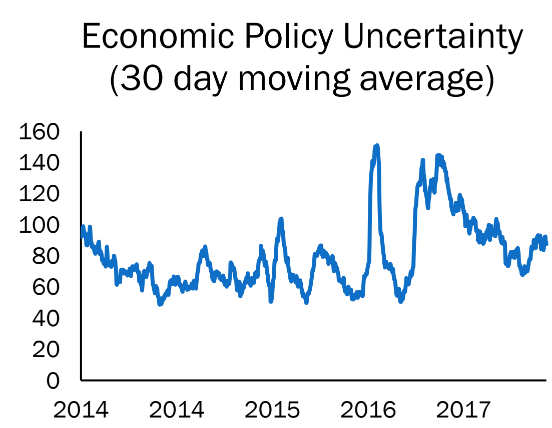
now. Of course, the flip side of this is that those selling the "insurance" aren't particularly worried about the downside of the market.

In contrast to the VIX, the CAPE measure (CAPE is an acronym for "cyclically adjusted price to earnings") is a measure of the "value" of the stock market – which is a notion for which it is very difficult to assign a measurement. The CAPE measures the price of the S&P 500 index compared to its earnings over the past decade. When the CAPE measure is high, long-term (7 – 10 years) future stock returns tend to be low. When the measure is low, long term future stock returns tend to be high. The average for the CAPE measure is also around 18 or so. The CAPE measure has been increasing consistently for almost a decade. As you can see in the figure, CAPE values are not only high, but accelerating. The current value is around 32. This value is the highest it has been since the time of the internet boom. Market valuations such as CAPE are only roughly related to future stock returns, but they are among the better indicators in existence (it turns out market forecasting is very difficult).



Taken together, the VIX and CAPE seem to imply a stock market that returns less than its historical average, while not moving around too much. We should take this time to mention that this is an assessment that Madison Financial Research has reached for several quarters now – and the market has consistently delivered higher returns than we have expected. It is important to note, however, that any predictions that utilize CAPE are much longer-term predictions than simply a few quarters. But even with that caveat, it should be clearly noted: market forecasts are notoriously difficult to provide with any accuracy. In market forecasting (and pretty much all aspects of life), humility and skepticism go a long way.

As 2017 draws to a close, one hallmark of the year has been the front-and-center nature of national politics. When it comes to financial markets, the effect of politics is usually a bit overstated. Overstated, but not unimportant, as the recent passage of the tax reform bill and the related stock market increase has demonstrated. Madison Financial Research has consequently begun to track another form of uncertainty, the Economic Policy Uncertainty (EPU) Index. This measure relies on aggregation of keywords from news stories to develop a measure of policy uncertainty.[2] This measure was only developed a few years



[2] You can find a more detailed discussion of EPU in a previous newsletter here:
http://www.madisonfinancialresearch.com/files/2016_Q4_Newsletter.pdf

ago, and as such its usefulness should naturally be viewed with skepticism. Think of this as an EPU trial period. We report it here as a moving average, which we think is likely to be the most valuable way to consider the index. As can be seen in the figure on the previous page, EPU spiked significantly after the 2016 national election. The index steadily declined as 2017 progressed, but then increased again during the progression of the tax reform bill. EPU remains elevated, but at a lower level than most of 2017.

The U.S. economy has been performing quite well for years, and there are signs that it may be accelerating. Estimates of 3rd quarter 2017 GDP growth (the most recent quarter for which estimates are available) registered a strong 3.2%, building on 3.1% from the previous quarter. This is a very solid 6-month period, and it will be interesting to see how long this level of growth can be maintained. The tax reform bill should modestly help GDP growth in the near term, but most economists indicate that the effect is likely to be relatively small. The unemployment rate is also strong, and now stands at 4.1%, continuing a decade-long march downward.

With unemployment so low, most economists expect inflation rates to begin to creep up. Indeed, many economists have expected inflation rates to increase for years now. At Madison Financial Research, we prefer to look to the market for such expectations, and for years these market-derived expectations have been muted. However, there are signs of increasing inflation in these measures. At the end of this quarter, market activity indicated an inflation expectation of about 1.9% per year over the next 5 years. At the end of last quarter, this measure was about 1.6% These are still quite low levels of inflation, but they appear to be creeping upward. The Federal Reserve, certainly keeping an eye on inflation, recently raised the Federal Funds target rate to a range of 1.25% - 1.50%. If inflation were to increase rapidly, we would expect to see the Fed correspondingly raise this target rate more aggressively.

Over the past couple years, we have watched with some concern as the "yield curve" comprised of U.S. Treasury bonds has slowly flattened. By this, we mean that the spread between 10-year and 3-month U.S. Treasury yields has narrowed. Economic studies show that when this spread gets very low, or becomes negative, it is often associated with economic weakness. Currently, there is a 1.02% spread between these yields (10 year Treasuries are yielding 2.41%, while 3 month Treasuries are yielding 1.39%). This is down from about a 1.27% spread last quarter. This is a low level, but not quite at the level typically associated with concern. However, the trend is going in the wrong direction, and we will continue to monitor this important economic indicator.

Quarterly Special Topic: Marriage and Wealth Inequality

The discussion of the distribution of income and wealth in the United States returned to the national discussion in the form of the tax reform bill. Because of the prevalence of income taxes across countries, it is generally easier to measure income inequality than wealth inequality, though certainly estimates of both exist. Economists tend to measure income inequality with a measure known as the Gini coefficient. A Gini coefficient of zero implies complete equality of incomes, and a coefficient of 100% implies maximum inequality. Relative to other developed countries, the U.S. tends to have greater income inequality. The World Bank estimates the Gini coefficient in the United States to be about 41% (the CIA actually estimates it a bit higher, around 47%), which is more unequal than about 2/3 of the world, and the vast majority of developed countries.[3] For the United States, this measure has been growing through time – in the 1980's, it was around 36%.

Greater income (or wealth) inequality is not necessarily a bad thing. It may, for example, represent the uneven distribution of resources resulting from hard work and a lifetime of responsible decision making in a society of equal and fair opportunity. In such a society, we might expect a great deal of income inequality, but we would also be likely to see intergenerational mobility (movement between income classes between generations). Unfortunately, in the limited number of cross-country intergenerational mobility studies, the United States tends to perform poorly compared to its developed-country peers. For example, a 2010 Brookings Institute study found that intergenerational mobility is about 2.5 times greater in Canada than in the United States. Germany has intergenerational mobility that is 1.5 times higher, and even France has intergenerational mobility that exceeds that in the United States by about 20%.[4]

So income inequality in the United States is getting more extreme, and inter-generational mobility is low, which is a fairly toxic combination. Certainly, we see signs of this toxicity in our political discourse. It is natural to wonder what the drivers of these trends are. And like any difficult problem, there are many explanations that in total amount to the big picture. Today, however, we are going to discuss a very large piece of the puzzle – the decline of marriage in the United States.

In recent years, several trends have conspired to render marriage in the United States a luxury good. Less affluent individuals are getting married less frequently, and forming less stable unions when they do. This greatly increases financial risk to both individuals over a lifetime, as well as any children their union provides. Among other (more romantic) aspects, marriage is an economic contract that conveys significant risk management features. The economic fortunes of a married couple are legally bound. Thus, in a married household with two working adults, if one adult becomes unemployed, there is a natural temporary fallback position onto the income of the working spouse. In times of medical hardship (which very often have severe financial consequences) or other unforeseen

[3] For comparison to the U.S. Gini coefficient of 41%, here are the Gini coefficients of a handful of other countries (remember, 100% is the most unequal):

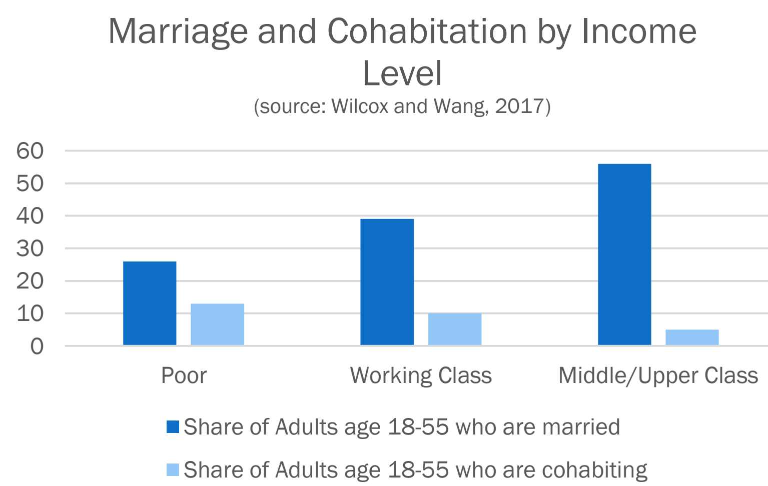
Belgium 28%, Germany: 31%, Ireland: 32%, Japan: 32%, Canada: 34%, Saudi Arabia: 45%, Brazil: 51%

[4] https://web.archive.org/web/20100822160146/http://www.brookings.edu/~/media/Files/rc/papers/2007/05useconomics_morton/05useconomics_morton.pdf

economic hard times, the mutual support of a marriage helps to mitigate the downside economic risks for both the adults in the relationship and the children.

There is nothing preventing this kind of economic cooperation for cohabiting unmarried couples, of course. However, as they have opted against a formalizing structure of this kind of cooperation, it is reasonable to theorize (and supported by the empirical evidence) that they are less likely to provide it. It is therefore unsurprising that in 2016 only 5.1% of married couples were living in poverty, while 22.6% of cohabiting households were.[5] Surprising or not, however, an institution yielding four and a half times greater chance of poverty is clearly an inferior economic good.

The better risk management features of marriage vs long-term cohabitation, in addition to reducing the chances of ending up in poverty, also increase the chances of accumulating wealth through time. For example, Zagorsky (2005) finds that long-term married couples (reporting their net worth individually) have accumulated 93% greater net worth over their lifetimes when compared to households populated by single individuals. Further the married couple's wealth increased about 16 percent per year of marriage. The breaking of the marriage bonds were particularly costly, which from an economic standpoint is also unsurprising – if you think you have safety nets in place, and you don't, the fall can be pretty bad. In the Zagorsky study, divorce was associated with wealth levels that were 77 percent lower than those experienced by single respondents.



So how does marriage tie in to income and wealth inequality? Marriage, with its risk management and wealth benefits, has been declining as an institution in the United States for decades. For example, about 72% of women had been married by age 30 in 1990, but that number was about 60% in 2008. There are not large differences in the percentage of educated vs. uneducated individuals that actually do get married. There are, however,

growing differences in the characteristics of the broader relationships formed among these two groups.

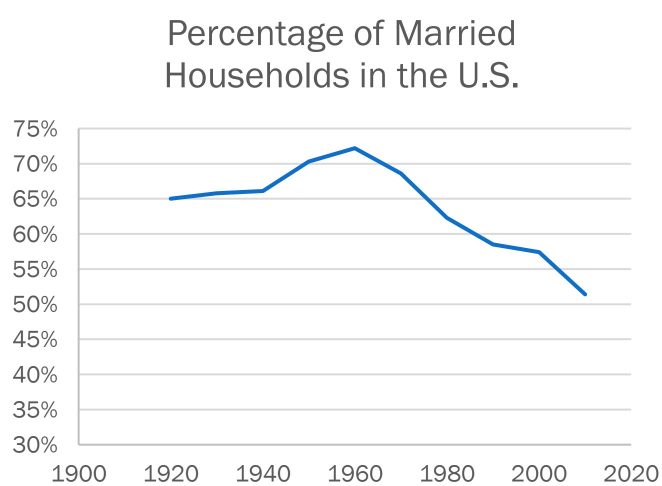
As a prime example of these diverging trends, consider childbirth. In 1980, a bit under 5% of college educated mothers bore a child outside of marriage. For those with a high school education or less, that percentage was 20%.[6] By 2007, about 10% of college educated mothers bore a child outside of marriage – a dramatic increase. However, far more dramatic is the change in the behavior of those with a high school education or less. Almost 70% of mothers in this group bore their child outside of

[5] SOURCE: U.S. Bureau of the Census, Current Population Survey, Annual Social and Economic Supplements.
[6] Statistics in this paragraph come from "Our Kids", a book by Robert D. Putnam (2015). If you find these issues interesting, we highly recommend the book!

marriage. Married mothers in this group have become a minority. If we reflect on the risk management benefits of marriage, and the financial risks to which this group of women is likely exposed, it is not surprising that the financial well being, measured by average incomes or net worth, of this group would be declining.

Another trend reinforcing overall inequality is among those that are married – a phenomenon known in demographic circles as homogamy. Homogamy (also known as assortive mating) in this context is the coupling of individuals with similar characteristics. Homogamy has been increasing in the United States for some time – people are increasingly marrying or co-habiting with people like themselves. At some level, this is rather intuitive - of course people are more inclined to marry those that share their interests, cultural outlook, etc… But through time, married couples have grown in similarity in economic status (at the time of marriage), education level, and employment opportunities. Those who are college educated are now much more likely to marry someone who is also college educated than in the past. Similarly, those who have an educational level of high school or less are much more likely to marry someone of a similar education level. Part of this explanation of course lies in the increased participation of women in the workforce over the last 50+ years, as well as the dramatically increased number of college-educated women. Men and women find themselves together on college campuses and in workplaces – the sorting is to some extent done for them by societal forces.

So if highly educated individuals are more likely to marry each other, and less educated individuals are more likely to marry each other, this alone is likely to exacerbate wealth inequality. Further, the less educated are more likely to have more unstable unions. They have higher levels of cohabitation instead of marriage, children from previous couplings, and probability of divorce. They therefore have lower financial prospects, which leads to greater wealth inequality.[7] The less educated, as an outcome of societal forces, have less robust risk management systems in place.[8] Further, the children of these two "classes" of unions are likely to have greater dispersion in financial prospects as well. The children from the highly educated families are more likely to have the resources to provide them a better education, and the social contacts and structures to encourage them in that direction. The children from less



[7] The probability that an individual was ever divorced by age 46 is 29% for college graduates, but 58% for those with a high school education or less. See https://www.bls.gov/opub/mlr/2013/article/marriage-and-divorce-patterns-by-gender-race-and-educational-attainment.htm

[8] There is some evidence that the divergence in "class" is even greater than what education alone can explain. Homogamy among parental social class also explains a great deal of the wealth differences among classes of married couples. See Charles, Hurst and Killewald (*Demography*, 2013)

educated families are less likely to have these advantages. So in addition to greater inequality seen at the present, the structure of marriage is such that it perpetuates the inequality into the future.

However, we see similar patterns of declining marriage rates and homogamy in many European countries. Indeed, marriage rates are in most cases are declining faster than in the United States. Why do we not see the levels of inequality there that exist in the United States? Well, there is evidence that inequality is growing in those countries as well, likely for similar reasons.[9] However, the magnitude of the problems are likely less severe specifically because of the risk-management support available in those countries. Most developed countries have some basic access to healthcare available at relatively low cost to all individuals. This eliminates a large financial risk to cohabiting couples and married couples alike. Further, the welfare systems in European countries tend to be considerably more comprehensive than in the United States, which again provides a safety net for both cohabiting and married couples. Interestingly, since these social safety-net features of other developed countries comparatively reduce some of the benefits of marriage, they may help explain some of the declining marriage rates in those countries. Effectively, the government is providing some of the risk coverage of life's disasters, and so it is less necessary to turn to the institution of marriage to secure that coverage.[10]

What is surprising is that in the United States, which has a very limited social safety net, the less educated are increasingly turning away from marriage as the institution of choice for the conception of children. The reasons for this are not well known, or at least agreed upon. The rise in child birth outside of marriage coincided with the rise of easy access to birth control. One plausible explanation is that while the social structures that reinforced marriage declined, the use of birth control among the less educated did not rise enough to keep pace. The net result has been an increase in wealth inequality in the United States, and a decrease in intergenerational mobility.

[9] http://www.worldbank.org/en/news/feature/2014/07/03/growth-inequality-and-social-welfare-cross-country-evidence

[10] Further, European income tax rates tend to be a great deal more progressive than in the United States. This is largely unrelated to the effects of marriage, but has a clear effect of reducing income inequality.

About Us

Madison Financial Research, LLC (MFR) is a registered Investment Adviser.[11] Jason Fink provides all of the investment advising offered by MFR. Dr. Fink has a PhD in Economics from the University of Virginia, and is a Professor and Wachovia Securities Faculty Fellow at James Madison University. He has over two decades of industry and academic experience, including previous positions at First Union Capital Markets, Fannie Mae, the University of Virginia and Florida State University.

What is Madison Financial Research?

MFR exists to provide *unbiased* answers to any financial questions its clients might have, and any help that its clients might need. We are comfortable working with a wide range of clients. For example, we are happy to explain the process of constructing an inexpensive and effective portfolio to novice investors, but also have particular knowledge on endowment spending policies to aid charitable institutions. We want to help investors understand their investments.

In the finance industry, almost all the people an individual can go to for advice have something they are trying to sell. A bank tells you why you need a mortgage. A financial adviser tells you why you should buy an annuity. An insurance agent tells you why their insurance product is ideal.

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These questions can be simple –

> "Can you help me get started in understanding online brokerages?"
> "Is purchasing this particular annuity a good idea?"
> "Is my financial adviser charging me a lot for what he or she is providing?"

They can be complicated –

> "When can I retire, and how can I optimally construct my portfolio?"
> "Can you provide an overall assessment of my portfolio, including insurance, 401 (k), and other major holdings? How can I improve my approach? Should I diversify internationally?
> "What is a sustainable spending rate from a given portfolio?"

We have the expertise to handle virtually any financial question, and the patience and teaching experience to provide understandable and actionable answers. And outside of our time, *we have no products to sell* - our advice is unburdened by an alternate agenda.

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The financial world is complex. We can simplify it.

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