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Sovereign Debt and Economic Growth in the Euro Zone

Mehdi Monadjemi   **John Lodewijks**

Abstract
Following the initial stimulatory response to the 2008 financial shock, European Union policymakers crafted a program of austerity based on fiscal contraction. This program was partly justified by empirical research alleging a clear causal relationship between high levels of sovereign debt and low (even negative) rates of economic growth. This empirical study, using graphical presentations, partial correlations and Granger Causality tests, finds a wide range of growth outcomes at every level of public debt among countries studied. As such, policy settings based on simple debt-growth regressions based on some threshold level of debt should be avoided.
Keywords: Sovereign debt, Euro zone, economic growth
JEL Classification: F34, F36, F43

I.   Introduction

Sovereign risk was traditionally associated with the risk of developing countries defaulting on their foreign currency loans. This has been recently highlighted with Argentina's latest default (its eighth). The term could also be applied to the risk that private investors faced of governments nationalizing and expropriating their private assets. More recently it relates to the risk of default on euro debts held at the European Central Bank by EU members.

The relationship between sovereign debt and economic growth has been subject of extensive empirical research. The extension of this topic to the Euro Zone area became important since the significant rise in the sovereign debt of several members of European Monetary Union (EMU) particularly, Greece, Portugal, Spain and Italy. High budget deficits coupled with low economic growth inside the straight jacket of monetary union have been blamed for the rising sovereign debt of the EMU periphery members.

Recently Eichengreen and Panizza (2014) stated that International Monetary Fund forecasts, and the EU's Fiscal Compact, suggest that to maintain debt sustainability and reduce their debt/GDP ratios down to a 60 percent target, Europeans high debt countries should generate primary budget surpluses equivalent of 5 percent of GDP for a period of 10 years. This suggestion is consistent with austerity programs designed for reducing indebtedness of heavy indebted countries. The authors, however, argue that the IMF suggestion for primary budget surplus is unrealistically high and not practical. The authors argue that a less restrictive surplus of 3 percent of GDP for 5 years is more practical. This surplus goal is likely achievable when economic growth is high, the current account is in surplus, the debt is high and the parliament is supportive of the government. The relevant issue is the sustainability of the debts and their effects on economic growth. At the moment the prospect of economic growth for the high debt European countries is not promising. The relationship between sovereign debt and economic growth is explored in this article.

Generally the government debt ratio (government debt to GDP ratio) of the 12 EMU countries rose after the Great Financial Crises of 2007 - 2008. Governments of the affected countries attempted to rescue their venerable financial institutions by standing ready to support their liabilities or by injecting cash directly. These developments increased government debts as governments attempted to finance their deficits. Average debt ratios of 12 members of the EMU are presented in Figure-1 where debt ratios in percentages are

measured on the vertical axis and 12 countries are numerically shown on the horizontal axis. In all 12 cases the average debt ratios were higher in 2008 – 2012 than in 1996 – 2007.

Figure 1 Average Government Debt Ratios in 12 EMU members
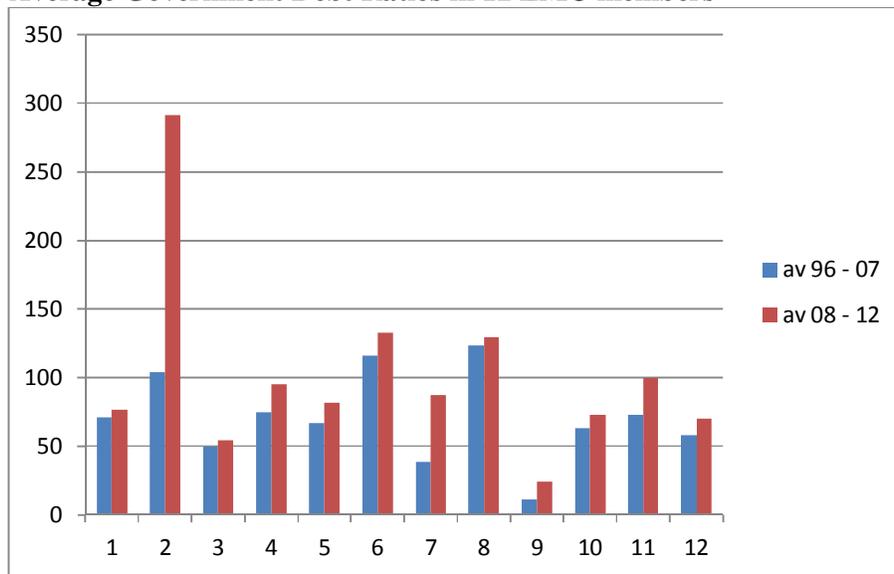
On the x axis numbers 1 to 12 refer to France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Austria. Belgium, Finland and Spain respectively

Portugal Austria Belgium Finland Spain

Most of the studies in this area used regression analysis to estimate the relationship between debt and growth and the sustainable level of indebtedness. In the relationship between economic growth and debt, economic growth affects debt and debt affects economic growth. Accordingly, the estimate of the coefficient of the debt is biased.

The purpose of this paper is to examine the relationship between sovereign debt and economic growth using graphical presentations, partial correlations and Granger Causality tests. Particular emphasis is placed on the non-linearity of the relationship between government debt and growth. The review of recent literature is presented in Section II. The controversial findings of Reinhart and Rogoff are discussed in Section III. Sources of Data and empirical results are given in Section IV. Concluding remarks and policy recommendations are offered in Section V.

II.   Review of the Recent Empirical Literature
Most of the research in the area of public debt concludes that unsustainably high government debt has a negative effect on economic growth. Often this evidence is used to defend restrictive fiscal policy though curtailment of public expenditure or raising taxes. The following approach was used in Fischer and Easterly (1990) to express the government debt to GDP ratio:

Change in d Ξ (primary deficit/y) - (seignorage/y) + (real interest rate - growth rate) **x** d (1)

where d and y are government debt ratio to GDP and nominal GDP respectively and primary deficit is non interest government spending less government revenues. Identity (1) implies that if the government is running a primary deficit larger than seignorage, and if the real

interest rate exceeds the growth race, the debt to GDP ratio will continue to rise without limit. In this case government debt is unsustainable.

Kourtellos, Stengos and Tan (2013) suggest that the relationship between public debt and growth is conditioned by the quality of a country's institutions. When a country's institutions are poor, then, more public debt leads to lower growth (everything else constant). However, if a country's institutions are of significantly high quality, then, public debt has no adverse effect on growth. The authors argue that their focus of research shifts from the long-run effects of the quantity of public debt towards its interaction with the fundamental determinant of growth such as the quality of the country's institutions.

Dreger and Reimers (2014) argued that after the financial crises of 2008-2009, declining government revenues coupled with rising government spending to rescue venerable financial institutions, led to a significant rise in public debt in the affected countries. The rapid rise of sovereign debt especially in Europe raised concern about the long run stability of the European Monetary Union. While the debt crisis started in the periphery, core euro area states like Italy and Spain also have been affected. In their study the authors examined the nonlinear relationship between the debt-to-GDP ratio and real per capita GDP growth for members of the EMU as well as a set of industrial countries by distinguishing between periods of sustainable and non-sustainable debt. If the nominal interest rate exceeds nominal output growth, primary budget surpluses are needed to reach a stable government debt ratio. The negative impact of the debt-to-GDP ratio is limited to the members of the EMU during periods of non-sustainable sovereign debt. In the panel of other industrial countries, the negative debt effect declines. Furthermore, the results of the study suggest that being a member of the EMU may introduce additional risk. Eventually, as suggested by other studies such as Feldstein (2011) and Eichengreen (2007), the path towards a fiscal union with a common liability for national debt may be proper solution to resolve the EMU's debt and deficits problem.

Checcherita-Westphal and Rother (2012) showed a non-linear relationship between growth of GDP per capita and gross government debt to GDP ratio for 12 members of EMU during 1970-2008. The debt ratio had a positive effect on growth up to 90-100 percent. After this threshold, the growth rate was negatively affected by the rise in debt ratio. The 12 original EMU members included Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain. For these countries the average government debt ratio rose from 30 percent in 1970 to 60 percent during the past decade. In this study two stage least square and GMM regressions in the context of panel data were used to estimate the relationship between the growth of per capita GDP and debt ratio. Furthermore, the authors argued that private saving, public investment and total factor productivity are channels through which public debt has a non linear impact on economic growth.

However, Panizza and Presbitero (2013), contrary to much of the existing literature, showed that public debt has no causal effect on economic growth. Initially, the authors found a negative effect of public debt on growth using instrumental variables. However, when they corrected for endogeneity, the negative causal effect disappeared. The authors showed that instrumental variable regressions do not show that public debt affects growth in OECD countries. The instrumental variables method is based on the fact that, when foreign currency debt is present, changes in a country's exchange rate influence the debt-to-GDP ratio. The followings points summarize the main arguments of Panizza and Presbitero (2013):

(i) there are many studies that suggest that public debt is negatively correlated with economic growth in developed economies; (ii) there is no study that provides a strong support that a causal relationship is from public debt to economic growth in advanced economies; and (iii) their results based on instrumental variable regression are not supportive of such causal relationships.

III.   Reinhart and Rogoff

Several influential studies by Reinhart and Rogoff have created considerable controversy. Reinhart and Rogoff (2009) show the rise in real government debt in the three years after a banking crisis in fourteen countries. The authors found that government finances deteriorate significantly, causing the average public debt to rise by 86 percent. In a separate study Reinhart and Rogoff (2008) argue that the significant rise in government debt are mainly because of sharp decline in tax revenue and, in many cases, substantial rise in government spending to control the recession. They believe that bank bailout costs are, in many cases, only a minor contributor to post–financial crisis significant rise in debt burdens.

Reinhart and Rogoff (2010) investigated the systemic relationship between high public debt levels, growth and inflation. They examined the experience of 44 countries using two centuries of data on central government debt, inflation and growth. Their main findings showed that for both advanced countries and emerging markets, high debt/GDP levels (90 percent and above) are associated with lower growth outcomes. Much lower levels of external debt/ GDP (60 percent) are associated with lower growth rates for emerging markets. Rarely countries "grow" their way out of debts. As the nonlinear response of growth to debt moves towards historical boundaries of "debt intolerance"   ceilings, market interest rates can begin to rise quite suddenly, creating difficult adjustment. Their finding that growth falls when government debt ratio rises above 90 percent soon became a political argument in support of austerity. The results of their study showed that over the period of 1790 – 2009 the average growth rate fell from 3 percent per year to 1.7 percent when government debt ratio exceeded 90 percent. In the short run when the critical debt ratio is reached, the growth rate falls from 3 percent to -0.1 percent. That is, it is associated with sharp contractions in economic activity.

Reinhart and Rogoff claimed that their empirical research demonstrated that rising levels of government debt are associated with significantly lower growth rates, indeed negative growth. Rogoff claimed that soaring government debt is the 'most significant vulnerability' and 'will trigger the next crises. These statements can be seen as providing the intellectual underpinnings for austerity policies in many nations. However, their results have been comprehensively challenged in Herndon, Ash and Pollin (2013). Their replication of the Reinhart and Rogoff study uncovered data omissions, weighting ambiguities and elementary coding errors with their Excel spreadsheet. Reinhart and Rogoff accidentally excluded data from one-quarter of the 20 countries they analysed in their 2010 paper in a non-peer reviewed issue of the *American Economic Review*. The selective exclusion of data, coding errors and inappropriate weighting of summary statistics led to serious errors and incorrectly represents the relationship between public debt and economic growth. It was concluded that their findings were neither accurate nor robust.

IV.   Data and Empirical Results

Given the conflicting empirical evidence, and the heighted public awareness of the faulty results presented by Reinhart and Rogoff, and the austerity policies partly based on the

original Reinhart and Rogoff study, this article provides some light on the relationship between government debt and economic growth in the context of these empirical disputes.

All of the data used in this study are annual rates on two series, growth rate of real GDP and total central government debt percentage of GDP for 12 members of EMU. The data were collected from the main economic indicators of the OECD site - http://www.oecd.org/statistics/.

It was mentioned earlier that it was claimed that government debt becomes unsustainable when debt approaches 90 – 100 percent of GDP. Figure 2 presents a similar graph to Reinhart and Rogoff (2010) for 12 EMU members over the period of 1996 – 2012. In this figure, growth rates are measured on the vertical axis and ranges of average debt ratio for 12 countries are shown on the horizontal axis. Generally, growth rates are higher when the debt ratio is lower than 60 percent. However, there are two observations of above 90 percent debt where one of them has a growth rate higher than the debt ratio of 30 - 60 percent and the other has one is roughly equal to 30 – 60 percent. There are **no** negative growth rates when the debt ratio passes 90 percent.

Figure 2 Average Growth Rates 1996 – 2012

A90 represents above 90 percent.
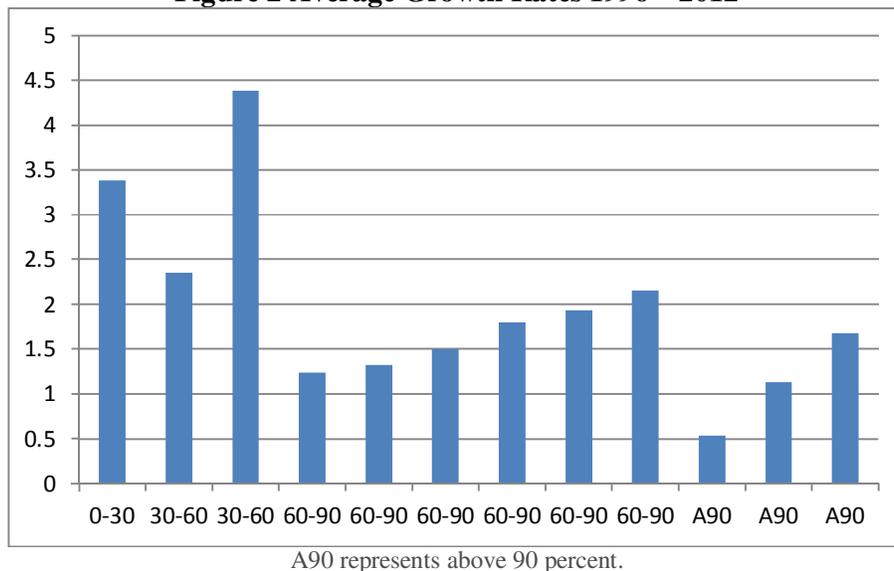
Government debt ratios for the 12 original members of the EMU and their corresponding growth rates are presented in Figures 3, 4, 5 and 6. For the sake of clarity, each figure contains only six countries. Debt ratios are plotted in Figures 3 and 4 and show that with the exception of Belgium, all of the debt ratios were steady or rising moderately. However, with the advent of financial crises all of these trends started rising sharply in 2007 and 2008 and continued to rise. These developments are partly due to the government's borrowings to stimulate depressed economies and partly due to providing financial assistance to troubled financial institutions.

The growth rates in Figures 5 and 6 reveal steady rates and even some impressive double-digit rates such as Ireland and Luxemburg in late 1990s and early 2000s. Both figures show sharp drops for all 12 countries in 2007 and 2008. With the exception of Greece, subsequently the growth rates of most countries recovered somewhat although the resulting growth has been modest.
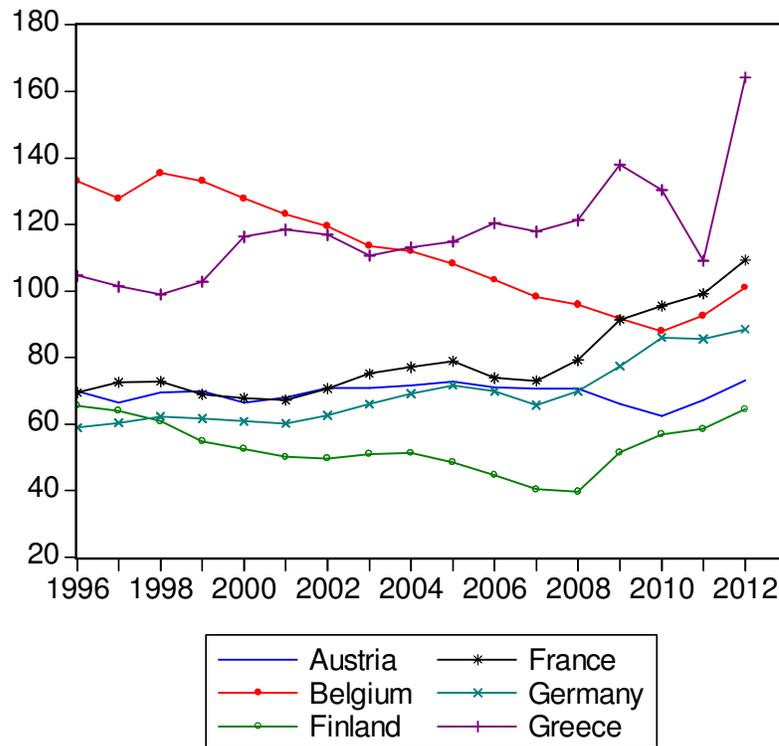
Figure 3 Government Debt Ratios
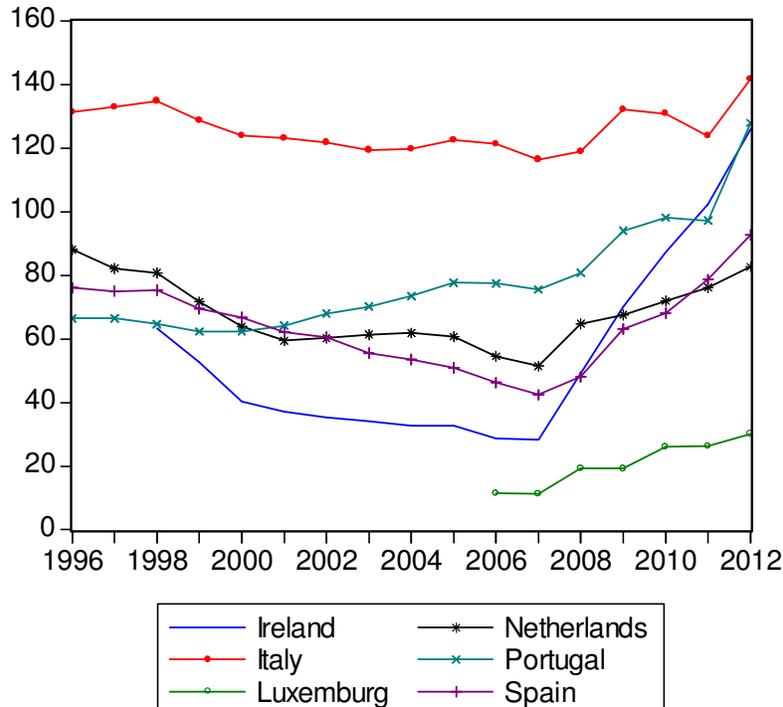

Figure 4 Government Debt Ratios
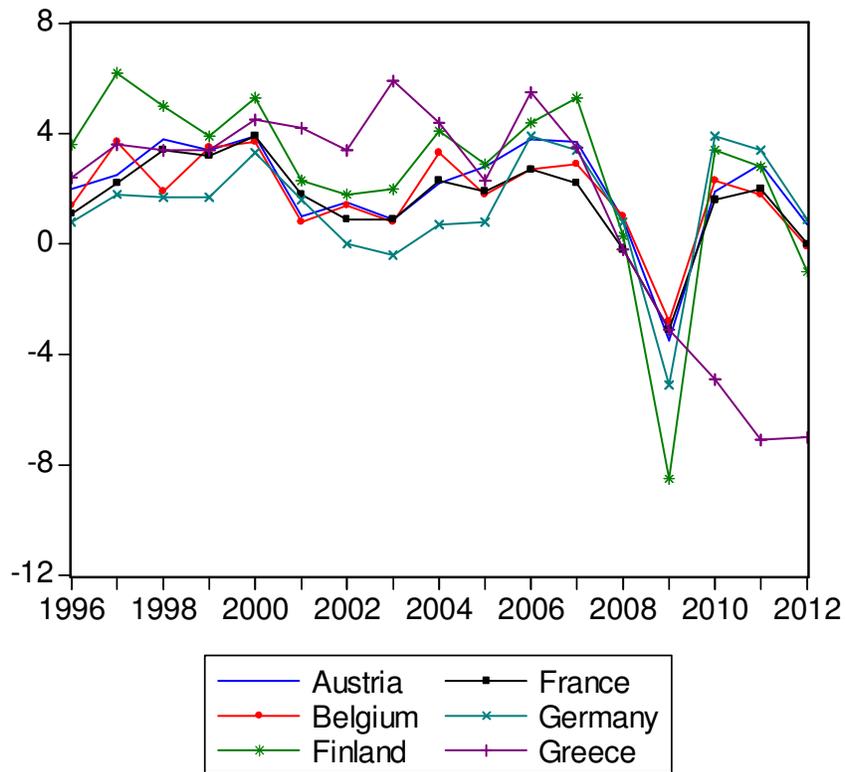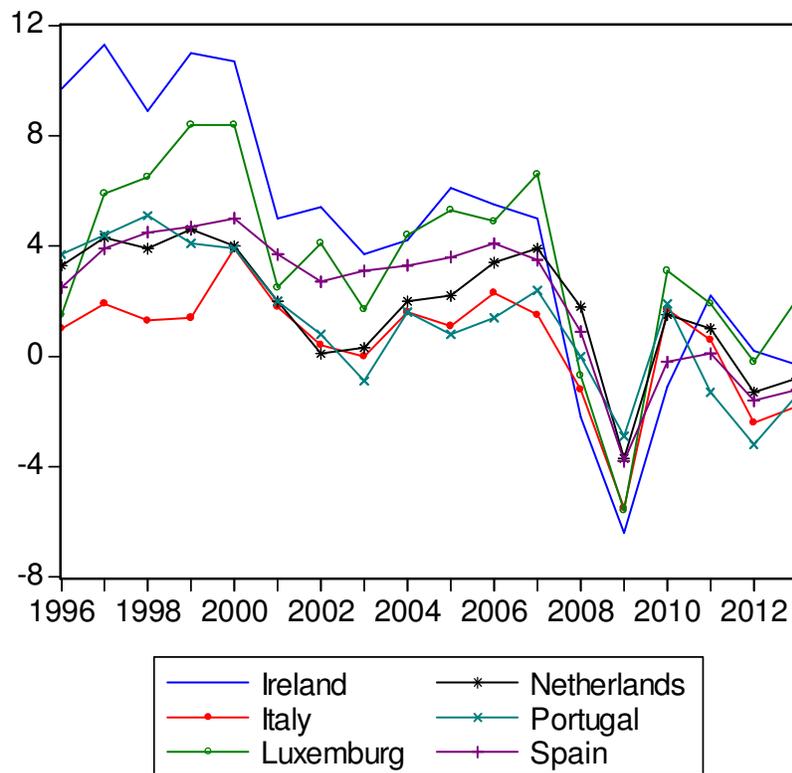
Figure 5 Growth Rates

Figure 6 Growth Rates

The trends of debt ratios and growth rates depict a negative relationship between government debts and growth rates during the financial crises. However, it is difficult to see specific negative trends in other periods. For example, Belgium's government debt in excess of 100 percent has been associated with growth in the 1990s and early 2000s.

Partial coefficients of correlation may help for further investigation into the relationship between debt and growth. To this end, the sample is divided into two sub-samples, prior and after the financial crises. The purpose of this exercise is to investigate if the sharp rise in debt ratios after the financial crises had an adverse effect on the growth rates.

Table 1 Coefficients of correlation Debt Ratios and Growth Rates

Country \ Period	1996 - 2006	2007 - 2012
Austria	-0.13	0.15
Belgium	0.13	0.017
Finland	0.48	-0.15
France	-0.19	-0.12
Germany	-0.027	0.02
Greece	0.40	-0.39

Table 2 Coefficients of Correlation Debt Ratios and Growth Rates

Country \ Period	1996 - 2006	2007 - 2012
Ireland	0.60	-0.12
Italy	0.63	-0.49
Luxemburg	-	-0.24
Netherlands	-0.11	-0.40
Portugal	-0.48	-0.66
Spain	0.24	-0.56

Government debt data for Luxemburg were only available from 2006.

Coefficients of correlation between debt ratios and growth rates are presented in Tables 1 and 2. The results in Tables 1 and 2 indicate that during the period of rising debt ratios, 2007 – 2012, there were 9 relatively large negative cases. Some of these negative cases such as Finland, Greece, Ireland, Italy and Spain were large positive numbers in the earlier period. These observations may tempt one to conclude that there is a negative association between growth rates and government debt ratios when the former is rising. However, for two reasons this observation is not strictly valid. First, coefficient of correlation is a measure of association and not a cause and effect. Second, the recession in the counties under consideration has certainly contributed to the negative association during the latter period.

For further investigation of the relationship between government debt ratios and the growth rates, an attempt is made to examine the Granger Causality (GC). To this end, means of the debt ratios are calculated and the GC for those debt ratios above 90 percent is estimated. Means of the debt ratios for 12 countries 1996 – 2012 are presented in Table 3.

Table 3 Means of Debt Ratios 1995 - 2012

Austria	69.3	Ireland	54.67
Belgium	113.28*	Italy	126.0*
Finland	53.86	Luxemburg	20.58
France	78.28	Netherland	69.39
Germany	68.46	Portugal	77.42
Greece	116.8*	Spain	65.55

There are three countries marked with an asterisk indicating that their mean of debt ratios are larger than 90 percent. GCs for these three countries are shown in Table 4.

Table 4 Granger Causality Results

Country		F statistics	Probability
Belgium	government debt not causing growth	3.07	0.09
Greece	government debt not causing growth	1.17	0.35
Italy	government debt not causing growth	1.73	0.22

In two out of three cases, the hypothesis of government debt not causing growth cannot be rejected.

V.   Concluding remarks and policy implications

The existing empirical literature examining the relationship between government debt and economic growth is not unanimous even if a number of studies assert that high government debt has a negative effect on economic growth. The best-known empirical work has been undertaken by Reinhart and Rogoff (2010). This work, however, has been subject to withering criticism and the authors have retracted a number of their original results. This is particularly troubling as the original (uncorrected) results appeared to have been highly influential in providing the intellectual case in favour of draconian austerity policies in Europe that have caused considerable economic disruption, demonstrations and political instability. There are ample studies that confirm that fiscal contraction when interest rates are near zero (and there is the treat of deflation) is inimical to growth.

Our investigations in this article find no negative growth rates when the debt ratio passes 90 percent and indeed that for two countries the growth rate actually increases or shows no effect at this higher debt level. The trends of debt ratios and growth rates depict a negative relationship between government debts and growth rates during the recent financial crises. However, it is difficult to see specific negative trends in earlier periods. Even if a negative association exists it is not clear if it is a causal relationship or affected by other variables. The results of Granger causality tests and for those countries with very high debt showed that in two out of three, the hypothesis of government debt not causing growth cannot be rejected. In other words, for those two countries studied over that brief historical period, growth appears to be hampered by excessive government debt levels but the quantitative effect is not clear.

We conclude that it is folly to generalize on the basis of the data without accounting for countries with or without their own currency (compare Greece and the UK), with very different financial systems, histories and cultures, degrees of openness to globalization and growth experiences. Institutional quality matters. As does the uses to which the government debit is put. Debt accumulated for government consumption purposes will have a very different consequence for enhancing a country's productive capacity than investments in infrastructure, new technology and human capital expenditures. Variation in GDP growth within each of the public debt/GDP categories is large. There is a wide range of growth outcomes at every level of public debt among countries studied. As such, policy settings based on simple debt-growth regressions based on some threshold level of debt should be avoided.

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Explaining GDP Growth: A Long Term Horse Race, 1955-2013

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Abstract

From 1955 through 1980, both the slope of the yield curve and the level of stock returns provided considerable information about future output growth. Using data for growth, the yield curve and returns in a long term horse race from 1955 through 2013, this study shows that the explanatory power of the yield curve virtually collapsed after 1980. The explanatory power of stock returns also weakened in the 1990s but recovered considerably thereafter. Although the returns-output growth relation is not completely stable, our results suggest this relation is much more robust than the yield curve-output growth relation. The returns-output growth relation is much less sensitive to changes in cyclicality, inflation, and the resulting response of monetary policy.

Introduction

To improve both investment performance and the conduct of monetary policy, investors and economists have analyzed the relation of financial market variables to real variables such as output growth, real consumer spending growth, and industrial production. As well as the growth of money and credit, analysts have focused on the slope of the yield curve, or the spread between long term rates and short term rates. To a lesser degree, they have looked at stock prices, including returns on stocks.

The slope of the yield curve is often viewed as a forecast of the future direction of rates. A positively sloped curve suggests that rates are likely to rise. Consistent with this view is the notion that the slope of the yield curve indicates the degree of stimulus or restraint that the Federal Reserve is injecting into the economy. Under normal conditions, notably before 2008, the Fed exerted direct control over the federal funds rates. Efforts by the Fed to push the funds rate below long term rates indicate the Fed's desire to promote faster growth and inflation over time.

In line with the view that long term rates and forward rates tend to predict the future direction of rates, Fama (1984) reports that forward rates provide information about the direction of short term interest rates. Campbell and Shiller (1987) and Mishkin (1988) provide further evidence of the ability of the yield curve to predict future rates. Since nominal rates reflect both real returns and expected inflation, this link suggests that forward rates and, by extension, the slope of the yield curve may contain information about either future inflation or real growth. With regard to inflation, Mishkin (1990) suggests that the yield curve explains not only real rates of interest but also inflationary expectation 1-12 months ahead and Fama (1990) indicates that the yield curve provides information about inflation three to five years into the future. With regard to real activity, Fama suggests that the yield spread explains real growth 2-3 years ahead.   Harvey (1989) reports that the yield spread explains about 30% of the fluctuation in output growth

between 1955 and 1980. Estrella and Mishkin (1997) and Hamilton and Kim (2002) also indicate that the yield curve provides information about the pattern of real growth. Estrella and Mishkin (1996), Dueker (1997) and Dotsey (1998) indicate that the yield curve helps to forecast recessions.

Harvey (1989) found that the forecasting power of the yield curve for 1955-1980 deteriorated considerably thereafter. Hardouvelis (1988) and Estrella and Hardouvelis (1991), using data through 1988, also note a deterioration in the predictive performance of the term structure beginning in 1985. Estrella and Mishkin (1996), Dueker (1997) and Dotsey (1998) also report deterioration into the 1990s.

A positive relation between stock returns and future output could result from expectations about future earnings, in which case the effect is from output growth to returns. Alternatively, it could result from a wealth effect on consumer spending (Poterba, 2000), in which case the causal direction runs from returns to output. Either way, the focus of Fama (1981) on the real return-output relation spurred considerable research on the relation between returns and output growth. In several papers, Fama observed and emphasized that stock returns, responding to expected earnings and dividends, were positively correlated with future output growth. Barro (1990) and Schwert (1990) provided further evidence to support the relation between real returns and output growth.

In his empirical work, Fama used annual average data and showed that returns were positively correlated with next year's output growth. He also noted that an often observed negative correlation between current growth and current inflation was spurious, proxying for an inverse relation between current inflation and future output growth. This notion is referred to this as the proxy hypothesis. Benderly and Zwick (1985) confirmed the proxy effect but explained it in terms of a real balance effect of inflation on output growth rather than an effect of future output on current inflation. In another study linking returns and output growth, Levine and Zerzos (1998) noted a positive effect of stock prices and returns on output and production through the improved liquidity of banks and the financial system.

Harvey reported that returns explained only about 5% of the fluctuation of output growth between 1955 and 1980, compared with the much larger 30% explained by the yield curve. He suggested that part of the reason for the low correlation between returns and output growth was the tendency of stock prices and returns to reflect not only expected growth in earnings and dividends but also the perceived risk of equity investments.

Noting the deterioration in the return-output relationship into the 1980s and 1990s across many industrialized countries, Binswanger (2000, 2004) argued that speculative bubbles dominated fundamentals in the determination of equity prices.

This paper compares the explanatory power of real stock returns and the yield curve on output growth in a long term horse race over the interval from 1955 to 2013. This interval extends the results reported in the extant literature and allows for a finer analysis. This interval includes dramatic changes in the economic and financial environment. As an example, from 1953 to 1980, inflation rose from about 2% to 10%, but then declined back to 2% between 1980 and 2000. Other factors also differ before and after 1980 as discussed more fully in the paper. The

main contribution of this paper is to show that the difference in the economic environment is a powerful factor in the ability of the yield spread and stock returns to explain the output growth.

The paper continues with Section 2 that outlines the model and the general framework to be estimated, describes the measurement of variables, and identifies the time interval for estimation. Section 3 reports the results. Section 4 provides an interpretation of the results. Section 5 is a summary and conclusion.

I.   The Model and the Data

The model for estimation in this paper is most easily viewed as a single equation for the growth rate of real GDP. Real GDP growth (%RGDP) is related to the yield spread (SPREAD) and/or stock returns (RRSP) from a previous period, which can be written as

$$\%RGDP(t) = \alpha + \beta_1 SPREAD(t\text{-}1) + \beta_2 RRSP(t\text{-}1)) + \epsilon(t)$$

The rationale for the yield spread (the long term rate minus the short term rate) to explain future output growth runs along three general lines. The first is the expectations theory of the term structure which holds that long-term interest rates are equal to the geometric mean of current and expected future short term rates. If investors fear interest rate or price risk more than reinvestment risk, long term rates should have a term premium relative to short term rates so that, on average, long term rates will be higher than short term rates (a positively sloping yield curve). If and when investors expect short term rates to fall, such as during an anticipated recession or economic slowdown, the yield curve will flatten or even invert. When investors expect short rates to rise because of an expected economic expansion, the yield curve will steepen.

The second rationale for the yield curve to explain future output growth is the notion that the slope of the yield curve indicates the degree of stimulus or restraint that the Federal Reserve is injecting into the economy. Under normal conditions, notably before 2008, the Fed exerted direct control over the federal funds rates. Efforts by the Fed to push the funds rate below long term rates indicate the Fed's desire to promote faster growth and inflation over time. When the Fed wants to slow the economy, presumably to control inflation, they will raise short term rates relative to long term rates.

An entirely different notion proposed by Harvey (1988) to explain the predictive power of the yield curve is that individuals prefer stable consumption rather than high consumption during periods of rising income and low consumption when income is falling. When consumers expect a recession, they will sell short-term financial instruments and purchase one-year discount bonds to obtain income during the recession year. As a result the term structure flattens or inverts.

Stock returns can explain future output growth for either of two reasons. The first, as emphasized by Fama (1981), is that stock prices and returns reflect expectations about real future earnings and dividends which should in turn reflect real economic activity. In this case, stock prices reflect rather than cause future output growth and their role as an economic indicator is reflected in their permanent inclusion as a component in the composite index of leading indicators. The second reason for stock prices and returns to explain future output growth is the effect of stock prices on household wealth (see Poterba (2000)). For retirement, education,

emergencies and other reasons, households save to increase their wealth to some desired target level over time. An increase in stock prices allows higher consumer spending by reducing the amount of saving necessary to achieve the desired wealth target. An increase in stock prices and wealth stimulates consumer spending and increases future output growth.

Since stock prices and output fluctuate almost randomly during short intervals, this analysis, following Fama (1981), uses annual data. The variables are measured as follows:

Real GDP growth (%RGDP) is measured using annual average data. Our GDP data series was obtained from the Federal Reserve Bank of St. Louis data base. We compute %RGDP as follows:

$$\%\text{RGDP(t)} = Ln\left(\frac{RGDP(t)}{RGDP(t-1)}\right)$$

The yield spread (SPREAD) is computed using the 10-year treasury (T10) constant maturity bond rate as the long term interest rate. The short term rate was measured by the federal funds rate (FFR). Following Harvey we compute SPREAD as follows:

$$\text{SPREAD(t)} = Ln\left(\frac{(1+T10(t))}{(1+FFR(t))}\right)$$

Results using either the 3-month treasury bill rate or the 1-year constant maturity treasury rate as the short term rate were similar to those using the federal funds rate. All interest rates were obtained from the St. Louis Federal Reserve data base and were measured using December data.

Real stock returns (RRSP) were measured using the S&P 500 stock price index (SP). The nominal stock price measure was deflated by the consumer price index. Returns were measured using only changes of real stock prices (that is, the capital gain or loss component of total return), using December average data. Total returns including dividends yielded similar results as those using only the capital gains component. Nominal returns also yielded similar results to those using real returns. S&P prices were obtained from Robert Shiller's data base, so that:

$$\text{RRSP} = Ln\left(\frac{SP(t)}{SP(t-1)}\right)$$

The time interval for estimation runs from 1955 through 2013. For estimates regarding stock returns, we present estimates for 1955-1977 and 1978-2013 because of the performance of stock returns as discussed in the next section. For estimates regarding the yield spread, we present estimates for 1955-1980 and 1981-2013 because of the dramatic change at that time from a generally stimulative monetary policy that contributed to an increase in inflation from about 2% in the 1950s to 10% in 1980 to a more anti-inflationary monetary policy thereafter that contributed to sharply falling inflation between 1980 and 2000. For the equation using stock returns and yield spread, we present estimates for 1955-77, 1978-2013 and in addition for 1955-1980 and 1981-2013 to allow a direct comparison of the effects of adding the yield spread into the equation that includes stock returns.

II.   Results

Parameter estimates regressing the growth rate of real GDP growth against real stock return, for 1955-2013, 1955-1977, 1955-1980 and 1978-2013 are presented in the upper part of **Table 1** with "t-statistics" below the estimates of the regression coefficients and "p-values" below the "t-statistics."

Table I. Real GDP growth explained by Real Stock Returns or Yield Spread

Period	α	β_1	β_2	Adj.R^2	DW
1955-2013	0.03	0.08		0.4	1.28
t –stat	12.6	6.4			
p-value	0.0	0.0			
1975-1977	0.03	0.1		0.61	1.37
t –stat	10.8	6			
p-value	0.0	0.0			
1978-2013	0.02	0.06		0.27	1.22
t –stat	8.7	3.8			
p-value	0.0	0.0			
1955-2013	0.03		0.36	0.06	1.49
t -stat	8.8		2.2		
p-value	0.0		0.04		
1955-1980	0.03		1.19	0.45	1.48
t -stat		8.2	4.6		
p-value	0.0		0.0		
1981-2013	0.03		0.09	-0.02	1.35
t -stat	6.2		0.47		
p-value	0.0		0.64		

These results show a positive and statistically significant effect of returns on real GDP growth for 1955-2013, but this result for 1955-2013 contains quite different results for the two sub-periods. For the 1955-77 interval, the adj. R^2 is 60%, higher than the 40% adj. R^2 for the total period. This result contrasts sharply with Harvey (1989) who reported that, for 1955-80, returns explained only about 5% of the variation in output growth. Harvey used nominal rather than real returns, but as mentioned above our results were unaffected by the choice between nominal and real returns. The only possible explanation for these divergent results could be the quarterly frequency used by Harvey that captured more volatility in the stock returns. The positive results are more consistent with those of Fama (1981), who emphasized that returns reflect real growth one year later, which can be interpreted as returns one year earlier explaining output growth in the current period. Schwert (1990) confirms this result for a century long interval, 1889-1988, and Barro (1990) confirms it across a range of industrialized countries besides the US.

From an adj.R^2 of 60% for 1955-77. the adj.R^2 falls to 28% for 1977-2013. Even this much lower adj. R^2 is somewhat misleading because subintervals within the 1977-2013 interval show still lower or even statistically insignificant returns. This is consistent with Binswanger (2003,2004) who reports a sharp drop in the predictive power of returns across several industrialized countries during the period after 1980. We discuss the 1977-2013 period in more detail below.

Parameter estimates regressing the growth rate of real GDP growth against the yield spread for 1955-2013, 1955-1980 and 1981-2013 appear in **Table I** immediately below the results for returns discussed above.

For the total interval from 1955 to 2013, the yield spread explains 6% of the variation in real GDP growth. For 1955-1980, the yield spread explains 45% of the variation, but its explanatory power fell virtually to zero for 1981-2013. The positive result for 1955-80 is broadly consistent with the results reported by Harvey (1989) who reports that the yield spread explains about 30% of the variation in growth between 1955 and 1980. Harvey then notes deterioration in the relation after 1980, and this deterioration is reconfirmed by Hardouvelis (1988) and Estrella and Hardouvelis (1991).

Parameter estimates of regressing the growth rate of real GDP growth against the returns and the yield spread for 1955-2013, 1955-1977, 1955-1980, 1978-2013 and 1981-2013 are presented in **Table II**.

In line with the results for returns and the yield spread separately, the combined results show positive performance for the 1955-77 and 1955-80 intervals and less positive predictive power for the 1978-2013 and 1981-2013 periods. For 1955-1980, and also for 1955-2013 presumably because of the effects from the 1955-80 sub-period, the variables in combination explain more than either variable by itself. The adj. R^2 of .59 for 1955-80 compares with an adj.R^2 of .48 for returns alone and .45 for the yield spread by itself. In the 1955-80 interval, the coefficients of both return and the yield spread are statistically significant at the .05 level. These 1955-80 results are generally consistent with those of Hu (1993), who showed statistically significant effects of both returns and the yield spread in a combined regression using data from 1958-92.

In the next section, with information presented in two additional tables, we focus on three questions? Why does the explanatory power of the yield spread disappear completely after 1980? Though the explanatory power of returns also weakens after 1980, indeed after 1977, why do returns perform considerable better than the yield spread for the post 1980 interval? Why do returns and spread in combination explain more than either returns or the spread alone for the 1955-80 interval?

Table II. Real GDP growth explained by Real Stock Returns and Yield Spread

Period	A	β_1	β_2	Adj.R^2	DW
1955-2013	0.03	0.08	0.25	0.43	1.25
t -stat	10.6	6.2	1.9		
p-value	0	0	0.06		
1955-1977	0.03	0.08	0.41	0.62	1.22
t -stat	8.8	3.6	1.2		
p-value	0	0	0.25		
1978-2013	0.02	0.07	0.25	0.31	1.31
t -stat	6.8	4	1.6		
p-value	0	0	0.11		
1955-1980	0.03	0.06	0.73	0.59	1.32
t -stat	9.8	3	2.7		
p-value	0	0.01	0.01		
1981-2013	0.02	0.08	0.24	0.42	1.48
t -stat	6.1	5	1.6		
p-value	0	0	0.12		

III.   Further Interpretation of the Empirical Results

To answer the three questions just posed, **Figure 1** first presents three series of adj. R^2 for 20-year window regressions, from 1975-95 to 1993-2013. We selected 1975 as the start of this exercise since up to that time both SPREAD and RRSP show reasonable explanatory power. The first, labeled RRSP, we obtain by regressing real GDP growth (%RGDP) against real returns (RRSP), the second labeled SPREAD is obtained by regressing %RGDP against the yield spread (SPREAD), and the third labeled BOTH results from regressing %RGDP against both RRSP and SPREAD. As mentioned above, for 1955-1980, the adj.R^2 for SPREAD was .45, and it drops sharply thereafter. In the first window regression for 1975-95, the adj. R^2 had already fallen to .13 and by 1980-2000, the adj.R^2 is .02. For all later regressions, the adj.R^2 is virtually zero or negative.

To understand this deterioration, it is useful to look at the nine post-1955 recessions, which are shown in **Table III**. In this table, we show the severity of each recession as measured by the increase in the unemployment rate during the recession. We also show the increase in the federal funds rate in the preceding twelve months before the cyclical peak and the onset of recession.

From both the unemployment and interest rate perspective, the differences between 1955- 1982 and 1983-2013 are striking. As well as the sharp increase in inflation from 2% to 10% mentioned in the Introduction, the 1955-82 interval experienced six recessions (five if the 1980 and 1981-82 are combined) with an average increase in the unemployment rate (combining 1980 and 1981-81) of 3.7 percentage points. Between 1983 and 2007, as well as the decline in inflation from 10% back to 2%, the economy experienced only two recessions with an average increase in the unemployment rate of 1.8 percentage points, or roughly half the average increase in the earlier recessions.

Figure 1. Adj R^2 for 20 year window regression on RRSP, SPREAD and BOTH
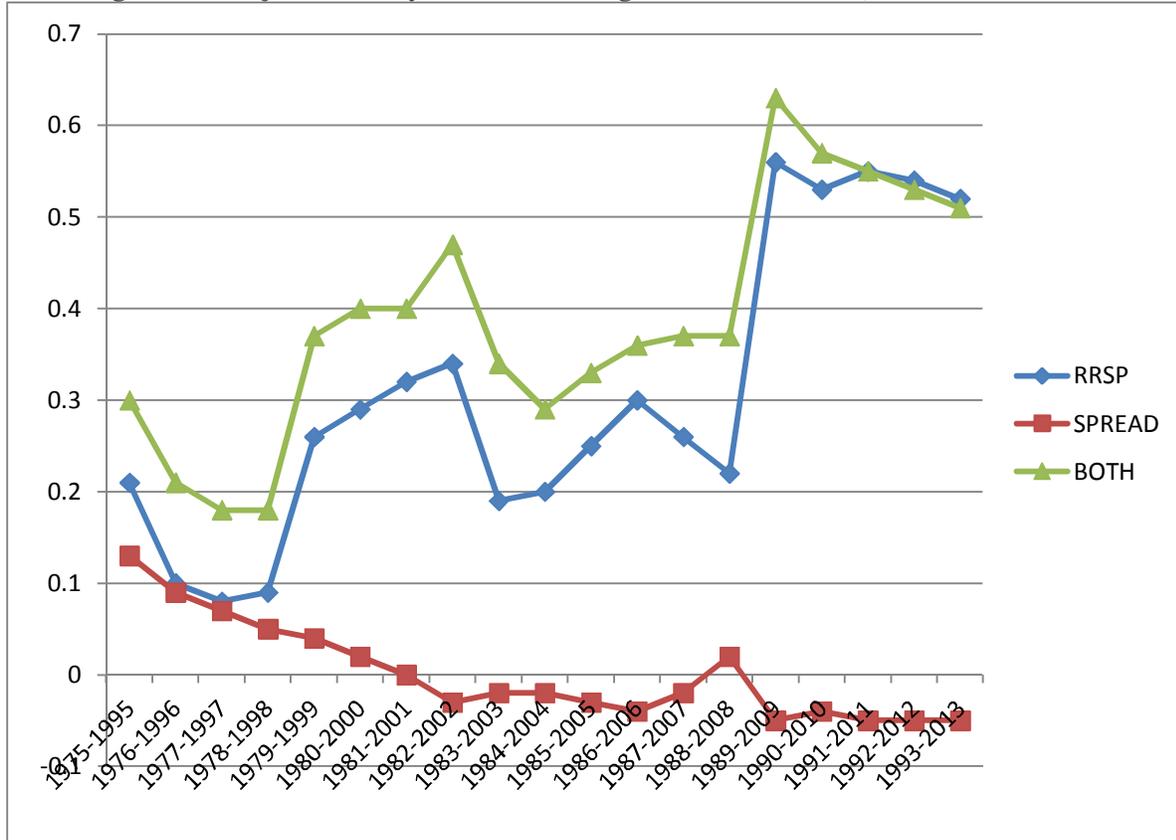
The different pattern of the funds rate is even more remarkable. In the six recessions between 1955-1982, here treating the 1980 and 1981-82 as separate recessions, the funds rate rose an average of 460 basis points, or almost five percentage points, in the twelve months leading up to these recessions. This clearly results from an aggressive attempt by the Federal Reserve to control inflation. The Fed was willing to risk recession if necessary to bring inflation under control.

During the two mild recessions of 1990-1991 and 2001, the federal funds rate actually fell, by 109 basis points leading up to the 1990-1991 recession and 54 basis points ahead of the 2001 recession. It seems clear from this general discussion of the dramatically different environment in terms of output growth, inflation, and financial market conditions that the early power of the yield curve to predict output growth would weaken or completely disappear after 1982.

The post 1982 interval finally included a severe recession in 2008. The unemployment rate rose 5.6 percentage points, from 4.4% in 2007 to 10% in early 2009, the most severe recession of the post War interval. The contrast with the second most severe downturn, in 1980-82 when unemployment rose 5.2 percentage points, highlights the difference between the 1955-82 and 1983-2013 intervals. The 1980-82 recession was engineered by the Federal Reserve, with successive funds rate increases of 760 basis points and 1001 basis points increases back to back, in a dramatic attempt to quell inflationary expectations. The 2013 recession could not have been

more different. Inflation was scarcely a problem. The funds actually fell 31 basis points in the twelve months before the cyclical peak. Again, there is no reason in this environment to expect the yield curve to provide the type of predictive information about future output growth that it provided up to 1982.

Table III.   Unemployment and Federal Funds Rate During Recessions

| Recession date | Unemployment rate | | | | |
	Pre-recession low	Date	Post-recession high	Date	Δ Pre_Post
August 1957-April 1958	3.7	Mar-57	7.5	Jul-58	3.8
April 1960-February 1961	4.8	Feb-60	7.1	May-61	2.3
Dec 1969-November 1970	3.4	Apr-69	6.1	Dec-70	2.7
Nov 1973-March 1975	4.6	Oct-73	9	May-75	4.4
January 1980-July 1980	5.6	May-79			
July 1891-Nov 1982	(recessions too close, no low)		10.8	Dec-82	5.2
July 1990-March 1991	5.2	Jun-90	6.8	Mar-91	1.6
March 2001-Nov 2001	3.9	Dec-00	6	Dec-01	2.1
December 2007-June 2009	4.4	May-07	10	Oct-09	5.6
	Federal Funds Rate				
	Peak FFR	Year (t)	FFR Year (t-1)	Δ FFR	
August 1957-April 1958	3.24	Jul-57	2.75	0.49	
April 1960-February 1961	3.92	Apr-60	2.96	1.06	
Dec 1969-November 1970	8.57	Dec-69	6.02	2.55	
Nov 1973-March 1975	10.78	Sep-73	4.87	5.91	
January 1980-July 1980	17.61	Apr-80	10.01	7.60	
July 1891-Nov 1982	19.04	Jul-81	9.03	10.01	
July 1990-March 1991	8.15	Jul-90	9.24	-1.09	
March 2001-Nov 2001	5.31	Mar-01	5.85	-0.54	
December 2007-June 2009	4.94	Sep-07	5.25	-0.31	

The situation with stock returns is different. As shown in the window regressions, the adj.R^2 drops to .21 in 1975-95 from considerably higher numbers earlier in the 1955-1985 interval and then falls to .08 in 1977-1997 and .09 in 1978-78. However, the adj.R^2 then recovers to the .20-.35 range during all but one interval up to 1988-2008. Then in 1989-2009 it soars to .56 from .22 in 1988-2008 and remains higher than .50 through 1993-2013. The deterioration from 1977-1995 to 1978-98 results from very high returns in 1996, 1997 and 1998 accompanied by only slightly higher than average growth in 1997, 1998 and 1999. The very high returns were associated with continued disinflation, declining unemployment, and rapid productivity growth, and a simple relation linking real growth and real returns cannot capture these positive effects. Even more salient is the sharp increase in the adj.R^2 in 1979-2009 in response to the very sharp drop in output in 2009 (the worst post WWII recession) following the 40% drop in returns in 2008.

In general, the returns-growth relation is subject to sharp fluctuations as factors other than output growth affect returns, but unlike the spread-growth relation, there is no fundamental change to completely invalidate this linkage. Indeed, the 2008-2009 experience of a sharp output decline in 2009 following the 40% drop in stock prices in 2008 is a sharp confirmation of the link between output growth and returns.

Turning to the link of spreads and returns in combination to output growth, the 1955-80 results show positive and statistically significant effects of both returns and the yield spread. The adj.R^2 of .59 is considerably larger than the adj.R^2 of .48 using returns alone and .45 using spreads alone. The independent effects of each variable suggest that each captures factors not captured by the other. In particular, the spread variable reflects monetary policy actions and their likely effect on output growth. The return effect reflects the combination of a wealth effect (stock prices affecting future growth) and expected real earnings and dividends (expectations of future growth affecting current stock prices).

The spread effect is entirely dependent on particular economic conditions and the response of the Federal Reserve to these conditions. The output growth effect of returns based on the wealth effect and earnings expectations is likely to persist in a wider range of environments than the effect of the spread variable.

IV.   Summary and Conclusion

The U.S. economy experienced enormous changes during the post WWII period. In the early 1950s, the economy was still recovering from the Great Depression and many economists and investors were concerned that, without sizable cold war defense spending, the economy might fall back into depression. The stock market was quite depressed, with dividend yields higher than bond yields, and interest rates and inflation were in low single digits.

A general determination to lower unemployment and a Federal Reserve focus on interest rates and financial conditions rather than the money supply caused the Federal Reserve to pursue a highly stimulative monetary policy that helped push inflation from about 2% in the 1950s to 10% in 1980. In the late 1970s, the Federal Reserve reversed course and raised interest rates dramatically to curb inflation. Their restraint triggered a pair of recessions in between 1980 and

1982. The sharp rise in unemployment, and continued monetary restraint throughout the 1980s and 1990s brought inflation back down to 2% by 2000.

During the early post WWII period, the slope of the yield curve, along with the general level of interest rates, was widely used as in indicator of monetary policy. As the Federal Reserve was repeatedly forced to raise short term rates massively to control inflation, the resulting recessions confirmed a strong link between the slope of the yield curve and future output growth. This relation collapsed in the period after 1982, as the economy shifted from accelerating inflation in the 1955-82 interval to disinflation from 1982 through 2000 and beyond. Estimates (1955-2013) in this paper of a virtual collapse in the yield curve as an explanatory variable of future output growth result largely from changes in the pattern of inflation and real growth and the Federal Reserve response to these changes. The yield curve-growth relation appears totally dependent on a particular set of economic and financial conditions, and unless these conditions recur, the yield curve is unlikely to provide useful information about future output growth.

To a lesser degree, economists and investors in the early post WWII period focused on a link between stock returns and future output growth. This relation also performed well through the late 1970s and weakened after 1980. However, following a deterioration in the relation in the late 1990s, the relation recovered considerably in the period after 2008. Although the return-output relation is not completely stable, this recovery shows that the return-output relation is much less dependent than the yield curve on particular economic and financial conditions. Either through wealth effects on consumer spending, or as an indicator of future earnings and dividends, returns are likely to provide useful information about future output growth irrespective of the changes in economic and financial conditions that invalidated the predictive power of the yield curve.

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Wine Pricing Inefficiencies among Major Online Wine Sellers

Ron Christner　　　**Daniel Arango**

Abstract

The purpose of this paper is to compare, analyze and evaluate the relative competitiveness of wine pricing across major online wine retailers as it relates to the Law of One Price. The design utilized is to measure and evaluate the reasons for the differences, between the per bottle prices, of recent internet wine offerings by major internet wine retailers against the average United States prices found on winesearcher.com, a very comprehensive and constantly updated shopbot listing of wine prices from hundreds of sources in and outside in the United States. A key finding is that at least two of the largest and best known online wine retailers consistently offer wine at per bottle prices at substantially higher levels than the United States average and United States minimum prices available for the same wine. Further, before any shipping or related adjustments or similar considerations it is likely that the Law of One price does not currently apply to internet wine pricing. Limitations of this study include the limited observation time period of 3 months and the relatively small number of internet wine sellers' prices compared, four, and the limited number of wines studied, which was 139. The study results provide insight to consumers as well as to wine producers as to pricing and marketing practices of major internet wine sellers and indirectly to wine retailers. This is the first study to evaluate the competitiveness of pricing by major internet wine retailers while providing relative wine value guidance to consumers and comparative marketing information to producers and wine merchants.

Keywords – wine, online, retail, competition, websites, price, shopbot

I.　　Introduction

We begin with discussing the Law of One Price which has been the subject of much empirical research and has led to widely different conclusions about the theory.　These studies and conclusions mainly relate to what constitutes the Law of One Price and to what extent it holds under a given set of assumptions and/or constraints.

In this study we have a rather well-defined nominal price for virtually identical products across various internet wine sellers. The price at the winery and as listed in major wine rating publications is the equivalent of a manufacturer's suggested retail price (MSRP) and is generally the maximum price. Exceptions can be found for very expensive, highly rated, relatively scarce wines coveted by wine collectors. However, the number of collectible quality wines, often offered by auction, are relatively few in number and are generally not included in this study as they are not affordable for most wine buyers, and thus they are not a significant part of the online wine seller's market.

The Law of One Price is a well-known theory which generally suggests that virtually identical goods should sell for approximately the same price adjusted for search and transportation costs and possibly quantity discounts. Exceptions to the Law of One Price have also been attributed to uninformed consumers, the seller's reputation, ease of use of the website, and service or return related policies. We observe in this research a significant degree of price dispersion among major online internet wine sellers.

II.   Literature Review

In his article regarding the Law of One Price Stigler (1961) suggests that price dispersion is a manifestation and measure of ignorance of the market. Thus, uninformed consumers and high search costs may relate to and explain the degree of price dispersion observed in a given market. Salop and Stiglitz (1977) in a series of related articles differentiate between the costs of information acquisition for different consumers as a cause of price dispersion and they suggest that large price differences Stiglitz and Salop (1982) may be possible because some firms may effectively discriminate among potential customers that value things such as quantity discounts. Similarly, in the earlier article Salop and Stiglitz (1977) contend that firms may charge informed and uninformed customers different prices. They suggest that uninformed buyers generally only observe one price before they buy while informed buyers observe all, or many, prices.

As far as service related price dispersion Pan, Ratchford, and Shankar (2002) found that service quality differences did not explain a large proportion of price variation. They did conclude that the number of competitors in a market may be the more important price dispersion factor.

Engel and Rogers (2001) test what they call the proportional Law of One Price utilizing price indexes and conclude that goods sold in different locations, and related differing transportation costs are major contributors to price dispersion across similar goods. Trade barriers and currency fluctuations across national boundaries are also cited as causes of price dispersion according to Parsley and Wei (1996).

In their study examining price variation among internet firms selling identical products Baylis and Perloff (2002), found substantial price dispersion for cameras and scanners but price rankings that were relatively constant over time. Thus, there was no price adjustment to compete with superior, lower, prices. They discuss Salop and Stiglitz's (1977) observations that firms may charge informed and uninformed customers different prices. They similarly observe that uninformed buyers observe one price and informed buyers observe all, or many, prices. They also found that "bad" firms, that charge higher prices and offer poorer service than their competitors did not tend to go out of business over time. Baylis and Perloff (2002) also adjusted their results for shipping fees and rebates. They concluded that internet firms charge a wide range of prices for a homogeneous product.

An Australian based study on online wine buyers by Bruwer and Wood (2005), noted that the motivation for visiting wine retail websites was price comparisons for about 42% of the study respondents. They conclude that online wine buying is price information sensitive as reflected in high shopping cart abandonment rates after comparing prices. Similarly, a global study by Ernst and Young (2001), examined online shopping cart, but not wine specific, abandonment indicated primarily price and shipping cost related reasons for the behavior. There was a 40% shopping cart abandonment rate after a price check and a 38% abandonment rate after shipping cost verification. The overall cart abandonment rate was 78% in the U.S. compared to the lowest rate of 53% for Israel, and the highest rate of 79% in the U.K. portion of the study sample.

A recent France based online wine website study of 1813 wine buyers by Bressolles and Durrieu (2010), estimated that in 2009, 4% of global wine sales were via the internet and that this market

was growing at a rate of 30% per year. They also concluded that the perception of what is offered for sale, at what price, and the degree of security of the transaction differs among three different classes of online wine buyers.

Another recent international wine study by Forbes (2012) found that gender does not significantly influence frequency of wine purchases. However, gender was found to significantly influence consumer utilization of price and wine region cues across the four countries studied. They were New Zealand, Australia, the U.K. and the U.S. The Forbes study (2012) found that women evaluated the price cue significantly more often than men. A similar international wine buying study Priilaid, Sevenoaks, Aitken and Chisolm (2013), evaluated the relative importance of wine origin, expert ratings, brand, and price. They found price is a significant factor in the actual evaluation of wine, especially among females. Also, expert ratings also significantly affected wine evaluation in their blind tastings.

A U.K. study by Quinton and Harriidge-March (2008), found price was of premium importance in deciding whether to trust an unknown wine provider enough to make a wine purchase. Previous experience with a wine seller was also found to be an important factor in trust levels.

Another study focusing on brand name and country of origin of wines by Heslop, Cray, and Armenakyan (2010), found interaction effects of the two variables as to price expectations. For example, French wines were seen as having the highest wine price expectations. Hoffman (2004) and Hussain, Cholette, and Castaldi (2009), found a positive correlation between a customer's income and price paid per bottle of wine. Also, knowledge about wine was positively correlated with wine consumption in these studies. Similarly, Johnson and Bastian (2007), found expertise about wine to be positively correlated with wine consumption and higher spending on wine. However, in a Swiss based study Brunner and Siegrist (2011) found that out of 17 lifestyle variables or reasons to drink, or buy, wine participants for whom wine bargains and special offers were most important spent the least money on wine but bought the highest volume of wine.

U.S. based studies of price dispersion among wine offers for identical wines across different price brackets include a recent study by Jaeger and Storchmann (2011). Specifically, they examine whether location differences account for the wide price dispersion and the related value of search returns, especially for expensive wines. They reported wide degrees of dispersion across low and high priced wines. For example they found that a 2005 Chateau Latour was $695 a bottle at a Petaluma, California, store and $2000 a bottle for the same wine in a wine store in Champaign, Illinois. At the lower end they found 2007 Yellowtail Merlot sold for $4.99 in Buffalo, New York, and $9.99 a bottle in Jersey City, New Jersey.

Use of the internet to compare prices when buying identical products would suggest relatively low search costs and resulting price competition. But many studies contradict that supposition. Pan, Ratchford, and Shankar (2002) found substantial online price dispersion across a broad variety of 581 goods.

A study by Jaeger and Storchmann (2011) utilized the same winesearcher.com website referenced in our study as a wine pricing benchmark. The Jaeger study covers the period from

2006-2008, for worldwide retail wine prices with reference to the approximately 6,300 wine stores covered by the winesearcher website. They observed 186 wine brands of various vintages and found at least 100 different prices for each. They found substantial price dispersion for identical wines which averaged overall a coefficient of variation of 23.4%. The variance was higher for red wines than white, and higher for more expensive than for less expensive wines.

An interesting paper on the mixed early history of successful and unsuccessful online wine ventures is documented in a study by Gebauer and Ginsburg (2003). The study traces the history and genesis of one of the major online retailers in our study, Wine.com. Founded in 1995, wine.com was initially an online only retailer. The Gebauer and Ginsburg (2003) article suggests that wine.com's strategy focuses on expanding their market to new customers rather than taking market share, by competitive pricing, from competitors. They further note that in 2003 wine.com featured ratings from five international wine publications as well as an internal tasting panel, ostensibly as a wine marketing tool. Currently, as we note in our study wine.com references 13 wine raters including their own internal tasting panel and frequently emphasize their 90 point wines under $20, most often priced at $19.99, as a primary wine buying category. The G and G study (2003) also notes that State licensing requirements and costs associated with having or not incurring the cost of warehouses and logistic related costs are important in pricing of wine online. This is because some internet wine retailers buy and store wine before they sell it and others simply find the buyer and then the winery is responsible for shipping and state licensing related costs and documentation.

Use of the winesearcher.com website as a benchmark for wine pricing comparisons requires a discussion of price robots, or shopbots for short. These websites allow comprehensive and fast retail price comparisons, particularly for homogeneous products. Winesearcher provides a very broad global comparison of prices sourced from thousands of websites with prices generally updated daily. It offers the most comprehensive list of wine retail prices available. There have been a number of recent studies evaluating whether lowering the search time, and related costs, makes pricing more efficient and competitive in removing or at least modifying the search cost constraints or considerations as they apply to the Law of One Price. It therefore might be expected that shopbots like winesearcher would reduce search time for price and product comparisons for homogeneous goods and lead to substantial price competition and possible lower price dispersion.

However, most recent studies contradict the premise that shopbots cause more conformance to the Law of One Price. For instance Zhang and Jing (2007) in a study relating to book and computer hardware purchases find that consumers are visiting multiple online retail sites after visiting shopbots. They suggest that consumers are looking for quality as well as price information. Similarly Brynjolfsson, Dick, and Smith (2004) suggest service quality is an important non price factor in choosing an online retailer. They also found that people who stop at the first screen on a shotbot site are the most price sensitive. Thus, people who go on to multiple screens tend to care about more than just the price. In an earlier article Smith (2002) also suggested that shopbots have divided loyalties between customers', consumers', and retailers' interests as evidenced by the fact that many shopbots allow retailers to pay a fee for priority positioning in the comparison tables. Moreover, Ellison and Ellison (2009) found that certain

websites like Pricewatch.com attracted very price sensitive customers. Thus the product and the type or orientation of the shopbot website may make a difference in price sensitivity of users.

Ellison and Ellison (2009) also suggest that another mitigating factor may be an attempt by some retailers to bait the consumer with a low price and then try to switch them to a higher priced product citing unavailability of the first choice. Higher or lower shipping costs or longer or shorter delivery times than the competition could also be differentiating factors.

Smith and Brynjolfsson (2001) suggest that some customers are more sensitive to shipping costs and sales taxes than to the price of the product. They suggest this may also depend on whether a base price, possibly based on quantity ordered, is inclusive of things like shipping costs and may also depend on the cognitive ability of the consumer to adjust for the difference in making a purchase decision. Thus, many online and non-online wine retailers offer "free" shipping depending on how many bottles, or dollar amount, of wine you order. According to Waldeck (2005) the degree of price dispersion across online websites is explained by the existence of two diverse consumer classes and the ability of retailers to segregate their marketing message to them. They posit the existence of two different price sensitive and non-price sensitive, consumers. Of course this may differ by product type and characteristics of the product(s) a shotbot website.

In contrast Ghose and Yao (2011) contend that very low price dispersion in electronic markets is found if actual transaction, rather than posted, prices are examined. They also have a very good summary of the empirical literature on online and offline price dispersion studies through 2007. Note, that with the exception of the Jaeger and Storchmann (2011) study we found no other research on the price dispersion across online wine retailers.

III.   The Sample

The primary wine pricing information source for the study was chosen from internet wine offers sent by email during the months of January through March of 2014. They were mostly based on offers from four of the most well-known and frequent, email sellers active on the internet, Wine.com, and WineExpress.com, WineAccess.com and WinesTilSoldOut.com. The number of wines used in the study was 139, mostly moderately priced in a range between $10 and $30 per bottle. However, some well-known and much more expensive wines were included for comparison purposes. The sample is mainly red wines because the vast majority of offers were for red wines. The initial price comparison benchmark which provides information about wine prices, and ratings, is an extensive search engine, or shopbot, called Winesearcher.com. As much as possible there were immediate comparisons to the offer price vs. the data on wine searcher as to the average price, lowest price, and minimum price available. Wine searcher data is generally updated daily and was consulted within one day to at most one week after the initial offer. Winesearcher.com offers wine prices globally from approximately 6,300 retailers.

Percentage differences were calculated comparing the initial email offer price with average prices available from wine searcher for each wine. The tables also indicate maximum and minimum prices, when available, shown on winesearcher.com. The data sample consists of 139 wines and primarily focuses on prices available from four of the eleven well-known online wine retailers included in the study.

Major Wine Rating Sources
Generally the four most well-known and acknowledged to be the strictest wine rating sources up to about 2012 were in general order of importance:
1. Robert Parker – Wine Advocate Publication
2. Wine Spectator Magazine
3. Wine Enthusiast Magazine
4. Steven Tanzer – International Wine Cellar Publication

Since 2012, we have two well-known people who broke away from the first two, above, and started their own wine rating service. They are:
1. Antonio Galloni – used to work for Robert Parker
2. James Suckling – used to work for Wine Spectator Magazine

The other six rating services used by wine.com and some other wine seller websites are, in my opinion, less respected and sometimes even unknown to wine collectors and consumers. In addition, the Pinot Report specializes in Pinot Noir wine. Decanter Magazine is also fairly well-known but most wine consumers have probably never heard of The Wine News, Wine and Spirits, Connoisseur's Guide, tasting panels, etc.

The problem is whom to believe and who to rely on for at least consistency of ratings when many of the rating services rate the same wines very differently. However, it is much easier to say a wine is highly rated (and thus, desirable) if there are many rating sources, and when you add on the many annual tasting events in the United States that award gold medals it gets even more confusing.

Wine Marketing Strategy Differences
General
Most websites do not competitively price the wines that are highly-rated and/or well-known. Highly-rated generally means 90 points or above on a 100-point scale.
    1. Wine Express
Wine Express is affiliated with a major wine rating source, *Wine Enthusiast Magazine*, and a major wine website, Snooth. Generally, they market their wines using a combination of tasting notes and ratings sometimes tied in with Snooth. They are generally the least competitive in pricing. They emphasize write-up and sometimes ratings and do not usually emphasize price.
    2. WINEX
WINEX emphasizes ratings versus price. They are usually competitive on price but have some restrictions on where and how much they can ship which varies with state laws. WINEX generally concentrates on ratings with brief descriptions which are often quoted from the rating. They are generally among the most price competitive of the several wine websites. There are other sellers like Gary's and sometimes K&L wines which tend to often offer better than average prices fairly consistently.
    3. Wine Access
Wine Access strategy could be called "selling the story." They emphasize the story of wine, vineyard, producer, vintage, top restaurants who carry the wine rather than ratings, unless highly rated. As an alternative they emphasize the winery consultant, personal relationships and visits with the producer or sometimes awards or ratings, if applicable. They also emphasize the discount from suggested retail price which is sometimes overstated. They generally offer the longest average narrative as to why one should buy the wine. Often they are not price-

competitive especially on highly-rated wines. Many of their wines are unrated and relatively unknown.

    4. Wines Til Sold Out

Wines Til Sold Out emphasizes a combination of a short time offer, usually one day or less, high ratings, and competitive prices. However, their most frequent wine ratings are by Jonathan H. Newman, not a nationally known or recognized wine rater.

    5. Wine.com

Wine.com emphasizes a broad range of offerings, and ratings. However when emphasizing ratings they currently show thirteen different wine rating sources, including their own tasting panel, which is an internal tasting panel having questionable objectivity. They are generally not very price competitive but frequently offer free shipping. They emphasize relatively high ratings compared to price such as 90 point rated wines selling for under $20 (often $19.99). They make no attempt to compare the value of multiple raters' opinions. They generally rely upon the raters' comments, quotes, and they offer a very wide selection of wines. As noted in the paper their prices per bottle are generally not competitive with other sites compared. Wine.com does often offer a 10% discount for orders over $149+ or sometimes for orders over $249.

    6. Sokolin

Sokolin is one of the major wine stores in New York City. They have their own internal tasting panel. They have a broad selection of wines, emphasize ratings and are generally not highly competitive on price.

    7. Lot 18

Lot 18 emphasizes scarcity. Wines are for sale for a limited time period, 1-3 days, with some repeats, and generally the wines are not well-known and do not have very good ratings but they quote the best-known sources when they are rated. They emphasize ratings from their own tasting panel and the wine story.

    8. Empire

Empire emphasizes price and often offers to ship four bottles for free for mostly highly-rated wines. They vary widely in how competitively they price their wines. Because many are not well-known, or sometimes produced solely for them, price comparisons are difficult.

General Pricing Observations

    1. Higher ratings by major wine rating sources, or in Wine Spectator annual top 100 list generally means a higher than average price markup.

    2. "Free" shipping varies by wine source and wine price. More expensive bottle price means more likely free shipping.

        But many sources frequently offer 3 bottles ship free (WEP), 4 bottles ship free (Empire), 6 bottles ship free (Wine Access), 12 bottles (case) ships free (various), and 2 cases ship free (Cameron Hughes). Or Ship free based on dollar amount of order $149 or $249 (Wine.com) or free shipping all year, at fixed annual price of $46 (Wine.com). Wines Til Sold Out generally offers free shipping on 2, 3, or 4 bottles depending on the per-bottle price; more expensive, fewer bottles equate to free shipping. Minimum order cost, for free shipping offers seems to be $50-$100, depending on the offer and distance shipped.

    IV.   **Results**

We found substantial dispersion in the pricing of identical wines over a recent three month period January – March 2014 when collecting and comparing prices among online retail websites

for wine. The focus was on four of the wine websites that make very frequent offers to sell wine. They were Wine.com characterized by some sources as one of the largest and one of the earliest online wine websites. The second was Wine Express. Wine.com and Wine Express both have other wine affiliated websites or wine related ventures. Wine.com has a separate wine selling website called Wine Shopper. Wine Express is an affiliate of the Snooth.com website which primarily offers wine commentary on wine producers, wine regions, etc. Wine Express also publishes *Wine Enthusiast Magazine*, a major wine rating publication. The third is Wine Access. The fourth is Wines Til Sold Out (WTSO). These four online retailers generally offer or feature at least one wine per day.

Each offer was compared to Winesearcher.com data on prices for the same wine offered within one or two days of the offer by the four sites. There were frequent spot checks on one of the lowest priced alternatives to make sure of the availability of the wine being actually for sale. It was noted in collecting the data that the least competition, in pricing, or the highest average price overall found on winesearcher and the other wine retail websites were associated with the highest rated wines, defined as a rating 90 points or above by the 6 top rating services as previously identified in this study. Those would include Robert Parker, Wine Spectator, etc. Also, generally the higher priced, better known, wines had above average price dispersion across wine retailers. For example a highly regarded well known wine BV Private Reserve Cabernet Sauvignon from the 2010 vintage varied in offer price from $80-$125 a bottle across well-known wine websites referenced from winesearcher. However, Hewiitt 2010 cabernet, a wine selection on Wine Spectator's well know and widely followed annual top 100 list only varied in price from $85-$100, possibly because the wine and list price was so well known. Many lesser known but highly rated wines also exhibited wide price offer variation. For example, note that Winesearcher generally gives the average wine price per bottle and sometimes gives the price range. Often, the lowest price retailer source in the range is not found on the first screen, page. In those limited cases we have not used the lowest prices in the range but instead show the lowest price on the first page. Also, we generally use only prices from about 10 well known wine retailers as our lowest price source. There were no instances where Wine Express or Wine.com had the lowest price and almost no instances where the two source websites were below the average price. In contrast WTSO almost always had an offer price substantially, or at least somewhat, below the average wine searcher retail price. WTSO was not found to list their prices on winesearcher.

V.   Summary Statistics and Conclusions

Table 2, summary statistics, indicates that Wine Express and Wine.com's offering prices are almost never below the average U.S. price as indicated in winesearcher.com. Further, as indicated in the detailed Table 1 listings Wine.com and especially Wine Express offer prices that are usually substantially above the lowest price offered for identical wines and sometimes even above the wineries retail selling price.

Also, it is relatively common, to some extent on all the websites, but most frequently on Wine Express that the starting base price, from which a discount is always offered, is overstated. Generally there were at least five U.S. sources that offer the wine at a lower price than Wine Express on the first page of the winesearcher.com website. Although, the sample sizes differ for the different retail wine websites there are very consistent non-competitive price offers originating from WineExpress.com and Wine.com. As indicated, in Summary Table 2 Wine

Express offer price, supposedly always discounted, was above the average pricing on 33 of 41 offers observed. Similarly, Wine.com discounted offer price was higher than average 25 of 39 times. In contrast for Wine Access 4 of 19 offers were above the average and for WTSO 2 of 13 were above the average. For the entire sample of 139 price offers, 76 of 139 were above average. The 139 included the other major wine retail websites listed in the key for Table 1. Note than 58 of 76 above average price offers out of the 139 total were from two of the eleven total websites, specifically, Wine Express and Wine.com. Generally the seven other websites were used as comparables for wines offered by WCM and WEP websites.

In summary, much more often than average and consistently over time, Wine.com and to an even greater extent Wine Express offers were above average and were much above the lowest priced wine offers available in the U.S., including these from the other well-known, reputable wine retailers included in the study. The differentials from average observed averaged 12% for (WCM) to almost 16% (WEP) for and varied by a much greater percentage from the lowest available price.

This result confirms the observation in many other wines, and non wine, related studies previously cited that the Law of One Price does not seem to apply among major online wine retailers. That result has not likely changed over time as the author of this study has observed and compared wine prices between WEP, WCM, and WS (Winesearcher) over the past three years and come to the same conclusion.

Observations on the possible reasons for price dispersion across online websites of wine retailers include

1. Some of the variation can be explained by shipping cost related offers. However, the value of free shipping would vary by website, source, and the number of bottles ordered as well as the distance to the destination. Therefore a per bottle price is considered a reasonable first cut proxy for competitiveness in pricing of well-known wines. A few retailers like Cameron Hughes and to a lesser extent Lot 18 specialize in custom made wines for the retailer or wines that are not well known and/or from rather small producers. Many of these wines, however, are submitted to the ratings sources by producers and in the case of ratings scores below 90 the ratings are generally not mentioned in the offers. Some of the wine websites also poll their customers to rate the wines they have bought and tasted and then publish the cumulative results.
2. As noted, highly rated well known wines may be easier to sell at higher than competitive prices. There is often a status effect associated with drinking and sharing these sometimes scarce wines that may result in more of an impulse type purchase with little price sensitivity.
3. Previously cited studies have suggested wide price dispersion in homogeneous products related to different consumer classes which may differ as to price sensitivity, price awareness, and previous experience with the retailer as to service related factors such as product return policies.
4. There is also the question of whether wine is a product that may have somewhat unique characteristics that contribute to price dispersion. Is it for some people an impulse buy, particularly when they buy the story of the vineyard, the wine producer or wine

consultant's reputation, the excellence of the vintage or region, the famous restaurant that has it on their wine list, etc.?

We conclude that internet wine prices, especially from some of the best known websites, are not competitive. It may be that a subset of wine consumers are price sensitive, and critically compare prices. However, it is not likely that the size of that subset is large enough to change the pricing behavior and strategies of at least two of the best known online wine retailers.

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Key to Table 1

WEP - Wine Express
WCM - Wine.Com
L18 - Lot 18
EMP - Empire Wine
WIX - Wine Exchange
WAC - Wine Access
KL – K&L Wines
SWE - Saratoga Wine Exchange
GWM - Gary's Wine and Marketplace
TWC - The Wine Connection
WTSO - Wines Til Sold Out
Zachy's - Z
WHWS - White Horse Wine & Spirits
HG - Hops and Grapes
USWS - Union Square Wine & Spirits

Table 1 (*Abbreviated): Wine Offer Prices January – March 2014

		Wine Searcher			Source										
		Low	High	Average	WCM	WEP	EMP	WIX	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
1	Vietti - Barbera d'Asti Tre Vigne 2011	14	22	18	18	19	17	15	17	17	57.14%	28.57%	28.57%	0.00%

		Low	High	Average	WCM	WIX	KL	TWC	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
2	Beaulieu Vineyard Private Reserve Cabernet Sauvignon 2010	70	120	94	90	100	80	80	110	80	71.43%	30.00%	28.57%	-4.26%

		Low	High	Average	WCM	WEP	EMP	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
3	Liberty School Cabernet Sauvignon 2010	11	16	15	19	15	11	12	13	72.73%	36.36%	72.73%	26.67%

		Low	High	Average	WCM	EMP	WIX	KL	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
4	Joseph Phelps Cabernet Sauvignon 2011	50	70	63	65	63	53	55	55	40.00%	26.00%	30.00%	3.17%

		Low	High	Average	WCM	KL	TWC	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
5	Belle Glos 'Meiomi' Pinot Noir 2012	15	20	20	20	20	21	22	20	46.67%	33.33%	33.33%	0.00%

		Low	High	Average	WCM	EMP	WIX	KL	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
6	Perrin & Fils Chateau de Beaucastel Chateauneuf-du-Pape 2010	64	90	100	90	89	80	100	80	56.25%	56.25%	40.63%	-10.00%

		Low	High	Average	WCM	EMP	WIX	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
7	Bodegas Borsao Garnacha Tres Picos 2011	11	16	17	19	11	12	12	72.73%	54.55%	72.73%	11.76%

		Low	High	Average	WCM	EMP	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
8	Stag's Leap Petit Syrah 2010	25	45	33	40	31	31	28	80.00%	32.00%	60.00%	21.21%

		Low	High	Average	WCM	EMP	WIX	SWE	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
9	NV Henriot Souverain Brut Champagne	32	44	51	46	34	50	52	62.50%	59.38%	43.75%	-9.80%

		Low	High	Average	WCM	EMP	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
10	Sella & Mosca Cannonau di Sardegna Riserva 2009	11	17	15	15	12	12	12	54.55%	36.36%	36.36%	0.00%

		Low	High	Average	WCM	EMP	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
11	Sebastiani Sonoma County Cabernet Sauvignon 2011	13	19	15	16	13	19	14	46.15%	15.38%	23.08%	6.67%
		Low	High	Average	WEP	EMP	WIX	KL	TWC	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)

59	Silver Oak Cellars Cabernet Sauvignon Napa 2008	80	95	99	90	85	90	95	95	90	95	18.75%	23.75%	12.50%	-9.09%

		Low	High	Average	WEP	WCM	WIX	KL	TWC	SWE		% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
60	Cakebread Cellars Reserve Chardonnay Napa Valley 2011	50	85	64	70	72	60	60	65	55		70.00%	28.00%	40.00%	9.38%

		Low	High	Average	WEP	WCM	EMP	KL	SWE	GWM		% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
61	Clos du Val Cabernet Sauvignon Napa Valley 2010	22	30	30	35	35	24	25	32	30		59.09%	36.36%	59.09%	16.67%

		Low	High	Average	WEP	WCM	EMP	TWC	SWE	GWM		% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
62	Ferrari-Carano Siena 2011	16	20	20	25	28	16	20	23	20		75.00%	25.00%	56.25%	25.00%

		Low	High	Average	WEP	WCM	EMP	SWE	GWM			% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
63	Forefront Pine Ridge Vineyards Cabernet Sauvignon Napa Valley 2011	20	28	20	23	20	16	22	17			75.00%	25.00%	43.75%	15.00%

		Low	High	Average	WEP	WHWS	HG	WCM	SWE			% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
64	Barba Montepulciano D'abruzzo Vasari 2008	7	19	15	20	7	8	23	19			228.57%	114.29%	185.71%	33.33%

		Low	High	Average	WEP	WCM	KL	SWE	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
65	Napa Cellars Pinot Noir 2012	18	22	20	25	20	18	22	38.89%	11.11%	38.89%	25.00%

		Low	High	Average	WEP	WCM	EMP	SWE	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
66	Terra d'Oro Winery Zinfandel 2011	12	17	15	17	14	12	18	50.00%	25.00%	41.67%	13.33%

		Low	High	Average	WEP	EMP	WIX	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
67	Bodegas Faustino I Gran Reserva 2001	22	40	27	40	32	30	30	81.82%	22.73%	81.82%	48.15%

		Low	High	Average	WEP	WCM	EMP	SWE	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
68	Villa Pozzi Nero d'Avola 2012	6	12	8	11	10	6	12	100.00%	33.33%	83.33%	37.50%

		Low	High	Average	WEP	WCM	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
69	Simi Cabernet Sauvignon Alexander Valley 2011	16	25	20	23	20	24	17	56.25%	25.00%	43.75%	15.00%

		Low	High	Average	WEP	EMP	SWE	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
70	Regina di Renieri 2009	33	40	35	35	33	35	35	21.21%	6.06%	6.06%	0.00%

		Low	High	Average	WEP	WCM	WIX	GWM	% diff (low-high)	% diff (Low-Average)	% diff (low-offer)	% diff (Offer-Average)
71	Girard Petite Sirah 2011	17	32		29	30	23	24	88.24%	-100.00%	70.59%	#DIV/0!

The Abbreviated Table 1 contains the first two pages of offerings from Wine.com and Wine Express. The rest of the table is available upon request.

Table 2 Summary Statistics

Offer/Source	Sample Size	# of instances (Offer > Average)	Ave. % Diff (Offer-Average)	Ave. % Diff (Average - Offer)	Coefficient of Variation
WCM	39	25	+11.53%		.236
WAC	19	4		-13.57%	.25
WEP	41	33	+16.64%		.21
WTSO	13	2		-36.90%	.256
OTHER	27	12			
ALL	139	76	+14.60%		.25

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Crowdfunding and the Expansion of Access to Startup Capital

Kurt Stanberry   Forrest Aven

Abstract

This paper analyzes recent developments in crowdfunding, a new financing technique to improve access to capital. The United States Congress and President Obama, in a rare show of bipartisan action, passed the JOBS Act in 2012 (the Jumpstart Our Business Startups Act). The law is designed to stimulate economic growth and expand job creation by improving access to public capital markets for emerging growth companies. Furthermore, the US is not the only nation attempting to expand access to capital for startups, several other large capital markets are doing the same thing including China, India, and the EU. The future of access to capital for small business entrepreneurs will be significantly expanded through the use of crowdfunding.

Prologue

The United States Congress and President Obama, in a rare show of bipartisan action, passed the JOBS Act in 2012, (the Jumpstart Our Business Startups Act). The law is designed to stimulate economic growth and expand job creation by improving access to public capital markets for emerging growth companies. Furthermore, the US is not the only nation attempting to expand access to capital for startups, several other large capital markets are doing the same thing including China, India, and the EU.

Cost-effective access to capital for companies of all sizes plays a critical role in the US national economy, and companies seeking access to capital should not be hindered by unnecessary or overly burdensome regulations; thus the law will facilitate capital formation while also promoting investor protection. The US law will enhance access to private and public capital because of three primary changes in US securities laws, including: 1) enhancing the ability of companies to raise funds through transactions that are exempt from registration under the Securities Act of 1933; 2) making it easier for emerging growth companies to pursue an initial public offering under the Securities Act by easing the regulatory burdens associated with IPOs and phasing-in the obligations of being a public company, and 3) raising the dollar thresholds that require privately-held companies to register their securities under the Securities Exchange Act of 1934 and become subject to the periodic disclosure requirements applicable to public companies.

Some aspects of the law became effective immediately after it was signed into law, however most provisions had to be created / written after the law's passage. The JOBS Act directed the U.S. Securities and Exchange Commission (SEC) to implement new rules and requirements through its rulemaking process. The JOBS Act will, once all the provisions are implemented, provide significant new benefits to SMB's (small and mid-size businesses), which will now be referred to as 'Emerging Growth Companies' or EGC's. When an EGC is contemplating going public, it will be able to avail itself of liberalized communications restrictions and scaled-back disclosure requirements for a period of time, including exemptions from certain provisions of the Sarbanes-Oxley Act and the Dodd-Frank Act, as well as certain audit rules. The new law will

increase access to capital by lifting the prohibition on general solicitation and advertising in certain private placements, permitting crowdfunding, and increasing the offering amount for small business IPO's (Regulation A-type offerings) from $5 million to $50 million.

This paper will address specific changes in the US capital market brought about by the new law, and also summarize developments on a global basis.

I.   Crowdfunding: A New Version of IPO

The law has several sections, each designed to address a specific aspect of the process of the access to capital: Emerging Growth Companies (Title I), Access to Capital for Job Creators (Title II), Crowdfunding (Title III), Exchange Act Registration and Deregistration (Titles V–VI).

The JOBS Act requires the SEC to write rules and issue studies on capital formation, disclosure and registration requirements, which means the SEC will promulgate rules to permit privately-held companies (including start-ups and entrepreneurs) to engage in "crowdfunding" offerings of up to $1 million per year to various investors that will be exempt from registration under the Securities Act.

Essentially, crowdfunding is a capital raising activity whereby a company solicits the investment of small amounts of money from a large number of investors, primarily through the use of the Internet. Prior to the JOBS Act, however, crowdfunding had only limited usefulness for facilitating investments in smaller companies because such offerings do not fit clearly into any of the pre-JOBS Act private placement exemptions under the Securities Act or under applicable state securities or blue sky laws.

The Securities Act generally prohibits companies from offering or selling securities unless the offering has been registered with the SEC or qualifies for one of a limited number of exemptions from registration. The registration process is very expensive and time-consuming, to the point that a registered securities offering is almost never a realistic financing option for a typical start-up company trying to raise small amounts of money from numerous investors. In addition, even for companies with the resources to complete the registration process, by making a registered offering these companies become subject to the reporting requirements of the Exchange Act, which makes the process even more unattractive by adding another layer of complexity. Although scaled-back disclosures are available for smaller reporting companies and the JOBS Act has reduced the disclosure burdens for IPOs by emerging growth companies, these relaxed registration provisions are not aimed at, and do not necessarily, fit a company desiring to raise small amounts of capital through crowdfunding.

While the pre-JOBS Act private placement exemptions from Securities Act registration may provide useful means for raising capital, the investor sophistication and wealth requirements and prohibition on general solicitations in many of these exemptions make it practically impossible for these businesses to use the Internet and social media to find investors as well as to approach small investors and investors outside their circle of contacts. Many private placements are also subject to the state securities or "blue sky" laws that serve to add further expense to the process. While the JOBS Act makes it easier to conduct private placements to accredited investors

through general solicitations, a company wishing to raise funds through crowdfunding would likely need access to non-accredited investors in order to accomplish its capital needs.

In order to facilitate the ability of privately-held companies to access capital through crowdfunding, the JOBS Act added a new Section 4(6) to the to the Securities Act that specifically exempts crowdfunding transactions from registration under the Securities Act so long as such transactions comply with certain requirements (the "Crowdfunding Exemption").

A. Effective Date the Changes

The SEC is required to adopt rules implementing the Crowdfunding Exemption as a part of the JOBS Act. As a result, it is important to note that the issuers will not be allowed to use the Crowdfunding Exemption until the SEC adopts implementing rules providing greater detail required by the JOBS Act.

B. Primarily for Small Businesses Due to Offering Limits

The total amount of securities an issuer may sell to all investors, including any amount sold in reliance on the Crowdfunding Exemption, during the 12-month period preceding the date of the transaction shall not exceed $1 million.

C. What Companies Will Qualify to Use the Law

Under the JOBS Act, the only companies eligible to rely on, and to avail themselves of, the Crowdfunding Exemption are those companies that: (a) are domestic entities, (b) are not subject to the reporting requirement of the Exchange Act, and (c) are not investment companies. Such company also must not be considered a "bad actor" under a definition to be determined by the SEC, which is to be based in part on the disqualification provisions of current Regulation A.

D. Investor Limitations

The JOBS Act also limits the total amount of securities an issuer may sell to any individual investor who purchases securities in a crowdfunding transaction in a given 12-month period. The amount of such limitation is based on the individual investor's annual income or net worth, as follows: (i) if the investor's annual income or net worth is less than $100,000, the cap is the greater of $2,000 or 5% of annual income or net worth or (ii) if the investor's annual income or net worth is greater than $100,000, the cap is 10% of annual income or net worth, up to a maximum of $100,000.

E. Mandatory Use of Intermediaries/Funding Portals

Crowdfunding transactions must be conducted through a broker or a "funding portal" that has registered with the SEC and any applicable self-regulatory organization. A "funding portal" is defined under the JOBS Act to be a person acting as an intermediary involving the offer and sale of securities through the Crowdfunding Exemption; provided that that such person does not: (a) offer investment advice or recommendations; (b) solicit purchases, sales, or offers to buy securities offered or displayed on its website or portal; (c) compensate employees or other persons for such solicitation based on the sale of securities displayed or referenced on its website or portal; (d) hold, manage, possess or otherwise handle investor funds or securities or (e) engage in other activities prohibited by SEC rules. The officers, directors, and partners of an intermediary may not have a financial interest in the company using its services for a crowdfunding offering.

F. **Regulation of Intermediaries/Funding Portals**

Intermediaries will be responsible for:
- Educating and screening potential investors;
- Taking appropriate action to reduce the risk of fraudulent transactions (including checking the background of the issuer and its insiders);
- Providing any required disclosure to the SEC;
- Ensuring that the issuer does not receive any investors' money until the target offering amount has been raised; and
- Taking steps to ensure that investors do not purchase more than their annual limit of securities of the issuer.

In addition, intermediaries will also have restrictions on their abilities to use finders and similar persons and on certain of their financial relationships with issuers.

G. **Disclosure Obligations**

Companies that intend to engage in a crowdfunding offering under the JOBS Act also must furnish the following information to the SEC and to potential investors (which the intermediary must furnish at least 21 days prior to the first sale of shares pursuant to the crowdfunding offering):
- Names of the issuer's directors, officers, and each person holding more than 20% of its shares;
- Issuer's business plan;
- Financial information of the issuer, depending on the size of the offering;
- For offerings of less than $100,000, issuers must provide income tax returns and financial statements certified by the issuer's principal executive officer;
- For offerings of more than $100,000 but less than $500,000, issuers must provide financial statements reviewed by an independent public accountant;
- For offerings of more than $500,000, issuers must provide audited financial statements;
- How the proceeds will be used;
- Amount of the target offering, the deadline to reach the target amount, and regular updates regarding the progress of the company in reaching the targeted amount; and
- Information about the offered securities and the issuer's other securities, including how the shares were valued, and about the risks to crowdfunding investors relative to the issuer's other investors.

The JOBS Act also requires that the SEC adopt rules that require the issuer to provide ongoing financial disclosure on at least an annual basis.

H. **Additional Regulatory Compliance Requirements**

In addition to the disclosure obligations to be satisfied in connection with a crowdfunding offering, companies relying on the Crowdfunding Exemption:
- May not advertise the terms of its offering, except through an intermediary;
- May not compensate any person to promote its offering through communications provided by an intermediary (unless the person discloses the receipt of such

> compensation each time it makes a promotional communication in accordance with rules to be established by the SEC);
> * Must provide at least annually to the SEC and its investors reports of results of operations and financial statements of the company; and
> * Must satisfy any other requirements imposed by the SEC.

Although issuers are generally prohibited from advertising the terms of a crowdfunding transaction, they will be permitted to use advertisements that direct potential investors to the broker or funding portal intermediary. Since such advertisements will permit the issuer to direct the public to generally accessible intermediary websites that describe the transaction, issuers in crowdfunding transactions will have much greater leeway to offer and sell securities to strangers than they previously have had in traditional private placements, as these prohibit general solicitations of investors.

I. Potential Liability of Issuers under the Crowdfunding Exemption

Companies selling securities in a crowdfunding offering will be subject to civil liability under Section 12(a) (2) of the Securities Act (the provisions that provides for prospectus liability for public offerings). As a result, a purchaser could bring an action against an issuer for misstatements or omissions made orally or in written materials in the course of the offer and sale of such securities.

J. Securities Exchange Act Issues

Prior to the enactment of the JOBS Act, Section 12(g) of the Exchange Act and the rules promulgated thereunder generally required companies with $10 million in assets and a class of equity securities held of record by 500 or more persons at the end of their fiscal year to register their equity securities under the Exchange Act and to become subject to the reporting requirements of the Exchange Act (unless such securities were already so registered under the Exchange Act. This created significant concerns for privately-held companies that were seeking to raise equity financing, but were not yet ready to undertake the substantial and expensive reporting and corporate governance requirements of the Exchange Act. Certainly, such requirements could have a negative impact on relatively small offerings to numerous investors (such as under current Regulation A, serial exempt private placement offerings, and potentially, crowdfunding offerings).

However, as part of the JOBS Act, the holders of record thresholds for requiring Exchange Act registration were increased to 2,000 persons, provided that no more than 499 persons are non-accredited investors. In addition and perhaps even more important, the JOBS Act provides specific additional relief under the Exchange Act registration requirements for shares issued pursuant to the Crowdfunding Exemption. Such shares are not included in the calculation of the holders of record.

The crowdfunding exemption from the calculation of holders of record applies to the securities sold in such transactions, not the purchasers or holders of such securities. As a result, companies engaging in crowdfunding offerings may need to establish a mechanism to track such securities prior to any subsequent Exchange Act registration (i.e., special legends).

K. **Restrictions on Re-sales**

Shares that are sold pursuant to the Crowdfunding Exemption may not be resold by the investor until one year after the purchase of the shares, unless such shares are: (a) subsequently registered under the Securities Act; (b) transferred back to the issuing company; (c) transferred to an accredited investor or family member of the investor or (d) transferred in connection with the investor's death or divorce. Further, the SEC may impose additional restrictions by rule.

L. **State Preemption**

Offerings under the Crowdfunding Exemption will not be subject to registration under the laws of any state or regulation relating to securities offerings or documentation requirements. States do retain the authority to take enforcement actions against companies, funding portals, and other persons or entities for fraudulent conduct in connection with a crowdfunding offering.

M. **Does It Enhance Access to Capital?**

The Crowdfunding Exemption could prove helpful to small and emerging businesses looking for access to additional sources of funding. The potential impact of these changes include, among other things:

- Crowdfunding has the potential to be a very attractive fundraising vehicle for start-ups and other small companies because it provides them a new relatively inexpensive means, after considering the post-offering requirements, to find investors outside of the traditional angel investors or multiple friends and family rounds. Crowdfunding transactions provide companies with the ability to attract investment from ordinary, "retail" investors who ordinarily cannot be meaningfully included in traditional private placements.
- Companies selling securities pursuant to a crowdfunding offering may find themselves with a large base of unsophisticated investors, which may require them to expend more time and resources in their shareholder communications and investor relations than might otherwise be the case (e.g., may require additional solicitation efforts when seeking shareholder action, and more regular reporting of financial and business results).
- Companies will be required to comply with both offering and post-offering disclosure requirements that might not be required by companies raising private equity capital by other means (including the ongoing annual financial disclosure that will be required). However, it is not clear that this will add much cost to the disclosure process used in connection with other exempt offerings.
- However, companies engaging in a crowdfunding offering pursuant to the Crowdfunding Exemption will be required to hire intermediaries to conduct the transaction. This will increase the costs of the offering and currently it is difficult to predict what those costs might be.
- It may be more difficult for companies that have engaged in a crowdfunding offering to attract later round financing or to engage in a merger or acquisition transaction due to likely requirement that shareholder approval be obtained. Further, most venture capital and private equity firms, as well as most institutional investors, are reluctant to invest in an entity with a large base of unsophisticated investors. In any event, any such transaction will require substantial shareholder communication and will likely be more expensive to undertake.

In spite of its limitations and obligations, the Crowdfunding Exemption will still give many companies access to investors that they would not have been able to reach through traditional private placements prior to the passing of the JOBS Act. Companies willing to comply with the JOBS Act's significant disclosure and other requirements will be able to use crowdfunding to find investors previously unavailable to them.

II.   International Applications of the Crowdfunding Concept in Major Markets
A. China

Peer to peer lending was first introduced in China in 2006. Similar to other countries, the world was in the midst of a recession and bank deposit rates were low, and thus any opportunity that promised higher returns appealed to investors interested in generating more income. The China Securities Regulatory Commission (CSRC) is in the process of creating regulations for the fast growing crowdfunding industry. This entails both peer-to-peer (P2P) lending and equity crowdfunding. The CSRC recently officially stated that equity crowdfunding is an emerging internet-based financing method which supplements conventional financing approaches and mainly serves micro enterprises and SMEs. The new approach is relevant to expanding financing channels for micro enterprises and SMEs, facilitating capital formation, supporting innovation and entrepreneurship, and developing a sound multi-layered capital market system.

Recently, the Commission has carried out in-depth research and survey regarding the equity crowd funding industry. At present, based on overseas regulatory experience and the results of the research and survey, it is dedicated to developing a set of regulatory rules for crowdfunding financing. With regard to the guidelines for the regulation of the equity crowd funding industry, the Commission will, taking into account the current stage of development and characteristics of China's equity crowdfunding industry, as well as the general requirements of 'encouraging innovation, preventing risks, pursuing interests while avoiding damages, ensuring sound development' and complying with existing laws and regulations, and principles of appropriate and innovation supervision, strengthen the self-regulation of the industry, promote the sound and regulated development of the equity crowdfunding industry, protect the lawful interests of investors, prevent financial risks, and highlight the role of the financial industry in serving the real economy. Thus it is fair to say that in China, as in the US, regulators recognize the beneficial aspect of both P2P funding and equity crowdfunding but the demand for regulatory oversight is growing as the new form of finance gains popularity.

B. New Regulations Needed

In various stories recently filed by Chinese state press agency *Xinhua*, some questions arose about the growing business of peer-to-peer (P2P) lending. Apparently over 70 P2P crowdfunding platforms in China collapsed last year, around 60 in the fourth quarter. The dramatic increase in failures has alerted investors, along with regulators, to the enormous potential for default accompanying promised high returns. The article shared an anecdotal experience of investor Zhang Yutang who had invested 300,000 yuan in a P2P program on Xiogan based Tianlidai. The platform went bankrupt and Zhang has lost his entire investment. Reportedly Tianlidai took the funds contributed to its own projects instead of acting as an intermediary for lenders and borrowers. The story indicates that this is not an isolated occurrence, and demonstrates the need for regulation.

Without much government intervention the number of P2P platforms has increased to 800 with revenue reportedly exceeding 100 billion yuan. These numbers are from Wangdaizhijia an industry platform that tracks the various P2P sites. The growing number of competing sites have increased competition between them – some promising outlandish returns which are often too good to be true. Bai Chenguy, general secretary of the China Association of Microfinance has estimated that 80% or more of these P2P platforms may fail.

As the benefits of P2P finance are recognized as aiding in economic growth, there is an expectation that regulation will soon be implemented to ensure a vibrant and healthy industry.

C. India

India has seen a massive crowdfunding success story many years before the term was coined. Today's India, with its huge market and human capital, has become a popular destination for global business and other investments that have identified opportunities. Its crowdfunding however has been restricted to micro-financing projects, and the occasional donation-reward funding category. The legal issues in India are an integral part of crowdfunding, as they are in the US. India has used the same donation model as the US has with websites similar to Kickstarter, in which individuals make a financial contribution to a project without any expectations of financial benefits. India has also developed a lending model wherein the investor will loan money to the project with the expectation of being repaid under the terms and conditions agreed. Similar to the US, India has also developed a new investment model in which investor receives an equity stake in the project.

Experts believe that within the next year, many crowdfunding platforms will be created in India, and worldwide, nearly a thousand such platforms will be launched. Recently in India, platforms such as Wishberry and Ignite Intent have been launched. Most of them are in the rewards and donation category, as there aren't many regulatory issues around this model. There have been attempts at crowdfunding for events like the Goa Project and campaigns like Teach for India. Crowdfunding is also becoming an alternative funding channel for the film industry.

However, the concept of online crowdfunding is new to India as it is to most countries. The industry is not yet very investor-friendly. It seems some people in India are still not ready for this concept. Low trust levels of doing the things online are also a challenge. India's ecommerce space may need to mature more before anything substantial can happen. To build a credible case for the equity crowdfunding industry to grow in India, it will be necessary for these platforms to proactively approach the regulators and work with them to build long-term credibility and transparency. For example, e-commerce in India got a boost when they initiated the concept of cash on delivery. Similarly, crowdfunding will have to look at building an offline base to induce mass awareness and encourage broader participation.

There remain significant legal issues surrounding crowdfunding in India, since equity-based online crowdfunding is not yet totally legal. The Reserve Bank of India in 2012 approved Milaap, a non-profit microfinance institution, to start crowdfunding of startups from overseas. Various stakeholders such as banking regulator RBI, the Finance Ministry and the Corporate Affairs Ministry must be involved in expanding the concept for it to become successful.

There is no doubt that crowdfunding is rapidly being explored as a legitimate way of raising funds for startups and existing businesses. Since the US has started to accept this concept, countries such as India and China, as well as the EU, won't be far behind.

D. EU

The EU has not yet passed the necessary new laws, however crowdfunding is an emerging alternative source of financing which the EU is exploring. The European Commission is exploring the potential and the risks of this relatively new and growing form of finance, as well as the national legal frameworks applicable to it, in order to identify whether there is value added in European level policy action in this field.

The European Commission has launched a consultation group to explore the added value of potential EU action. All citizens and organizations were welcome to contribute to this consultation open during 2013. Contributions were particularly sought from competent authorities, crowdfunding platforms, entrepreneurs and individuals who launched a crowdfunding campaign and citizens who contributed to such campaigns. The EU Commission is now in the process of evaluating the results.

III.   Future of Crowdfunding

Unlike some other laws, with crowdfunding there has already been a "soft-start" rollout of this technique. The non-ownership version of this technique has been wildly popular and surprisingly successful in allowing small cap entrepreneurs and creative artists to raise non-equity donation capital. It stands to reason the concept should continue to flourish in the for-profit equity version, and thus achieve the goal of expanding access to capital for small business ventures.

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Financial Executives and Auditor's Concern

Angie Abdel –Zaher

Abstract

SAS No.59 guides auditors in assessing client's ability to continue as going concern. SAS No.59 requires auditors to assess management's plans and provides guidance as to what information to consider. The purpose of this paper is to determine the extent to which client Characteristics influences auditor's judgments. A sample of 1,949 financially stressed firms with December 31st, 2005 fiscal year end. We examine client gender and executive's turnover preceding auditor's going concern opinion for 1,949 financially stressed firms during 2005. The paper extends work by Mutchler (1986), Chen and Church (1992), Geiger and Raghunandan (2001), Geiger, Raghunandan, and Rama (2005), and Behn, Kaplan, and Krumwiede (2001) by modeling and testing the association between the auditors' going –concern report and mitigating factors. After controlling for financial condition, size, and leverage, the results of the study indicate that auditor' going-concern reporting decisions are strongly linked to CFO turnover and CEO gender. The result indicates auditors going concern opinion is influenced by CEO gender but surprisingly no influence by CFO gender. Given the primary role and significance of CEO, decisions made by the CEO given his or her characteristics difference impacts auditors' perception of the firm's future performance. Furthermore, auditors are influenced when CFO turnover occur during the year of the audit while auditors are not influenced by CEO turnover during the year of the audit. Since auditor's opinions is highly valued and have a great impact on investor's decision, it is highly crucial that we investigate the factors that impact auditor's decision making. This study is the first to examine client characteristics impact on auditors' opinion. Results of this study suggest further audit research to discover the influence of gender biases and stereotypes on audit judgments.

Keywords: gender, auditor opinion, going concern.

Introduction

Executive's profiles have a direct impact on the future of a corporation. A chief executive officer's or a chief financial officer expertise, characteristics, and decision-making fashion affect the corporation through the various projects taken, financial structure, and corporate strategy. Management characteristics and resulting decisions can as documented through the literature have a direct impact on firm's performance. Empirical evidence has supported the association between CEO turnover and firm's poor financial performance (e.g, Coughlan and Schmidt, 1985; Warner et al., 1988; Weisback, 1988; Parrino, 1997). Furthermore, there is a strand of literature exploring the role of female CEOs and executives in corporate decisions and firm performance (Mohan and Chen 2004; Wolfers 2006; Welbourne 1999). Female executives are often judged to be more risk averse and therefore less likely to take on risky investment decisions. While executive turnovers often signal that a corporation is going through financial turmoil.

In this paper, we would like to examine management characteristics impact on auditor's decisions. Since, auditor's role is to investigate all factors impacting current and future firm performance, the question we ask "whether clients' characteristics play a significant role in auditors' opinion". As we know from the literatures, auditors will examine all the financial factors as well as all the non-financial factors when assessing firm's performance status and

whether a modified going concern opinion is to be rendered (Mutchler (1986), Chen and Church (1992), Geiger and Raghunandan (2001), Geiger, Raghunandan, and Rama (2005), and Behn, Kaplan, and Krumwiede (2001)). The objective of this paper is to examine factors that impact auditor's decision-making process. We examine the impact of management characteristics like tenure and gender on auditor's modified going concern opinion. Motivation for this study comes from Statement on Auditing Standards No. 59, The auditor's Consideration Of an Entity's ability to continue as a Going Concern, requiring auditors to evaluate whether substantial doubt exists on an audit client's ability to continue as a going concern (AICPA, 1988). Auditors' responsibility is to look for existing conditions and events that indicate substantial doubt on the client's ability to continue as a going concern. The auditor is asked to look for negative trends, other indications of possible financial difficulties, internal matters, and external matters like management characteristics and plans when assessing client's financial status and modifying audit report for uncertainties that may affect the company's ability to continue as a going concern (AICPA, 1988). Failure to issue a warning against impending bankruptcy or failure can result in subsequent costly litigation faced by auditors (Carcello and Palmrose, 1994; Palmrose, 1997; Francis and Krishnan, 1999). We examine prior audit reports for a sample of financial stressed companies during the year 2005 and test for the association between the type of audit opinion issued on the financial statements and client's characteristics.

Background and Hypothesis

SAS No. 59 requires auditors to assess management's plans and provides guidance as to what information to consider. Various researchers have found that often management's plans include valuable information that demonstrates the entity's ability to overcome the adverse circumstances (Ellingsen et al. (1989). Auditors will take client's characteristics to determine whether a company has a strategy to deal with those financial challenges. Ellingsen et al. (1989) point out that once auditor has substantial doubt about a firm after considering the financial indicators, the auditor will look to management's plans or characteristics. SAS No. 59 specifically state that auditors "obtain information about the plans and consider whether it is likely the adverse effects will be mitigated for a reasonable period of time" (AICPA 1988, Para. 07). In situations that auditors are assured that management plan adverse the effect of a going concern, according to Ellingsen, no audit report modification would be required. Furthermore, Bell (1991) emphasized the importance of considering management plans as mitigating factors to explain auditors' opinion. Behn et al. (2001) found a strong association of certain management plans and auditors' going-concern reporting decisions. In this study, we examine management characteristics like Gender and Tenure to examine the impact on auditors' decision-making process.

Executives Turnover

Conventional wisdom states the importance of the CEO as the most significant chain of command in any US corporations. The market carefully monitor's CEO actions to preempt any changes affecting corporate performance. CEO turnover has been the focus of various researches relating CEO turnover to poor firm performance (e**.**g, Coughlan and Schmidt, 1985; Warner et al., 1988; Weisback, 1988; Parrino, 1997).

Executives Gender

As the corporate ladder is spanned, how many female executives actually reach the executive levels. Are there still gender biases that hinder their performances? Or are female executives inherently different in performance when compared to their male counterparts. According to the literature, we have found that executive gender play a critical role on corporate strategies impacting current and future performance.

Interestingly very few researches have examined CEO characteristics and its relation to corporate performance (Bertrand and Schoar (2003); Bertrand, Kramarz, Schoar and Thesmar (2004); Bertrand and Hallock's (2001); Lee and James (2003)). Many have examined education, age, and characters and found that there is a large effect of CEO Characteristics on firm performance. Many have found significant gender impact on firm performance, highlighting the pay gap, which represents lower skill set for females vs. male executives (Bertrand and Hallock's 2001). Others have looked at the negative market reaction of female appointed executive vs. a male executive (Lee and James' 2003). In addition, Welbourne (1999) and Catalyst (2004) suggested that the wage discrepancy is many related to expertise gap in women vs. female.   Nevertheless, there is Mohan and Chen's 2004 paper that found no significant different between IPO pricing and CEO gender.

Additional studies examined diversity among top executives in general, namely CFO's and others (Presidents, Chairpersons of the Board). For Example, Justin Wolfers 2006 found no significant differences in returns of holding stock in female-headed firms when compared to male-headed firms for S&P 1500 firms over the period 1992-2004. Byrnes et al. (1999) found a significant support for the proposition that women, on average, are more risk averse than men in a variety of decision contexts through a review of 150 studies related to gender differences in risk taking.

In summary, prior research suggests that females are more risk-averse, more cautious, and more likely to be compliant with accounting regulations. The possible loss of reputation, coupled with the risk-aversion, reduced overconfidence, and greater likelihood of compliance, suggests that executive's gender can be a factor to consider for auditors decision-making process.

In this paper, we extend earlier research by examining whether auditors consider executive turnover and gender when he or she is faced with a modified going concern opinion. If the auditor does not have access to management plans because the previous CFO left and a new CFO coming on board, the auditor is more likely to issue a going-concern opinion. In addition, we are examining auditor's objectivity and whether client's gender has a significant impact on auditor's opinion.

Earlier literature examine the association between certain financial indicators to the issuance of a going concern opinion (e.g., Mutchler, 1985 and 1997; Levitan & Knoblett, 1985; Menon & Shwartz, 1987; Dopuch et al., 1987; Bell & Tabor, 1991; Chen & Church, 1992; Gaeremynck & Willekens, 2003), while research examining auditors consideration of managements actions is

scarce (Mutchler et al., 1997; Behn 2001; Geiger & Rama, 2003). Geiger and Rama 2003 [1]have looked at the association between audit and non-audit service fees received and the auditor decision regarding the type of opinion given to financially stressed firms. Bruynseels et al. 2006 [2]investigated the impact of industry specialization and audit methodology on audit reporting accuracy. Bruynseels & Willekens 2006 found auditors perceive the engagement in (long term) cooperative agreements as a mitigating factor and labeled short-term actions like cost reduction and marketing strategies as additional risk to the going concern assessment.

Behn et al. 2001 and Geiger and Rama 2003 recognizing the hidden relationship between the likelihood of going-concern opinions and other non-financial factors. Behn et al. (2001)[3] recognized this relationship of certain management plans and auditor going-concern opinion.

In this study, we are examining the information content in the executive characteristics and the auditor modified opinion. We contribute to the going-concern literature by testing the association between the likelihood of going-concern opinions and a change in executive turnover and gender for a sample of distressed US companies. Comparable to earlier going-concern studies, we rely on information found on Compustat database and auditor analytics as a base for financial information as well as auditor's opinion and CFO turnover.

The remainder of this paper is organized as follows: In the next section we develop our hypothesis, model development, and sample selection. In section 4, we provide our Analysis and Results.

Hypothesis
SAS No. 59 set the guidelines for auditors to consider when assessing client's ability to continue as a going concern opinion. SAS No. 59 requires auditors to take an active role in their evaluation of a company's ability to continue as a going concern. The auditor is required by SAS No.59 to look for negative trends, internal and external factors that trigger the auditors to have any substantial doubt about the continuance of a firm. It specifically urges auditors to evaluate management plan for going concern-mitigating factors. When examining management plans, the auditor may get a clear picture of management plan to combat the company's adverse position and he or she may overcome his substantial doubt and only in this case, under SAS no. 59 a going-concern audit report is not required. Nevertheless, if auditor continues to have such doubt, a modified opinion is given. In this study, we argue, if the executive is changing, the likelihood that the auditor will find a combating management plans diminishes, and the auditor

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[1] Geiger & Rama 2003 found both audit fees and non-audit fees to be significantly associated with the issuance of going-concern modified audit opinion after controlling for financially stress, reporting lag, default status, and management plans.
[2] Bruynseels et al. 2006 used a sample of US bankrupt manufacturing companies between1998-2001 found that audit firms using a business risk methodology are less likely to issue a going-concern opinion for a firm that subsequently goes bankrupt. I They did not find evidence supporting that specialist auditor is more likely to issue a going concern opinion for companies that subsequently go bankrupt. In addition, their study found very strong evidence that auditors, irrespective of their type are 'fooled' into not issuing a going concern opinion for clients that subsequently go bankrupt when the client is planning on raising cash in the short term.
[3] Behn et al. 2001-found going-concern opinion decisions to be strongly related to publicly available mitigating information regarding certain management plans, after controlling for financial condition, size, default status, and the propensity to voluntarily disclose information.

will be more inclined to issue a going concern opinion. Whether auditor's opinion is impacted by executive gender will be examined to test auditor's objectivity.

Since very few prior studies provide evidence that auditors are committed on reviewing management plans, our objective with this research to explain whether auditor's opinion is associated with executive turnover and gender. Our research questions whether auditor's modified going concern opinion can be reliably predicted using the information of the executive change regardless of the reason behind the change or turnovers of executives that are not caused by retirement but caused by dismissals or resignations.

An auditor's modified opinion is subject to many factors, we examine whether a new CFO/CEO to the company have an association on the type of opinion rendered. And we investigate further, whether the reason behind the change of the previous CFO (non-retirement) has an association on the auditor opinion type. In addition, we test executive gender (CEO/CFO) impact on auditor's opinion. In order to test such models, we develop our hypothesis as follows:

H_{a1}: Companies that have CEO/CFO change during the year of the audit are more likely to receive a going-concern opinion.

H_{a2}: Companies that have CEO/CFO change due to non-retirement during the year of the audit are more likely to receive a going-concern opinion.

H_{a3}: Companies that have female CEO/CFO is less likely to receive a going concern opinion.

Method

We examine audit reports for a sample of financially stressed companies during the year 2005. We specifically, examine if the audit report on the financial statements immediately following CEO/CFO change has been modified for going-concern uncertainties. We use a multivariate logistic regression to control for variables associated with auditor reporting. The audit report of the year of the CEO/CFO change is the dependent variable in our model and CEO/CFO, the CEO/CFO change measure, is the variable of interest in this study.

According to McKewon et al. 1991, auditors are more likely to issue going-concern modified opinions for stressed companies rather than non-stressed companies. Consistent with Mutchler (1985) and Hopwood et al. (1994), Kida (1980), Chen and Church (1992) and Mutchler {1985}, we define a company as stressed if it exhibited at least one of the following financial stress signals: (1) negative working capital, (2) a loss from operations (3) negative retained earnings (4) a bottom line loss.

The control factors used in the multivariate logistic regression, based on prior research (Multchler 1985, 1997; Mckeown et al. 1991a; Chen and Church 1992; Raghunandan and Rama 1995; Carcello et al. 1995; Geiger and Raghunandan 2002, Geiger, Raghunandan, and Rama 2005), are financial ratios (NITA, CACL, CATA, CASHTA), company size (LSALES), auditor size (BIG4), and default status (LTDA). In addition, we also include two other control factors: whether the company had a CEO/CFO change and whether the CEO/CFO change was caused by dismissals/resignation. We measure financial conditions using the financial ratios mentioned below to measure financial distressed firms. We measure client size (LNSALES) using log of sales (in thousands of dollars), as suggested by Bell (1991), the larger the company, the less

likely it to receive the going concern. We assigned CEO/CFO change [4]that happened after the modified going concern as no change for our research interest since we are interested only on CEO/CFO changes that preceded the modified-going concern opinion date. CEO/CFO change [5]is measured as a change only if it happened prior to the auditor going concern opinion was filed in the year of the audit report 2005.

The relationship between the audit opinion following a CEO or CFO change and the factors discussed above is examined using a logistic regression to estimate the coefficients in the following model:

$$GC = b_0 + b_1 * NITA + b_2 * CASALES + b_3 * CACL +$$
$$b_4 * CASHTA + b_5 * LTDA + b_4 * LSALES + b_7 * BIG\ 4 +$$
$$b_8 * CFO + b_9 CEO + b_{10} CEOgend + b_{11} CFOgend$$

where:

GC   =1 if audit opinion is going-concern modified, and 0 otherwise;
NITA   =Net Income/Total Assets;
CASALES   =Current Assets/Sales
CACL   =Current Assets/Current Liabilities;
CATA   =Current Assets/Total Assets
CASHTA   =Cash/Total Assets;
LTDA   =Long-Term Debt/Total Assets
LNSALES   =Natural Log of Sales (in millions of dollars);
BIG4   =1 for Big 4 auditor, 0 otherwise.
CFO   =1 for CFO change, 0 no change
CFOCHG2   =1 for CFO change due to non-retirement, 0 for retirement
CEOgend   =1 for female CEO, 0 otherwise.
CFOgend   =1 for female CFO, 0 otherwise.
CEO   =1 for CEO change; 0 otherwise.

Sample and Data

The list of U.S. public company receiving a going-concern opinion was obtained from Audit Analytics for the year 2005. Relevant financial statements data were obtained from Compustat. Consistent with prior research, we deleted companies in the financial, real estate, and utility sectors because such companies have unique financial characteristics (Geiger and Raghunandan 2002). We reached our sample[6] size of 1,976[7] sampled firms with all financial data [8]found after

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[4]**In cleaning the duplicate CIK codes for the officer changes, the following assumption was used:
- If the company has the same CEO or CFO filing twice, the earlier date of filing is kept as the filing date while the later date is deleted
- If the company has different CEO or CFO filing within the 2005 year, the later CEO or CFO filing date is kept while the later date is deleted
- If the company has different CFO filing within the 2006 year, the earlier CEO or CFO filing date is kept while the later date is deleted

[5] In case, where multiple CFO event change was filed, the first CFO change filing date is chosen, while the closer CFO change filing date was used in some instance if it is closer to auditor Going concern opinion
[6] The 1976 sample were chosen as follows

eliminating foreign firms and any firms with fiscal year end that is not December 31, 2005 companies (Mckeown et al. 1991: Mutchler et al. 1997, Geiger and Raghunandan 2002).

Results

The sample consisted of 331 companies (17%) received a modified going-concern. Out of the 331 firms with going concern opinion, 19 % had firms with CFO changes that preceded the going concern audit opinion.

Table 1 provides descriptive data and comparisons of the going-concern modified and non-going –going concern modified firms indicating significant differences (p<0.01) on all control variables, except CASALES and CATA. Companies receiving a going-concern modified audit report were smaller, had higher CFO turnover, were in greater financial stress (lower NITA, lower CACL, lower CASHTA) and have higher long-term debt (LTDA). The result indicates that firms with going concern opinion suffer from CFO[9] turnover, liquidity problems, have higher long-term debts, and tend to significantly be smaller in size.

Results from the multivariate logistic regression are presented in Table 2. The overall model is significant (Chi-square= 726.32, p<0.001; pseudo-R^2=0.52). The coefficient for CFO variable [10]is positive and significant p<0.01, indicating that a going-concern modified audit report is more likely to be issued after a company changes CFO.

Meeting criteria 1-4 of stressed firms	3,354
Less: Foreign firms	(417)
FY ending other than 12/31/05	(801)
Missing Data	(187)
Final Sample	1,949

[7] Our sample contained 3417 with full financial statement data available on the Compustat annual Industrial file after deleting any non-stressed firms with missing CIK codes. We matched financial data by firm CIK with audit analytics database to find audit opinions. We match all firms receiving Modified-Going Concern opinion for all firms for the year December 31, 2005, assigning one to those companies receiving a modified going concern opinion, while a zero for firms with no modified opinion in audit analytics for the year. We searched Audit Analytics for both auditors' opinion information and CFO changes for those sampled firms

[8] When analyzing our data we winsorize any financial ratio that fall out of the absolute value of 10, any ratio falls below –10 or above +10 is winsorized to the closest upper or lower whichever applies.

[9] We wanted to make sure our results are robust for the CFO turnover (CFO). We restricted the definition of CFO changes to non-retired CFO's (CFOCHG2) and the results did not change. The univariate test showed a significant mean difference between CFO changes caused by non-retirement for GC firms vs. non-GC firms. The result indicated a significant difference with Chi-Square P-value test of <0.01 for the all CFO changes (CFO) and specifically non-retirement CFO changes (CFOCHG2).

[10] Additional Analysis: We wanted to rerun our predictable variables and test whether CEO change or CEOCHG2 will present association with auditor's modified audit opinion. We added the variable CEO and CEOCGHG2 to reflect firms with CEO changes during the year of the audit (2005) and CEO changes that are caused by non-retirement. We ran the models with the predictable variables while replacing CFO with CEO changes, nevertheless, no significant relationship was found between CEO changes or CEOCHG2 and auditor's modified going-concern opinion. Our tested model was as follows:

GC $=b_0+b_1*NITA+b_2*CASALES$ $+b_3*CACL+b_4*CASHTA+b_5*LTDA+b_6*LSALES+b_7*BIG4$ + $b_8*RESTRUCT+b_9*FIN\_10+ B_{10}*CEO$

Table 2 presents estimation results for the Logistic Model specific, as shown, the likelihood of a firm receiving a modified going concern opinion is significantly positively related to the change of the CFO[11] (coefficient=-0.59, P-value<0.01), significantly negatively related to the NITA (coeff.=-0.66, p-value <0.01), significantly negatively related to the CACL (Coeff.=-0.39,P-value<0.01), significantly positively related to the CATA (Coeff.=0.82, p-value<0.05),and significantly negatively related to the change of both CASHTA (Coeff.=-1.29, p-value<0.05) and LNSALES (Coeff=-0.48, p-value<0.01).   The model correctly classified 90.1% of the companies receiving going-concern opinion.   Odds ratio, Exp (B) indicates that as CATA increases by 1, firms are 2.27 times more likely to be classified as going concerns. In addition, as CFO change increases by 1, firms are 1.50 times likely to receive auditor modified-going concern opinion. The odds ratios for NITA, CASA, CASHTA, LNSALES and BIG4 indicate little change in the likelihood of a firm receiving a modified- going concern opinion because they were all below the predictors.

We further restricted our definition of CFO changes to CFO changes that are not caused by retirement but by resignation or dismissals. Our result as shown in table 2 remain significant with CFOCHG2 having a positive coefficient of 0.61 and p-value of <0.05. We also reran our two models for CFO and CFOCHG2 to test CEO change and CEOCHG2 to test for association. The results is shown in table 2b, stating no significant association between CEO turnover and auditor going concern opinion.

When testing CFO gender we found marginal significant association between going concern opinion and CFOgend (positive coefficient of 0.405 and p-value of <0.10). Furthermore, we find a higher significant association of CEOgend with a positive coefficient of 0.754 and a p-value less than 0.05 as stated in Table 2.

GC $= b0 + b1*NITA + b2*CASALES + b3*CACL + b_4*CASHTA + b_5*LTDA + b_6*LSALES + b_7*BIG4 + b8*RESTRUCT + b9*FIN\_10 + B10*CEOCHG2$

[11] A second logit model contained the same predictor variables; nevertheless, we restricted CFO changes to CFOCHG2 variable to analyze only the CFO changes caused by non-retirement (mostly like dismissals or resignations). The linear regression coefficients indicate that multicollinearity was not violated since tolerance statistics for all variables were greater than 0.2. Table 2 Presents estimation results for the Logistic Model specific, as shown, the likelihood of a firm receiving a modified going concern opinion is significantly negatively related to the change of the CFOCHG2 (coefficient=-0.60, P-value<0.01), significantly negatively related to the NITA (coeff.=-0.66, p-value <0.01), significantly negatively related to the CACL (Coeff.=-0.389,P-value<0.01), significantly positively related to the CATA (Coeff.=0.779, p-value<0.05),and significantly negatively related to the change of both CASHTA (Coeff.=-1.14, p-value<0.05) and LNSALES (Coeff=-0.460, p-value<0.05). The model correctly classified 89.8% of the companies in distinguishing between Going concern opinion and Non-Going concern opinion firms. Odds ratio, Exp (B) indicates that as CATA increases by 1, firms are 2.18 times more likely to be classified as going concern. In addition, as CFOCHG2 variable increases by 1, firms are 1.430 times likely to receive auditor modified-going concern opinion. Moreover, as LTDTA increases by 1, firms are 1.31 times to receive auditor modified-going concern opinion.   However, odds ratios for NITA, CASA, CASHTA, LNSALES and BIG4 indicate little change in the likelihood of a firm receiving a modified- going concern opinion. Meaning, in a distressed firm' context, poor liquidity, high debt ratio is positively associated with the likelihood to receive a going-concern opinion, while CFOCHG2 event is negatively associated with a firm receiving a going-concern opinion.

Audit Firm Size Effect
To ensure our results are robust to auditor firm size and our results are not driven by auditor size (BIG4), we reran our regressions with Big 4 audit firms only as shown in Table 2. Many earlier studies have indicated a significant difference based on audit firm size in a variety of auditing context. It is likely that auditor decision related to going-concern would vary across audit firms of different size.

First we include only BIG4 indicator variable in the regression, we found the results remain consistent with CFO having a positive coefficient of 0.66 and remain to be significant at p<0.05). In addition, we ran possible different interaction effects of BIG4 with the other independent variables stated in this study. Taken together, these results did not change the significance affect of CFO change and CFOCHG2 change caused by non- retirement. The results confirms that CFO change and CFO changes caused by non-retirement have predictive relation of going-concern opinion whether the auditing firm is a BIG4 or non-Big4 with a (CFO change P-value=0.03, CFO change non-retirement p-value=0.03). Additional study was done examining the association of a CEO turnover on auditors' going concern opinion, however, no significant association was found (Table 3).

Sensitivity Analyses[12]
Since management plans play an important variable in our model, as robustness checks, restructuring[13] and FIN_10 [14] are included as control variables. The results of our model including RESTRUCT and FIN-10 did not change both the CFO change and the CFOCHG2 variable significance with both p-value <0.05.

Conclusions
The Accounting scandals like that of Enron and WorldCom have made tremendous changes to the business world nevertheless the auditing field. Today, the auditing profession has come under increased scrutiny over the past several years concerning the growing number of going-concern modified (GCM) opinion. Sarbanes Oxley Act (Sox) demands that auditor decisions be more conservative in the period after December 2001 (Geiger, Raghunandan, Rama 2005)[15]. With such increase in the number of going concern opinion, various literatures looked at the factors that have an association on the type of audit opinion rendered.

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[12] Therefore, we ran the models using the following variables:
GC $\quad = b_0 + b_1 * NITA + b_2 * CASALES + b_3 * CACL + b_4 * CASHTA + b_5 * LTDA + b_6 * LSALES + b_7 * BIG4 + b_8 * RESTRUCT + b_9 * FIN\_10 + B10 * CFO$
GC $\quad = b0 + b1 * NITA + b2 * CASALES + b3 * CACL + b4 * CASHTA + b_5 * LTDA + b_6 * LSALES + b_7 * BIG4 + b_8 * RESTRUCT + b_9 * FIN\_10 + B10 * CFOCHG2$

[13] First, RESTRUCT that takes a value of one if firm reported at least one of the Compustat annual data items#376, #377, #378, or #379 is not equal to zero, and zero otherwise.
[14] indicator variable that takes a value equal to one if the firm's equity to asset ratio (Compustat ADI#108 divided by Total assets Compustat ADI#6) or long term debt to asset ratio (Compustat ADI#111 divided by Compustat #6) is greater than 10%, otherwise zero.

[15] Geiger et al. 2005 analyzed 226 financially stressed companies that entered bankruptcy during the period from 2000 to 2003 and found that auditors are more likely to issue going-concern modified audit opinions in the period after December 2001.

SAS No. 59 (April, 1988) emphasizes that auditors need to assess the negative financial trends that a company may be facing, like that of defaulting on debt or any other non financial condition that may indicate there could be substantial doubt about the entity to continue as a going-concern. In addition, it requires auditors to consider management plans to mitigate the effects of these adverse circumstances.   It directs auditors to not overlook management's strategies when their firm is facing a going concern situation. We argue that auditor is required to consider management plans in mitigating the modified going concern opinion and will present a remedy action plan to the auditor that may influence the auditor's opinion. Nevertheless, when the firm is going through a CFO change, the likelihood of a strategic mitigating plan to exist is diminished and therefore, the auditor will be more likely to issue a modified going concern opinion.

Our objective is to examine whether auditors consider CFO turnover found in financially stressed firms when assessing client's going-concern opinion. Our study examines the association between CFO turnover and the auditor's decision regarding the type of opinion rendered to financially stressed company. We examine 1949 firms that received a GCM auditor's opinion in the year 2005 that were preceded by a CFO turnover. We find that, after controlling for financial stress, client size, auditor type, auditors were more likely to issue a GCM in the year 2005 given a CFO change in the year of the audit opinion.

We argue that CFO turnover have an impact on the auditor GCM opinion and CEO gender play a key factor hat is evidenced by the significant responsibility burden By SAS No. 59 on the auditor to consider other mitigating factors.

We argue that auditors by examining management plans to combat adverse company position, the auditor may feel that the company will remerge from the adverse circumstances through management plans. In addition, we feel that if the CFO is new to the company and the previous CFO has just resigned during the year of the audit, the auditor may be more inclined to give a modified going-concern opinion. Furthermore, CEO gender remains a factor in auditor's opinion and will continue to be a factor for future research in this area. Previous research has tackled strategic events on auditors opinion, nevertheless, has any research looked at client characteristics like turnover and gender specifically as a mitigating factor to auditor's opinion. Our results confirms our hypothesis that indeed (CFO changes) and (CFO changes non-retirement) are associated with an increase in the likelihood for a firm to receive a going-concern opinion. In addition, CEO gender has a direct impact on auditor's when issuing a going concern opinion.   We ran additional variables to control for restructuring or equity ratios or BIG4 to make sure our test results are robust. We continue to find significant association between CFO turnover and auditor's modified going concern opinion.

Our results found significantly more going-concern opinion in the 2005 when CFO had resigned or dismissed during the year of the audit before the auditor issue their opinion. Nevertheless, we found no significant result when a CEO dismissals or resignation before the auditor opinion was rendered during 2005.

The evidence presented in this paper can also be used to support the perspective that auditors abide by SAS No. 59 guidelines which proposes that auditors look at other mitigating factors when assessing clients' substantial doubt to continue as a going concern. This study finds evidence that going-concern decisions are associated with CFO turnover regardless whether the CFO turnover was caused by dismissal, resignation or retirement. It is apparent that auditors are motivated by SAS No. 59 to look at management strategic plans that may assure the auditor that the company may continue in business as usual. Furthermore, when auditors are faced with a company with a CFO leaving and a new CFO coming on board, the auditor may be more likely to issue a going concern opinion for he or she do not have a transparent picture of the new CFO plan in combating the firms business condition. CEO gender makes a significant difference on whether the auditor gives a modified going concern opinion.

To our knowledge, this the first paper examines changes in auditor opinion for companies that experience a CFO change in the year of the audit. Possible interesting future research may examine if an associated existed in the pre SOX period and in period prior to SAS No. 59 ruling.

Our paper focuses only one year, 2005 which may be a limitation to the study, further research could be used to test whether such association continues to exist in further years. We did not include a measure of industry competition as argued by Defond and Park (1999). They argued that in competitive industry, it is easier to identify unfit CEOs that may cause a higher frequency of CEO turnover. Future research may take this research a step further by finding whether those companies with CFO turnover and going concern opinion did in fact file bankrupt. It will be interesting to see some predictive value in the executive characteristics and actions for investors to capitalize on.

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Table 1: Descriptive Statistics and Univariate Tests of Differences between Distressed Firms with Going-Concern Opinion and Distressed Firms with No Going-Concern Opinions

Panel A: Continuous Variables: Mean

Variables	NGC(n=1618)	GC firms (n=331)	Test of Difference*	
	Mean	Mean	Coef.	P-value
NITA	-0.130	-1.804	10.992	0.000
CASALES	1.598	1.712	-0.697	0.486
CACL	2.750	1.190	13.670	0.000
CATA	0.506	0.536	-1.676	0.103
CASHTA	0.273	0.231	2.579	0.010
LTDA	0.211	0.351	-2.844	0.005
LNSALES	4.560	1.118	19.532	0.000

Panel B: Discrete Variables-Audit opinions in 2005

Variable	Not Modified (n=1618) N(%)	GC Modified (n=331) N (%)	Total (n=1949)	Chi-Square Tests	Asymp. Sig. (2-sided) p-value
Big4	1082 (66.9%)	64 (19.3%)	1146 (58.8%)	256.230	0.000
CFO Turnover	205 (12.7%)	63(19%)	268 (13.8%)	7.387	0.007
CEO Turnover	196 (12.1%)	29 (8.8%)	225 (11.5%)	3.024	0.082
CFOCHG2	179(11.1%)	61 (18.4%)	240(12.3%)	13.808	0.000
CEOCHG2	172 (10.6%)	26 (7.9%)	198 (10.2%)	2.319	0.128
CFOgend	30 (8.8%)	5 (14.3%)	35 (9.3%)	0.368	0.544
CEOgend	48 (3.0%)	14 (4.2%)	62 (3.2%)	1.423	0.233
CFOcode*CFOgender	22 (1.4%)	7(2.1%)	29 (1.5%)	1.069	0.301
CEO Turnover*CEOgend	6 (0.4%)	3 (0.9%)	9 (0.5%)	1.714	0.190
chg2*CFOgender	18 (1.1%)	5 (1.5%)	23 (1.2%)	0.373	0.541
CEOchg2*CEOgend	5 (0.3%)	3 (0.9%)	8 (.4%)	2.398	0.1215

Table 2 Logistic Regression 2005 Results

$Model: GC = b_0 + b_1 * NITA + b_2 * CASALES + b_3 * CACL + b_4 * CASHTA + b_5 * LTDA + b_4 * LSALES + b_7 * BIG4 + b_8 * CFO + CFOgend + CEOgend$

*,** Indicate $p < 0.05$. Chi-square values are shown in italics.

Variables	Full Sample (n=1976)	BIG4 Only (n=1100)	Full Sample (n=1976)	BIG4 Only (n=1100)
Intercept	0.29	(2.61)	0.29	-2.62
	-1.26	*10.54*	*-1.22*	*10.59*
NITA	-0.66*	-2.72*	-0.66*	-2.72*
	-24.86	*38.00*	*-24.95*	*38.23*
CASALES	-0.07	(0.10)	-0.07	-0.10
	1.93	*1.15*	*-1.87*	*1.08*
CACL	-0.39*	(0.17)	-0.39*	-0.17
	-35.44	*1.76*	*-35.457*	*1.79*
CATA	0.78*	0.57	0.78*	0.57
	-4.3	*0.47*	*-4.29*	*0.47*
CASHTA	-1.13*	(1.45)	-1.14*	-1.47
	-4.64	*1.60*	*-4.733*	*1.67*
LTDA	0.27	0.05	0.27	0.06
	-1.57	*0.01*	*-1.644*	*0.02*
LNSales	-0.46*	(0.09)	-0.46*	-0.08
	-75.92	*0.80*	*-75.64*	*0.75*
Big4	-0.37*	-0.36*		
	-2.97	*-2.83*		
CFO	-0.59*	0.66*	-	-
	-8.23	*3.72*		
CFOCHG2			0.61*	0.69*
			-8.24	*3.74*
Model Chi-Sq.	725.47*	116.56*		
[Pseudo R^2]	0.52	0.27		

Variables are defined as follows:

GC	=1 if audit opinion is going-concern modified, and 0 otherwise;
NITA	=Net Income/Total Assets;
CASALES	=Current Assets/Sales
CACL	=Current Assets/Current Liabilities;
CATA	=Current Assets/Total Assets
CASHTA	=Cash/Total Assets;
LTDA	=Long-Term Debt/Total Assets
LNSALES	=Natural Log of Sales (in millions of dollars);
BIG4	=1 for Big 4 auditor, 0 otherwise.
CFO	=1 for CFO change, 0 no change
CFOCHG2	=1 for CFO change due to non-retirement, 0 for retirement

Table 2b Logistic Regression 2005 Results

Model: $GC = b_0 + b_1 * NITA + b_2 * CASALES + b_3 * CACL + b_4 * CASHTA + b_5 * LTDA + b_4 * LSALES + b_7 * BIG 4 + b_8 * CEO$

Variables Only	Full Sample	BIG4 Only	Full Sample	BIG4 Audit Firms
	(n=1976)	(n=1100)	(n=1976)	(n=1100)
Intercept	0.38	-2.55	0.38	-2.54
	2.11	*10.13*	*2.12*	*10.10*
NITA	-0.68*	-2.78*	-0.68*	-2.78*
	25.86	*40.38*	*25.80*	*40.11*
CASALES	-0.06	-0.09	-0.06	-0.09
	1.69	*0.93*	*1.65*	*0.95*
CACL	-0.39*	-0.17	-0.39*	-0.17
	35.06	*1.86*	*35.23*	*1.85*
CATA	0.81*	0.72	0.81*	0.73
	4.60	*0.73*	*4.63*	*0.76*
CASHTA	-1.16*	-1.68	-1.16*	-1.68
	4.82	*2.18*	*4.83*	*2.18*
LTDA	0.29	-0.01	0.29	0.01
	1.83	*0.00*	*1.87*	*0.00*
LNSales	-0.45*	-0.08	-0.45*	-0.08
	73.87	*0.67*	*73.97*	*0.68*
Big4	-0.37*		-0.37*	
	2.96		*3.06*	
CEO	-0.38	0.06		
	2.07	*0.02*		
CEOCHG2			-0.42	-0.05
			2.23	*0.01*
Model Chi-Sq.	719.76*	113.14*		
[Pseude R^2]	0.51	0.27		

*,** Indicate $p < 0.05$. Chi-square values are in italics.
Variables are defined as follows:
GC   =1 if audit opinion is going-concern modified, and 0 otherwise;
NITA   =Net Income/Total Assets;
CASALES   =Current Assets/Sales
CACL   =Current Assets/Current Liabilities;
CATA   =Current Assets/Total Assets
CASHTA   =Cash/Total Assets;
LTDA   =Long-Term Debt/Total Assets
LNSALES   =Natural Log of Sales (in millions of dollars);
BIG4   =1 for Big 4 auditor, 0 otherwise.
CFO   =1 for CFO change, 0 no change
CFOCHG2   =1 for CFO change due to non-retirement, 0 for retirement

Table 2b Logistic Regression 2005 Results

Model: $GC = b_0 + b_1*NITA + b_2*CASALES + b_3*CACL + b_4*CASHTA + b_5*LTDA + b_4*LSALES + b_7*BIG4 + b_8*CEO + b9*CFO + b10*CEOgend + b11*CFOgend$

Variables	Model 1	Model 2	Model 3	Model 4
	(N=1949)	(N=1949)	(N=1949)	(N=1949)
Intercept	0.278	0.274	0.35	0.311
NITA*	-0.663	-0.663	(0.66)	-0.658
CASALES	-0.067	-0.065	(0.07)	-0.071
CACL*	-0.387	-0.388	(0.39)	-0.388
CATA**	0.819	0.822	0.79	0.798
CASHTA*	-1.290	-1.302	(1.24)	-1.243
LTDA	0.345	0.355	0.35	0.373
LNSales*	-0.476	-0.474	(0.48)	-0.479
Big4***	-0.318	-0.314	(0.31)	-0.321
CFO Turnover*	0.659		0.58	
CFOCHG2*[*]		0.673		0.671
CEO Turnover	-0.311		(0.46)	
CEOCHG2***		-0.361		-0.523
CFOgend***	0.405	0.413	0.23	0.405
CEOgend*	0.754	0.756	0.39	0.396
CFO_CFOgend			0.76	

[*]*,**, ***[*] Indicate p <0.01, 0.05, 0.10 respectively.

Variables are defined as follows:
GC　　　=1 if audit opinion is going-concern modified, and 0 otherwise;
NITA　　=Net Income/Total Assets;
CASALES =Current Assets/Sales
CACL　　=Current Assets/Current Liabilities;
CATA　　=Current Assets/Total Assets
CASHTA =Cash/Total Assets;
LTDA　　=Long-Term Debt/Total Assets
LNSALES =Natural Log of Sales (in millions of dollars);
BIG4　　=1 for Big 4 auditor, 0 otherwise.
CFOgend =1 for Female CFO, 0 no change
CEOgend =1 for Female CEO , 0 for retirement
CFO　　=1 for CFO change, 0 no change
CFOCHG2=1 for CFO change due to non-retirement, 0 for retirement
CFO　　　=1 for CFO change, 0 no change
CFOCHG2=1 for CFO change due to non-retirement, 0 for retirement

Table 3

CEO_CEOgend**			1.9	
CFOChg2_CFOgend				0.058
CEOChg2_CEOgend**				2.02
Model Chi-Sq.	726.32*	726.59*	731.21	730.59
[Pseude) R^2	0.52	0.52	0.52	0.52

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