



Dividend Policy and Inflation in Australia: Results from Cointegration Tests

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Abstract

This paper examines the relationship between dividends and inflation in Australia by testing for cointegration between these two variables. The results of the tests indicate that inflation is contributing to dividend growth. This finding can be interpreted in different ways. Trying to follow a dividend policy which is perceived to be optimal Australian firms may, for example, believe that there is a desirable level of real dividend income to be paid out to their investors. A second possible interpretation of the results would be that inflation simply increases the nominal volume of corporate earnings and thereby leads to higher dividend payments.

Keywords: Dividend policy, Inflation, Cointegration, Stock market

1. Introduction

This paper provides an analysis of the relationship between dividends and inflation in Australia by testing for cointegration between these two variables. Finding a statistically significant stable long-term relationship between dividends and the price level would be quite interesting. In fact, this approach offers a new perspective on two of the most important problems faced by the modern theory of finance. The first of these two major issues is to explain why firms pay dividends. The second important question is whether stocks are a useful hedge against inflation. Obviously, the approach suggested here will not give direct answers to these questions but will help to analyse the relationship between inflation and the dividend policy of Australian firms. The paper is organized as follows: Section 2 and 3 briefly review issues related to the optimal dividend policy of a firm and the relationship between inflation and the stock market. The fourth section describes the data sets examined. Section 5 presents the results from the cointegration tests. The final section concludes by discussing the implications of the empirical evidence presented in this paper.

2. Dividend Policy

Assuming that capital markets are perfect and that there exist no taxes and Miller and Modigliani (1961) have argued that the value of a firm is not affected by its dividend policy. Therefore, dividend changes have no economic implications and there is no optimal dividend policy for a firm. This Dividend Irrelevancy Hypothesis is based on the argument that dividends are paid from earnings and that investors do not prefer dividends to capital gains or vice versa. In fact, given that the tax laws of many countries discriminate against dividend income by taxing dividends more heavily than capital gains there even are strong arguments against dividend payments. However, dividends are regularly paid by many firms.

Agency theory may give a justification for the existence of dividend payments. Most importantly, trying to overcome information asymmetries the management of a firm can use dividend changes to signal revised earnings expectations to its investors. Testing this hypothesis has produced mixed empirical evidence. Allen and Michaely (1995) have provided an excellent survey of the literature and have noted that much work remains to be done. Taking a similar view, Collins, Saxena, and Wansley (1996) have argued convincingly that the dividend policy issue is yet unresolved.

3. Stock Prices and Inflation

Many investors seem to believe that stocks are a useful hedge against inflation. Generally speaking this assumption is based on the argument that stocks are claims on real capital. At first sight it seems to be very convincing to assume that inflation by definition increases the nominal value of real capital and therefore leads to higher stock prices. A more detailed view on the relationship between inflation and the stock market reveals a quite simple mechanism that can help

to explain why there should be a positive relationship between inflation rates and stock returns: Higher prices increase the revenues of firms leading to higher corporate earnings and – ultimately – to an increase of stock prices. While this mechanism is intuitively appealing, there are some obvious problems.

As a matter of fact, Campbell and Shiller (1988) have pointed out that two countervailing trends are present. First of all – and as already noted - inflation raises corporate earnings and increases future expected dividends. This effect is, of course, positive for stock returns. But there is also a second important effect of higher inflation rates. Namely, inflation increases the discount rate (via the Fisher effect) and therefore lowers stock prices. Given the existence of these two countervailing trends the mixed empirical evidence documented in the literature is no surprise at all. At least in the short run there is no clear picture. In fact, many econometricians have reported that stock returns and inflation rates are negatively correlated. Brenner and Galai (1978), for example, have presented a survey of earlier empirical studies. These studies in general seem to show that the inflation rate and stock returns are negatively related. Therefore, the empirical evidence published in the seventies seems to indicate that stocks are a poor hedge against inflation. In spite of the negative contemporaneous correlation of stock returns and inflation most financial economists today seem to accept the idea that inflation has a positive effect on stock returns in the long run. Boudoukha and Richardson (1993) as well as Kolari and Anari (2001) have reported empirical evidence indicating that stocks can indeed serve as long-term inflation hedge.

4. Data

Inflation is measured using the Australian All Groups Consumer Price Index which is reported on a quarterly basis by the Australian Bureau of Statistics. The index is based on a basket of goods and services known to account for a high proportion of the consumption expenditures in Australia and therefore is accepted as official measure of inflation. In fact, monetary policymakers in Australia use CPI inflation as target (see, for example, Heath, Roberts and Bulman (2004)). The current reference base period of the Australian All Groups Consumer Price Index is 1989–90.

The Australian All Ordinaries Index is usually used as proxy for the performance of the Australian stock market. This index consists of the 500 largest companies listed on the Australian Stock Exchange (measured by market capitalization) and therefore is a broad measure of stock market activity. Marrett and Worthington (2008), for example, have argued that the All Ordinaries covers about 92% of Australian companies by market value. Consequently, many investors seem to believe that the All Ordinaries Index is a suitable market indicator for Australian stocks. Data on the volume of dividends paid by the index constitutes is provided by Bloomberg (dividend per index share). Bloomberg reports data on dividends starting in the second quarter of 1999. Thus, there are just enough data points to perform cointegration tests.

5. Empirical Analysis

According to ADF-tests (not reported) both the Australian consumer price index (CPI) and the All Ordinaries stock market index dividend time series are nonstationary. As a consequence, the cointegration test developed by Johansen (1991) is used to search for a long-term relationship between the two variables. The results of the test for cointegration between consumer prices and the All Ordinaries stock market index dividend time series are reported in table 1. The test statistics indicate quite clearly that cointegration is a relevant phenomenon. Therefore, a stable long run relationship between dividends and the price level seems to exist. In other words, both variables follow a common trend. This result does not depend on the choice of the CPI as the measure of inflation. Table 2 shows that the dividend time series and the Australian GDP price deflator are also cointegrated.

Table 1. Cointegration between dividends and the CPI

Table 2. Cointegration between dividends and the GDP price deflator

Finding cointegration between dividend payments and the price level does not necessarily imply that stocks are a good hedge against inflation because dividends are only one source of equity market returns. However, the results reported above do suggest that inflation is contributing to dividend growth. There are different possibilities to interpret these empirical findings. In fact, Australian firms may assume that there is a desirable level of real dividend income to be paid out to their investors. This would imply that the corporate sector does indeed believe in the existence of some sort of optimal dividend policy. A second (and probably less noteworthy) interpretation of the results reported in table 1 and 2 would be that inflation simply increases the nominal volume of corporate earnings. Given that dividends are paid from earnings this could imply that the corporate sector also increases dividend payments.

6. Conclusion

The empirical evidence presented above indicates quite clearly that there is a stable long run relationship between dividend payments and the price level examining data from Australia. Finding cointegration between the consumer price level and the dividends payments of Australian firms does not necessarily imply that stocks are a useful hedge against inflation – especially not in the short run. This study can also not help to explain why firms pay dividends at all. However, the cointegration tests reported above do indicate that dividend changes are related to the phenomenon of

inflation. As a matter of fact, firms seem to increase their dividend payments facing an environment of a rising price level in order to stabilize the real value of dividend income. Therefore, higher inflation is a major driver of dividend increases. This finding does have a number of interesting implications. Most importantly, a higher variability of inflation may distort the ability of firms to use dividend changes to signal revised earnings expectations to their investors.

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Table 1. Cointegration between dividends and the CPI

Sample (adjusted): 1999Q4 2008Q1				
Trend assumption: No deterministic trend (restricted constant)				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.484237	26.52963	20.26184	0.0060
At most 1	0.111460	4.017979	9.164546	0.4095
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.484237	22.51165	15.89210	0.0039
At most 1	0.111460	4.017979	9.164546	0.4095
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 2. Cointegration between dividends and the GDP price deflator

Sample (adjusted): 1999Q4 2008Q1				
Trend assumption: No deterministic trend (restricted constant)				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.471150	27.54874	20.26184	0.0041
At most 1	0.159037	5.889039	9.164546	0.1995
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon, Haug and Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.471150	21.65970	15.89210	0.0055
At most 1	0.159037	5.889039	9.164546	0.1995
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon, Haug and Michelis (1999) p-values				