



# Bank dividend policy and the global financial crisis: Empirical evidence from Europe

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## ABSTRACT

The global financial crisis has caused controversial discussions about the capital base of the banking industry in Europe. Dividend cuts and omissions have been suggested as one possibility to improve the financial strength of banks by retaining earnings. However, there are fears that investors could interpret a reduction of dividends as a sign for future problems. The dividend signalling and dividend smoothing hypotheses quite clearly are the theoretical basis for these worries. The basic idea of this study is that without empirical evidence supporting the hypothesis dividends did matter in the past, banks should not fear dividend cuts or even dividend omissions. The empirical evidence from the European banking industry reported here does not indicate that dividend signalling and dividend smoothing are relevant economic phenomena.

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## 1. Introduction

The world economy has suffered from the consequences of the global financial crisis. The banking sector was hit especially hard. Therefore, it is no surprise at all that stock prices of banks all over the world have dropped significantly. While the problems clearly originated in the U.S. housing market many European banks have also been affected by the crisis. These major difficulties of the financial services industry resulted in bailouts and nationalizations. There also is a time dimension to the problem. At first, losses at banks were directly related to the U.S. subprime crisis (mortgage backed securities and collateralized debt obligations). Then the global recession increased the volume of nonperforming loans and caused falling stock prices and a widening of credit spreads. Meanwhile, fiscal problems of some European countries even have caused concerns about sovereign credit risk. At the moment, new (and higher) capital requirements as already codified in Basel II, rating downgrades of debtors and expected future loan losses will increase the demand for capital. Moreover, as a reaction to the crisis there are discussions to further tighten bank capital standards (e.g., Rajan, 2009; Bullard et al., 2009). In sum, the banking sector not only in Europe has been, still is and most certainly will be in need of additional capital.

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Banks only have limited possibilities to strengthen their capital base. Given that numerous banks already had issued new equity raising capital from external sources there was a shortage of capital for financial institutions in 2009. Private investors simply did not want to increase the exposure to banks in their equity portfolios. In many countries governments stepped into the breach and even nationalised some banks. Due to harsh criticism of the bank rescue plans in the U.S. and other countries banks would at the moment experience major difficulties to obtain additional help from governments. Especially the U.S. media criticized that banks used “taxpayer funds” to pay dividends. Meanwhile, stock prices have at least partly recovered. The Dow Jones Stoxx 600 Banks Price Index, for example, has risen considerably from its lows in March 2009. However, it could still prove to be quite expensive for banks to obtain additional capital by issuing new equity. Banks might also decide to reduce their exposure to risk. This would imply that the banking sector would have to lower the supply of credit (at least in the short run – see [Buch and Prieto \(2012\)](#) on long and short run effects of changes to bank capital on loans). However, in a recession economic policymakers certainly are not interested in reducing the availability of bank credit because there are fears that a negative shock to credit supply could further hurt the economic activity. [Walsh and Wilcox \(1995\)](#), for example, have shown that loan supply shocks did have a negative effect on the U.S. output examining data from the 1960s and 1970s. Moreover, [Akhter et al. \(2010\)](#) recently also have provided empirical evidence indicating that the availability of credit helps to avoid poverty. Therefore, economic policymakers surely do not favour a reduction to bank lending in an economic crisis. In fact, the government bailouts in Europe and other parts of the world have mainly been intended to stabilize the availability of credit.

Banks can also improve their capitalisation by cutting or even omitting dividend payments. However, some observers seem to fear that investors and financial analysts could interpret a reduction of dividend payments as a negative signal indicating future problems. These discussions do have a history. In fact, [Mayne \(1980\)](#) has noted that U.S. banks used dividend cuts to improve their capital base in the banking crisis of the years 1973 to 1976. More recently, [Boldin and Leggett \(1995\)](#) have argued that retained earnings were the primary source of capital for the U.S. banking industry after the savings and loan crisis. However, [Bessler and Nohel \(1996\)](#) have pointed out that bank managers in the U.S. were reluctant to cut dividends in the 1980s despite suffering losses. After the subprime crisis the Federal Reserve, for example, in early 2012 did not want to permit Citigroup to raise its dividend in order to improve the ability of the bank to cope with future financial shocks. Interestingly, the financial press had reported that shareholders back then had been pressuring U.S. banks to pay higher dividends.<sup>1</sup>

Given these controversial discussions about dividend cuts we plan to empirically analyse the dividend policy of the European banking industry using a framework that has recently been suggested by [Reddemann et al. \(2010\)](#). More precisely, we are searching for hints indicating that dividend signalling or dividend smoothing are relevant economic phenomena using vector autoregressive models (VAR) (respectively vector error correction models (VECM)). In short, the basic idea of this study is that without empirical evidence supporting the hypothesis that dividends did matter in the past, analysts and other stakeholders should not react on or fear dividend cuts or even dividend omissions by the respective bank.

The paper is organized as follows: [Section 2](#) discusses dividend policy issues from the perspective of corporate finance theory. [Section 3](#) then provides a literature review focussing on empirical tests of the theories of dividend determination introduced in [Section 2](#). The fourth section describes the data sets examined and discusses some methodological issues. In [Section 5](#) the empirical evidence is presented. The final section concludes.

## 2. Some thoughts about dividend policy issues

In their seminal paper [Miller and Modigliani \(1961\)](#) have argued convincingly that the dividend policy of a firm is irrelevant assuming that the firm's investment policy is given, capital markets are perfect and taxes do not exist. In this environment higher dividends simply result in lower capital gains. Consequently, the dividend policy of a firm does not have any economic relevance when investors do not prefer dividends to capital gains or vice versa. Therefore, it could be argued that the controversial discussions about dividend cuts or omissions of banks are pointless and that banks should reduce the volume of dividend payments to strengthen their capital base without having to fear any negative consequences.

The dividend irrelevancy hypothesis obviously produces major difficulties in trying to explain the existence of dividends. In fact, there is a dividend puzzle because it can be observed that numerous firms in many countries regularly pay dividends. The corporate finance theory has suggested a number of arguments why dividends may not be irrelevant at all. The most popular approaches to explain the existence of dividend payments are based on agency theory. These theoretical concepts rely on the assumption that the management of a firm is not necessarily motivated to act in the best interest of the owners.<sup>2</sup> In fact, it is quite common to argue that dividend payments lead to a reduction of free cash flow and thereby force the management of a firm to obtain capital from external sources more frequently when new investment projects have to be financed. Raising new capital forces a firm to give information to investment bankers, prospective investors and other economic agents. This process of providing information to financial market participants is assumed to reduce agency costs helping the owners to monitor and control the management of the firm. However, obtaining capital from external sources by issuing new equity generates transaction costs. According to this theory the optimal dividend policy of a firm should minimize the sum of the transaction costs and the agency costs.

<sup>1</sup> Reports discussing this problem have, for example, been published by the New York Times and Bloomberg News.

<sup>2</sup> It could also be argued that firms may run out of lucrative investment projects and in this case should return financial funds to investors by increasing dividend payments. However, given that central banks not only in the U.S. and UK have lowered the refinancing costs banks at the moment seem to have many profitable investment opportunities.

It is also very popular to argue that dividend changes can be used to overcome information asymmetries, being dissipative signals. According to this so-called dividend signalling theory – which is one of the most important approaches to explain the existence of dividend payments – managers can reduce or increase dividends to signal revisions to earnings expectations to financial analysts and investors. Moreover, it has also been suggested that firms try to avoid the need to reduce dividend payments because of concerns that dividend cuts or omissions could be perceived to give disturbingly negative signals to external economic agents. According to this so-called dividend smoothing hypothesis dividends are rarely decreased but also not increased to an unsustainable level. Dividend smoothing can be interpreted as dividend signalling with precaution. In order to avoid dividend cuts there should only be increases to dividend payments when the management of a firm believes that future cash flows are strong enough to enable the firm to sustain the new higher level of dividend payouts. This theory does also assume that a strong link between dividend payments and corporate earnings exists. However, [Goddard et al. \(2006\)](#) have argued convincingly that the signalling and smoothing hypotheses make opposing predictions about the temporal relationship between corporate earnings and dividend payments. While the dividend signalling hypothesis assumes that dividends should lead corporate earnings the dividend smoothing hypothesis predicts that earnings should lead dividend payments.

Banks are often seen to be special. [Allen \(2001\)](#), for example, has argued that standard microeconomic theory does have some problems in trying to explain the role of financial institutions and has pointed towards some inconsistencies assuming that there is an agency problem investing directly in firms and no agency problem giving funds to a bank. Macroeconomists, on the other hand, tend to believe that banks are of special importance (e.g. [Himmelberg and Morgan, 1995](#)). The global financial crisis has given some support to this hypothesis as the problems in the banking industry have had major negative consequence for the world economy. This essential macroeconomic role is an important reason for banks being subject to special regulatory requirements. It is quite popular to argue that government regulation may also affect the payout policy of banks (e.g., [Rozeff, 1982](#); [Bessler and Nohel, 1996](#)). Obviously, one of the main goals of bank regulation is to protect the customers. However, it can be argued that bank regulation also reduces the agency costs borne by the shareholders of a firm by providing an external monitoring instance. According to this view dividend payments by banks and other regulated industries are even more puzzling than dividend payments by industrial firms. Similar problems also do arise in the insurance industry. In an attempt to explain dividend payments by insurance companies [Casey et al. \(2007\)](#) have argued that investors in the insurance sector prefer a high degree of leverage since regulation does protect not only customers but also investors against insolvency. This interesting hypothesis predicts that investors can use the dividend income from holding insurance stocks to obtain other financial assets and maintain a high level of relatively risk-free leverage with their portfolio of insurance stocks.

On the other hand, some financial economists argue that it is quite difficult for external economic agents to adequately evaluate the market value of a bank's assets. [Boldin and Leggett \(1995\)](#), for example, have noted that market values are not presented on a continuous basis to external economic agents. Therefore, investors, depositors and creditors cannot easily distinguish well-run from poorly managed banks. As a consequence, dividend signalling could even be more important for banks than for industrial firms. Again, similar arguments have also been made with regard to the insurance industry. [Akhigbe et al. \(1993\)](#), for example, have noted that it is very difficult for external economic agents to assess the true economic condition of any insurance company at a particular point of time. Most importantly, they have argued that accounting procedures frequently hide major changes in the market values of real estate holdings which, of course, are an important asset class for the insurance industry.

Higher dividend payouts also imply a smaller contribution to capital, weakening the financial strength and thereby the ability of a bank to take more risks. Therefore, in the banking industry an increase to dividend payments is not always seen as a positive signal by investors and financial analysts (e.g. [Boldin and Leggett, 1995](#)). Yet again, similar arguments have been discussed in the literature examining the dividend policy of insurance companies (e.g. [Harrington, 1981](#); [Akhigbe et al., 1993](#)).

### 3. Literature review

In economic theory it is very common to discuss dividend policy issues from the perspective of industrial firms. Therefore, empirical research has focussed mainly on this type of companies. In fact, there have been numerous studies reporting empirical evidence for industrial firms and it would certainly be beyond the scope of this paper to provide a survey of this literature. Moreover, this is also not necessary because there already are some excellent review articles (e.g. [Allen and Michaely, 1995](#); [Bhattacharyya, 2007](#)). However, it has to be noted that only few econometricians have focussed on the dividend policy of the banking industry. Given that dividend policy issues often are discussed from the viewpoint of Miller and Modigliani this is probably no major surprise. In this world analysing bank dividend policy means examining irrelevant firms doing irrelevant things. This is hardly a motivation for applied econometricians. [Rozeff \(1982\)](#), for example, has analysed the determinants of the dividend policy of U.S. firms and has omitted banks, insurance companies and other regulated industries from his empirical investigations restricting his analysis to unregulated industries.

Still, there have been some important studies mostly examining U.S. data. Back in the 1970s [Gupta and Walker \(1975\)](#) have shown that bank dividends are related to corporate profits, total asset growth and liquidity. [Mayne \(1980\)](#) has documented that the size of a bank does influence dividend policy examining data from more than 12,000 U.S. banks. Larger banks seem to pay higher dividends. This empirical finding is explained by the facts that the stocks of larger banks are more widely held and that these institutions have better access to external capital and therefore do depend less strongly on internally generated funds. Moreover the study shows that banks affiliated with holding companies tend to pay higher dividends than independent banks. [Boldin and Leggett \(1995\)](#) have found empirical evidence supporting the dividend signalling hypothesis examining data from 207

U.S. banks and employing cross sectional regression techniques. They have used credit ratings as a proxy for expected future earnings and have reported a statistically significant positive relationship between dividends and credit ratings. Collins et al. (1996) have analysed how dividend payout ratios have reacted to changes to insider holdings (which obviously affect agency costs) examining data from the U.S. financial services industry (38 banks and 15 insurance companies). They have argued that there are similarities to the behaviour of firms in unregulated industries. Banks and insurance companies tend to increase their dividend payout ratios when the level of insider holdings decreases. Bessler and Nohel (1996) have documented that banks experience statistically significant negative abnormal returns around the announcement date of dividend cuts or omissions. Financial markets also seem to react more strongly to dividend cuts of banks than to dividend cuts of non-financial firms. More recently, Dickens et al. (2003) have identified a number of possible relevant factors for the dividend policy of U.S. banks and have reported that there are five statistically significant determinants of dividends. According to their study the relevant factors are investment opportunities, size, agency problems, dividend history and risk. These findings have been confirmed by Theis and Dutta (2009). Only very few authors have shown an interest to study the dividend policy of European banks. Most importantly, Eriotis et al. (2007) have shown that the dividend policy of Greek banks differs from the dividend policy of Greek industrial firms in a statistically significant way. More precisely, bank managers in Greece seem to be less interested in paying a stable long run target dividend.

To sum up, the empirical findings reported in the relatively few studies of bank dividend policy do provide some insights but certainly no clear answers to the question why dividends are paid. In spite of far more research efforts this can also be said about results reported for industrial firms. Thus, there are some similarities. In fact, many financial economists seem to believe that an additional empirical evidence is needed (e.g. Allen and Michaely, 1995; Collins et al., 1996).

#### 4. Data and methodology

Bhattacharyya (2007) has noted that properly conducted future empirical research should account for all implications of the underlying economic theories of dividend policy. Most importantly, Basse (2009) has suggested that inflation may be relevant arguing that this important macroeconomic variable is a major driver of dividend growth which is usually neglected in empirical tests of theories of dividend determination. This fact could help to explain why the dividend policy issue is not resolved yet. As a matter of fact, a gradual increase of dividend payments due to higher inflation rates could, for example, be falsely identified as empirical evidence supporting the dividend smoothing hypothesis.

Therefore, this study tries to analyse the dividend policy of European banks by also considering inflation. In order to do so we use a variant of the VAR approach introduced by Goddard et al. (2006) who have examined the relationship between dividend payments and corporate earnings. This variant has been suggested by Reddemann et al. (2010) and employs VECM techniques in conjunction with impulse response analysis. The approach also considers inflation as a third endogenous variable of the model. The approach obviously requires us to take a more macroeconomic perspective examining aggregate data on earnings and dividends. Therefore, we analyse quarterly data on dividends per index share and earnings per index share of the Euro Stoxx Banking Index. These time series are supplied by Bloomberg. Inflation is measured by the EMU consumer price index reported by Eurostat. This is a very popular gauge of inflation in the Euro Zone. As a matter of fact, Fama and Schwert (1977) have noted that eventual consumption is the purpose of investing in financial assets and that therefore the consumer price index is the correct measure of inflation in the context of financial econometrics. In order to avoid possible problems with structural breaks due to the introduction of the Euro in January 1999 our sample is from 1998 Q4 to 2008 Q4.

To test for cointegration we use the procedure suggested by Johansen (1991). This multivariate cointegration test is based on VAR techniques. In Eq. (1)  $y$  is a vector of  $m$  possibly non-stationary variables,  $A_i$  is a  $m \times m$  matrix (with  $i = 1, \dots, n$ ), and  $c_1$  and  $c_2$  are  $m$  vectors of constants respectively trend coefficients:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_n y_{t-n} + c_1 + c_2 t + u_t. \quad (1)$$

The error term  $u_t$  is assumed to be normally distributed. Differentiating and rearranging yields:

$$\Delta y_t = (A_1 - I) y_{t-1} + A_2 y_{t-2} + \dots + A_n y_{t-n} + c_1 + c_2 t + u_t \quad (2)$$

$$\Delta y_t = (A_1 - I) \Delta y_{t-1} + (A_1 + A_2 - I) y_{t-2} + \dots + A_n y_{t-n} + c_1 + c_2 t + u_t \quad (3)$$

$$\begin{aligned} \Delta y_t &= \Pi_1 \Delta y_{t-1} + \Pi_2 y_{t-2} + \dots + \Pi y_{t-n} + c_1 + c_2 t + u_t \\ &= \sum_{i=1}^{n-1} \Pi_i \Delta y_{t-i} + \Pi y_{t-n} + c_1 + c_2 t + u_t \end{aligned} \quad (4)$$

where:  $\Pi_i = -(I - \sum_{h=1}^i A_h)$ ,  $\Pi = -(I - \sum_{i=1}^n A_i)$ .

The cointegration test is based on determining the rank of the so-called long run impact matrix  $\Pi$ . There exist  $k$  cointegration relationships among the variables when the rank of the matrix  $\Pi$  is  $k < m$ . The trace statistic tests the null hypothesis that there

are at most  $k$  cointegration relationships where  $\lambda_i$  are the  $m - k$  ordered eigenvalues from the reduced rank regression.  $T$  is the number of observations:

$$\text{Trace} = -T \sum_{i=k+1}^m \ln(1 - \lambda_i). \quad (5)$$

Cointegration describes an equilibrium relationship between non-stationary variables which share common stochastic trends. When cointegration relationships among the variables examined do exist this important information has to be used in the process of model building by estimating a vector error correction model (VECM). The dynamics of this model can then be analysed estimating impulse response functions.

The dividend signalling and dividend smoothing hypotheses quite clearly are the theoretical basis for the argument that banks should be extremely careful when using dividend cuts or omissions to strengthen their capital base. Therefore, it has to be tested whether dividend signalling or dividend smoothing are relevant economic phenomena. Following [Goddard et al. \(2006\)](#) and [Reddemann et al. \(2010\)](#) empirical evidence indicating that dividends lead corporate earnings would be supportive for the dividend signalling hypothesis while the finding that earnings lead dividends would give support to the dividend smoothing hypothesis.

## 5. Results

ADF- and KPSS-tests (not reported) indicate that the three time series examined in this study are non-stationary and integrated of order 1. The cointegration tests reported in [Table 1](#) signal that two cointegration relationships exist between the three variables general price level (EMU\_CPI), corporate earnings (Indx\_Eps\_Before\_XO) and dividend payouts (Dvd\_Sh\_Last). The critical values for the test are from [Doornik \(1998\)](#). Seasonal dummies were included in the testing for cointegration because the dividend time series shows strong seasonality. Different deterministic trend assumptions did not affect the results. Due to the limited amount of data points available we use 4 time lags estimating the model. Analysing the residuals of the VECM does indicate randomness; the Portmanteau test with 12 lags yields a p-value of 0.3418. Given the restrictions to data availability there may be problems with a small sample bias. As a matter of fact, [Hargreaves \(1994\)](#) has performed Monte Carlo experiments indicating some difficulties using the Johansen test with less than 100 data points. However, he has also argued that applied econometricians commonly work with sample sizes of about 50 observations.

Impulse response functions are generated using the Cholesky decomposition. Therefore the results may be sensitive to the ordering of the variables. In this study an economic theory quite clearly dictates the ordering of variables (general price level → earnings → dividends) because the general price level obviously is the most exogenous variable and dividends are paid from corporate earnings so that dividends should be seen as the least exogenous variable (with regard to variable-ordering induced problems of impulse-response analysis see, for example, [Basse and Reddemann, 2010](#)). According to [Hoover and Jordá \(2001\)](#) the VECM can now be considered to be a structural model. The confidence intervals (95% level) are computed using Efron bootstrap techniques (e. g. [Efron and Tibshirani, 1993](#)). Examining the impulse response functions displayed in [Fig. 1](#) does indicate quite clearly that there is no empirical evidence for dividend signalling or dividend smoothing because neither the response of dividends to a shock to corporate earnings nor the reaction of earnings to a shock to dividends is statistically significant.

Interestingly, there is a statistically significant positive reaction of the inflation variable to a shock to dividend payouts. This empirical finding obviously does not imply that dividends “cause” inflation in a philosophical sense. The impulse response function only indicates a Granger causality; firms seem to anticipate future inflation rates and tend to adjust their dividend policy to expected changes to the general price level. This result quite clearly shows that inflation can be an important variable testing the theories of dividend determination.

## 6. Conclusion

In examining the dividend policy of the European banking industry there is no empirical evidence indicating that dividend signalling and/or dividend smoothing are relevant economic phenomena using the approach suggested by [Reddemann et al.](#)

**Table 1**  
Johansen cointegration test results.

Johansen trace test					
Range: 1998Q4–2008Q4					
4 time lags, seasonal dummies					
R0	Trace stat.	90%	95%	99%	p-values
0	47.94	32.25	35.07	40.78	0.0010
1	23.92	17.98	29.16	24.69	0.0134
2	6.19	7.60	9.14	12.53	0.1828

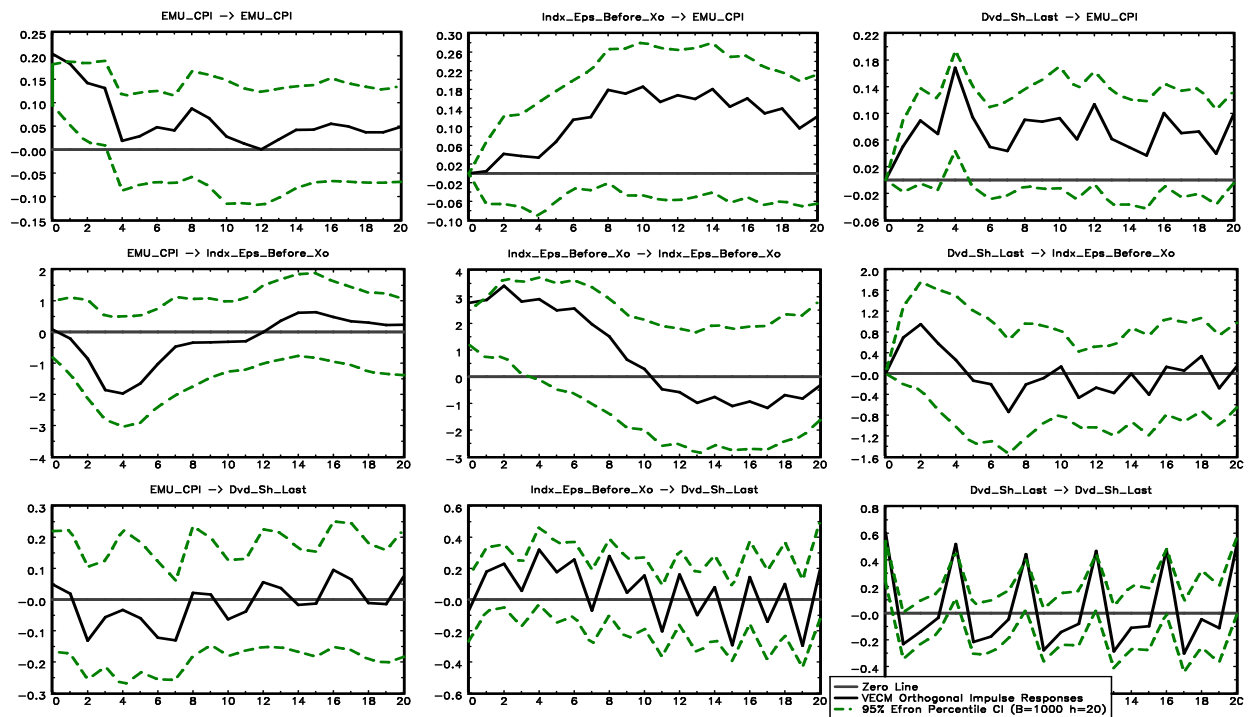


Fig. 1. Impulse response functions (OLS).

(2010). Therefore, facing a severe financial crisis, European banks should definitely consider cutting or omitting dividends to improve their financial strength. The fears of major negative consequences due to investors and financial analysts assuming that dividend reductions are a reliable sign for future problems are not supported by the data sets analysed here.

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