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By Invitation:

Dr Azar is Full Professor of Finance and Economics at Haigazian University. The views expressed in the note are his and do not necessarily reflect the views of Blominvest Bank. The note is slightly on the quantitative-econometric side, so it might be a bit difficult for readers with not enough background to follow, but the overall analysis and conclusions are sound and clear.

Lately there was a renewed interest about the relation between the inflation rate and stock returns (Azar, 2022)¹. However, the case of Lebanon has not been considered and tested so far. This is the purpose of this note. It will check the theory on two share prices, BLOM Listed, which is a bank, and Solidere A, which is a real estate firm. They are two of the largest three listed companies on the Beirut Stock Exchange. The background theory is called the inflation irrelevance proposition and it posits that inflation, and more strongly foreign exchange rates, do not have a significant statistical relation with stock returns. The proposition follows from the notion that stock prices are the present values of future cash flows discounted at an appropriate discount rate. If the inflation rate is higher then, both the cash flows and the discount rate are upped leaving the present value the same. This is strongly true on average even if the market is imperfect, or taxes are distorting, or money illusion exists. Moreover, in addition for testing for inflation irrelevance, the note will include a discussion of financial market efficiency. Briefly, the irrelevance proposition robustly applies, and financial efficiency is roughly found, more strongly for the BLOM stock than for Solidere.

We begin with the data. They span the monthly period between January 2008 and December 2021, or 168 observations. They include both stable periods and highly unstable hyperinflation periods. Monthly values for the share prices of BLOM are obtained from the web site investing.com, and are about the listed prices of the bank's shares. Solidere A share price data are retrieved from the database of Blominvest Bank. The inflation rate is found on the page of the Lebanese central agency for statistics (CAS). The monthly average foreign exchange rate of the US dollar is taken from the web site [lirarate](http://lirarate.com). The remaining variables, the domestic and foreign deposit and loan interest rates, and the coincident indicator, are from the web site of the Banque du Liban.

¹ Azar, S. A, (2022). *Inflation, Inflation Variability, and Stock Returns*. Book Publisher International, India and UK.

First, let us consider BLOM. The model is classic in its specification. The BLOM stock log returns are regressed on the inflation rate, the percentage change in the US dollar, the percent change in the coincident indicator, and the change in the LBP and US loan rates. See Table 1.

All coefficients are elasticities. This model is obtained from the theoretical Gordon constant growth dividend formulae. For details see Azar (2022). Remarkably, the regression's ANOVA F-test carries a value of 0.524, way below any conventional critical value. The regression's p-value is 0.2146, is higher than 10% and denotes that the whole functional specification is rejected: there is no statistical significance. Or, in other terms, the 4 independent variables fail to explain significantly stock prices. This is evidence in favor of semi strong market efficiency whereby public information is already incorporated in stock prices and therefore does not affect these prices².

Table 1:
 Dependent Variable: D(LOG(BLOM))
 Method: Least Squares
 Sample: 2008M01 2021M12
 Included observations: 168
 HAC standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006224	0.007221	-0.861951	0.3900
D(LOG(CPI))	0.384370	0.266700	1.441208	0.1515
D(LOG(AVERAGE))	-0.283274	0.227169	-1.246975	0.2142
D(LOG(CI))	0.080656	0.097988	0.823121	0.4116
D(ILOANLL/1200)	9.581413	11.98223	0.799635	0.4251
D(ILOANUS/1200)	-8.789196	29.83586	-0.294585	0.7687
R-squared	0.025234	Mean dependent variable	-0.005561	
Adjusted R-squared	-0.004852	S.D. dependent variable	0.082826	
S.E. of regression	0.083026	Akaike info criterion	-2.104256	
Sum squared residuals	1.116727	Schwarz criterion	-1.992686	
Log likelihood	182.7575	Hannan-Quinn criterion	-2.058976	
F-statistic	0.838732	Durbin-Watson stat	1.751832	
Prob. (F-statistic)	0.524025	Wald F-statistic	1.434390	
Prob. (Wald F-statistic)	0.214595			

Unfortunately one anomaly can be noticed. The intercept in Table 1 is not statistically significant, which means that on average BLOM returns have respectively a zero conditional and unconditional values. The expectation is for a positive intercept. Hence

² Weak form efficiency is also applicable as BLOM returns are described by a martingale, which is a special case of a random walk, that has a zero drift or intercept. As such, stock prices are unpredictable by past, previous, or prior information.

the BLOM share price did not provide a positive reward in terms of average capital gains yields.

Finally, the regression in Table 1 demonstrates that inflation and changes in the US dollar exchange rate are separately and jointly statistically insignificant as explanatory variables. This is in very strong support to the inflation irrelevance proposition. Hence the BLOM shareholder turns out to be a sophisticated investor, quite like his foreign counterpart, and on whom international standards are germane. One last comment is in order. The evidence in the literature is for a statistically significant and negative effect of interest rates on stock prices, an effect which measures interest rate risk and reflects a duration factor³. This is true for the non-bank sector. However, the banking sector may or may not respond negatively to interest rates. Higher loan interest rates are likely to initiate a rise in profits, and a rise in stock returns, i.e. a positive relation. However, the effect of higher rates on a bank could also be negative following the duration mechanism. It could also be negative if higher interest rates raise deposit rates well before loan rates, because of the difference in maturities. On net, it seems that stock returns are not affected. Anyway, the fact that interest rates do not impact stock returns can be interpreted as an even more semi strong efficiency result because public information present in current interest rates is not priced⁴.

In Table 2 the regression results for Solidere A are reported. The model includes the now classic independent variables, inflation, the percent change in the US dollar rate, the percent change in the coincident indicator, the change in real domestic deposit interest, the change in inflation, the percent change in real returns on the dollar, and the first lag of the dependent variable. Since the effect of the latter is statistically significant, with a t-statistic of 2.514 and an actual two-tailed p-value of 0.0129, then the direct conclusion is that Solidere prices are not weak form efficient. Past information, embodied in the lagged variable, explains significantly current stock returns. However, this is not evident if one adjusts for transaction costs and risk considerations. Hence, past information may not be profitable and worthy of taking advantage of. Notable features of the regression results is that the duration coefficients on the change in the real rate and in inflation rates is around -54.55, and are statistically significant. The estimate of 54.55 is in years. By comparison a stock has usually an infinite horizon and life. It implies a dividend yield of 1.83%, $=1/54.55$, which is rather on the low side, and this agrees with Solidere's history of low dividend distributions.

However, the significance of the duration effect is noteworthy. This is due to the fact that Solidere is not a bank but a real estate firm, and is adversely affected by a rise in the discount rate and in the opportunity cost of capital. It was argued above that the absence of effect of current, publicly known, interest rates supports weak form market efficiency. This is not totally exact. The variable is the *change* in interest rates and may indicate the realization of an unexpected news component if the interest rate is a random walk, like it is empirically found. Unexpected news are generally believed and

³ Duration is negative and is measured in years. It is a weighted average of the yearly cash flows multiplied by the time period. It is always less than the maturity. It reflects the sensitivity of a security to interest rate changes. For example, a coefficient of -54.5 means that a one basis point increase in interest rates decreases the security price by 0.545%.

⁴ Two stability tests on the regression, or Ramsey's RESET tests, produce p-values of 0.9157 and 0.3986 on including in the regression respectively the squared fitted variable alone, and the tripled fitted variable in addition to the squared fitted variable. The null hypothesis of stability and well-specification fails to be rejected. This supports indirectly the absence of breakpoints, although the sample witnesses stable and unstable values of the regressors.

presumed to impact both nominal and real macro and financial variables. The regression intercept, or conditional mean, is also on average zero, which is startling. Finally, the inflation irrelevance proposition is proven correct as the inflation variable enters with no statistical significance in the regression (Table 2). The t-statistic is 0.775 and the p-value is 0.4396, failing to reject the null of independence. The strong form of the inflation irrelevance proposition is also proven correct as the US dollar variable enters with no statistical significance in the regression (Table 2). The t-statistic is 1.6723 and the p-value is 0.0964, failing to reject the null of independence⁵.

Table 2:
 Dependent Variable: D(LOG(SOLIDERE))
 Method: Least Squares
 Sample: 2008M02 2021M12
 Included observations: 167
 HAC standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006800	0.005284	-1.286897	0.2000
D(LOG(CPI))	0.105094	0.135639	0.774805	0.4396
D(LOG(AVERAGE))	0.290417	0.173663	1.672305	0.0964
D(LOG(CI))	-0.002442	0.138270	-0.017664	0.9859
D(ILL/1200-D(LOG(CPI)))	-54.54234	24.38586	-2.236638	0.0267
D(D(LOG(CPI)))	-54.64986	24.08126	-2.269393	0.0246
D(IUS/1200+D(LOG(AVERAGE))- D(LOG(CPI)))	0.047217	0.201897	0.233866	0.8154
D(LOG(SOLIDERE(-1)))	0.346343	0.137775	2.513838	0.0129
R-squared	0.277055	Mean dependent variable		0.001802
Adjusted R-squared	0.245227	S.D. dependent variable		0.077012
S.E. of regression	0.066906	Akaike info criterion		-2.524336
Sum squared residuals	0.711751	Schwarz criterion		-2.374971
Log likelihood	218.7820	Hannan-Quinn criterion		-2.463712
F-statistic	8.704800	Durbin-Watson stat		1.889058
Prob. (F-statistic)	0.000000	Wald F-statistic		36.72279
Prob. (Wald F-statistic)	0.000000			

⁵ The same two stability tests on the regression, named as Ramsey's RESET tests, produce p-values of 0.1617 and 0.3768 on including in the regression respectively the squared fitted variable alone, and the tripled fitted variable in addition to the squared fitted variable. The null hypothesis of stability and well-specification fails to be rejected. This supports indirectly the absence of breakpoints, although the regressors take both stable and unstable values.

As a conclusion, financial market efficiency is a common feature of the two stocks. Past information does not help in predicting the BLOM share prices, public information is already incorporated in BLOM stock prices, and they are rightly depicted as weak form and semi strong market efficient. In addition BLOM share prices carry no interest rate risk following interest rate changes, and leave no place for duration effects. Nevertheless, BLOM's average conditional and unconditional returns are nil while they are expected to be positive. Solidere seems to present weak form market inefficiency as historical prices predict current prices, but it is questionable whether this relation is profitable after allowance for transaction costs and risk adjustment. Solidere has conventional duration effects of around 55 years in conformity to international evidence. The other part of the analysis, which is the major and most important part, is that inflation irrelevance is very strongly supported for BLOM and rather strongly for Solidere. This conclusion increases significantly the extent of the support for inflation irrelevance worldwide. Therefore, Lebanon is not an exception to this new and original paradigm. Hyperinflations and mega depreciations do not leave an impact on stock prices, which is immune of such adverse conditions. This is at face value counterintuitive but is evidence of the existence of vast and widespread rationality in financial markets.

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