The Short-Run Dynamics of Primary Placements and the Diversification Benefits of Universal Banking¤

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Abstract

This paper provides an empirical analysis of the impact of macroeconomic factors on the aggregate volume of securities issuance, and on the level of industrial loans outstanding, for the US. The analysis is conducted within a simultaneous equations framework. We find that the issuance of stocks and bonds, as well as changes in the outstanding stock of loans are interrelated, forward looking, and influenced by business conditions. Moreover, diversification benefits for universal banks are relevant, as both the issuance of bonds and loans respond to changes in the current level of economic activity and monetary policy, but in opposite ways.

Keywords: External Finance, Market Prices.

JEL classification codes C30, G32.

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I Introduction

This paper provides an empirical analysis of the impact of macroeconomic factors on the aggregate volume of securities issuance, and on the level of commercial and industrial loans outstanding, for the US economy. We disregard long-run trends of the markets, focussing instead on the short-term dynamics, to study how the equilibria of the markets are influenced by the business cycle. Furthermore, we try to shed some light on how macroeconomic shocks impact on different streams of bank revenues. Investment banks, in fact, earn fees by underwriting, and placing in the market, securities issued by corporations, while the main stream of revenues for commercial banks is the interest on commercial and industrial loans. Universal banks provide both securities intermediation services and direct lending; if the issuance of securities is imperfectly correlated with direct lending, universal banks are better suited to face macroeconomic shocks. The fees from underwriting securities generate, in this case, important diversification benefits, yielding more stable revenues.

Like previous studies, such as Pástor and Veronesi (2005), and Ivanov and Lewis (2008), we undertake analysis of securities issuance at monthly frequency. However, while they use data on the number of transactions, we employ a newly constructed dataset which gathers monthly aggregate data on the volume of issuance, from January 1973 to June 2007. This difference is relevant, because the fees that banks earn are proportional to the volumes intermediated. We study reduced form equations, by regressing the rate of growth of equilibrium aggregate quantities (volumes of issuance) on factors different from their prices, focusing in particular on secondary market prices, short-term interest rates, and business cycle indicators. By jointly considering the issuance of shares, debt and loans, we hope to obtain a more clear picture of the dynamics which drive the different markets. The simultaneous-equations approach followed in this study makes it possible to analyze in an unifying framework how the issuance of securities is related with direct lending, and therefore whether there is potential for diversification benefits between

underwriting and lending activities.

We find substantial evidence that the different markets are interrelated. The general evidence is that business conditions indicators can explain a sizeable proportion of the time-series variability of the volumes of securities traded in primary markets.[1] For instance, both the issuance of bonds and industrial loans react to changes in the rate of economic activity and monetary policy stance, but in opposite ways: bond issuance rises when interest rates and the industrial production decline, while the opposite holds for loans. This finding has important implications, as diversification benefits for universal banks become relevant. Fees from bonds issuance may provide an important hedge for banks in periods of low interest rates when, for instance, the FED reacts with expansionary monetary policies to economic downturns. We also find that an important factor explaining the different behavior of bonds and loans is the persistence in the two series. Loans are much more persistent, so that any shock has much longer memory. As a consequence, short-term trends in bond issuance change much faster than those of loans, which are sluggish, because banks provide insurance to industrial firms. Bonds, on the contrary, are extremely sensitive to current market conditions, and market timing is a crucial factor in corporate bonds issuance. We find, in fact, that not only the issuance of stocks, but also that of bonds is forward-looking, strongly reacting to higher prices in secondary markets. Non-financial firms, thus, react to changing market conditions initially by recurring to bank lending, for example by using commitment loans, and by issuing securities only when market conditions become favorable. This dynamics is also supported by the empirical result that the issuance of industrial loans Granger-causes corporate bonds, but not vice versa.

The remainder of the paper is organized as follows. Section II discusses the relevant literature. Section III describes the dataset. Section IV introduces the empirical model and the econometric technique employed to conduct the analysis. Section V discusses the empirical results while Section VI concludes.

[1]The results we obtain for primary placements of shares are in line with the existing literature (see, for instance, Lowry (2003) and Ivanov and Lewis (2008)).

II The literature

The issuance of shares and debt have been the subject of extensive research. The aim of this literature is to explain the underlying causes of the dramatic swings in the volume of primary placements of shares and bonds observed in developed financial markets. The literature has evolved into two different strands. In the first strand the issuance of shares and debt is normally analyzed in the context of the optimal decision of the firm. The empirical studies have been mainly conducted by employing firm-level data and have focused on predictions of the Pecking Order and the Trade-Off Theory. However, Fama and French (2005) find substantial evidence against the Pecking Order Theory, since they find that equity issues are very common and that most of the firms issuing shares are not under duress. Moreover, both Fama and French (1999) and Rajan and Zingales (1995) obtain evidence against one the basic predictions of the Trade-Off Theory, given that they find a negative relationship between leverage and profitability. Other studies have found that stock prices are a major factor driving share and debt issuance. For instance, Pagano et al. (1998) have analyzed the determinants of IPOs in the Italian market and conclude that "the likelihood of an IPO is increasing in the company's size and the industry's market-to-book ratio".[2] Similarly, Welch (2004) analyzes the US market and concludes that stock returns are the only relevant variable in explaining the level of issuance while, in most circumstances, the fundamental "corporate issuing motives remain largely a mystery".[3] Hovakimian et al. (2001) find that "high past stock returns and market-to-book ratios are associated with larger issues of common equity as well as long-term or convertible debt".[4] Finally, Elyasiani et al. (2002) provide evidence that the market-to-book value is extremely significant in explaining the size of bond issuance.

The second strand of literature has developed a substantial body of empirical evidence which suggests that macroeconomic factors are important driving forces for external finance, so that demand side factors should not be disregarded. These factors, in fact, could

[2] See Pagano et al. (1998) p. 27.
[3] See Welch (2004) p. 106.
[4] See Hovakimian et al. (2001) p. 19.

directly influence stock and bond market prices, and indirectly the amount raised, as well as the timing of the issuance. For instance, Lamont and Stein (2006) find that equity issuance of existing firms is substantially more sensitive to aggregate stock prices than firm-level prices, thus supporting the hypothesis that macro factors affecting stock markets are fundamental to understand the dynamics of primary placements. This hypothesis is also supported by a number of other studies. The survey of the literature by Ritter and Welch (2002) shows that market conditions are the most important factor influencing the decision to go public, and that the stage of the firm in its life cycle may be relevant, although to a much lesser extent, while Casalin and Dia (2009) find that stocks and bonds issuance is not affected by the volatility of market prices. Furthermore, Lamont and Stein (2006) find that not only share issuance, but also M&A activity is strongly influenced by aggregate stock prices. As a consequence M&As are likely to be a major driving force behind securities issuance.

Given the empirical evidence that macroeconomic factors play an important role in the explanation of the dynamics of primary placements, researchers have put forward a number of different explanations of the cyclical nature of IPOs based on changing business conditions (e.g. Lowry (2003) and Pástor and Veronesi (2005)), investor sentiments (e.g. Ritter (1991) and Dorn (2009)), and asymmetric information between owners and outside investors (e.g. Myers and Majluf (1984) and Dittmar and Thakor (2007)). These studies differ in terms of findings and dataset employed.[5] Lowry (2003) and Pástor and Veronesi (2005) are the first studies which conduct a comprehensive empirical analysis for the market of IPOs, while Helwege and Liang (2004) undertake a similar analysis for IPOs in different industries. All these studies find strong support for the hypothesis that capital demand lies behind fluctuations in IPO volume, while they obtain mixed results for the asymmetric information and investor sentiments hypotheses (see also Ivanov and

[5] In terms of dataset, these studies conduct their empirical analysis by using annual and quarterly data on IPO volumes (see Lowry (2003) and Pástor and Veronesi (2005)). When monthly data are employed, the analysis makes use of the number of IPO transactions instead of IPO volumes (see Helwege (2002), Pástor and Veronesi (2005), and Ivanov and Lewis (2008)). Both these types of datasets gather data for US IPOs and cover periods from 1970 to 2002.

Lewis (2008)).[6]

The analysis we conduct aims also to investigate the potential diversification benefits of universal banking. While there is a substantial theoretical literature on potential benefits and costs of universal banking (e.g. Benston (1994) and Boyd et al. (1998)), the empirical literature is much less developed. Kroszner and Rajan (1994) study the US banking system before the passage of the Glass-Steagall Act, and find no evidence that conflict of interests induced universal banks to cause damage to the public. For a similar period, White (1986) finds that universal banks were not more unstable and risky than other banks. More recently, Vennet (2002) has conducted a large study on the cost and revenue efficiency of European banks in the post-deregulation period. He finds that universal banks are characterized by significantly higher average levels of operational and profit efficiency relative to specialized banks. Stiroh (2004) provides an analysis of the diversification benefits generated by the increased share of non-interest income of banks in the US, finding that non-interest income is strongly correlated with interest revenues. Finally, Kwast (1989) examines actual return and volatility data related to a wide range of banking activities, and suggests that diversification benefits between securities returns and traditional bank lending are rather limited.

III Dataset

This study employs a newly constructed dataset which gathers monthly aggregate data for the volumes of primary placements of shares, debt, and commercial and industrial loans for the period January 1973- June 2007 for the US. The use of this dataset has two main advantages. Firstly, while previous studies which undertake analysis at monthly frequency used data on the number of transactions (see, for example, Pástor and Veronesi (2005), and Ivanov and Lewis (2008)) our dataset gathers data on the volumes of issuance. Secondly, by using data on volumes it becomes possible to investigate whether there are

[6]Derrien and Kecskés (2009) obtain similar evidence using Canadian data.

diversification benefits for universal banks which simultaneously undertake underwriting and lending activities. The revenues generated by the two activities, in fact, are proportional to the volumes intermediated.

The data on the issuance of stocks and corporate bonds are taken from the Statistical Supplement to the Federal Reserve Bulletin. The two series represent issuance of non-financial corporations. Figures include gross proceeds of issues maturing in more than one year, and both private and public placements in the case of bonds, while public placements only in the case of shares.[7] The series on corporate loans is the amount (volume) of all commercial and industrial loans at all commercial banks. All figures are deflated by using the Consumer Price Index. The dataset also includes series for the Industrial Production and the Composite Leading Indicators indices, for interest rates on three-month T-Bills, and for a yield spread which is given by the difference between interest rates on ten- and three-year government bonds. We consider also two indices for the stock and bond market, respectively the S&P500 and the Barclays Corporate Bonds Index. All these series are obtained from databases available at the Federal Reserve Bank of St Louis and OECD, and from Datastream.

IV The Model

We study reduced form equations, by regressing the rate of growth of equilibrium aggregate quantities on factors different from their own prices. The hypotheses we want to investigate involve linear relationships among the volumes raised by means of primary placements of shares (S_t), corporate bonds (B_t) and commercial and industrial loans (L_t), plus a set of pre-determined explanatory variables which includes current and lagged values of stock ($R_{S,t}$) and bond ($R_{B,t}$) market returns, changes in the Industrial Production (Δip_t) and Composite Leading Indicators (Δcli_t) indices, changes in the yield of three-month T-Bills (Δi_t), and the yield spread (YD_t) between ten- and three-year government

[7] Figures exclude secondary offerings, employee stock plans, investment companies other than closed-end, intra-corporate transactions, and Yankee bonds.

bonds. The choice of the pre-determined variables is mutuated from the literature on the determinants of IPOs of shares and bonds. Different authors have proposed different explanations of the cyclical nature of IPOs, based on changing business conditions, investor sentiments, and asymmetric information between owners and outside investors. All these studies conclude that that business conditions are important determinants of the issuance of shares and debt (see, among others, Lowry (2003), Helwege and Liang (2004), Pástor and Veronesi (2005) and Ivanov and Lewis (2008)). In the light of this empirical evidence, we consider an expanded set of proxies for business conditions already employed in the literature which includes indicators for the expected cost of capital and profitability.[8] Private firms, in fact, respond to changing market conditions by optimally choosing to go public when the expected cost of capital is low. Moreover, time-variation in expected profitability creates periods in which firms find it desirable to raise finance so they can exercise growth options. First-differences of three-month T-Bills yields (the risk-free rate) and realized returns on the stock and bond markets are the proxies we employ for the expected cost of capital (see Lowry (2003) and Mayfield (2004)). The indicators we use to proxy expected profitability are the first-differences of the levels of the Composite Leading Indicators and Industrial Production indices, as well as the spread between ten- and three-year government bonds (see Pástor and Veronesi (2005) and Ivanov and Lewis (2008)). From a preliminary analysis, it can be shown that the three sources of external finance are non-stationary.[9] Throughout the analysis the series will be therefore considered

[8]The simple version of the business condition hypothesis asserts that during economic expansions, economy-wide demand for capital is higher and more firms go public.

[9]Augmented Dickey-Fuller (1979) (ADF) and Phillips and Perron (1988) (PP) tests fail to reject the null of unit root when applied to the three series in levels. However, when the same tests are applied to grow rates the null is soundly rejected at standard significance levels. This result is consistent with different specifications of the above tests.

in their growth rates. The functional form of our model is as follows:

$$\Delta S_t = \alpha_0^1 + \alpha_1^1 \Delta B_t + \alpha_2^1 \Delta L_t + \alpha_3^1 R_{S,t} + \alpha_4^1 \Delta cli_t + \sum_{i=1}^{k_{1,R_S}} \beta_i^1 R_{S,t-i} + \\ + \sum_{i=1}^{k_{1,R_B}} \beta_{i+k_{1,R_S}}^1 R_{B,t-i} + \sum_{i=1}^{k_{1,S}} \gamma_i^1 \Delta S_{t-i} + \sum_{i=1}^{k_{1,B}} \gamma_{i+k_{1,S}}^1 \Delta B_{t-i} + \sum_{i=1}^{k_{1,L}} \gamma_{i+k_{1,S}+k_{1,B}}^1 \Delta L_{t-i} + \varepsilon_{S,t} \quad (1)$$

$$\Delta B_t = \alpha_0^2 + \alpha_1^2 \Delta S_t + \alpha_2^2 \Delta L_t + \alpha_3^2 R_{B,t} + \alpha_4^2 \Delta ip_t + \alpha_5^2 \Delta i_t + \sum_{i=1}^{k_{2,R_S}} \beta_i^2 R_{S,t-i} + \\ + \sum_{i=1}^{k_{2,R_B}} \beta_{i+k_{2,R_S}}^2 R_{B,t-i} + \sum_{i=1}^{k_{2,S}} \gamma_i^2 \Delta S_{t-i} + \sum_{i=1}^{k_{2,B}} \gamma_{i+k_{2,S}}^2 \Delta B_{t-i} + \sum_{i=1}^{k_{2,L}} \gamma_{i+k_{2,S}+k_{2,B}}^2 \Delta L_{t-i} + \varepsilon_{B,t} \quad (2)$$

$$\Delta L_t = \alpha_0^3 + \alpha_1^3 \Delta S_t + \alpha_2^3 \Delta B_t + \alpha_3^3 \Delta ip_t + \alpha_4^3 \Delta i_t + \alpha_5^3 \Delta YD_t + \sum_{i=1}^{k_{3,R_S}} \beta_i^3 R_{S,t-i} + \\ + \sum_{i=1}^{k_{3,R_B}} \beta_{i+k_{3,R_S}}^3 R_{B,t-i} + \sum_{i=1}^{k_{3,S}} \gamma_i^3 \Delta S_{t-i} + \sum_{i=1}^{k_{3,B}} \gamma_{i+k_{3,S}}^3 \Delta B_{t-i} + \sum_{i=1}^{k_{3,L}} \gamma_{i+k_{3,S}+k_{3,B}}^3 \Delta L_{t-i} + \varepsilon_{L,t} \quad (3)$$

The model makes it possible to investigate the explanatory power of macroeconomic factors considered in our analysis, as well as to test for potential interrelations among the different sources of external finance. The inclusion of lagged and cross-lagged dependent variables has a threefold valence. Firstly, to be consistent with their stationary nature (under the null that all the current and lagged explanatory variables, except the lagged dependent variables, do not have explanatory power), the sources of external finance are allowed to evolve as mean reverting autoregressive stochastic processes. Secondly, lagged dependent variables can capture the effects of omitted factors. In fact, it is plausible to think that the variables included in the model are not the only macroeconomic determinants of the sources of external finance. Moreover, this specification of the model should ensure residuals not serially correlated.[10] Thirdly, the inclusion of cross-lagged dependent variables makes it possible to test for Granger-causality among the sources of external finance. The statistical significance of the explanatory variables as well as Granger-causality are assessed by means of standard Wald tests.

[10]The inclusion of lagged dependent variables is in line with what suggested by Granger and Newbold (1974) and with previous studies on IPOs like Lowry (2003) and Pástor and Veronesi (2005) in which autoregressive specifications are used.

To investigate the presence of endogeneity among ΔS_t, ΔB_t and ΔL_t we make use of the PT test, a system version of the Hausman Test developed by Revankar and Yoshino (1990). The authors show that this test is equivalent to a standard F-test of zero coefficients in a system like that of eqs.(1)-(3), and that it is implementable through 3SLS estimations. The implementation of the PT test consists of two different stages. In the first stage we consider each equation of the system separately, we regress each potentially endogenous variable on all the pre-determined variables of the system and we save the residuals for each regression. In the second stage each equation of the system is expanded to include as regressors the residuals previously obtained. The expanded system is then estimated by means of 3SLS. The PT test is a test of whether the coefficients attached to the residuals in each equation are jointly zero.

V Empirical Results

We start our analysis by carrying out the PT test for endogeneity. In order to identify the system of eqs.(1)-(3) we proceed with a general-to-specific approach in which the model is initially estimated with lagged and cross-lagged dependent variables and lagged stock and bond returns up to the fifth lag.[11] The lags not statistically significant are then removed, and the model is re-estimated by means of 3SLS. This procedure is re-iterated until all the lagged variables included in the system are statistically significant.[12] The

[11] The order of lags for the lagged and cross-lagged dependent variables was chosen by estimating a standard VAR model for the variables ΔS_t, ΔB_t and ΔL_t and by taking the longest lag length among those suggested by the LR statistic, the Akaike, Schwarz and Hannan-Quinn information criteria. The lag length for stock and bond returns was chosen arbitrarily.

[12] The final system is characterized by the following lag structure: $k_{1,R_S} = 1$, $k_{1,R_B} = 0$, $k_{1,S} = 5$, $k_{1,B} = 2$, $k_{1,L} = 0$, $k_{2,R_S} = 0$, $k_{2,R_B} = 0$, $k_{2,S} = 0$, $k_{2,B} = 5$, $k_{2,L} = 3$, $k_{3,R_S} = 1$, $k_{3,R_B} = 0$, $k_{3,S} = 0$, $k_{3,B} = 0$, $k_{3,L} = 5$. The instrumental variables considered are lagged values of primary placements of stocks, bonds and loans, current and past stock and bond market returns as well as current values of the yield spread, changes in Industrial Production and Leading Indicators Composite indices, and in yields of three-month T-Bills. The model has been supplemented with dummy variables to account for monthly seasonality and for a few idiosyncratic shocks that have produced sharp and quickly reversed contractions of issuance, such as the Stock Market Crash of October 1987, and the collapse of LTCM of 1998. To improve the fitting of the model we have included two dummies for May 2001 and February 1973 in the second and third equation respectively. The results, however, are not substantially influenced by the inclusion of the dummies.

system is identified as both the Order and the Rank conditions for identifiability hold.[13] The PT statistic based on the coefficients estimated calculates to 4.909 with p-value 0.556. This lends convincing empirical evidence in support to the hypothesis that ΔS_t, ΔB_t and ΔL_t are not endogenous.

Given the absence of endogeneity, for the remainder of the analysis the system of eqs. (1)-(3) will be estimated by using standard Least Squares (OLS) estimators. The estimating procedure follows the same general-to-specific approach previously implemented to carry out the PT test. The model is initially estimated with lagged and cross-lagged dependent variables and lagged stock and bond returns up to the fifth lag, the lags not significant removed, and the model re-estimated.[14] Adopting this approach we obtain the final empirical estimates reported in Table 1.

The analysis of the residuals shows that the model is reasonably well specified. The values of the Ljiung-Box statistics and LM tests for serial correlation, in fact, suggest weak presence of serial correlation in the residuals. Both the White and the ARCH LM tests show moderate presence of heteroscedasticity.[15] Unfortunately, the overall explanatory power of the pre-determined variables of the model is difficult to measure. In fact, while the adjusted R-squared for the three regressions are reasonably high, the statistical significance of the autoregressive terms might contribute much of the explanatory power, suggesting that the economic model leaves a lot unexplained. The adjusted R-squared obtained by excluding the autoregressive terms from the three equations are, respectively, 0.111, 0.111 and 0.228. However, as suggested by Lowry (2003), these statistics must be interpreted with caution as regressions without autoregressive terms are not properly specified.[16] Wald F-statistics for the joint significance of a set of explanatory variables

[13] The Order condition holds as the number of pre-determined (exogenous) variables excluded from each equation is at least as large as the number of (potentially) endogenous variables included in each equation less one. The Rank condition also holds. In fact, for each equation it is possible to construct a matrix from the coefficients of the variables excluded from that particular equation but included in the other equations of the system which have rank 2 (equal to the number of potentially endogenous variables less one).

[14] See footnote 11.

[15] The residuals originated by the first and third equation are not normally distributed, as suggested by the J-B test for normality. However, given the large number of observations in our dataset we can rely on the asymptotic properties of OLS estimators.

[16] See also Granger and Newbold (1974) p.117.

and estimates of economic significance provide alternative measures of the importance of the driving macroeconomic factors considered in our analysis. As shown in Table 1 the null that the pre-determined variables are jointly not significant is soundly rejected for each equation of the model. For instance, the null tested for the first equation of the model is $H_0 : \alpha_1^1 = \alpha_2^1 = \alpha_3^1 = \alpha_4^1 = \beta_1^1 = 0$. This hypothesis is soundly rejected as the F-statistic calculates to 10.43 with p-value 0.000. Similar evidence is obtained for the second and third equation.[17] This supports the conclusion that the sets of pre-determined variables considered in each equations of the model are important determinants of the three sources of external finance.

The variable that exerts the strongest influence on primary placements of shares is the return of the S&P500 index that is significant at the one percent level. We also find that lagged values of the return index are associated with positive issuance. These two results are entirely in line with the existing literature (see, respectively, Ivanov and Lewis (2008) and Hovakimian et al. (2001)). Empirical results suggest that a one standard deviation increase in the return index boosts the growth rate of the issuance of shares by 7.6 percent in the same period and 7.3 percent in the subsequent. The new result we obtain is that changes in bond issuance are also extremely significant, and the attached coefficient is positive. More specifically, a one standard deviation increase in the growth rate of the issuance of corporate bonds is expected to accelerate the issuance of shares by 7 percent. Stocks and bonds issuance are thus complements in the aggregate, in accordance with the findings of Lowry (2003) who shows that there are common factors (technological shocks and changes in the expected productivity of factors) which drive the issuance of both types of securities. On the contrary, we find that the growth rate in the volume of industrial loans outstanding have no statistically significant impact on stock issuance. The other variable that has a significant impact, albeit only at the ten percent level, is the Composite Index of Leading Indicators. This result provides further support to the evidence that the

[17] The null hypotheses tested for the second and third equations are, respectively, $H_0 : \alpha_1^2 = \alpha_2^2 = \alpha_3^2 = \alpha_4^2 = \alpha_5^2 = 0$ and $H_0 : \alpha_1^3 = \alpha_2^3 = \alpha_3^3 = \alpha_4^3 = \alpha_5^3 = \beta_1^3 = 0$. Both of them are soundly rejected at standard significance levels.

issuance of shares is forward-looking. In this case a one standard deviation increase in the Composite Index yields an increase in the growth rate of issuance of shares equal to 3.5 percent.

TABLE 1 HERE

As expected, primary placements of bonds are strongly associated with returns on the bond index that largely reflects forward-looking variations of interest rates and risk premia. A one standard deviation increase in the index is associated with a correspondent increase in the growth rate of bond issuance of 5.6 percent. Furthermore, we find that also bond issuance is significantly influenced by stock issuance, suggesting that the causality between issues of stock and bond is bi-directional. This result reinforces the idea that common factors could explain the issuance of both bonds and stocks (see Lowry (2003)). A one standard deviation increase in the growth rate of the issuance of shares is expected to accelerate the issuance of bonds by 8.6 percent. Interestingly, we find that lagged loans issuance have a strong, statistically significant, and persistent impact on the growth rate of bond issuance, so that the former Granger-cause the latter. In fact, the null that lagged values of loan issuance are jointly not statistically significant is soundly rejected at standard significance levels.[18] The signs of the attached coefficients at different lags fluctuate from positive to negative. However, we find that the cumulative effect of an increase in the growth rate of loans outstanding is positive, notwithstanding the fact that the contemporaneous effect is negative (but the last is not statistically significant). This result may depend on the poor liquidity of corporate bonds markets. When firms need additional liquidity, they cannot rely on bond markets, but they need to initially raise finance from banks. Bank loans can be extended with much more flexibility, for example by recurring to commitment lending. Bonds are normally issued only later, to repay the more expensive bank loans. By initially providing loans, banks transmit important signals to the markets, as Diamond (1991) has suggested. Fluctuations of T-bills yields have

[18]The null hypothesis $H_0 : \gamma_6^2 = \gamma_7^2 = \gamma_8^2 = 0$ is soundly rejected as the F-statistic calculates to 6.482 with p-value 0.000.

strong explanatory power, being significant at the one percent level. This variable is a good proxy for the monetary policy for most of the sample under analysis. The sign of the attached coefficient is negative. This result suggests that corporate bonds issuance rises following expansionary monetary policies. The reason is that a large share of the issuance is of highly rated papers that are good substitutes for state bonds in the portfolio of investors. This interpretation is confirmed by splitting the sample into two periods. The results (not reported to save space), are similar to those for the whole sample, but in the first half of the sample short-term interest rates become more relevant while the bond index loses explanatory power, and the opposite holds in the more recent sub-period. The issuance of more risky bonds such as junk bonds is, in fact, a phenomenon of the last two decades. The other variable that is strongly significant, at the one per cent level, is the growth rate of the Industrial Production Index. The sign of the attached coefficient is negative, indicating that the issuance of corporate bonds is counter-cyclical.[19]

Focussing now on the growth rate in the volume of loans outstanding, our empirical results show that both current and lagged values of bonds and stock issuance do not have any explanatory power. Thus, the issuance of shares and industrial loans present totally uncorrelated dynamics. The main driving force behind the issuance of loans is the short-term interest rates. In fact, loans outstanding grow as interest rates raise. This result is in line with the findings of Gertler and Gilchrist (1993a,b) and, more recently, Haan et al. (2007). These studies suggest that, in the case of large banks, commercial and industrial loans issuance rises following a monetary tightening. The volume of loans outstanding is positively influenced by changes of the Industrial Production Index (although the variable is significant at the ten percent only), indicating that the issuance of commercial and industrial loans is pro-cyclical. Moreover, past values of stock returns have some explanatory power (also in this case only at ten percent level), whereas bond market returns do not. Finally, the long-end of the term structure has a negative impact, but it is not

[19] These results are consistent with Goyenco and Ukhov (2009). These authors show that the US government bonds market becomes less liquid as interest rates and the level of economic activity increase.

significant at conventional levels.[20]

The finding that bank lending and corporate issuance react in opposite ways to changes in short-term interest rates and Industrial Production Index has the direct implication that diversification benefits for universal banks may be relevant. Our empirical results suggest that bank lending is pro-cyclical while the issuance of corporate bonds is counter-cyclical. Since direct lending is pro-cyclical, issuance of loans declines in economic downturns, whereas the issuance of corporate bonds grows. More specifically, a one standard deviation increase in the Industrial Production Index growth rate (equivalent to 0.7 percent) is expected to raise the growth rate of outstanding loans by 0.056 percent and to decrease that of bonds by 3.6 percent.[21] The magnitudes involved for both the variables are thus remarkably similar. As an example the level of loans outstanding in real terms for January 2000 was 5924.4 billions of US dollars so that the corresponding increase would have been of 3.31 billions (equivalent to 5.6 billions in nominal terms). The issuance of bonds in the same period was 86.23 billions and the corresponding decline would have been of 3.10 billions (equivalent to 5.24 billions in nominal terms).[22] Moreover, when the monetary policy is expansionary, bond issuance grows whereas direct lending decreases. In this case, a one standard deviation increase in short-term interest rates (equivalent to 53 basis points) is expected to accelerate the growth rate of outstanding loans by 0.1 percent and to decrease that of the issuance of bonds by 5.1 percent.[23] The magnitudes involved for January 2000 are therefore an increase of 5.92 billions in the level of loans outstanding (equivalent to 10.02 in nominal terms), and a decline of 4.39 billions for bonds (equivalent to 7.43 in nominal terms). The above results imply that not only diversification benefits for universal banks are large, but also that the security underwriting business provides a unique opportunity to hedge against credit and market risks of the direct lending activ-

[20] A number of different yield spreads have been taken into consideration as regressors of eq.(3). The yield spread between ten- and three-year government bonds is the spread with the greatest explanatory power.

[21] It is important to notice that the increase of 0.056 percent in the growth rate of loans outstanding is expressed on monthly basis, corresponding to an annual increase of 0.67 percent.

[22] The average bond issuance in real terms for the year 2000 was 116.9 billions of US dollars.

[23] In this case an increase of 0.1 percent on monthly basis corresponds to an annual increase of 1.21 percent.

ity.[24] Thus, universal banks may potentially be safer and more efficient than institutions providing separate banking activities.

An important factor explaining the different behavior of bonds and loans is the persistence in the two series. Loans are much more persistent than bonds, since the signs of their lagged coefficients are all positive, while the opposite holds for bonds. A formal measure for the persistency of the two series can be worked out by computing their half-life. We obtain that for industrial loans the half-life is 3 months while for corporate bonds there is immediate adjustment.[25] As a consequence, the impact of any shock has a longer memory on loans than on bonds, and short-term trends in bond issuance change much quicker than those of loans. The latter are sluggish because banks provide insurance to industrial firms against shocks of monetary or real origin, while bonds, on the contrary, are extremely sensitive to current market conditions. Liquidity is an important issue in corporate bond markets, and the right timing of an issue is crucial for its success. When financial markets are under distress, often anticipating a deterioration of the real economy, high levels of uncertainty might generate market wide 'lemon' problems, which could lead to a dry up of the liquidity available to market participants.

VI Conclusion

The development of capital markets over the last decades has reduced the role of traditional commercial banks and increased that of investment banks, as bonds have increasingly become the main source of finance for large firms in the US. Many commercial banks have reacted by developing, or purchasing, their own investment banking activities, becoming universal banks. Conversely, investment banks have often acquired commercial banks in order to get access to deposits, a cheap and stable source of finance, and to ben-

[24] In terms of volumes the issuance of corporate bonds is much larger than the issuance of shares. However, fees charged for the underwriting of shares are, on average, much higher than those charged for the underwriting of corporate bonds.

[25] Since both series follow AR(5) processes, the half-life is computed by following one of the methodologies reported in Rossi (2005). More specifically, our methodology consists of running regressions in ADF form and calculating the half-life on the basis of the coefficient of the lagged level variable.

efit from the guarantee provided by deposit insurance schemes. In this analysis we have jointly studied the aggregate volumes of shares and corporate bonds issued, and commercial and industrial lending. We have neglected the long-run trends, and focused instead on the short-term cyclical dynamics. We thus identify the driving forces of their respective cyclical fluctuations, evaluating also the potential benefits that universal banks may obtain from diversification.

Our results suggest that the equilibrium aggregate volumes of the different securities are interrelated, and that macroeconomic indicators which proxy business conditions explain sizeable proportions of their time-series variations. More specifically, we find that the issuance of stocks and bonds are mutually reinforcing processes. This result supports the argument put forward by Lowry (2003) that the issuance of these two types of securities can be driven by common factors. We speculate that M&A activities could be a strong driving force behind primary placements of these securities, in line with the findings of Lamont and Stein (2006).[26] Furthermore, in line with the literature, we find that the issuance of both shares and corporate bonds is forward-looking, as they strongly react to current stock and bond market valuations. This can reflect either a valuation of the expected profitability of investments, or an opportunistic timing of the issuance on part of insiders, in order to exploit asymmetric information. The issuance of shares is also positively affected by past stock market valuations, indicating that market momentum, rather than just the level of the price index, is a strong factor behind primary placements. We then find that the Composite Index of Leading Indicators has explanatory power for the issuance of shares. This lends further support to the argument that the issuance of shares is forward-looking, and strongly driven by business conditions. On the other hand, we find that the issuance of shares and loans are totally disconnected.

We have obtained substantial evidence that also primary placements of corporate bonds and industrial loans are interrelated, but in this case the relationship is unidirectional. We find, in fact, that lagged values of loans have strong explanatory power on

[26] Unfortunately, we cannot investigate this hypothesis as data on M&As are not readily available.

primary placements of bonds, while the reverse does not hold, so that loans Granger-cause bonds. The current level of economic activity, as well as changes in the monetary policy stance, have a statistically significant, and economically relevant, influence on both the issuance of bonds and the level of commercial and industrial loans outstanding. More specifically, we find that the two types of securities respond in opposite ways to changes in the above macroeconomic indicators. Higher levels of industrial production are, in fact, associated with larger issuance of loans, probably because industrial firms finance inventories by resorting to unused commitment loans. On the contrary, bond issuance rises when the level of economic activity declines. A plausible explanation is that in periods of expansion the cyclical component of the supply declines, as firms benefit from larger cash flows and need less external finance. Moreover, bond volumes quickly respond to an expansionary monetary policy while, on the contrary, bank commercial and industrial lending rises when the monetary policy is tightened. Thus, as a recessions lurks, industrial firms need to rely on bank lending because financial markets freeze, but as the FED reacts by slashing interest rates, corporate bonds become cheaper, even if risk premia remains substantial, so that firms proportionally reduce their recourse to bank lending. As a consequence, bond markets may be very important to mitigate the impact of a bank-driven credit crunch.

The above results suggest that universal banks can substantially mitigate the pro-cyclicality of the revenues from lending activities, since the fees from underwriting bonds are counter-cyclical. These benefits are potentially very important whenever systemic, macroeconomic shocks occur. Such shocks, in fact, generate risks that to a large extent are non-diversifiable, since they are strongly correlated across different classes of assets and different geographies. Moreover, the benefits from diversification are made even more relevant by the evidence that the issuance of shares and industrial loans present totally uncorrelated dynamics. As a consequence, universal banks may benefit from substantial diversification among different sources of revenues, and they could be safer and more efficient than institutions providing separate banking activities.

Table 1: OLS estimates of the econometric model (1)-(3).

$\Delta S_t = \alpha_0^1 + \alpha_1^1 \Delta B_t + \alpha_2^1 \Delta L_t + \alpha_3^1 R_{S,t} + \alpha_4^1 \Delta cli_t + \beta_1^1 R_{S,t-1} + \sum_{i=1}^{5} \gamma_i^1 \Delta S_{t-i} + \varepsilon_{S,t}$

α_0^1	α_1^1	α_2^1	α_3^1	α_4^1	β_1^1	γ_1^1	γ_2^1	γ_3^1	γ_4^1	γ_5^1
-0.127	0.161	-1.926	1.710	6.823	1.621	-0.542	-0.388	-0.235	-0.168	-0.087
(-4.959)	(3.973)	(-0.857)	(3.420)	(1.782)	(3.904)	(-10.93)	(-7.975)	(-4.640)	(-3.417)	(-1.736)

$Q(4)^{\dagger} = 1.404$ (0.844) $Q(8)^{\dagger} = 4.708$ (0.788) $Q(12)^{\dagger} = 13.97$ (0.320) $Q(16)^{\dagger} = 21.30$ (0.167)

$LM(5)^{\P} = 1.519$ (0.183) $LM(10)^{\P} = 1.367$ (0.193) $LM(15)^{\P} = 1.736$ (0.042) $LM(20)^{\P} = 1.515$ (0.073)

$LM(25)^{\P} = 1.407$ (0.095) $W^{\flat} = 46.67$ (0.015) $ARCH(2)^{\natural} = 1.671$ (0.189) $ARCH(4)^{\natural} = 1.842$ (0.120)

$JB^{\sharp} = 14.99$ (0.001) $\overline{R}^{2\,\ddagger} = 0.446$ $F^{\S} = 10.43$ (0.000)

$\Delta B_t = \alpha_0^2 + \alpha_1^2 \Delta S_t + \alpha_2^2 \Delta L_t + \alpha_3^2 R_{B,t} + \alpha_4^2 \Delta ip_t + \alpha_5^2 \Delta i_t + \sum_{i=1}^{5} \gamma_i^2 \Delta B_{t-i} + \sum_{i=1}^{3} \gamma_{i+5}^2 \Delta L_{t-i} + \varepsilon_{B,t}$

α_0^2	α_1^2	α_2^2	α_3^2	α_4^2	α_5^2	γ_1^2	γ_2^2	γ_3^2	γ_4^2	γ_5^2	γ_6^2	γ_7^2	γ_8^2
-0.033	0.178	-3.287	2.663	-4.752	-0.102	-0.580	-0.468	-0.317	-0.241	-0.151	13.07	-10.26	5.583
(-1.836)	(4.448)	(-1.173)	(3.170)	(-2.146)	(-2.803)	(-13.71)	(-9.040)	(-7.026)	(-5.230)	(-3.427)	(4.000)	(-3.122)	(1.972)

$Q(4)^{\dagger} = 2.599$ (0.627) $Q(8)^{\dagger} = 9.802$ (0.279) $Q(12)^{\dagger} = 16.69$ (0.161) $Q(16)^{\dagger} = 18.01$ (0.323)

$LM(5)^{\P} = 0.580$ (0.715) $LM(10)^{\P} = 2.108$ (0.023) $LM(15)^{\P} = 1.475$ (0.111) $LM(20)^{\P} = 1.148$ (0.298)

$LM(25)^{\P} = 0.999$ (0.466) $W^{\flat} = 44.19$ (0.046) $ARCH(2)^{\natural} = 0.596$ (0.551) $ARCH(4)^{\natural} = 0.681$ (0.605)

$JB^{\sharp} = 1.101$ (0.576) $\overline{R}^{2\,\ddagger} = 0.488$ $F^{\S} = 15.92$ (0.000)

$\Delta L_t = \alpha_0^3 + \alpha_1^3 \Delta S_t + \alpha_2^3 \Delta B_t + \alpha_3^3 \Delta ip_t + \alpha_4^3 \Delta i_t + \alpha_5^3 \Delta YD_t + \beta_1^3 R_{S,t-1} + \sum_{i=1}^{5} \gamma_i^3 \Delta L_{t-i} + \varepsilon_{L,t}$

α_0^3	α_1^3	α_2^3	α_3^3	α_4^3	α_5^3	β_1^3	γ_1^3	γ_2^3	γ_3^3	γ_4^3	γ_5^3
0.001	0.001	-0.001	0.074	0.002	-0.001	-0.012	0.443	-0.020	0.156	0.011	0.112
(1.528)	(0.594)	(-0.972)	(1.871)	(3.729)	(-1.435)	(-1.748)	(7.120)	(-0.309)	(2.962)	(0.240)	(2.455)

$Q(4)^{\dagger} = 0.642$ (0.958) $Q(8)^{\dagger} = 2.725$ (0.950) $Q(12)^{\dagger} = 15.34$ (0.233) $Q(16)^{\dagger} = 21.35$ (0.165)

$LM(5)^{\P} = 0.931$ (0.460) $LM(10)^{\P} = 1.398$ (0.179) $LM(15)^{\P} = 1.203$ (0.267) $LM(20)^{\P} = 1.424$ (0.106)

$LM(25)^{\P} = 1.332$ (0.134) $W^{\flat} = 27.55$ (0.233) $ARCH(2)^{\natural} = 9.138$ (0.000) $ARCH(4)^{\natural} = 5.002$ (0.000)

$JB^{\sharp} = 23.42$ (0.000) $\overline{R}^{2\,\ddagger} = 0.488$ $F^{\S} = 6.024$ (0.000)

Notes: Sample period spans from 1973:01 to 2007:06. Empirical estimates worked out by using the HAC covariance matrix proposed by Newey and West (1987). T-statistics in parenthesis. † Ljung-Box Q-statistics for residuals at lags 4, 8, 12 and 16. ♭ White tests for heteroscedasticity. ♮ LM tests for ARCH heteroscedasticity at lags 2 and 4. ♯ Jarque-Bera tests for normality. ¶ LM tests for serial correlation at lags 5, 10, 15, 20 and 25. § Wald F-tests for the joint significance of a set of explanatory variables. P-values in parenthesis. ‡ Adjusted R-squared calculated as $1-(1-R^2)(T-1/T-k)$ where T=no. of obs. and k =no. of estimated parameters.

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