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Fabrizio Casalin and Enzo Dia

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The Diversification Benefits of Universal Banking

Fabrizio Casalin[a]*, Enzo Dia[b]

[a] *Newcastle University Business School, NE1 7RU, Newcastle upon Tyne, United Kingdom.*

[b] *Department of Economics, Università degli Studi di Milano Bicocca, 20126, Milan, Italy.*

Abstract

We find that both the aggregate issuance of bonds, and the volume of commercial and industrial loans outstanding in the US, respond to fluctuations in industrial production and interest rates, but in opposite directions. This empirical result suggests that universal banks can reduce the cyclical fluctuations of their income, by jointly providing direct lending and security underwriting services.

Keywords: Universal Banking, Diversification

JEL classification: G21, G24.

*Corresponding author. Tel.: +44-0191-222-6850, Fax:+44-0191-222-6838.
E-mail addresses: fabrizio.casalin@newcastle.ac.uk, enzo.dia@unimib.it.

1 Introduction

Since the immediate aftermath of the subprime crisis, an ongoing debate has taken place regarding the systemic risks generated by universal banking. Several commentators have proposed the adoption of a regulatory framework which introduces a rigid segmentation of the industry, in the spirit of the Glass-Steagall Act. This view, however, implicitly assumes that universal banks cannot benefit from the diversification of their activities into security underwriting and direct lending. But while benefits and cost of universal banking have been analyzed on theoretical grounds (e.g. Benston (1994) and Boyd et al. (1998)), the empirical literature is much less developed. In their studies of the US banking system before the introduction of the Glass-Steagall Act, Kroszner and Rajan (1994) find no evidence that conflict of interests induced universal banks to cause damage to the public, while White (1986) finds that universal banks were not more unstable and risky than other banks. Moreover, Vennet (2002) has provided evidence that in Europe, universal banks benefit from higher levels of efficiency relative to specialized banks. On the contrary, Kwast (1989) suggests that diversification benefits between investment in securities and bank lending are limited.

We investigate the issue, by conducting 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. Aggregate data, in fact, make it possible to analyze the impact of macro variables on the aggregate profits of the banking system, since by placing shares and bonds banks earn fees proportional to the sums raised, while fees from commitment loans are proportional to the amount granted (commitment lending now represents more than three fourths of commercial and industrial lending in the US).[1] Moreover, for given interest margins, net interest revenues are proportional to the amount of loans outstanding; since labour and industrial costs are partially quasi-fixed, profits rise with the volumes intermediated. The estimation is performed by means of reduced form

[1] Stiroh (2004) suggests that the largest share of the non-interest income of US banks is obtained from commitment lending.

equations, by regressing the rate of growth of equilibrium aggregate quantities on factors different from their prices, focusing in particular on secondary market prices, short-term interest rates, and business conditions indicators.

We find evidence that stocks and bonds are complementary sources of finance for non-financial firms, since the level of issuance of both changes in the same direction in response to macroeconomic shocks. As a consequence, by jointly providing equity and debt intermediation services, investment banks can reap limited diversification benefits. On the contrary, the amount of bonds issued, and the outstanding stock of commercial and industrial loans, react to changes in the rate of economic activity and monetary policy stance in opposite ways: bond issuance rises when interest rates are low, and declines as the Industrial Production Index rises, while the opposite occurs for loans. Diversification benefits for universal banks are thus 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.

2 Dataset and Empirical Model

The dataset gathers monthly aggregate data for the volumes of primary placements of shares and debt of non-financial corporations, together with the volume of all commercial and industrial loans at all commercial banks, for the US economy. All figures are deflated by using the Consumer Price Index. The dataset includes the Industrial Production Index, the Composite Index of Leading Indicators, yields on three-month T-bills, a yield spread between ten- and three-year government bonds, and returns on the S&P500 and Barclays Corporate Bonds Index. These series are obtained from the Federal Reserve Bulletin, Federal Reserve Bank of St Louis, OECD, and Datastream, and they span from January 1973 to June 2007.

The hypotheses we want to investigate involve linear relationships among the volumes raised by means of primary placements of shares (S_t), and corporate bonds (B_t), the outstanding volume of commercial and industrial loans (L_t), plus a set of pre-determined explanatory variables, borrowed from the literature on the determinants of IPOs of shares and bonds. These last include: current and lagged values of stock ($R_{S,t}$) and bond ($R_{B,t}$) market returns, plus the first-differences of three-month T-bill yields (Δi_t), as proxies for the expected cost of capital (following Lowry (2003), and Mayfield (2004)); the first-differences of the levels of the Composite Index of Leading Indicators (Δcli_t), and the Industrial Production Index (Δip_t), plus the spread between ten- and three-year government bonds (YD_t), as proxies for the expected profitability (following Pástor and Veronesi (2005) and Ivanov and Lewis (2008)). From a preliminary analysis, it can be shown that S_t, B_t, and L_t are non-stationary, and the series will therefore be considered in their growth rates.[2] The model we estimate is the following:

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

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

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

The 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), as they can capture the effects of omitted factors. Finally, the inclusion of cross-lagged dependent variables makes it possible to test for Granger-causality. To investigate the presence of

[2] Augmented Dickey-Fuller (ADF) and Phillips-Perron tests fail to reject the null of unit root when applied to the three series in levels.

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).

3 Results and Discussion

In order to identify the model we follow a general-to-specific approach.[3] Since the PT cannot reject the null that ΔS_t, ΔB_t and ΔL_t are not endogenous at standard significance levels, the estimates reported in Table 1 are obtained by means of OLS.[4]

In line with the literature, we find that current and lagged values of the return of the S&P500, and the Composite Index of Leading Indicator, drive primary placements of shares. We also find that changes in bond issuance significantly and positively influence share issuance, and vice-versa, suggesting a bi-directional link between the issuance of stocks and bonds, highlighting that common factors, such as technological shocks, drive the issuance of both types of securities, as Lowry (2003) suggests.

Primary placements of bonds are associated with positive returns on the bond index (indicating lower interest rates), and declining T-bill rates. Corporate bond issuance thus rises following expansionary monetary policy. Lagged levels of loans outstanding have a statistically significant, and persistent impact on bond issuance, so that loans Granger-cause bonds; the cumulative effect of an increase in the amount of loans outstanding is positive.[5] The Industrial Production Index is also strongly significant, and the sign of the attached coefficient is negative, indicating that the issuance of corporate bonds is counter-cyclical.

Loan volumes are persistent, whereas those of bonds are not. We find that the half-life for industrial loans is of three months, while the adjustment for corporate bonds is

[3] The parameters k_{j,R_S}, k_{j,R_B}, $k_{j,S}$, $k_{j,B}$, $k_{j,L}$ for j=1,2,3 are initially set equal to 5 and then the lags not statistically significant progressively removed.

[4] The model has been supplemented with dummy variables to account for seasonality and for idiosyncratic shocks, such as the Stock Market Crash of October 1987, and the collapse of LTCM of 1998. The results, however, are not influenced by the inclusion of the dummies.

[5] The null $H_0 : \gamma_6^2 = \gamma_7^2 = \gamma_8^2 = 0$ is strongly rejected at standard significance levels.

Table 1: OLS estimates of the model of Equations (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) $\quad Q(8)^{\dagger} = 4.708$ (0.788) $\quad Q(12)^{\dagger} = 13.97$ (0.320) $\quad Q(16)^{\dagger} = 21.30$ (0.167)

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

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

$JB^{\sharp} = 14.99$ (0.001) $\quad \overline{R}^{2\,\ddagger} = 0.446 \quad F^{\S} = 10.43$ (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) $\quad Q(8)^{\dagger} = 9.802$ (0.279) $\quad Q(12)^{\dagger} = 16.69$ (0.161) $\quad Q(16)^{\dagger} = 18.01$ (0.323)

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

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

$JB^{\sharp} = 1.101$ (0.576) $\quad \overline{R}^{2\,\ddagger} = 0.488 \quad F^{\S} = 15.92$ (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) $\quad Q(8)^{\dagger} = 2.725$ (0.950) $\quad Q(12)^{\dagger} = 15.34$ (0.233) $\quad Q(16)^{\dagger} = 21.35$ (0.165)

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

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

$JB^{\sharp} = 23.42$ (0.000) $\quad \overline{R}^{2\,\ddagger} = 0.488 \quad F^{\S} = 6.024$ (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. T-statistics in parenthesis. † Ljung-Box Q-statistics of 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 the sets of pre-determined variables. P-values in parenthesis. ‡ Adjusted R-squared calculated as $1-(1-R^2)(T-1/T-k)$.

immediate.[6] 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 main driving force behind the issuance of loans is the short-term interest

[6] As in Rossi (2005), the half-life is calculated by running regressions in ADF form.

rate, as loans outstanding grow as interest rates rise. This result is in line with the findings of Gertler and Gilchrist (1993) and Haan et al. (2007) that, in the case of large banks, commercial and industrial loans issuance rises following a monetary tightening.[7] Loans outstanding are also positively influenced by the industrial production, indicating that the issuance of commercial and industrial loans is pro-cyclical (while provisions for loan losses are anti-cyclical, so that also profits from lending are cyclical).

The finding that bank lending and corporate issuance respond in opposite ways to changes in the short-term interest rate and industrial production has the direct implication that diversification benefits for universal banks are relevant, and the security underwriting business provides a unique opportunity to hedge against the credit and market risks of the direct lending activity. Such risks, in fact, are to a large extent non-diversifiable, since they are strongly correlated across different classes of assets and markets. Universal banks may potentially be safer and more efficient than institutions providing separate banking activities.

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[7] The large literature on the impact of market rates on interest margins provides no evidence that margins decline as market rates rise.

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