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## Fiscal policy and the banking system in Italy: have taxes, public spending and banks been procyclical in the long-run?

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# Fiscal Policy and the Banking System in Italy. Have Taxes, Public Spending and Banks been Procyclical in the Long-Run?

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# Fiscal Policy and the Banking System in Italy. Have Taxes, Public Spending and Banks been Procyclical in the Long-Run?

## Abstract

This paper analyses the relations between the banking system fluctuations, on one hand, and taxation and public spending, on the other one, using a VECM methodology. We find some evidence of procyclicality of fiscal policy using variables such as government spending, taxes, and primary surplus. Effects in the opposite direction are much smaller. Results are quite stable over time.

JEL Code: N13, N14, E32, E60.

Keywords: credit cycles, fiscal policy, procyclicality.

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## 1. Introduction

As the international credit crisis related to sub-prime loans has recently suggested, some relevant relations exist between credit cycles and fiscal policy over the business cycle. The fiscal package launched by President George W. Bush aimed at producing a stimulus for the slowing American economy and the \$700 trillion bail-out plan are vivid examples of such a relation. In fact, in order to contrast a possible macroeconomic downturn stemming out from the sub-prime credit crisis the US government is providing expansionary fiscal packages. While these are examples of anticyclical fiscal policy, a procyclical effect has been envisaged by the Centre for Economics and Business Research, which maintains that British taxpayers face up to 5p in the pound in extra taxes because of the credit crunch created by the banks.<sup>1</sup>

Thus, one may argue, there is not only a typical relation between fiscal cycles and political cycles, as stated by Alesina *et alii* (2008) with relation to different institutional contexts, but a certain relation between fiscal policy and credit cycles could be observed as well, whilst this kind of relationship is not considered in the theoretical literature on credit cycles (Kiyotaki and Moore, 1997). This paper will try to explore and verify empirically some hypotheses on the relations between credit cycles and fiscal policy emerging from the positive observation of the Italian banking system in the long-run. The key hypothesis is related to previous analysis of the procyclicality of the Italian banking system (Brambilla and Piluso, 2007) and long-run fiscal policy (Ricciuti, 2008).

The paper is organised as follows: section 2 deals with the current literature on the procyclicality of the banking and financial sectors; section 3 shows and discusses some general trends in the behaviour of the Italian banking system in the long period, from 1890 to 1973, and why this could be considered an interesting case for evaluating correlations, if any, with fiscal policies all over the business cycle. Section 4 presents both data and methodologies here used to verify some key hypotheses on the relationship between credit cycles and fiscal policies in the long-run. Results are presented in section 5. Finally, some general conclusions will be drawn from this specific national experience.

<sup>1</sup> The Sunday Times, 21<sup>st</sup> September 2008.

## **2. Are banking system and fiscal policies procyclical in the long-run?**

The procyclicality of credit in relation with economic dynamics has recently gained a certain momentum in the literature as a specific macroeconomic theme as a consequence of the increasing interest arising from central bankers and lawmakers for its several prudential and regulatory implications (Kaminsky, 1999; Logan, 2000; Berger and Udell, 2002; Bliss and Kaufman, 2003). Some authors directly related their studies on credit procyclicality to the risk-capital requirements proposed by the Basel Committee on Banking Supervision (Krainer, 2002; Altman *et alii*, 2005; Goodhart *et alii*, 2004). The topic is apparently related to credit-risk models and to the relative efficiency of borrowers screening models over economic fluctuations. It deals with defining the best incentives to develop prudential tools (Jimenez and Saurina, 2005), while an explicit counter-cyclical hypothesis is less generally considered (Bernanke *et alii*, 1998). The prescriptive goal of these studies is quite explicit. The more or less explicit starting point is that ineffectiveness in managing credit risks and boosting risky loans in the expansionary phase of the business cycle could damage the economic growth in the long-term. In fact, a typical effect of the huge increase in the bank lending during the upturn phase is the tendency to the worsening of capital allocation by the banking system. In contrast, banks tend to rationing credit even to the best borrowers during the downturn phase of the cycle. Thus, it is highly probable that a credit crunch occurs with tough effects on investments and, as a consequence, on the pace of the economic growth (Demirguç-Kunt and Levine, 2001).

Even if a growing number of empirical studies on the procyclicality of financial and banking systems have been published, it remains rather hard to assess this complex phenomenon over the long period. As Benjamin Friedman already stressed twenty years ago, it is not simple to generalise findings relating to some specific period (Friedman, 1988). Indeed, one of the most difficult point to evaluate is the role of the change occurred in the main characteristics of business and trade cycles, banking crises, and financial regulation. As Barry Eichengreen and Michael Bordo (2001) have more recently observed, we can recognise at least four different main periods in the 120 years from 1880 onwards: 1880-1913, 1919-1939, 1945-1971, and 1973-1997. These periods profoundly differ for the relative intensity and frequency of bank crises, for the nature, or the absence, of financial regulation, for diversity of inflation rates and exchange rates

regimes, on the financial side; for the variation of the growth rate of productivity and output, for relevant distinctions of tendencies in trade cycles, on the real economy side. According to Eichengreen and Bordo, up to 1913 the richest countries and developing economies experienced a substantially low, even if increasing, inflation and a relative stability of exchange rates; frequent and recurrent banking crises were faced by soft supervision and regulation. In contrast, the second period was characterised by increasing monetary instability and banking crises, critical phenomena followed by the emergence of a rather rigid regulation, whilst dramatic economic fluctuations were accompanied by a harsh reduction in international trade. In the third period (1945-1971) bank lending was seriously constrained by credit controls in the aggregate and, rather frequently, forced towards preferred manufacturing and exporting sectors, while inflation became more and more rampant and, at the end of the period, exchange rates fluctuated and investments were gradually dwarfed by shocks in the oil and raw materials supply (Bordo *et alii*, 2001; Eichengreen and Bordo, 2003).

Even if this approach is well-founded, it is equally interesting to test the opposite hypothesis. That is, are changes really relevant to shape long-term patterns affecting the relations between credit cycles and business cycles? Or, differently, is a long-term pattern observable in this kind of relationship? If this occurrence was actually observable despite the varying of regulatory schemes and macroeconomic contexts, an innovative perspective would emerge drawing our attention on a long-run behaviour of financial institutions over economic cycles. Thus, such a different perspective could be useful to improve the understanding of what procyclicality actually is and how it works. Indeed, the current analysis on procyclicality is mostly concerned on relatively short and medium term periods. This approach has almost two main effects: first, it is quite apparent that significant changes in regulation or in the nature of the business cycles are not considered; second, a long-period analysis on distinct individual national cases, whose banking system was significantly altered by regulation after a major crisis, may offer some innovative perspective on the phenomenon.

A first attempt to analyse credit fluctuations over business cycles in the long-run has recently been done for the Italian case. Business cycles and the banking sector have been considered over a quasi-century period (1890-1973), during which major changes in the economic structure and one institutional break occurred with major effects on the

regulatory scheme. According to its main empirical findings, banking system's cycles appear strongly correlated with business fluctuations, both for size (measured through banks' total assets as a proxy) and activities (credit supply is measured through a loans-on-liabilities ratio as a proxy), even if the profitability of the banking sector is not correlated to business cycles at all (even if measured as a long-term profitability through variations of capital requirements, i.e. net worth capital). The smoothing process over the cycles emerging after a structural break, more or less in the middle of the time span, suggests that some role could be recognised for the large upsurge in public spending as an increasing component of the aggregate demand after the Second World War (Brambilla and Piluso, 2007).<sup>2</sup>

This is an interesting point that may suggest a new perspective on the complex relation between banks and government over the business cycle, as economic literature usually tends to relate the procyclicality of the banking system, or financial systems, to regulation (Bernauer and Koubi, 2004; White, 2006) or to monetary policy (Toolsema, 2004). The paper analyses the relations between the banking system fluctuations, on one hand, and taxation and public spending dynamics, on the other one, by using a VECM methodology. We have found significant correlation between government spending on the loans-to-liabilities ratio and on total assets variations for the whole banking system. Using the primary surplus, an indicator of expansionary or restrictive fiscal policy and government debt as fiscal variables, we find that primary surplus, in contrast with debt, has a short-term effect on banking behaviour when the banking system is considered as whole. When turning our attention to the relatively small subset of saving banks we find that government expenditure has a significantly negative effect on the loans-to-liabilities ratio. Instead there are no effects on total assets, whilst taxes have significantly negative effects on loans and total assets. Saving banks, therefore, seem more affected by fiscal policy than the whole banking system and, in particular, they are negatively affected by taxes. These findings are rather consistent with the semi-public nature of this group of more prudent financial institutions according to the Italian regulatory scheme prevailing over the entire period. Finally, it is rather noteworthy that, according to our estimates,

<sup>2</sup> The Italian case has been considered in the short and medium run by other authors relatively recently; there are three studies available: Gambacorta and Mistrulli, 2003; Quagliariello, 2006; Filosa 2007. Both the two latter ones use a VAR approach.

both banking and fiscal procyclicality emerged in the long-run, even if some major regulatory and political changes occurred.

### **3. Stylised facts on the Italian banking system and fiscal policy**

From its very beginning, after the Unification promoted by Piedmont in 1861, the Italian banking system experienced several recurrent crises until the adoption of a rigid regulatory scheme in the mid-1930s, whilst fiscal policies were rather erratic under different political regimes. Banking crises did not cause serious operational restriction throughout supervision and regulation until the 1920s. Even if governments and central authorities did not intervene directly in regulating banking behaviour for a long time, government was repeatedly forced to bail out a number of banks and cooperative banks through the indirect support of the main bank of issue, whenever *Banca Nazionale nel Regno d'Italia* re-financed failing banks by obtaining a favourable tax regime on the exceeding share of note issuing (Luzzatto, 1968). This practice of bailing out banks in troubles had some negative effects on public finances, even if it has been recognised by scholars only at a micro level up to now (Pantaleoni, 1895; Confalonieri, 1975). Even though a certain relation between banking bail-outs and fiscal policy has been observed in some case-studies, there are no quantitative assessments of this phenomenon. Neither there is any tentative evaluation of fiscal policies adopted by governments in order to stimulate the real economy when some financial failure could negatively affect the pace of growth. The smoothing effect emerging on the dynamics of both credit cycles and business cycles after the Second World War, just when public spending became an increasing relevant share of the aggregate demand and when a tough financial regulation was introduced, may suggest that there could be interesting and significant relations between them, as we can see in figure 1 (Brambilla and Piluso, 2007).



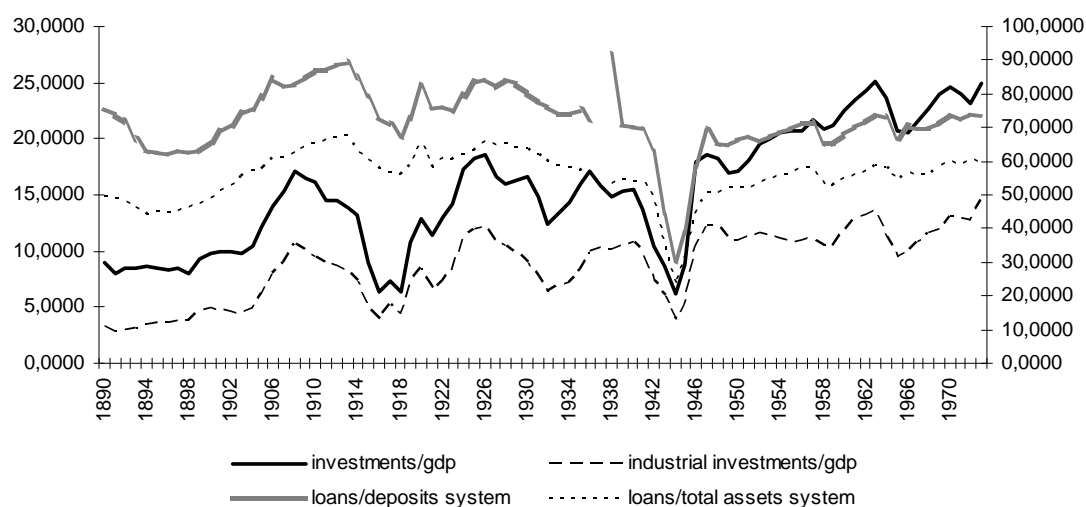


Figure 1. Investments on GDP (left axis) and loans on total assets and on deposits of the Italian banking system as a whole (right axis) (1890-1973)

Indeed, investments on GDP series, and its industrial investments' component, may offer some interesting insights into the more sensitive variables to the lending dynamics of the Italian banking system as a whole. In fact, these time series present a remarkable change in the second half of the 1940s when the Banking Law of 1936 became really effective after the autarky and the Second World War. The GDP growth rate in the economic miracle period was less volatile as well, with a minor slow in 1964. Both business and credit cycles became more stable, most likely because of expansionary fiscal policies related to the Keynesian mood then prevailing in Europe and in the USA (Cohn and Federico, 2001). A more regulated banking sector and gradually expansionary fiscal policies from the early 1950s seem to suggest that there is a certain correlation between them, at least in that period of high economic growth, low inflation and increasing aggregate demand at least partly drawn by growing public spending and, mostly, exports (Delli Gatti *et alii*, 2005).

As it has been observed, from the Unification to the European integration of the 1980s Italian public finance was dominated by a long-run fiscal rule largely accepted and pursued by even very differently oriented governments, such as liberal or fascist, or post-war centre-left/centre-right democratic coalitions. All over the period governments engaged themselves in putting public finance in balance (Ricciuti, 2008). Another view on the Italian fiscal history maintains that the fiscal dominance of the monetary policy was a long-term feature of the Italian economy, only broken in the early 1980s when the

Bank of Italy acquired a substantial independence in setting the monetary policy (Spinelli and Fratianni, 2001). Thus, if in the long period fiscal policies appeared to be constantly oriented to the balance, banking regulation was significantly revised after a remarkable series of crises and failures in the mid-1930s. Nevertheless, procyclicality emerges from our estimates: banking variables of the overall size of the sector and of the whole offer of credit are correlated to real variables of income and investments<sup>3</sup> (Brambilla and Piluso, 2007).

The micro-analysis has shown that banking crises and failures were generally faced by recurring to tolerant monetary policy measures. By strongly refinancing banks in troubles in order to avoid their failure, the Bank of Italy related its stabilisation policy to fiscal dynamics via variations on the taxation regime of the money supply exceeding reserve standards (Toniolo, 1978 and 1980; Bonelli, 1991). Thus, major bail-outs produced an expansionary fiscal policy with an impact on the public debt. Oddly enough, our estimates do not show any significant correlation between banking variables and monetary ones. Indeed, it may be argued that the true mechanics depicted above it is more like to work when banking variables and fiscal variables are estimated. In fact, this is what we can observe, even if there is a certain difference between periods about the frequency and the strength of banking crises and bankruptcies. In the first part of the period, when universal banks were operating predominantly all the major crises occurred (in 1892-93, 1907, 1914, 1921, 1923, 1928, 1932-33) hitting the largest banks and either a high number of local banks (Bonelli, 1971 and 1991; Confalonieri, 1974-1976, 1980-1982, 1994; Toniolo, 1993 and 1995). In these decades governments pursued the balance among their most important objectives, even if some exceptions to the rule were experienced during periods of war, such as at the eve of the First World War. As plotted in Figure 2, the government expenditure over GDP ratio was completely out of control only during the two world wars and the autarky in the second part of the 1930s, when it peaked up to over 40%.

<sup>3</sup> The latter ones are particularly sensitive in the subset of the investments in construction and public works.

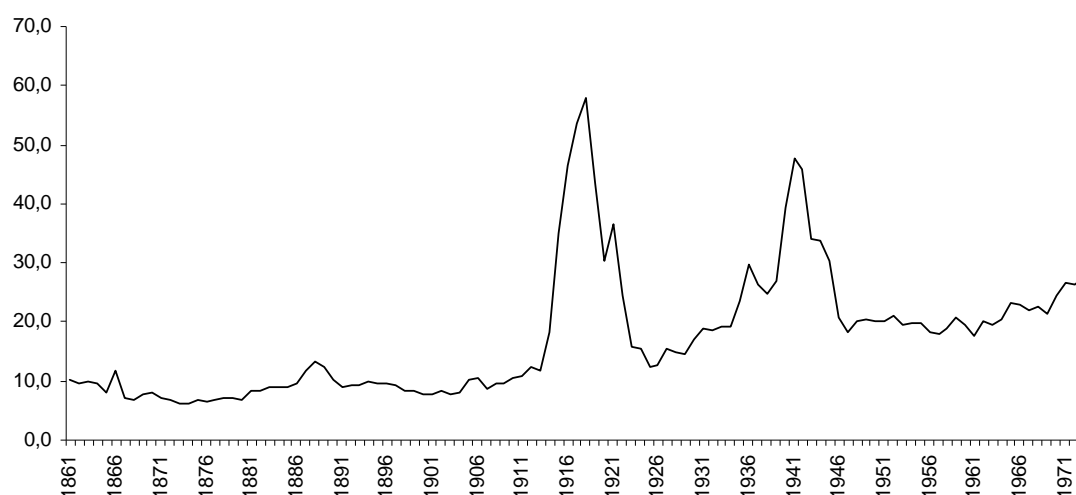


Figure 2. Government expenditure over GDP ratio, percentage (1890-1973)

It is noteworthy that after the Second World War this variable tended to stay over the average of the previous period. Along all the 1950s and 1960s government spending over the GDP ratio gained a steady double digit value, a trend initially loomed in the late 1920s. The debt over GDP ratio has a different movement over the long period. This variable tends to decline sharply when economic growth gained a momentum, which is in the first decade of the century and in the 1950s and 1960s. A long period of high growth and increasing public spending during the Golden age seems to be associated to certain stability within the banking system (see Figures 1, 2 and 3).



Figure 3. Government debt over GDP ratio, percentage (1890-1973)

Indeed, during the Golden age the Italian banking system did not experience any serious banking crisis, except the failure of a semi-public institution, heavily involved in a political scandal: the bankruptcy of the *Banco di Santo Spirito* was silently faced by a *de facto* bail-out in 1963-1964. The subsequent significant crisis occurred only after the end of our series, in 1980, when *Banco Ambrosiano*, involved in a political scandal and in a currency turmoil which produced some huge write-offs, failed without any serious intervention by central monetary authorities (Bellavite Pellegrini, 2002).

As fiscal policy is positively correlated with investments, in particular growth in public expenditures foster investments, it is easy to suppose that some relations between banking behaviour and fiscal policy could be each other related via investments' cycles.

#### 4. Data, methodology and sources

We analyse the relationship between fiscal and banking variables. In the latter variables include the log of real government spending (*LogRealGov*), the log of real taxes (*LogRealTax*), and the real primary budget surplus (*RealSur*). These data are taken from Fratianni and Spinelli (2001). Banking data are collected from balance-sheets figures from three different databases realised by the Bank of Italy, reclassified to get homogeneous data (Cotula *et alii*, 1996; Banca d'Italia, 1937-1975).<sup>4</sup> As we lack of information on interest rates applied to different borrowers (by size, sector, ownership) and on non-performing loans we employ rougher indicators as proxies: i) total assets, as a proxy of credit supply as a whole in order to evaluate effects of cycles on the size of the entire sector; ii) the loans over liabilities ratio is here used to measure the rate of intermediation; iii) the liquidity of the system is a proxy aiming to have a control of credit crunch. In particular, we consider the behaviour of the whole banking system and the behaviour of a subset, Savings & Loans. *LogLoanssys* and *LogLoan\_s&l* are the logs of loans on total liabilities both from the whole system and for Savings & Loans, respectively, while *Gtotalassetssys* and *Gtotalassets\_s&l* refer to the growth of total assets of the banking system and of Savings & Loans: finally, *LogLiqsys* is the overall liquidity of the banking system. For real variables (gross domestic product and

<sup>4</sup> The first part of our series is based on Cotula *et alii* (1890-1936), while the other parts are taken from historical statistics publicly provided by the Bank of Italy (1937-1965) and from the *Bollettino bimestrale* every two months by the same institution (1966-1973).

investments as a whole) we use historical estimates and series provided by Rossi *et alii* (1993).<sup>5</sup> *Realinvgrowth* is the growth of real investments.

We are interested in the relationship between fiscal and banking variables, therefore we first estimate an unrestricted VECM in the following form:

$$\Delta y_t = \Pi y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + u_t \quad (1)$$

where  $y_t$  is a vector of  $K$  time series variables,  $\Pi = -(I_K - A_1 - \dots - A_p)$ ,  $\Gamma_i = -(A_{i+1} + \dots + A_p)$ ,  $A_i$  being matrices of coefficients ( $K \times K$ ) and  $u_t$  is an unobservable error term. The first term of equation (1) includes the short-run parameters and it is stationary, while the second term includes long-run parameters and it is I(1). The lag-length is selected according to the Akaike Information Criterion (AIC, thereafter). VECM estimates are then used to detect derive impulse response functions.

## 5. Results

### 5.1. Stochastic properties of the series

The first step of the analysis is the assessment of the stochastic properties of the series. We perform this task by using two tests: the Augmented Dickey-Fuller (ADF) in which the null hypothesis is unit root against the alternative of stationarity (Dickey and Fuller, 1979), and the KPSS test proposed by Kwiatkowski *et alii*. (1992) where the null hypothesis is stationarity against the alternative of unit root. Ideally, rejection of the null in the first test should be confirmed by non rejection of the null in the second (and vice versa), leading to a consistent result.

Table 1 reports the specifications and the results of the two tests. For the ADF test the lag-length is determined according to the Akaike Information Criterion, searching for up to 10 lags. The time trend is included according to its significance in the estimations. The lag-length for the KPSS test is set equal to 2 by default. The trend is included when it is used in the relevant ADF test.

<sup>5</sup> There are more updated reconstructions of Italian historical national accounts (Fenoaltea, 2005) but they consider only a subset of the time-span we have considered. For homogeneity we decided to use the estimates by Rossi *et alii* (1993).

Table 1 – Unit root tests

Variable	ADF		KPSS	Verdict	
	Lag-length	Trend Test statistics			
Gtotalassetssys	1	Y	-6.5209	0.1058	Stationary
Gtotalassets_s&l	0	N	-5.8265	0.1049	Stationary
LogLiqsys	2	Y	-2.8780	0.3456	Non-stationary
LogLoan_s&l	1	Y	-3.8681	0.2066	Stationary
LogLoansys	2	N	-2.4057	0.2035	Non-stationary
LogRealGov	1	Y	-2.1389	0.4586	Non-stationary
Realinvgrowth	1	N	-7.1159	0.0821	Stationary
LogRealTax	1	Y	-2.2747	0.3631	Non-Stationary
RealSur	1	N	-3.0010	0.1244	Stationary

For the ADF test with trend critical values are: -3.96, -3.41, -3.13, while for the test without trend are they are -3.43, -2.86, and -2.57 at the 1%, 5% and 10% significance levels, respectively. For the KPSS test critical values for mean stationarity are 0.347, 0.463, 0.739, whereas for trend stationarity they are: 0.119, 0.146, and 0.216 at the 10%, 5% and 1% significance levels, respectively. The column trend indicates the inclusion (or not) of a trend in the tests.

For all the series but one we got consistent results. For example, in the case of *Gtotalassetssys*, *Gtotalassets\_s&l*, *LogLoan\_s&l* and *Realinvgrowth* we can reject the null of non-stationarity in the ADF test at the 1% significance level, and the KPSS does not reject the null of stationarity. For *SurGdp*, we reject the null of unit root at the 5% significance level in the ADF test, and cannot reject stationarity in the KPSS test. Therefore, we conclude that these series are  $I(0)$ . In contrast, for *LogRealTax*, *LogRealGov* and *LogLiqSys* we cannot reject the null of unit root, and we do reject the null of stationarity in the KPSS test at the 1% level. The same applies to *LogLoansys*, where the null of stationarity is rejected at the 5% level. Therefore, we conclude that these series are  $I(1)$ .

## 5.2 Cointegration

Having assessed the order of integration of the variables, we need to ascertain the order of cointegration of the VECMs we will estimate in order to evaluate procyclicality. Table 2 reports the Johansen tests. We can conclude that at the 5% significance level in the first two models there is one cointegrating vector, whereas at the same significance level there are three cointegrating vectors for the third model, and for the fourth model there are three cointegrating vectors at the 1% significance level.

Table 2 – Johansen cointegration tests

r	LR	p
LogRealGov, LogRealTax, Gtotalassetssys, LogLoansys		
0	82.67	0.0004
1	45.23	0.0301
2	13.46	0.7045
3	2.53	0.9133
LogRealGov, LogRealTax, RealInvgrowth, LogLoansys		
0	116.83	0.0000
1	43.25	0.0445
2	19.17	0.2765
3	2.95	0.8715
LogRealGov, RealSur, Gtotalassetssys, LogLoansys		
0	201.16	0.0000
1	96.04	0.0000
2	33.22	0.0040
3	12.82	0.0429
LRealGov, LRealTax, Gtotalassets_s&l, LogLoan_s&l		
0	368.32	0.0000
1	171.99	0.0000
2	87.55	0.0000
3	33.35	0.0000

Critical values with trend and intercept at the 10%, 5% and 1% significance levels are: for  $r = 0$  60.00, 63.66 and 70.91; for  $r = 1$  39.73, 42.77, and 48.87; for  $r = 2$  23.32, 25.73, and 30.67; for  $r = 3$  10.68, 12.45, and 16.22.

### 5.3 A VECM analysis

We analyse the procyclicality between fiscal policy and banking by means of impulse response functions generated by the VECM models. If, following a shock in banking variables, fiscal aggregates move in the same direction, this is evidence of procyclicality. We also look at the other way round, by tracing out the effects of fiscal variables on banking.

Figure 4 considers the VECM between *LogRealGov*, *LogRealTax*, *Gtotalassetssys* and *LogLoansys*.<sup>6</sup> In these estimations we are interested in the interrelation between fiscal policy on the whole banking system. The AIC suggests using 8 lags and Table 2 suggests imposing 1 cointegrating vector. Banking variables have medium-term effects on fiscal policy, in particular a shock on loans has significant effect on government spending and taxes in the medium-run for the growth of assets,

<sup>6</sup> For this and the following estimates we have also included a dummy for the two World Wars, but results do not substantially change. Results are available upon request.

and more lasting for loans. In turn, the two fiscal variables show different effects: government spending does not significantly impact on banking activity. In contrast, taxes have short-run effects.

Figure 5 replicates the analysis of Figure 4, substituting the growth of total assets with the growth of total investments, a measure of demand for loans from firms. In this case the suggested optimal number of lags is 10, and there is one cointegrating vector. Growth of real investments positively affects both fiscal variables. In contrast, the effect of loans is somehow reduced with respect to Figure 4. Taxes and government spending have a very short-lived effect on loans and on the growth of real investments, making fiscal policy quite ineffective in promoting economic activity.

In Figure 6 we substitute taxes with the primary surplus, an indicator of expansionary/restrictive fiscal policy. The number of lag is 11, and Table 2 suggests using three cointegrating vectors. Government spending reacts negatively to changes in total assets in the short-run, but over the medium run this effect becomes positive. As a result, an improvement in the fiscal position is shown in the short-run, but then it becomes insignificant. Loans have also a positive effect on government spending, and a negligible one on real surplus. Growth of total assets is not affected by fiscal variables, whereas government spending has a long-run effect on loans and real surplus a short-run effect.

Figure 7 considers the variables *LogGovGdp*, *LogTaxGdp*, *Gtotalassets\_s&l* and *LogLoan\_s&l*, turning our attention to the subset of Savings & Loans. In this case the number of lags suggested by the AIC is 14, and three cointegrating vectors are imposed. The effects of shocks in banking variables are quite small in size and tend to be very short. Government expenditure and growth of total assets are substitute in the short-run, whereas a shock on taxes has a positive and significant impact on banking variables. A shock of loans has a medium-run effect on government spending but not on taxes. Saving and Loans, therefore, seem less affected by fiscal policy than the whole banking system.



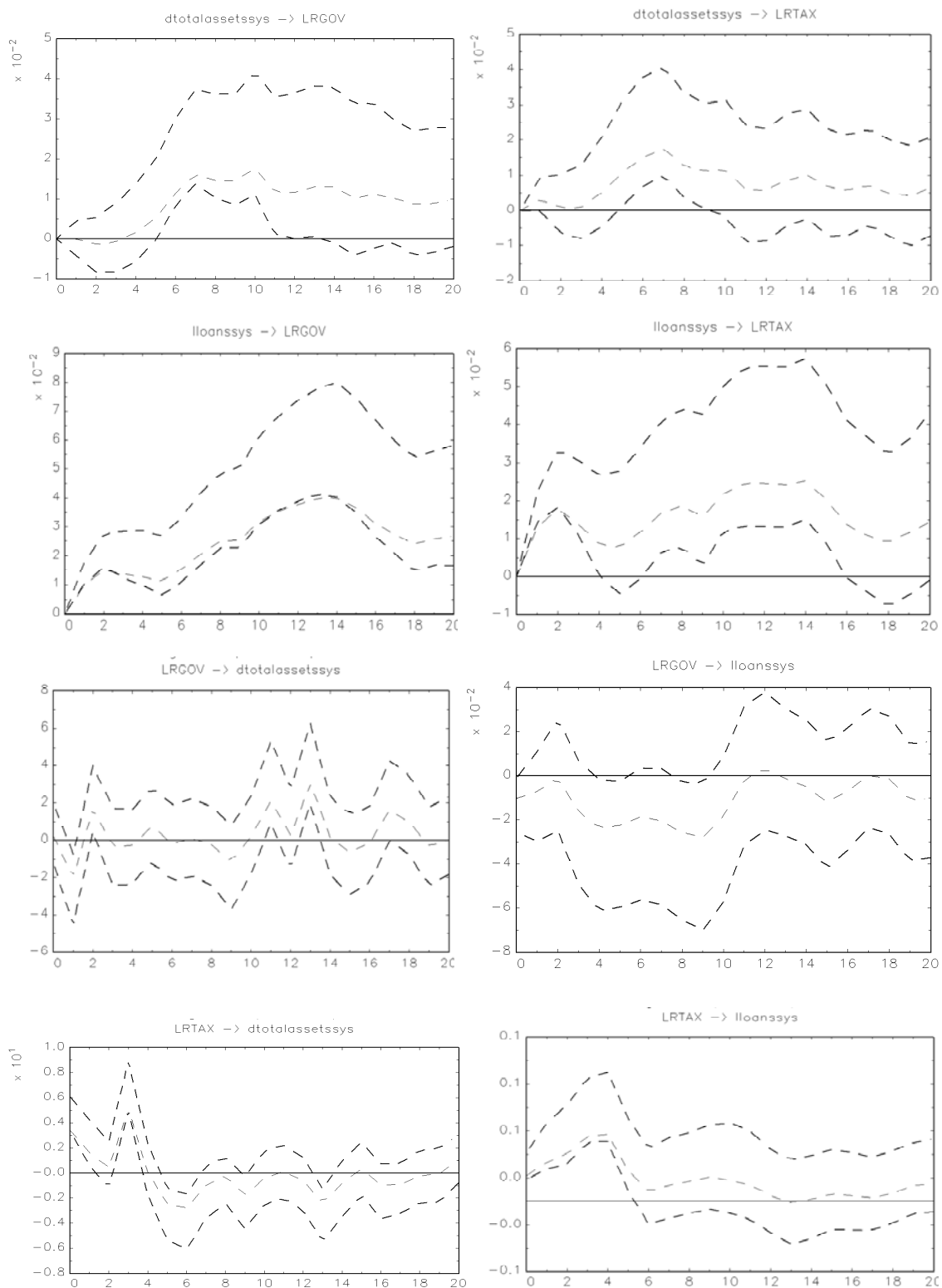


Figure 4 – VECM between government spending, taxes, growth of assets and loans

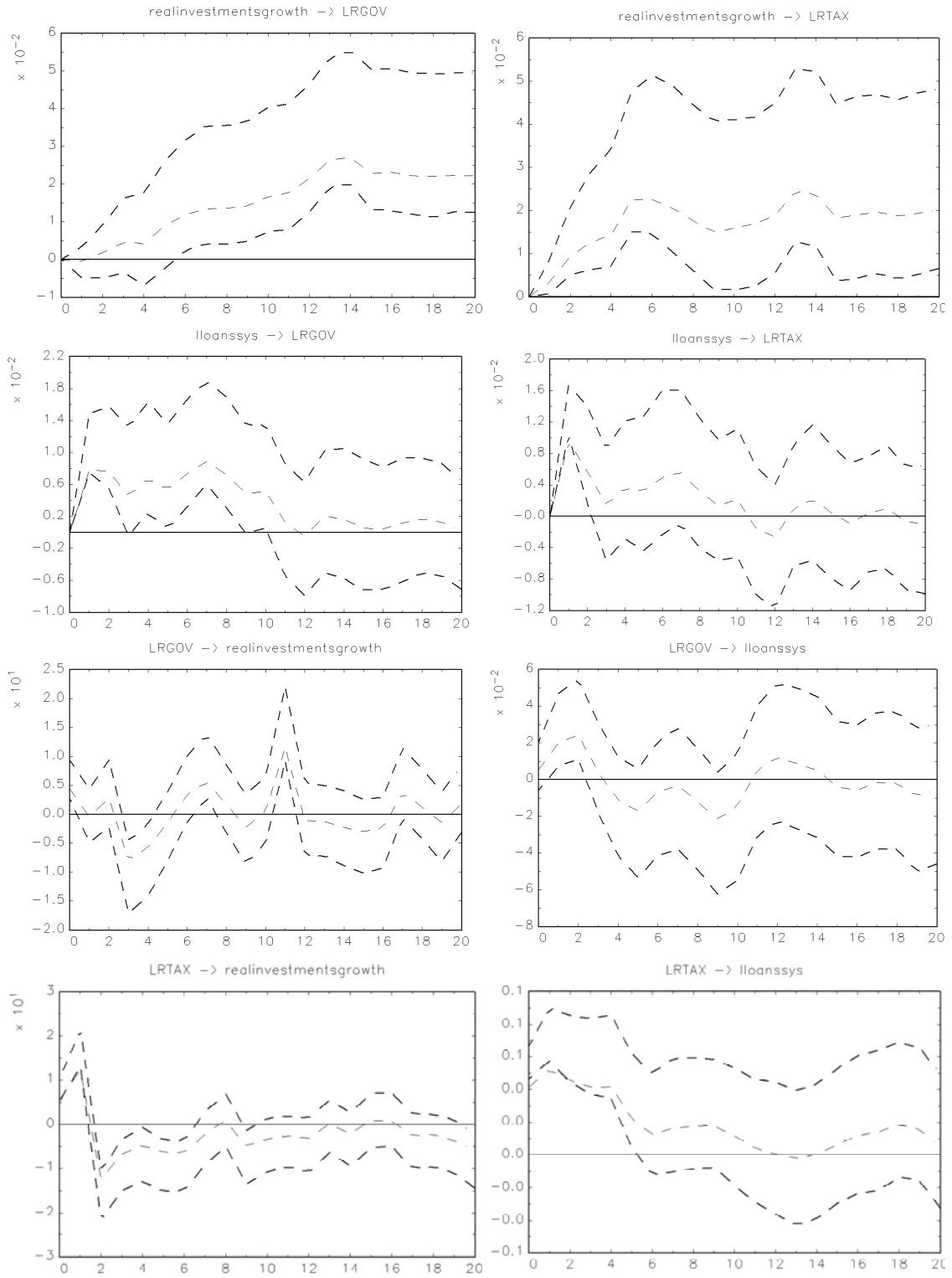


Figure 5 – VECM between government spending, taxes, investments' growth, and loans

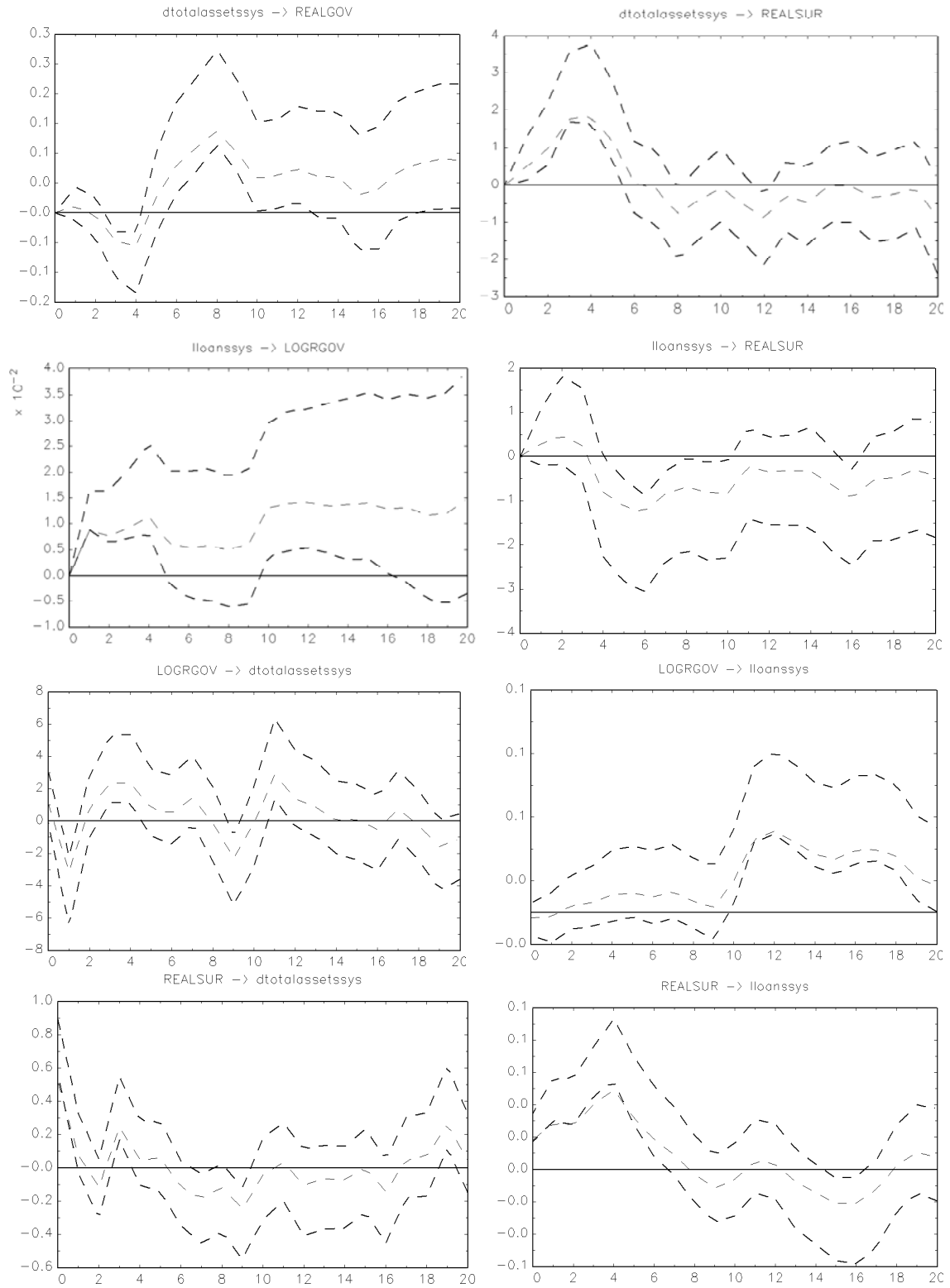


Figure 6 – VECM between, government spending, primary surplus, growth of assets and loans.

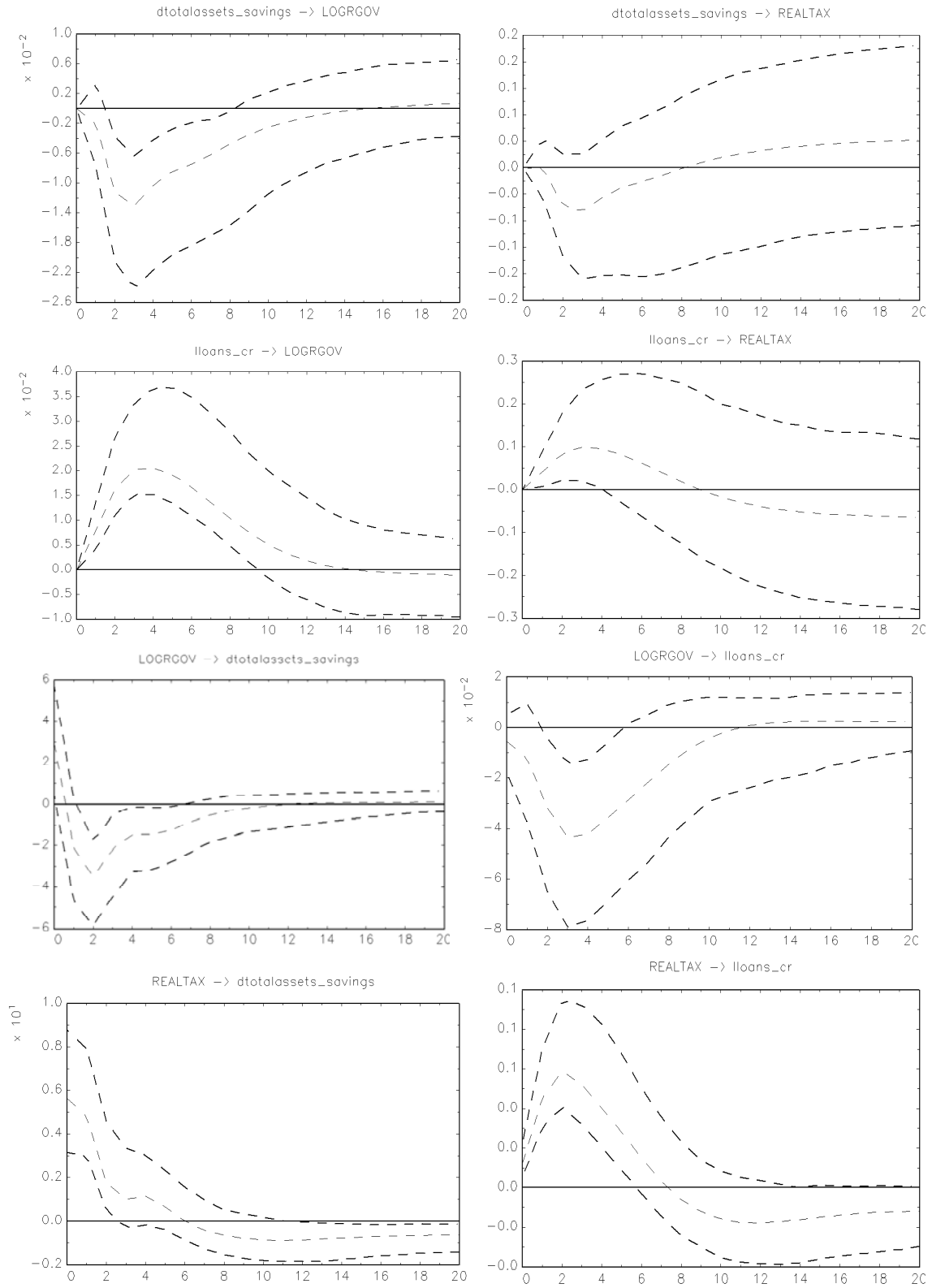


Figure 7 – VECM between government spending, taxes, growth of assets and S&L loans.

#### 5.4 Stability

In order to check for the stability of the relationships we have analysed before, it is appropriate to use the CUSUM statistics. For VECM models with a known number of cointegrating vectors, single-equation OLS is efficient and this set of statistics can be applied (Lütkepohl, 2004). Figures 8-11 show that for all the equations the statistics remain safely within the 5% significance level boundaries, indicating no structural breaks during the period, with the exception of *Gtotalassets\_s&l* in Figure 11.

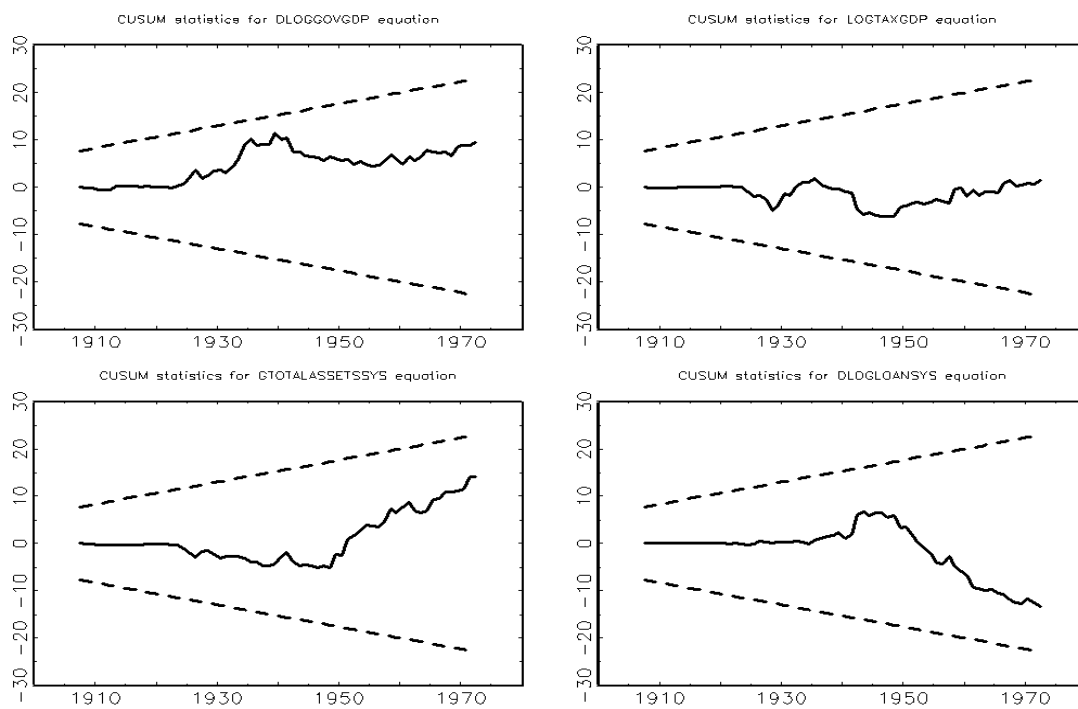


Figure 8. Stability of the VECM between government spending, taxes, growth of assets and loans

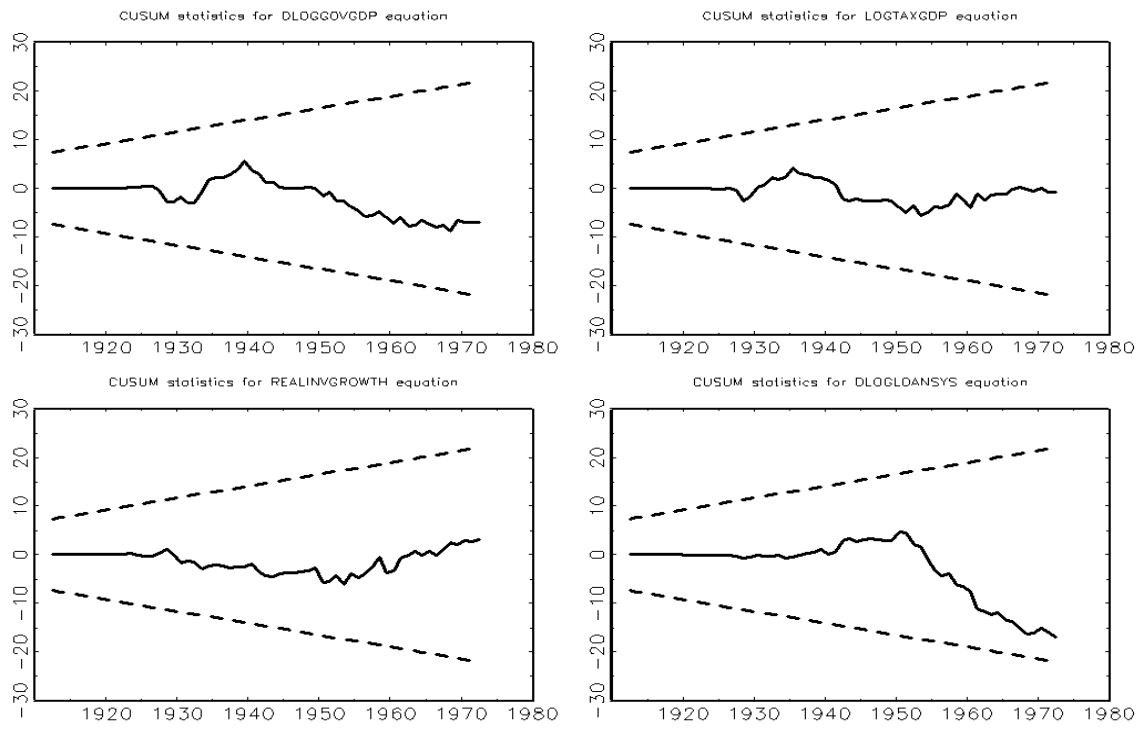


Figure 9. Stability of the VECM between government spending, taxes, growth of investment and loans

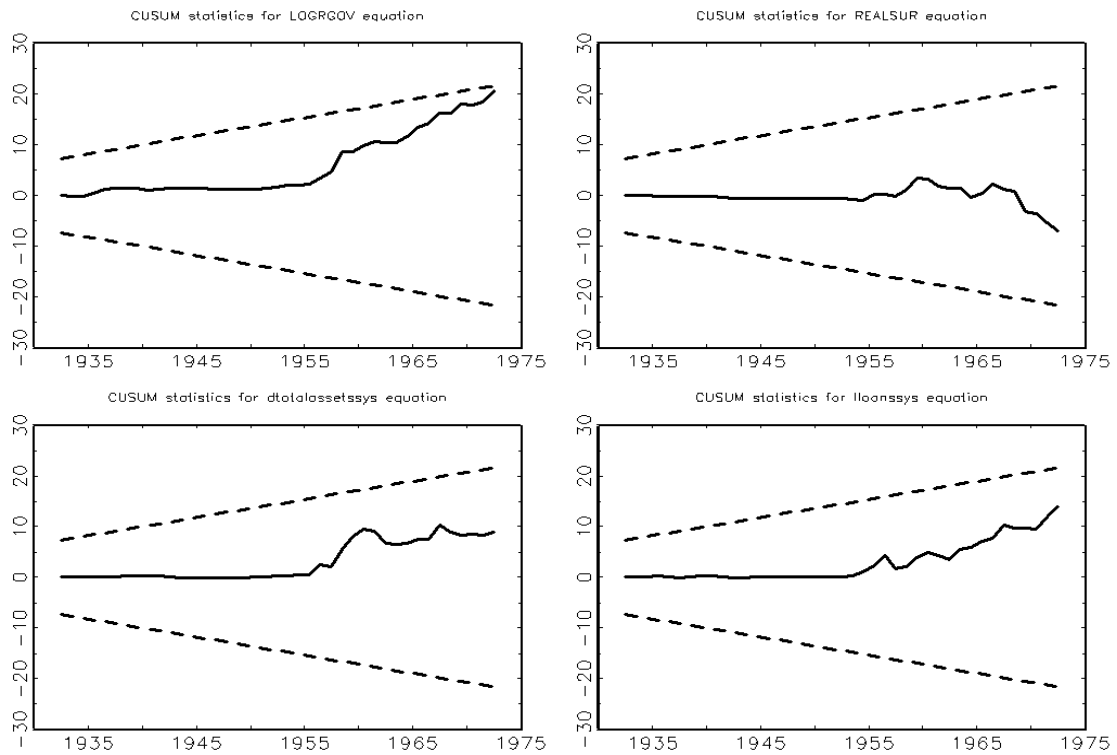


Figure 10. Stability of the VECM between government debt, surplus, growth of assets and loans

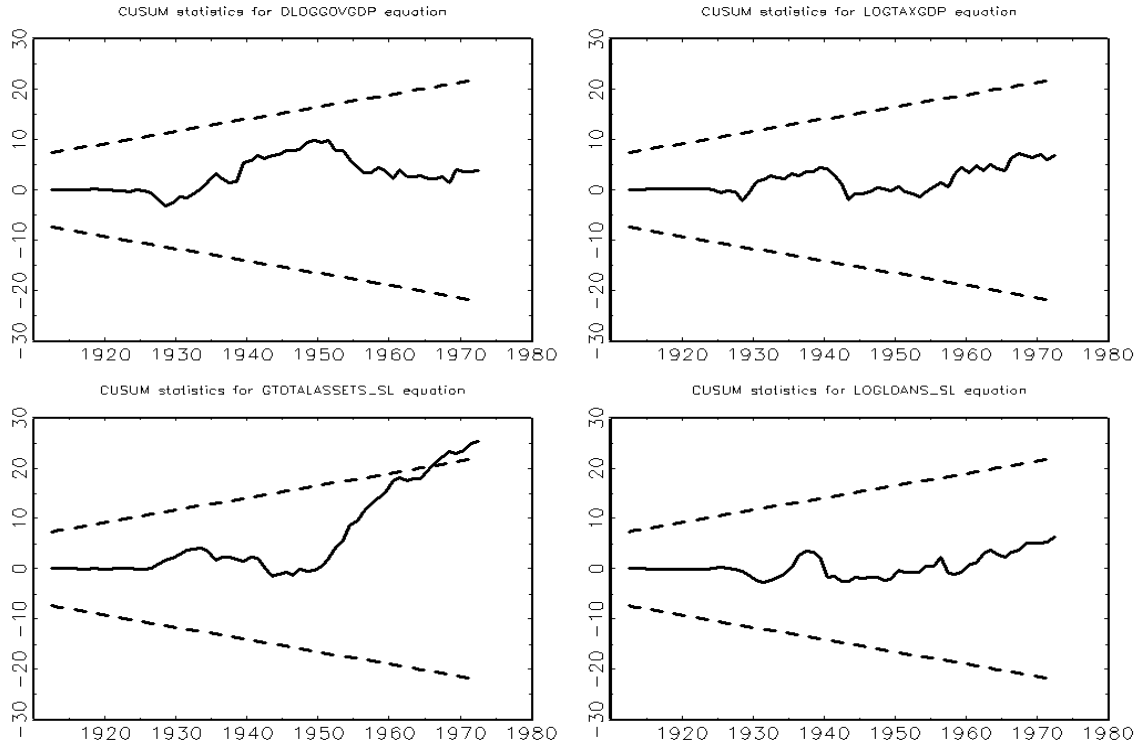


Figure 11. Stability of the VECM between government spending, taxes, growth of asset and loans of S&Ls

## 6. Conclusions

We have analysed the relations between the banking system fluctuations, on one hand, and taxation and public spending, on the other hand, using a VECM approach. We find significant procyclicality of fiscal policy (especially government spending) with respect to the banking system. Turning our attention to the subset of Savings & Loans we find smaller and less significant procyclicality, probably due to the more conservative nature of their banking policy. The relations we have uncovered appear stable over time. In a political economy interpretation of these findings, we think that in ‘good times’, when economic activity flourishes and banks increase their lending, fiscal authorities tend to increase their spending instead of saving for future rainy days. Indeed, the historical record of the Italian fiscal policy shows an upward trend in spending and large deficits and debt that have been reduced in a number of strong fiscal consolidations.

In this paper we have not estimated a structural version of the VECM model, we have taken an exploratory way in absence of an explicit theory linking the variables involved in the analysis. Further work should address this issue.



## References

- Albertazzi U. and Gambacorta L. (2006), Bank Profitability and the Business Cycle, Banca d'Italia, *Temì di discussione* no. 601.
- Alesina A., Campante, F. and Tabellini G. (2008), Why is Fiscal Policy often Procyclical?, *Journal of the European Economic Association*, 6, 1006-1036.
- Altman E.I., Brady B., Resti A., and Sironi A. (2005), The Link Between Default and Recovery Rates. Theory, Empirical Evidence and Implications, *Journal of Business*, 78, 2203-2228.
- Banca d'Italia, *Bollettino bimestrale*, 1937-1975.
- Bellavite Pellegrini C. (2002), *Storia del Banco Ambrosiano. Fondazione, ascesa, dissesto, 1896-1980*, Roma-Bari: Laterza.
- Berger A.N. and Udell G.F. (2002), The Institutional Memory Hypothesis and the Procyclicality of Bank Lending Behavior, Basel, *BIS Working Paper* no. 125.
- Bernanke B., Gertler M. and Gilchrist S. (1998), The Financial Accelerator in a Quantitative Business Cycle Framework, *NBER Working Paper*, no. 6455, March.
- Bernauer T. and Koubi V. (2004), Banking Crisis vs. Credit Crunch? A Cross-Country Comparison of Policy Responses to Dilemmas in Banking regulations, *Business and Politics*, vol. 6, n. 2.
- Bikker J. and Hu H. (2002), Cyclical Patterns in Profits, Provisioning and Lending of Banks, Amsterdam, *DNB Staff Reports* no. 86.
- Bliss R.R. and Kaufman G.G. (2002), Bank Procyclicality, Credit Crunches, and Asymmetric Monetary Policy Effects: A Unifying Model, *Federal Reserve Bank of Chicago Working Paper* no. 18.
- Bonelli F. (1971), *La crisi del 1907. Una tappa dello sviluppo industriale in Italia*, Torino, Fondazione Einaudi.
- Bonelli F. (1991), *Introduzione*, in Id. (ed.), *La Banca d'Italia dal 1894 al 1913. Momenti della formazione di una banca centrale*, Roma-Bari, Laterza.
- Bordo M., The Crisis of 2007: The Same Old Story, Only the Players Have Changed, Globalization and Systemic Risk, Chicago Illinois, September 28.
- Bordo M., Dueker M.J. and Wheelock, D.C. (2001), Aggregate Price Shocks and Financial Stability: The United Kingdom 1796-1999, *NBER Working Paper No* 8583.
- Brambilla C. and Piluso G. (2007), Are Banks Procyclical? Evidences from the Italian Case, 1890-1973, Università degli Studi di Siena, *Quaderni del Dipartimento di Economia Politica*, no. 523, December.
- Cohn J. and Federico G. (2001), *The Economic Development of Italy*, Cambridge, Cambridge University.
- Confalonieri A. (1974-1976), *Banca e industria in Italia, 1894-1906*, Milano, Banca Commerciale Italiana, 3 voll.
- Confalonieri A. (1982), *Banca e industria in Italia dalla crisi del 1907 all'agosto del 1914*, Milano, Banca Commerciale Italiana, 2 voll.
- Confalonieri A. (1994), *Banche miste e grande industria in Italia, 1914-1933*, Milano, Banca Commerciale Italiana.
- Cotula F., Iacoboni, R. and Vitali, O. (eds.) (1996), *I bilanci delle aziende di credito 1890-1936*, Roma-Bari, Laterza.
- Delli Gatti D., Gallegati M., and Gallegati M. (2005), On the Nature and Causes of Business Fluctuations in Italy, 1861-2000, *Explorations in Economic History*, 42,

81-100.

- Demirgüç-Kunt A. and Levine R. (eds.) (2001), *Financial structure and economic growth. A cross-country comparison of banks, markets, and development*, Cambridge (MA) and London, MIT Press.
- Dickey D and Fuller W.A. (1979), Estimators for Autoregressive Time Series with a Unit Root, *Journal of the American Statistical Association*, 74, 427-431.
- Eichengreen B. and Bordo M. (2003), Crises Now and Then: What Lessons from the Last Era of Financial Globalisation?, in *Monetary History, Exchange Rates and Financial Markets*, vol. 2, Cheltenham: Edward Elgar.
- Fenoaltea S. (2005), The Growth of the Italian Economy, 1861-1913: Preliminary Second-Generation Estimates, *European Review of Economic History*, 8, 273-312.
- Filosa R. (2007), Stress Testing of the Stability of the Italian Banking System: A VAR Approach, Università di Modena e Reggio Emilia, Dipartimento di Economia Politica *Heterogeneity and monetary policy* no. 0703.
- Friedman B.M. (1984), Money, Credit, and Interest Rates in the Business Cycle, *NBER Working Papers* no. 1482.
- Goodhart Ch.A.E., Hofmann B. and Segoviano M. (2004), Bank Regulation and Macroeconomic Fluctuations, *Oxford Review of Economic Policy*, 20, 591-615.
- Granger C.W.J. (1969), Investigating Causal Relations by Econometric Models and Cross-Spectral Specification, *Econometrica*, 37, 424-438.
- Kaminsky G. (1999), Currency and Banking Crises: The Early Warnings of Distress, *IMF Working Papers* no. 178.
- Kiyotaki N. and Moore J. (1997), Credit Cycles, *Journal of Political Economy*, 105, 211-248.
- Krainer R.E. (2002), Banking in a Theory of Business Cycles: A Model and Critique of the Basel Accord on Risk Based Capital Requirements for Banks, *International Review of Law and Economics*, 21, 413-433.
- Kwiatkowski D., Phillips, P.C.B., Schmidt P. and Shin Y. (1992), Testing the Null of Stationarity against the Alternative of a Unit Root: How Sure Are We that the Economic Time Series Have a Unit Root?, *Journal of Econometrics*, 54, 159-178.
- Jimenez J. and Saurina J. (2005), Credit Cycles, Credit Risk and Prudential Regulation, Banco de España, *Documentos de Trabajo* n. 0531.
- Logan A. (2000), The Early 1990s Small Banks Crisis: Leading Indicators, *Financial Stability Review*, Bank of England, December.
- Lütkepohl H. (2004), Vector Autoregressive and Vector Error Correction Models, in Lütkepohl H. and Krätzig M., *Applied Time Series Econometrics*, Cambridge, Cambridge University Press.
- Luzzatto G. (1968), *L'economia italiana dal 1861 al 1894*, Torino, Einaudi, 1991.
- Pantaleoni M. (1895), *La caduta della Società Generale di Credito Mobiliare Italiano*, Torino, Utet, 1998.
- Quagliariello M. (2006), Bank's Riskiness over the Business Cycle: A Panel Analysis on Italian Intermediaries, Banca d'Italia, *Temi di discussione* no. 599.
- Rajan R.G. (1994), Why Bank Credit Policies Fluctuate: A Theory and Some Evidence, *The Quarterly Journal of Economics*, 109, 399-441.
- Ricciuti R. (2008), The Quest for a Fiscal Rule: Italy, 1861-1998, *Cliometrica*, 2, 259-278.
- Rossi N., Sorgato G., Toniolo G. (1993), I conti economici italiani: una ricostruzione

- statistica, 1890-1990, *Rivista di storia economica*, n.s., vol. 10, 1-47.
- Spinelli F. and Fratianni M. (1996), *A Monetary History of Italy*, Cambridge, Cambridge University Press.
- Toniolo G. (1978), Crisi economica e smobilizzo pubblico delle banche miste (1930-1934), in Id. (ed.), *Industria e banca nella grande crisi 1929-1934*, Milano, Etas.
- Toniolo G. (1980), *L'economia dell'Italia fascista*, Roma-Bari, Laterza.
- Toniolo G. (1993), Il profilo economico, in Guarino G. and Toniolo G. (eds.), *La Banca d'Italia e il sistema bancario, 1919-1936*, Roma-Bari, Laterza, pp. 5-101.
- Toniolo G. (1995), Italian Banking, 1919-1936, in Ch. Feinstein (ed.), *Banking, Currency, & Finance in Europe between the Wars*, Oxford, Oxford University Press, pp. 296-314.
- Toolsema L.A. (2004), Monetary Policy and Market Power in Banking, *Journal of Economics*, 83, 71-83.
- White W.R. (2006), Procyclicality in the Financial System: Do We Need a Macrofinancial Stabilisation Framework?, *BIS Working Papers* no. 193.

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