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on fiscal policy outcomes

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THE EFFECT OF ASSET PRICE VOLATILITY ON FISCAL POLICY OUTCOMES

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ABSTRACT

This paper examines the effect of asset price volatility on fiscal policy stance. We find that asset price volatility affects the volatility of discretionary fiscal policy in a positive and significant manner, which according to Fatas and Mihov (2003) has negative repercussions on output volatility and economic growth. Higher residential property price volatility amplifies both the volatility of government spending and the volatility of the discretionary fiscal policy stance. Equity price volatility increases the volatility of the fiscal policy stance, primarily via the government revenue channel.

Keywords: Asset prices, fiscal policy, volatility.

JEL classification: E61, E62, H61, H62, E32

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1. Introduction

The on-going economic and financial market turmoil has been accompanied by a significant fall in asset prices, following several years of asset price boom. These asset price movements affect the fiscal policy stance through a series of channels (see e.g., Schuknecht and Eschenbach, 2004). Directly, they affect specific revenue categories, e.g., capital gains and losses related to direct taxes on households and businesses. Indirectly, they affect revenue via a feedback loop from higher asset prices to real economic activity (higher asset prices raise consumer confidence and consumption, via the wealth effect,) which increases the collection of indirect taxes. Finally, in case asset price busts lead to defaults of financial institutions, the state will be asked to intervene to preserve the stability of the financial system.

This paper goes beyond the previous literature in examining whether asset price volatility amplifies the volatility of fiscal policy outcomes, which according to Fatas and Mihov (2003) has negative repercussions on output volatility and economic growth.¹ Following previous studies, e.g., Jaeger and Schuknecht (2004) we use a real aggregate asset price index (taken from the Bank of International Settlements-BIS; see Appendix).

2. Asset price volatility and fiscal policy

Using data for 17 OECD countries for the period 1970 to 2005, we find preliminary evidence that asset price volatility has been increasing over time.² Driven by this evidence, we examine whether this had any significant impact on the volatility of fiscal policy stance, as measured by the standard deviation of the change in the cyclically adjusted primary balance as a percent of GDP. Next, we repeat the same exercise for the volatility of government spending and government revenue, as measured, respectively, by

¹ According to Fatas and Mihov (2003) the volatility of output caused by discretionary fiscal policy lowers economic growth by more than 0.8 percentage points for every percentage point increase in volatility

² While the volatility of economic activity cycles has fallen over the time (either due to better policies or to smaller shocks), the volatility of aggregate asset price movements appears to have increased. Splitting the sample into four sub-samples we see that the standard deviation of the output gap (real GDP growth) was 1.946 (0.025) in 1970-1979, 2.389 (0.018) in 1980-1989, 2.635 (0.025) in 1990-1999 and 1.508 (0.015) in 2000-2005, i.e. the volatility of economic activity has gradually declined over the time. However, in the case of the change in the aggregate asset price series, the standard deviation was 0.081 in 1970-79, 0.084 in 1980-89, 0.088 in 1990-99 and 0.141 in 2000-2005, i.e., it has been increasing.

the standard deviation of the change in the cyclically adjusted total expenditures excluding interest payments as a percent of GDP, and the standard deviation of the change in the cyclically adjusted total revenues as a percent of GDP.

Given that our analysis involves only 17 countries, we split the sample into four parts, 1970-1979, 1980-1989, 1990-1999 and 2000-2005 and construct volatility measures and average values for the respective variables and sub-samples. Therefore, our unbalanced panel involves at the maximum 68 observations.

The dependent variable is the log of the standard deviation of the change in the cyclically adjusted primary balance as a percent of GDP. The key explanatory variables are the log of the standard deviation of the change in aggregate asset prices and the log of the standard deviation of the real GDP growth. In principle, one could expect (as in Gali and Perotti, 2003) that a fiscal policy rule implies that the fiscal stance, i.e. a measure of discretionary fiscal policy making (e.g., the change in the cyclically adjusted primary balance as a percent of GDP), would react to output deviations from trend (or alternatively GDP growth). Hence, the fiscal policy maker can respond in a counter-cyclical or pro-cyclical manner to output growth movements; this implies that the volatility of real GDP growth should be taken on board when examining the determinants of the volatility of the discretionary fiscal policy stance. Note that the sign of coefficient can be either positive or negative, depending on whether the fiscal policy maker responds in a very pronounced manner or not. In a similar manner a fiscal policy maker might be asked to respond or take on board asset price movements. For example, this can happen when a fiscal policy maker has to respond to an asset price bust by increasing government spending in order to counterbalance the effects of falling asset prices on economic activity and, possibly to address the related vulnerabilities of the financial system (see Tagkalakis, 2009). Alternatively, if primary balances and in particular government revenues are not adjusted both for the economic and the asset price cycle, then cyclically adjusted primary balances (and cyclically adjusted revenues) will be affected by asset price movements (see e.g., Jaeger and Schuknecht, 2004 and Morris and Schucknecht, 2007). Hence, asset price volatility should be taken on board when investigating the determinants of the volatility of the fiscal policy stance. Note that the sign of the coefficient of the asset price volatility variable can be either positive or negative.

An alternative formulation involves the logs of the standard deviation of the disaggregated asset prices series, i.e., the change in real commercial property, real residential property and real equity prices. The additional control variables used are the average value of the cyclically adjusted primary balance as a percent of GDP and the average value of the debt ratio. These variables control for the initial budgetary conditions. An alternative specification includes the average value of the cyclically adjusted total expenditures excluding interest payments as a percent of GDP and controls for the government size and the role that the government might have in stabilizing the economy via discretionary fiscal policy (see Gali, 1994; Fatas and Mihov, 2003). Following Rodrick (1998) and Fatas and Mihov (2003) we include the ratio of imports and exports as a percent to GDP (Trade) to control for the fact that a higher degree of openness might induce governments to use more actively fiscal policy in order to stabilize their economies. Finally, we include the real short term interest rate (RIRS) to control for monetary conditions.

The government spending and revenue specifications include, respectively, the average values of the cyclically adjusted total expenditures excluding interest payments as a percent of GDP and the cyclically adjusted total revenues as a percent of GDP.

Two specifications are considered each time, one with the contemporaneous value of the volatility of real GDP growth and a second where we instrument the contemporaneous volatility of real GDP growth with its lagged value and the lagged value of the standard deviation of output gap. The second specification controls for the fact that some of the variation in the volatility of the cyclically adjusted fiscal policy variable might still be due to output volatility and not to discretionary policy.

The results presented in Table 1 indicate that higher asset price volatility translates into higher volatility of discretionary fiscal policy. Since both variables are in logs, the coefficients report the elasticity of the volatility of discretionary policy with respect to the asset price. A 1 percent increase in aggregate asset price volatility leads to a 0.16-0.27 percent increase in the volatility of discretionary fiscal policy.³ This finding is

³ According to Fatas and Mihov (2003) the volatility of output caused by discretionary fiscal policy lowers economic growth by more than 0.8 percentage points for every percentage point increase in volatility. Taking the findings by Fatas and Mihov (2003) at face value, a 1 percent increase in aggregate asset price

reaffirmed in Table 2 in the case of residential property and equity prices, with the effect of the volatility of residential property prices being more significant (a 1 percent increase in residential property price volatility leads to a 0.15-0.22 percent increase in the volatility of discretionary fiscal policy). On the other hand, real commercial prices have a negative, but insignificant, coefficient estimate. Moreover, an increase in output volatility has no significant effect on the volatility of discretionary fiscal policy.

Turning to the other control variables, we see there is significant evidence that openness, and higher interest rates increase the volatility of fiscal policy (Tables 1 and 2). Higher primary surpluses or lower deficits lead to less volatile fiscal policy outcomes (Tables 1 and 2). The proxy of government size enters with a positive coefficient (but is significant only in Table 2), implying that larger governments use fiscal policy more actively for stabilizing purposes and, thus, more volatile discretionary fiscal policy outcomes.

As reported in Tables 3 and 4, there is evidence at the disaggregated level that higher volatility in real residential property prices induces more volatile government spending outcomes (a 1 percent increase in residential property price volatility leads to about 0.22 percent increase in the volatility of government spending), while there is much weaker evidence in the case of government revenues.⁴ Increased equity price volatility amplifies the volatility of government revenues; a 1 percent increase in equity price volatility leads to about 0.37 increase in the volatility of government revenues. Output volatility has a positive effect on the volatility fiscal policy, though the effect is not significant. The bigger the government size the more volatile government spending is, which implies a more active stabilizing role for fiscal policy. More open economies have

volatility leads to a 0.16-0.27 percent increase in the volatility of discretionary fiscal policy, which then increases output volatility and consequently reduces economic growth by 0.13-0.22 percentage points.

⁴ This might be a bit odd given that one might expect that residential property prices affect mostly government revenues. However, as has been shown by Schuknecht and Eschenbach (2004) and Tagkalakis (2009) abrupt asset price movements (busts) linked with financial instability can lead to higher government spending. This will be the case when the government has to bear part of the burden of a private sector bailout or when it wants to take discretionary action in order to avert a negative feedback loop on economic activity which could lead to a full blown recession. Moreover, according to a recent European Commission (2009) study which investigates the fiscal costs of financial crisis, the deterioration of fiscal balances in past financial crises came primarily through the expenditure side, while revenue ratios were on average less affected.

to cope with more volatile government revenues. Finally, there is some evidence that a higher debt ratio is linked with less volatile government spending.

3. Conclusions

Based on the fact that asset prices are particularly volatile, we found that there is significant evidence that asset price volatility affects the volatility of discretionary fiscal policy in a positive and significant manner. Higher residential property price volatility leads to more volatile government spending and, thus, to more volatile discretionary fiscal policy stance. Equity price volatility affects the volatility of the fiscal policy stance primarily via the government revenue channel. On the other hand, output volatility has no particular effect on the volatility of fiscal policy stance. Openness and the size of government affect positively and significantly the volatility of discretionary fiscal policy; the first, primarily, through the revenue channel and the second through government spending.

Hence, fiscal policy makers should take into account asset price movements because they amplify the volatility of discretionary fiscal policy stance. This would imply that if primary balances and in particular government revenues are not adjusted for both the economic and the asset price cycle, then cyclically adjusted primary balances (and cyclically adjusted revenues) will be affected by asset price movements (see e.g., Jaeger and Schuknecht, 2004 and Morris and Schucknecht, 2007). As a consequence the fiscal policy maker will not have a clear grasp of developments in the fiscal policy stance. This points to the need for adjusting fiscal balances, and in particular government revenues, for asset price changes.

Given that asset price movements amplify the volatility of the discretionary fiscal policy stance, which in turn amplifies business cycle fluctuations and harms economic growth (Fatas and Mihov, 2003), a word of caution is needed as regards the fiscal policy interventions undertaken (and their likely continuation) in response to the on-going economic and financial market turmoil.

Fiscal policy makers should bear in mind, when asked to respond to abrupt asset price movements (e.g., an asset price bust) and to address the likely implications for the stability of the financial system (see Schuknecht and Eschenbach, 2004; Tagkalakis, 2009), that, while their intervention will most likely have a positive first order effect (in terms of safeguarding or restoring economic and financial stability), it will also entail the risk of increasing fiscal policy and, consequently, output volatility generating a negative effect on economic growth, thus, putting a toll on economic recovery. This negative effect should be perceived as an additional argument in favour of promptly withdrawing the fiscal measures taken as a response to the economic and financial crisis when the recovery gathers pace.

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Appendix

Data

We used a yearly unbalanced panel data set (1970-2005) of 17 OECD economies: Australia, Belgium, Canada, Germany, Denmark, Spain, Finland, France, United Kingdom, Ireland, Italy, Japan, Netherlands, Norway, New Zealand, Sweden, and United States.

Macroeconomic variables

The macroeconomic variables used extend from 1970 to 2005. Fiscal and output variables are from the OECD Economic Outlook (2007), the definitions used are: the lagged value of the cyclically adjusted primary balance as a percent of GDP (CAPBY), the change in the cyclically adjusted primary balance as a percent of GDP (DCAPBY), the lagged value of the debt to GDP ratio (Debt), the lagged value of the output gap (Output gap), the lagged value of the short term real interest rate (RIRS), the change in the primary balance as a share of GDP (Change in primary balance), the change in cyclically adjusted total expenditure excluding interest payments as a share of GDP (DCATDXY), cyclically adjusted total expenditure excluding interest payments as a share of GDP (CATDXY), the change in cyclically adjusted total revenues as a share of GDP (DCATRY), cyclically adjusted total revenues as a share of GDP (CATRY). We also used the real GDP growth rate and an openness index (TRADE) which was constructed as the ratio of imports plus exports to GDP.

Asset price variables

The main indicator is the change in the log of the annual aggregate real asset prices (DRAAP), which covers 1970-2005 for 17 industrial countries and combines price indices for three asset classes - equities, residential property and commercial property – by weighting the components using shares of the asset classes in private sector wealth. The private consumption deflator is used to convert nominal to real asset prices. In addition, we considered also the change in the log of the three disaggregate asset price indices, i.e., real commercial prices (DRCP), real residential prices (DRRP) and real equity prices (DREP).

Table 1: Aggregate asset price volatility and the fiscal policy stance

| Variables | OLS | IV | OLS | IV |
|------------------------------------|-----------------------|----------------------|--------------------|--------------------|
| Volatility of real GDP growth rate | -0.1068 (-0.88) | 0.2995 (0.36) | -0.0270 (-0.22) | -0.2437 (-0.41) |
| Volatility of asset prices | 0.2736*** (2.82) | 0.2589* (1.67) | 0.1693** (2.13) | 0.2091 (1.48) |
| CAPBY | -0.0736*** (-3.12) | -0.0553** (-2.27) | | |
| CATDXY | | | 0.0155 (1.65) | 0.0148 (1.10) |
| Debt | -0.0009 (-0.61) | -0.0016 (-0.81) | -0.0009 (-0.48) | -0.0015 (-0.78) |
| Trade | 0.0034** (2.18) | 0.0030* (1.73) | 0.0011 (0.47) | 0.0015 (0.63) |
| RIRS | 0.0587** (2.47) | 0.0076 (0.08) | 0.0408 (1.45) | 0.0590 (0.75) |
| R2 | 0.385 | 0.256 | 0.283 | 0.2415 |
| No of obs. | 54 | 47 | 54 | 47 |

Notes: Dependent variables: Volatility of the log of the change in the cyclically adjusted primary balances as a percent of GDP. All regressions include an intercept. The p-values in parentheses are based on heteroskedastic robust standard errors. *, **, *** significant at the 10%, 5%, 1% level, respectively.

Table 2: Asset price volatility and the fiscal policy stance

| Variables | OLS | IV | OLS | IV |
|------------------------------------|-----------------------|----------------------|--------------------|--------------------|
| Volatility of real GDP growth rate | -0.1070 (-0.92) | 0.1696 (0.31) | 0.0112 (0.10) | 0.1424 (0.32) |
| Volatility of commercial prices | -0.0469 (-0.62) | -0.0337 (-0.36) | -0.0985 (-1.38) | -0.0653 (-0.76) |
| Volatility of residential prices | 0.1064 (1.08) | 0.2214* (1.83) | 0.0935 (0.91) | 0.1527* (1.73) |
| Volatility of equity prices | 0.2076 (1.34) | 0.2019 (1.40) | 0.0136 (0.09) | 0.0367 (0.21) |
| CAPBY | -0.0650*** (-2.66) | -0.0514** (-2.18) | | |
| CATDXY | | | 0.0222** (2.08) | 0.0217** (2.02) |
| Debt | -0.0009 (-0.51) | -0.0011 (-0.68) | -0.0008 (-0.44) | -0.0014 (-0.79) |
| Trade | 0.0043** (2.38) | 0.0029 (1.63) | 0.0018 (0.67) | 0.0011 (0.48) |
| RIRS | 0.0658** (2.51) | -0.0074 (-0.10) | 0.0440 (1.48) | -0.0066 (-0.10) |
| R2 | 0.351 | 0.293 | 0.324 | 0.313 |
| No of obs. | 52 | 47 | 52 | 47 |

Notes: As in Table 1.

Table 3: Aggregate asset price volatility and government spending and revenue

| Variables | Government spending | | Government revenues | |
|------------------------------------|-----------------------|--------------------|---------------------|--------------------|
| | OLS | IV | OLS | IV |
| Volatility of real GDP growth rate | 0.2657 (1.37) | 0.4307 (0.48) | 0.1637 (0.73) | 0.8276 (0.89) |
| Volatility of asset prices | 0.1065 (0.86) | 0.1167 (0.52) | 0.1083 (0.74) | -0.0443 (-0.20) |
| CATDXY | 0.0279*** (3.19) | 0.0265* (1.76) | | |
| CATRY | | | 0.0070 (0.63) | 0.0223 (1.53) |
| Debt | -0.0036*** (-2.69) | -0.0034 (-1.57) | 0.0009 (0.38) | -0.0011 (-0.47) |
| Trade | 0.0018 (1.66) | 0.0020 (1.22) | 0.0041*** (2.72) | 0.0035* (1.84) |
| RIRS | 0.0027 (0.14) | 0.0134 (0.10) | 0.0371 (0.68) | -0.0384 (-0.28) |
| R2 | 0.385 | 0.369 | 0.200 | 0.118 |
| No of obs. | 56 | 47 | 56 | 47 |

Notes: Dependent variables: In columns 1 and 2 is the volatility of the log of the change of the cyclically adjusted total expenditures excluding interest payments as a percent of GDP, in columns 3 and 4 the volatility of the log of the change of the cyclically adjusted total revenues as a percent of GDP. All regressions include an intercept. The p-values in parentheses are based on heteroskedastic robust standard errors. *, **, *** significant at the 10%, 5%, 1% level, respectively.

Table 4: Asset price volatility and government spending and revenue

| Variables | Government spending | | Government revenues | |
|------------------------------------|---------------------|--------------------|---------------------|---------------------|
| | OLS | IV | OLS | IV |
| Volatility of real GDP growth rate | 0.2398 (1.25) | 0.4437 (0.64) | 0.0790 (0.39) | 0.3023 (0.53) |
| Volatility of commercial prices | -0.0493 (-0.57) | -0.0935 (-0.92) | 0.0287 (0.36) | 0.0279 (0.26) |
| Volatility of residential prices | 0.2182* (1.79) | 0.2581 (1.34) | 0.1771 (1.50) | 0.1030 (0.73) |
| Volatility of equity prices | 0.0855 (0.52) | 0.0785 (0.32) | 0.3656* (1.88) | 0.3725** (2.01) |
| CATDXY | 0.0276*** (2.91) | 0.0253** (2.10) | | |
| CATRY | | | -0.0012 (-0.15) | 0.0069 (0.80) |
| Debt | -0.0025 (-1.53) | -0.0024 (-1.43) | 0.0016 (0.60) | -0.0005 (-0.31) |
| Trade | 0.0018 (1.52) | 0.0016 (0.91) | 0.0042** (2.43) | 0.0040*** (2.80) |
| RIRS | 0.0002 (0.01) | -0.0146 (-0.13) | 0.0436 (0.81) | 0.0235 (0.25) |
| R2 | 0.451 | 0.417 | 0.253 | 0.436 |
| No of obs. | 54 | 47 | 54 | 47 |

Notes: As in Table 3.

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