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Provincial Public Expenditure in China: A Tale of Profligacy

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Abstract

This paper examines the cyclicality of provincial expenditure in China during the period 1978-2013. We assess whether provincial expenditure has been pro-cyclical using panel data for our analysis. Profligacy is found to be a regular feature of provincial fiscal policy. This profligacy occurs both in good and bad times and has markedly increased since 1994 with the increased autonomy of provinces. We further find that the profligacy bias is mitigated when financial constraints are relaxed, the remaining political life of the governor is long, government efficiency is strong, corruption incidence is low, and governments are large.

Key words

China, Fiscal cyclicality, Regional growth.

JEL codes

E62, H50, H60, R12.

I. Introduction

Because of their relative autonomy, provincial dimension is key in analyzing and understating China's macroeconomic policy. Indeed, while growth objectives seem to be coordinated between provincial and central governments, fiscal policy objectives tend to be different. The degree of coordination of fiscal policy between the different layers of governments is central for China's growth strategy and for the definition of its macroeconomic policies. At the current juncture, with the slowdown of economic growth, the search for an optimal fiscal policy in China is of essence.

Optimal fiscal policy consists in running a cyclical policy; that is a fiscal policy which is independent of the state of the economy according to classical theories or counter cyclical in the Keynesian world. However, existing evidence points to widespread pro-cyclical fiscal policy in developing and emerging countries (Gavin and Perotti, 1997; Lane, 2003; Ilzetzki and Végh, 2008). The literature explains this tendency mostly by institutional weakness and the lack of access to financial markets. Weak institutions encourage ineffective and often inappropriate spending of revenue windfalls, leaving countries with inadequate buffers to cope with adverse shocks (Tornell and Lane, 1999; Talvi and Végh, 2005). In addition, difficulties in accessing capital markets during recessions often force governments in developing countries to refinance or repay debt, obliging them to embark on contractionary policies (Gavin and Perotti, 1997; Caballero and Krishnamurthy, 2004). In theory, countercyclical fiscal policy is welfare improving since the optimal fiscal policy in a stochastic model with sticky prices is countercyclical (Christiano et al. 2011).

With increasing trends in decentralization around the world, the conduct of fiscal policy over the business cycle at the local level has recently received more attention. As for central fiscal authorities, the literature shows that local governments are inherently pro-cyclical because of relative tougher financing constraints and misalignment of policy objectives between local and central governments. Rodden and Wibbels (2010) examined the sensitivity of provincial government budgets to regional business cycles in seven countries with federal systems (Argentina, Australia, Brazil, Canada, Germany, India, and the United States). They argue that local governments are more pro-cyclical than central fiscal authorities because of their limited insurance (mostly via transfers from central government) against regional shocks, and restraints on borrowing and saving.

This paper examines the issue for China, and focuses on the cyclicality of fiscal policy at the provincial level. The case of China is particularly interesting because of its strong economic decentralization, and of the key role devoted to local governments in its overall growth agenda. They are more powerful than their counterparts in other federal countries. They also play a much more central role in local economies than their peers elsewhere. They are allowed to levy taxes, decide and implement budgets, and exercise substantial controls over the allocation of bank credits. In addition, because of the evaluation of the governors' performances by the central government, the setting of incentives is not always in line with optimal local fiscal policy.

This can lead to a more activist fiscal policy (which is often pro-cyclical) and may result in more volatility and lower growth (Ramey and Ramey 1995, Fatás and Mihov 2003, 2013). Recently Carmignani and Laurenceson (2013) supported these ideas. They showed that the well-documented asynchronous provincial business cycles are mostly driven by the sub-optimality of fiscal policy over the business cycle. They find that provincial expenditure was systematically implemented in a pro-cyclical manner during the 1978-2008 period. They conjecture that provincial fiscal policy might actually have had the effect of amplifying provincial business cycles.

In this paper, we study further the cyclicality of fiscal policy across Chinese provinces. We use an innovative and robust econometric strategy to explore whether the fiscal policy of Chinese provinces

is pro-cyclical like in most developing countries or contra-cyclical like in the developed economies. We go a step further and analyze the driving factors and the growth effect of the cyclical provincial expenditure. An original dataset covering proxies of financing constraints, institutional quality, and characteristics of provincial leaders was compiled. In so doing we are not only able to qualify the cyclicality of provincial expenditures but also identify possible mechanisms that promote pro-cyclical fiscal policy at the provincial level.

We find that all provinces are characterized by pro-cyclical spending across all sub-categories of spending with the exception of innovation funds which are acyclical. Moreover, this profligacy occurs both in good and bad times and has markedly increased since the increased autonomy given to provinces in 1994. Only one third of provinces have escaped from the profligacy trap since the reform. Estimates also indicate that the profligacy bias is mitigated when financial constraints are relaxed, the remaining political life of the governor is long, government efficiency is strong, corruption incidence is low, and governments are large.

The rest of the paper is organized as follows. The next section discusses the role of the institutional arrangements between the central and local governments in the cyclicality of provincial expenditure. Section III presents the potential drivers of cyclical fiscal policy at the provincial level in China. Section IV explains the empirical strategy used. The dataset is described in section V. The results are discussed in section VI, and section VII offers conclusions.

II. Provincial Institutions and Cyclical Expenditures

The institutional features of Chinese sub-national fiscal policy have evolved over time. Before 1978, the central/local fiscal relationship was mostly based on the system of "eating from one pot". At that time, fiscal functions were carried at the central government level with provincial fiscal policy consisting of collecting and remitting taxes (Feltenstein and Iwata, 2005). Since the end of the Cultural Revolution, Chinese provinces have gradually gained significant fiscal autonomy. After 1978, several additional functions were transferred to provincial governors. Decentralization was first based on a fiscal contract system from 1980 to 1993, and then on a revenue assignment system from 1994 to the present.

With the 1994 reforms, the autonomy of provincial governments increased significantly. In 1994, China introduced a major tax and fiscal reform program known as the tax assignment system to replace the discretionary fiscal contract system. This new scheme recentralized the majority of tax revenues. The upper-level governments have the decisive power over the fiscal schemes of their directly subordinate governments with little discretion of the central government (Jia et al., 2014). There are 5 hierarchical levels: Central, provincial, prefectural, county, and township. This fiscal reform was a milestone in China's intergovernmental relations, and largely reshaped the incentives of local government in economic development. Changing the resource-sharing system was to the advantage of the provincial governments; and the Central government focused more on the coordination and implementation of national economic policies (Naughton and Yang, 2010).

Decentralization in China has sometimes been defined as "Federalism Chinese style" (Montinola, Qian and Weingast, 1995) and more precisely as a market-preserving federalism. Decentralization began with the delegation of a large economic authority to local governments. Many reform policies were delegated to local governments, for instance for price liberalization or for the open-door policy. More and more state-owned enterprises have moved from central state authority to provincial authority. China's central government has limited its oversight of provincial economies to give a

more credible commitment to the devolution of its authority (Qian and Weingast, 1997). For instance, until the privatizations of the beginning of the 2000s, the local governments controlled the assets of the townships and village enterprises; so they had access to information that was not available to central government. In addition, Chinese provinces are relatively self-contained. They not only have responsibility to initiate reforms, but also to provide public services, and make and enforce law inside their own jurisdiction. They control a substantial amount of resources and drive regional economic development and the conduct of fiscal policy. With this in mind, the cyclical behavior may depend on political factors.

Despite the increasing autonomy of local authorities, central government still influences provincial fiscal policy behavior through the designation and the rating system of provincial leaders (Li and Wu, 2012). This situation was described by Xu (2011): "On one hand, regional officials control huge amounts of resources and they enjoy fairly broad autonomies within their jurisdictions; on the other hand, their career paths are controlled by the central government. Their career paths are tied by the performance of their jurisdiction". This misalignment of incentives between the central and local governments is not in line with optimal local fiscal policy.

In this organizational structure, the central government has a strong instrument to control the provincial governments and to give incentives to apply its own economic policy: it chooses, appoints, and rewards the provincial leaders. So the devolution of a lot of power over economic policy is possible. The opportunity for promotion is a strong incentive.[1] Provincial public expenditure may face two kinds of influence: the first one depends on the link between the provincial governors' promotion and the growth rate[2], which results in a competition between the provincial governors, so each of them has a strong incentive to spend; the second one depends on the importance of "clientelism" and on the local pressures for more expenditure.

Local authorities face a rating system that provides strong incentives to actively use fiscal policy to spur growth in the short run irrespective of the cycle. Oversight from the central government certainly plays an important role, as emphasized by Xu (2011). Local officials are appointed by higher levels of government officials, and are evaluated by the central government based on a range of criteria. On the one hand, this system of appointment and promotion of provincial leaders serves as a powerful instrument for the national government to induce regional officials to follow the central government policies. But on the other hand, the hierarchical administrative organization induces a shared authority which is beneficial to the local governments. This shared authority has been described by Qian and Xu (1993) as an "M form" economy with a reference to the organizational structure of the hierarchy in firms. The local governments at the bottom of the hierarchy have little bargaining power vis-à-vis their superiors but have substantial autonomy in developing their own regions. These 2 aspects, limited bargaining power and substantial autonomy, weaken bureaucratic controls and encourage market activities. It is a way to give more flexibility to the provincial governments to implement fiscal policy.

Provincial governments can adapt their policy to local demand with a large autonomy, but if there is not a vote as there should be following the theory of fiscal federalism, there is the sanction or the approval of central government every 5 years. Considering this leeway given to local governments and the fact that central government does not have any interest in the collusion between these local

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[1] For instance, from 1992 to 2008, every president, every premier, every newly elected Politic Bureau Standing Committee member of the four CCP congresses during this period was promoted from a provincial position (Xu, 2011).

For the performance criteria, see Whiting, 2010, p.105.

governments, there is a strong competition between them, for instance to be attractive for investments.

III. Factors of Cyclical Fiscal Policy

We seek to explain the cross-province variation in the cyclicality of provincial expenditure using a set of characteristics of provinces. According to the literature, various factors can explain the pro-cyclical nature of fiscal policies. For Chinese provinces, the dominant drivers would be related to financing constraints, political factors and institutional quality, and exposure to shocks and structural factors.

A. Financing constraints

The lack of access to credit markets explains pro-cyclical fiscal policy in developing countries (*e.g.* Gavin and Perotti, 1997). The inability to borrow forces local authorities with tax-raising powers to cut expenditure in bad times; similarly when cheap and easy financing is available there is a strong incentive for fiscal authorities to embark on an expenditure spree. It must be noted that a deficit is not allowed for Chinese provinces; but they got around this rule for a time by creating financing vehicles - these are now also forbidden because of the growing debt of the provinces. For some years, it was a way to find funds. Good data are not available, but it is reasonable to consider that these funds might mitigate the pro-cyclicality of the expenditure of the provincial governments in the short term, but undermine fiscal sustainability in the long term. We expect the degree of financial development at the provincial level to be a mitigating factor of fiscal profligacy.

B. Political factors and institutional quality

Some important papers in the literature highlight the role of the "voracity effect" in cyclical fiscal policy (*e.g.* Tornell and Lane, 1999). This effect works through the political factors that promote rent-seeking activities in good times. Political economy models suggest that appropriate checks and balances provide increased scope for improved macroeconomic management, including counter-cyclical fiscal policy, by reducing the rents extracted by politicians. For Chinese provinces, the political factors are likely to have an effect mostly at the Governor level. In China, governors are at the heart of regional economic policy. They have strong power in their province, but their career depends on central government. Given the absence of a formal democratic election system for governors in China, one can argue that the appointment process and some characteristics of governors could capture the political factors related to the rent-seeking behavior. In particular, the degree of turnover, the period in office, and the remaining political life could capture the extent to which governors are held more accountable for their actions at the provincial level.

The role of governor turnover in the cyclical pattern of provincial expenditures is a priori ambiguous. On the one hand, the risk of turnover could create incentives for optimal (a cyclical or countercyclical) policy (a disciplining effect). On the other hand, the risk of turnover could reduce the ability of governors to resist the demands of pressure groups in favor of a looser fiscal policy and lead to pro-cyclical fiscal policy (a moral hazard effect). Likewise, the number of years of tenure of office has an ambiguous effect on the design of optimal fiscal policy. The longer the period in office of a

governor, the more the governor has allies in the central government or the central party, and the less is his sensibility to the performance-based promotion scheme in force in China since 1978. In that context, there is a risk of avoidance and rent-seeking in the implementation of fiscal policy since a governor is likely to conduct policy independent of the interest of his province. Fiscal policy is then prone to be pro-cyclical. Moreover, according to the performance-based promotion scheme, the longer the mandate is, the better the results of the economic policies are. Then, governors that stay longer in office could be encouraged to adopt optimal local fiscal policy. As regards the remaining political life, the likelihood of remaining in charge makes the governor more susceptible to political pressure: a newly-appointed governor could more easily promote pro-cyclical policy, but having a longer remaining political life could also induce the leader to pursue a more prudent fiscal policy to help his career.

The quality of institutions is also a key parameter which shapes the management of fiscal policy over the business cycle. In the recent literature, Calderón et al., (2012) showed that the quality of public administration influences the conduct of cyclical macroeconomic policies. Frankel, Végh and Vuletin (2013) argued that improvements in the quality of institutions over time are the main explanation for the ability of some emerging and developing countries to switch to a more counter-cyclical fiscal policy. For Chinese provinces, we measure institutional quality by a set of indicators - government efficiency, fiscal transparency, the degree of marketization of the economy at the provincial level, and corruption. Better efficiency would ensure a better bureaucratic quality and a stronger capacity to deploy the desired policy. Likewise, a market-oriented economy would imply less distortions caused by government interventions, and stronger law and order enforcement. Better fiscal transparency would tend to mitigate the profligacy bias and the rent-seeking behavior.

Corruption is another key dimension of the quality of institutions which affects the cyclicality of public expenditures. Alesina et al. (2008) using a large panel data on developed and developing countries argued that corruption encourages profligacy in public expenditure. They showed that fiscal policy is more pro-cyclical in countries where corruption is more widespread. However, other authors stress different links between corruption and fiscal policy. Tanzi and Davoodi (1997), Friedman et al. (2000), and Ghura (2002) provide evidence that corruption leads to lower levels of tax collection and so fewer resources to support pro-cyclical government expenditure. Better governance may be positively correlated with fiscal pro-cyclicality if it increases the tax revenues available for expenditure. Thornton (2008) using an African sample found that less corruption leads to more pro-cyclicality. Corruption is considered to be a big problem in China, and the Central government has implemented a large program to fight it, which underlines the depth of this problem in the past. The extent of corruption is especially important in view of the decentralization, because local leaders have a large discretion over which laws to implement (Birney, 2014).

C. Exposure to shocks and structural factors

The frequency of shocks is critical to the capacity of fiscal authorities to deploy the desired fiscal policy. There are findings in the literature which suggest that the degree of output instability matters for the ability of fiscal authorities to conduct countercyclical fiscal policy (Lane, 2003; Talvi and Végh, 2005). In particular, taking political distortions as given, Talvi and Végh (2005) modeled why fiscal authorities would find it optimal to run smaller primary surpluses in good times instead of building buffers for downturns. They postulate that in an unstable environment (*i.e.* with frequent shocks) and with institutional weakness, it might be optimal for budgetary authorities in developing oil-producing countries to spend the windfall revenue during the good times, partly in response to demands from different political and social groups. As such, we anticipate that governments facing

high output volatility may find it optimal to pursue pro-cyclical fiscal policies. Trade openness also matters for the conduct of fiscal policy because it magnifies the vulnerability to shocks. If open economies are vulnerable to risk, as argued by Rodrik (1998), it may be especially important for the government to facilitate consumption smoothing by operating a countercyclical policy. The underlying idea is that more open economies are intrinsically more susceptible to external shocks, which creates public demand for countercyclical fiscal policy.

Beyond the financial, political, and institutional drivers of cyclical fiscal policy, there are structural factors that influence the conduct of fiscal policy over the business cycle. The size of the public sector is a good example, although its influence is ambiguous. According to the literature on automatic stabilizers (Galí, 1994; Fatás and Mihov, 2001), large provincial governments tend to embark on countercyclical policy which is associated with higher growth volatility. However, a large government could be a source of inefficiencies, instability, and pro-cyclical expenditure. For instance, a bigger government tends to take fiscal actions that have a larger macroeconomic impact, irrespective of the cycle, which in turn can translate into an exacerbation of the business cycle *i.e.* pro-cyclical stance. The level of development is another structural factor that matters. Lane (2003) argued that the stage of development has a systemic influence on fiscal profligacy. This is mostly premised on the fact that the technical capacity to implement the intended cyclical policy is dependent on the development stage. Finally, the initial fiscal position could also play a role -a strong fiscal deficit could incite the province to adopt a more prudent policy and reduce the pro-cyclicality.

IV. Empirical strategy

There is a well-developed empirical literature on assessing the cyclicality of fiscal policies, which we broadly follow in our approach (Talvi and Végh, 2005; Ilzetzki and Végh, 2008; Alesina et al., 2008).

A. Cyclicality of expenditure

A fiscal reaction function of the following general form is estimated:

$$G_{i,t} = \alpha + \beta Y_{i,t} + \delta G_{i,t-1} + v_{i,t} \tag{1}$$

where i and t represent province and period, respectively; $G_{i,t}$ is the indicator of fiscal policy defined as the change in fiscal stance; $y_{i,t}$ represents the output cycle, defined as output gaps or growth rates; and $v_{i,t}$, the disturbance term, captures fiscal shocks. While a few authors use fiscal balance as the dependent variable in equation (1), most of the studies focus on the growth or level of public expenditure when testing for cyclicality, especially in low-income provinces.[3] Since the automatic stabilizers are likely to be small at the provincial level, equation (1) is a reasonable approximation of

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[3]Kaminsky, Reinhart, and Végh (2005) among others have questioned the accuracy of fiscal balance indicators in assessing the cyclicality of the fiscal stance, mainly on two grounds. First, the fiscal balance and other indicators like the revenue- and expenditure-to-GDP ratios reflect the outcomes of policy, and are affected only endogenously by the actions of policymakers. For this reason, the direction of co-movements between these fiscal indicators and economic cycles might be ambiguous. Second, expressing fiscal variables as proportions of output could yield misleading results because the cyclical fiscal stance may be dominated by the cyclical behavior of output.

discretionary fiscal policy. The disturbance term is the sum of three orthogonal components: province and year fixed effects, η_i, μ_t, and an idiosyncratic fiscal shock, $\xi_{i,t}$ ($v_{i,t} = \eta_i + \mu_t + \xi_{i,t}$).

The fiscal reaction function describing how provincial government expenditure responds to changes in real output cycles and other factors in equation (1) can be reformulated as a Taylor-type rule without the inflation terms, as suggested by Calderón et al. (2004). This Taylor-type reaction function assesses the direction and level of co-movements between government expenditure and output deviations from their respective steady state trends.

$$G_{i,t} - G_{i,t}^* = \alpha + \beta\left(Y_{i,t} - Y_{i,t}^*\right) + \delta\left(G_{i,t-1} - G_{i,t-1}^*\right) + v_{i,t} \tag{2}$$

The superscript * denotes the long-term trend of the government expenditure and output. $(G_{i,t} - G_{i,t}^*)$ denotes the deviation of actual government expenditure from its long-term trend, $\left(Y_{i,t} - Y_{i,t}^*\right)$ denotes the deviation of output (or real GDP) from its long-term trend, and β denotes the short-term fiscal response to the economic cycle.

To estimate equation (2) a measure of the unobserved long-term values of government expenditure and output is required. One approach would be to use a dynamic equation with the lagged values of these variables used as proxies for the long-term values and run the regression in first difference (as in Lane, 2003 and Thornton, 2008). The literature has focused on the relationship between the growth rate of government expenditure and output by considering the logarithmic specification. This gives equation (3) which we adopt as our baseline model:

$$\Delta log G_{i,t} = \alpha + \beta \Delta log Y_{i,t} + \delta \Delta log G_{i,t-1} + v_{i,t} \tag{3}$$

The operator Δ is the first difference operator and log is the logarithm. The cyclicality of fiscal policy is then determined by looking at the sign and the size of the coefficient β which captures the short-term cyclical behavior of government expenditure and could be expressed as the first derivative of changes in expenditure with respect to changes in output, $\beta = \frac{\partial \Delta log G_{i,t}}{\partial \Delta log Y_{i,t}}$. When the indicator of fiscal policy is expressed in terms of government expenditure pro-cyclicality is assumed in the data if $\beta > 0$, *i.e.* a cyclical upturn (downturn) is associated with an increase (decrease) in government expenditure; countercyclicality if $\beta < 0$; and acyclicality if $\beta = 0$. The coefficient δ captures possible inertia effects in government expenditure. This coefficient is expected to have a positive sign and be less than 1.

Admittedly, estimating equation (3) poses several challenges because of the potential endogeneity. The main challenge is the reverse causality between provincial expenditure and output (since output is likely to be responsive to a fiscal stimulus, as explained by the standard neo-Keynesian model). Moreover, the lagged dependent variable is correlated with the error terms, leading to the well-known Nickel bias. An additional challenge is the possibility that some omitted variables may be correlated with provincial expenditure and output. To address these endogeneity issues, the existing literature makes use of external instruments such as the weighted growth of the main trading partners. Unfortunately such a series is difficult to construct for China because of the lack of data on intra-Chinese trade. Another technique often used in the literature is the generalized method of moments (GMM), which is particularly suitable for dynamic panels. However, the GMM technique is very sensitive to the risk of proliferation of instruments which is more pronounced, when splitting the sample or including interaction terms as done later in this paper. Depending on the lags chosen, the number of instruments can be larger than the cross-sectional dimension

and create an over-identification bias. For these reasons, our preferred estimates are based on the within fixed effect estimator which mitigates the simultaneity and omitted variables biases by controlling for time invariant idiosyncratic factors. We believe that endogeneity is less of a problem if the simultaneity and omitted variables biases are accounted for. In what follows we only discuss the fixed effect estimates. We present the results with and without the lagged dependent variable to assess the relevance of the so-called Nickel's bias discussed above. Finally, to produce robust results, autocorrelation and heteroskedasticity are corrected for.

B. Driving factors

The determinants of the cyclicality of provincial expenditure are analyzed through a two-step approach. In the first step, we focus solely on addressing the null hypothesis to determine whether fiscal policy is acyclical ($\beta = 0$), countercyclical ($\beta < 0$), or pro-cyclical ($\beta < 0$), across provinces. We further allow this coefficient to be province specific and time varying, as specified in equation in (4):

$$\Delta Log G_{it} = \alpha + \beta_{it} * \Delta Log Y_{it} + \vartheta_{it} \tag{4}$$

Equation (4) is a modified form of equation (3), excluding the vector of control variables. Following Aghion and Marinescu (2008), we estimate equation (4) using local Gaussian-weighted ordinary least squares. This technique determines the time-varying cyclicality coefficient $\hat{\beta}_{it}$ for province i at year t, by using all observations and assigning greater weights to those observations closest to the reference year. This is achieved by giving a Gaussian-centered weight to the reference period. As in Aghion and Marinescu (2008), we apply a ten-year rolling period approach to ensure that the cyclicality captured is the result of transitory discretionary fiscal policies. If τ denotes the length of the rolling period, then the error term ϑ_{it} follows a normal distribution function: $N(0, \sigma^2/w_t(\tau)$ with $w_t(\tau) = \frac{1}{\sigma\sqrt{(2\Pi)}} exp\left(-\frac{(\tau-t)^2}{2\sigma^2}\right), \tau \in (t-5, t+4)$. The smoothing parameter σ is arbitrarily set to 5 because the results are qualitatively robust to slight changes in this parameter. The β coefficients without control variables would be biased upward. However, estimating the coefficients without control variables allows us to explain fiscal pro-cyclicality with the control variables.

In the second step, we pool the estimated time-varying cyclicality coefficients ($\hat{\beta}_{it}$) and regress them against the vector of control variables that are thought to be the main drivers of cyclicality in developing provinces (as noted in the literature above). This is represented in equation (5)

$$\hat{\beta}_{it} = \gamma + \sum_{j=1}^{J} \lambda_j X_{jit} + \theta_i + \theta_t + \varepsilon_{it.} \tag{5}$$

X_j denotes the factors of interest. θ_i and θ_t are the province and year fixed effects, respectively. ε_{it} is the error term. Equation (5) is estimated with the weighted least squares technique using the inverse of the standard deviation of $\hat{\beta}_{it}$.

V. Dataset

The primary data source for this paper is China Data Center (http://chinadataonline.org/). We collect, at the provincial level, information on Gross Domestic Product (GDP), government expenditure and revenue, Consumer Prices Index (CPI), bank loans and deposits, and imports and exports, from 1978 to 2013. Output, expenditure (and its subsequent components such as expenditure for administration, capital construction, innovation funds, agriculture support, and social systems *i.e.* culture, health and education), and revenue are expressed in current Yuan. All fiscal variables are converted into constant prices using the CPI, since we do not want to eliminate any growth in provincial expenditure that takes the form of an increase in the relative price of public sector outputs.

For each of the Chinese provinces, we use a loan to deposit ratio. We also compile from different sources information on the quality of institutions: corruption, efficiency of the government, and the degree of marketization. One dimension of the quality of institutions is the corruption index measured by the province level number of recorded cases under direct investigation by the people's procuratorates divided by the regional population (cases per 100,000 persons). These data are taken from Cole et al. (2009), based on the Procuratorial Yearbook of China, and cover the period 1998-2003. Recorded cases include people charged with corruption, bribery, misappropriation of public funds, collective illegal possession of public funds, undisclosed source of large property, abuse of power, dereliction of duty, and fraudulent practices. Another dimension is public property. To catch this dimension we use the government efficiency index from Cole et al. (2009). This index is available for 1998 to 2003 and combines 40 separate indices covering all aspects of governance aggregated into four factors: public services, public goods, government size, and national welfare. The difference in good governance levels between Chinese provinces appears to be consistent with the disparity in regional economic development.[4] We draw on Fan et al. (2010) National Economic Research Institute (NERI) index of marketization of Chinese provinces, which was constructed to measure the degree of government regulation in Chinese provinces from 1998 to 2007. This index covers 5 main aspects of Chinese marketization: the relationship between the market and the government, the growth of the non-state economy, the development of product markets, the development of factor markets, and the market environment, including intermediaries and institutional and jurisdictional arrangements.

Information on the career of governors is taken from the website www.rulers.org which compiles the information on local and central leaders around the world. Their careers are proxied by three variables: a turnover variable which takes the value one at the year of at least one change of governor in a given province (turnover), the number of years in office (tenure) and the remaining political life to the next National people's congress (*i.e* the difference between the assumed retirement age 65 and the age at the next congress).

The trade openness indicator is calculated as the sum of imports and exports divided by GDP. We follow Talvi and Végh (2005) by including output volatility, which is measured as the standard deviation of the GDP growth rate using a 5-year rolling period. We include in the list of drivers the size of the public sector measured as the average ratio of provincial expenditure to GDP. Finally, the level of per capita GDP is included to control for potential of development.

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[4]In 2003, provinces with the highest scores are Beijing, Shanghai, Tianjin, Jiangsu, Jilin, Liaoning, Zhejiang and Heilongjiang, provinces that tend to be located in eastern coastal régions or on China's borders. In contrast, inland provinces, such as Shanxi, Jiangxi, Henan, Hunan, Guangxi, Chongqing, Sichuan, Guizhou, Yunan and Gansu, tend to have relatively lower efficiency scores.

VI. Estimation Results

In this section, we discuss our key findings. To that effect, we assess the cyclicality of total expenditure and its components. We also investigate the role of the phase of growth regime and the 1994 reform. Lastly we analyze the heterogeneity across provinces and the related driving factors.

A. Cyclicality of expenditure

Baseline. We first investigate whether sub-national public spending is acyclical, countercyclical. or pro-cyclical, at the provincial level. We estimate equation (1). Table 1 reports the difference and system GMM and fixed effects estimates of the cyclicality of real public expenditure across provinces. The optimal lag structure of internal instruments is 3. Based on the classical appraisal criteria, the GMM results are not internally consistent with our provincial dataset. The number of instruments outweighs the cross-sectional dimension, and the model is over-identified, with the probability for the Sargan-Hansen test of over-identifying restrictions being well above the accepted thresholds in the literature.[5] Because of these reasons, as discussed above, the fixed effect estimator is preferred. We estimate equation (1) with and without the lagged dependent variable to assess the influence of the possible Nickel's bias discussed above. We find that the coefficient associated with output growth is fairly stable across both specifications. In addition, the R-squared remains unchanged at 0.6 with and without the lagged dependent variable. The results are similar to those in the empirical literature (Carmignani and Laurenceson 2013). There is strong evidence that provincial expenditure is pro-cyclical. The coefficient of output growth is positive, statistically significant at the 1% level, but below 1. A 1% increase in provincial output is associated with an increase in provincial public expenditure of 0.41%. These estimates are robust to the use of a filtering technique to extract any cyclical components of output and expenditure (see Appendix 1). The coefficient of the output cycle remains positive, statistically significant at the 1% level, but below 1. In what follows, we shed further light on the profligate nature of provincial public spending in China.

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[5] Simply by being numerous, instruments over fit the instrumented variables, failing to correct for their endogenous components and biasing the coefficient estimates toward those from non-incremental estimators. As a consequence, the over-identification test is biased toward the null hypothesis of the validity of instruments. We found that the probability of the Hansen J-statistic test equals 1 in all cases.

Table 1: Cyclicality of Provincial Expenditure, 1978-2013

	Dependent Variable: Total Expenditure (Δ Log Git)			
	Generalized method of moments (GMM)		Within fixed effects	
	Difference	System		
	(1)	(2)	(3)	(4)
Δ Log Yit	0.308***	0.313***	0.440***	0.416***
	(0.086)	(0.084)	(0.069)	(0.069)
Δ Log Git-1	0.142**	0.137*	0.045	..
	(0.067)	(0.068)	(0.040)	..
Province fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	932	963	963	994
R2	…	…	0.665	0.664
Provinces	31	31	31	31
Instruments	37	40	..	..
Hansen	1.000	1.000	..	..
AR(1)	0.000	0.000	..	..
AR(2)	0.123	0.115	..	..

Note: Intercept included. Arellano-Bond's (1991) difference and system generalized method of moments. Robust standard errors are in parentheses. The Hansen test evaluates the validity of the instrument set; that is, tests for over-identifying restrictions. AR (1) and AR (2) are the Arellano-Bond autocorrelation tests of first and second order (the null is no autocorrelation), respectively. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Spending categories. We split provincial spending into capital and current expenditure and their components. A component approach is useful to understand how the profligate behavior plays out, and to help avoid reaching misleading conclusions that could arise from broad aggregates, especially if components move in offsetting ways (Lane, 2003). In the context of the Chinese provinces, we measure capital expenditure as the sum of capital construction and innovation funds. Current expenditure covers the remaining expenditure and includes support to agriculture, social expenditure (including culture, education, science, and health care), and expenditure related to government administration. The results are shown in Table 2. We find that pro-cyclicality exists (and is statistically significant at the 5% level) when considering current expenditure and capital expenditure as dependent variables. All sub-categories of current spending are found to be pro-cyclical. In particular, the profligacy of spending related to government administration is twice as high. As suspected, capital expenditure tends to be slightly more pro-cyclical than current expenditure. For a 1% increase in provincial output, capital expenditure tends to increase by 0.43% while current spending increases less, by about 0.37%. This pro-cyclicality is mostly driven by the changes in construction funds. Spending related to innovation funds are acyclical. Capital expenditure is more responsive to economic cycles, since in bad times the government has more leeway to cut or postpone capital expenditure compared to current expenditure, which is often statutory in nature, already committed, or non-discretionary.

Table 2: Cyclicality of Components of Expenditure, 1978-2013

Categorie of expenditure	Within fixed effects						
	β	SD(β)	N	R2	Provinces	Province fixed effects	Year fixed effects
Current Expenditure	0.367***	(0.064)	786	0.489	31	Yes	Yes
Agriculture support	0.365***	(0.132)	789	0.388	31	Yes	Yes
Social systems	0.338***	(0.062)	819	0.402	31	Yes	Yes
Administration	0.602***	(0.089)	811	0.556	31	Yes	Yes
Capital Expenditure	0.432**	(0.173)	742	0.468	31	Yes	Yes
Capital construction	0.442**	(0.167)	798	0.483	31	Yes	Yes
Innovation funds	0.033	(0.298)	742	0.284	31	Yes	Yes

Note: Intercept included. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Growth regimes. We test whether the pro-cyclicality of provincial expenditure depends on the position of the economy in the cycle. Two complementary arguments are proposed in the literature to support the rationale of asymmetric conduct of fiscal policy over the business cycle. Talvi and Vegh (2005) suggested that fiscal profligacy may be fueled by political pressure to spend windfall revenues in good times. Whereas Gavin and Perotti (1997) suggested that the pro-cyclical behavior might arise in bad times when fiscal authorities are shut out of markets obliging them to cut expenditure. For China, we suspect that in periods of good times and high tax intake, the leaders will be more sensitive to political pressure for more expenditure. Moreover, financial constraints will relax in good times. Distinguishing the phases of the business cycle in China might be tricky. The country has experienced steady two-digit growth rates over recent decades. In the paper, we use a simple rule by computing the deviation from the average provincial growth rate over the period 1978-2013 (Y*).[6] We generate a dummy variable taking the value 1 if the growth in year t is above Y* and 0 otherwise. This dummy is interactive with the growth. The same approach is followed for the periods of growth below the average. The results are shown in Table 3. We find that pro-cyclicality occurs in both phases of the cycle. Provincial expenditure consistently follows the cycle irrespective of good or bad times for all categories of expenditure. As seen above, a 1% increase in provincial output is associated with a less than proportional increase in provincial public expenditure.

Table 3: Cyclicality of Provincial Expenditure and Growth Regime, 1978-2013

Dependent Variable (Δ Log Git)	Within fixed effects		
	Total Expenditure	Current Expenditure	Capital Expenditure
	(1)	(2)	(3)
Δ Log Yit > Y*	0.417***	0.373***	0.441**
	(0.068)	(0.069)	(0.181)
Δ Log Yit ≤ Y*	0.418***	0.389***	0.461*
	(0.079)	(0.097)	(0.234)
Province fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	994	786	742
Provinces	31	31	31
R2	0.664	0.489	0.468

Note: Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

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[6]Results with classic filters are broadly unchanged. Estimates are available upon request.

1994 fiscal reform. We explore the effect of the 1994 reform on the cyclicality of provincial expenditure. As discussed above, in 1994 a structural shift occurred in China's decentralization system. Provinces were given more autonomy which has an influence on the conduct of local fiscal policy. We introduce additively and multiplicatively (with Δ *Log Yit*), a dummy variable taking the value 1 after 1994 and 0 before. The results are shown in Table 4. It turns out that profligacy has markedly increased with the increased autonomy of provincial leaders. The coefficient associated with Δ *Log Y_{it}* is positive, statistically significant at the 1% level, and estimated at 0.23. The coefficient associated with the interactive term is also positive, statistically significant at the 1% level, and estimated at 0.45. In other words, cyclical profligacy almost tripled after 1994. The similar pattern is observed in the profligacy of current expenditure which more than doubled. The change is stronger for capital spending which moved from acyclical before 1994 to highly pro-cyclical after the implementation of the reforms. The reforms have resulted in more profligacy in provincial expenditure.

Table 4: Impact of 1994 Reform, 1978-2013

Dependent Variable (Δ Log Git)	Within fixed effects		
	Total Expenditure	Current Expenditure	Capital Expenditure
	(1)	(2)	(3)
Δ Log Yit	0.230**	0.248***	0.139
	(0.089)	(0.073)	(0.215)
Dummy for 1994 reform	-0.190***	-0.183***	-0.464***
	(0.025)	(0.036)	(0.097)
Δ Log Yit*Dummy for 1994 reform	0.455***	0.358***	0.799**
	(0.133)	(0.099)	(0.388)
Province fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	994	786	742
Provinces	31	31	31
R2	0.670	0.495	0.472

Note: Intercept included. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Graduating class. We explore the heterogeneity of pro-cyclicality among provinces, whether some provinces were able to mitigate the pro-cyclicality bias over time, especially after the 1994 reform despite the general trend of increasing profligacy documented above. Following Frankel et al. (2013) who showed that over the last decade several developing countries have been able to "graduate" in the sense of overcoming the problem of pro-cyclicality and becoming countercyclical. We estimate the province specific cyclical response of public spending to growth ($\hat{\beta}_i$) over the period 1978-2013 and subsequently for 1978-93 and 1994-2013. Table 5 gives the value of the $\hat{\beta}_i$ coefficients by province, and highlights the changes over time of the cyclical coefficients. In line with the findings above, none of the provinces conduct a counter-cyclical policy, but we observe a strong heterogeneity among provinces and over time. We follow Frankel et al.'s (2013) classification to illustrate graduation among Chinese provinces. Accordingly, we find that about one third of provinces have been able to escape the profligacy bias. These are the so-called recent and established graduates. The recent graduates group includes 6 provinces that have been able to reduce the degree of pro-cyclicality. They have "graduated" from pro-cyclical expenditure (significant

positive $\hat{\beta}_i$) before the reform to countercyclical spending (significant negative $\hat{\beta}_i$) or acyclical (insignificant $\hat{\beta}_i$) after 1994. The established graduates group includes 5 provinces that have always been countercyclical (significant negative $\hat{\beta}_i$) or acyclical (insignificant $\hat{\beta}_i$). The rest of provinces can be categorized into the so-called still-in-school and back-to-school groups. The still-in-school group comprises 6 provinces for which pro-cyclicality continued after the reform (significant positive $\hat{\beta}_i$ before and after 1994). The back-to-school group is quantitatively the biggest (13 provinces) and is characterized by an amplification of the pro-cyclicality of public expenditure. These provinces were countercyclical (significant negative $\hat{\beta}_i$) or acyclical (insignificant $\hat{\beta}_i$) before 1994 and pro-cyclical (significant positive $\hat{\beta}_i$) after the reform.

Table 5: Cyclicality by Province: Testing for Graduation, 1978-2013

Province	1978-93				1994-2013				Status
	β	SD(β)	N	R2	β	SD(β)	N	R2	
Beijing	1.734**	(0.769)	16	0.206	1.488***	(0.349)	18	0.683	Still in school
Chongqing	2.652***	(0.210)	8	0.955	0.438**	(0.178)	18	0.245	Still in school
Guangdong	0.985*	(0.428)	9	0.296	0.605**	(0.226)	17	0.268	Still in school
Hunan	1.114**	(0.454)	16	0.283	0.554*	(0.266)	18	0.324	Still in school
Shanghai	1.475*	(0.791)	16	0.178	1.230***	(0.191)	18	0.776	Still in school
Shanxi	0.792***	(0.244)	15	0.340	0.376**	(0.156)	18	0.163	Still in school
Anhui	-0.433	(0.850)	9	0.282	1.031***	(0.107)	17	0.738	Back to school
Fujian	0.803	(0.458)	16	0.200	0.956***	(0.109)	18	0.773	Back to school
Guangxi	0.719	(0.522)	16	0.116	0.368*	(0.202)	18	0.187	Back to school
Hainan	0.431	(0.453)	14	0.199	1.066***	(0.305)	18	0.473	Back to school
Hebei	1.100	(0.959)	9	0.159	0.505***	(0.144)	18	0.365	Back to school
Henan	-0.347	(0.529)	16	0.059	0.527***	(0.121)	18	0.399	Back to school
Hubei	0.527	(0.551)	16	0.043	0.637*	(0.313)	18	0.223	Back to school
Jiangsu	0.618	(0.943)	16	0.056	0.717***	(0.113)	18	0.658	Back to school
Jiangxi	0.757	(0.489)	9	0.279	0.618**	(0.209)	17	0.368	Back to school
Liaoning	0.316	(0.951)	8	0.155	0.725***	(0.243)	18	0.385	Back to school
Shandong	-0.442	(0.789)	16	0.074	0.675***	(0.174)	18	0.485	Back to school
Tianjin	-0.308	(0.538)	16	0.014	0.674***	(0.194)	18	0.417	Back to school
Yunnan	0.282	(0.456)	15	0.244	0.575***	(0.169)	17	0.369	Back to school
Gansu	1.526***	(0.263)	16	0.423	-0.0443	(0.112)	18	0.032	Recent graduates
Guizhou	1.454***	(0.401)	16	0.443	0.467	(0.386)	18	0.140	Recent graduates
Inner Mongolia	0.605*	(0.304)	9	0.158	0.286	(0.222)	18	0.101	Recent graduates
Qinghai	0.726*	(0.348)	15	0.280	-0.515	(0.478)	18	0.195	Recent graduates
Shaanxi	1.231***	(0.245)	16	0.487	0.473	(0.317)	17	0.144	Recent graduates
Sichuan	0.731**	(0.217)	8	0.162	0.379	(0.367)	18	0.046	Recent graduates
Heilongjiang	1.758	(1.236)	16	0.190	0.256	(0.252)	18	0.068	Established graduates
Jilin	0.244	(0.509)	16	0.030	0.413	(0.254)	18	0.136	Established graduates
Ningxia	1.444	(1.353)	16	0.149	0.376	(0.412)	18	0.032	Established graduates
Xinjiang	0.278	(0.757)	16	0.009	0.301	(0.435)	18	0.029	Established graduates
Zhejiang	1.633	(1.087)	9	0.356	0.0242	(0.145)	17	0.141	Established graduates

Note: Estimates based on Ordinary Least Squares including a time trend. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

B. Driving factors

In this section, we study the determinants of the cyclicality of provincial expenditure. We estimate equation (5) depending on data availability. In Table 6, the dependent variable is the time-varying cyclicality coefficient as recovered from the estimation of equation (4). As expected, when the financial constraints are relaxed (an increase in the loan-to-deposit ratio) fiscal policy becomes less pro-cyclical for the period 1978-2013. The corresponding estimated coefficient is negative and statistically significant at the 1% level.

Among the political factors only the remaining political life appears to be significant: we find that the coefficient associated with remaining political life is negative. A longer remaining political life induces the leader to pursue a more prudent fiscal policy. The quality of the institutions is found to be a key mitigating factor of a pro-cyclical fiscal policy. Because of data limitations, we are only able to cover institutions for the 1998-2013 period. Pro-cyclicality of public spending is lower when governments are able to efficiently deliver public goods and services and address corruption. We find that a higher government efficiency is negatively and statistically associated with the cyclicality coefficient. In the same vein, provinces with more corruption cases are characterized by stronger pro-cyclicality.

Structural factors are also found to be significant drivers of the cyclicality of provincial spending. As expected, government size is negatively and significantly associated with lower profligacy. The level of development significantly lowers profligacy during the most recent period (1998-2013).

The remaining suspected variables are not statistically significant. The marketization index is not significant. Provinces that are more affected by shocks, proxied by the output volatility, are not more prone to pro-cyclical spending. Trade openness does not significantly impact cyclicality. We also control for the lagged deficit to GDP ratio but this variable is not significant.

Table 6: Determinants of the Cyclicality of Provincial Expenditure, 1978-2013

	Weighted Least Squares			
	Dependent Variable: Time-Varying Cyclicality (β_{it})			
	1978-2013		1998-2003	
	(1)	(2)	(3)	(4)
Log. GDP pc	0.610	0.549	-0.660*	-0.947**
	(0.435)	(0.459)	(0.356)	(0.435)
Government Size	-2.541**	-2.283*	-0.981*	-1.283**
	(1.101)	(1.150)	(0.535)	(0.580)
Trade openness	-0.158	-0.192	-0.0982	-0.116
	(0.120)	(0.119)	(0.0705)	(0.0738)
Output Volatilty		-0.316		0.785
		(0.785)		(0.512)
Loan-to-Deposit ratio	-0.473**	-0.433**	-0.0841	-0.0816
	(0.184)	(0.197)	(0.0920)	(0.0858)
Implicit Deficit-to-GDP (-1)	0.139	-0.154	-0.398	-0.285
	(0.897)	(0.946)	(0.516)	(0.513)
Turnover	0.0555	0.0145	-0.0138	-0.0147
	(0.0387)	(0.0283)	(0.0164)	(0.0156)
Tenure	-0.00199	-0.00420	0.0000214	-0.00101
	(0.0138)	(0.0119)	(0.00554)	(0.00529)
Remaining Political Life	-0.0185**	-0.0148**	-0.000810	-0.000674
	(0.00761)	(0.00708)	(0.00347)	(0.00313)
Corruption Cases			0.0234*	0.0265*
			(0.0137)	(0.0133)
Government Efficiency			-0.276**	-0.256**
			(0.102)	(0.0990)
Marketization Index (NERI)			-0.0343	-0.0225
			(0.0362)	(0.0328)
Province fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	926	910	180	180
Provinces	30	30	30	30
R2	0.645	0.624	0.982	0.983

Note: Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

VII. Conclusion

The relationships between central and provincial governments have been subject of a lot of comments but not about fiscal profligacy. This paper has two original contributions. First, we document the pro-cyclical characteristics of provincial expenditure. This underlines the sub-optimality of sub-national fiscal policy in terms of stabilizing local economies. In all provinces, fiscal policy does not smooth the business cycle. A disaggregated approach shows that profligacy is widespread across all budgetary lines. More importantly, the increased autonomy of provincial leaders has heightened the pro cyclical behavior of fiscal policy. However, there is group of provinces, about one-third, that was able to escape the profligacy bias.

Second, we explore the drivers of the profligate behavior. We find that fiscal policy is less pro-cyclical in provinces with large governments and relatively better access to credit. Institutional factors are also important. The voracity effect may be explained by the remaining political life of the governors, and this effect is increased by corruption. Generally speaking, the pro-cyclicality is reduced by the quality of institutions, including governments' efficiency. The profligacy bias is mitigated by stronger government efficiency, lower incidence of corruption, and larger governments.

To increase the efficiency of the macroeconomic policy one of the main channels would be to work on the institutions. In the context of a slowdown of economic growth and the growing debt of the Chinese provinces, it seems to be unreasonable to look for more financial flexibility except via better efficiency of the banking system to allow better allocation of capital. Improving the coordination of fiscal policy between the central government and the provincial ones is necessary to increase economic efficiency.

References

Aghion, P., and I. Marinescu, 2008, "Cyclical Budgetary Policy and Economic Growth: What Do We Learn from OECD Panel Data?" In NBER Macroeconomics Annual 2007, 22, edited by Daron Acemoglu, Kenneth Rogoff, and Michael Woodford. Chicago: University of Chicago Press.

Alesina, A., F. R. Campante, and G. Tabellini, 2008, "Why is Fiscal Policy Often Pro-Cyclical?" Journal of the European Economic Association, 6(5), pp. 1006-36.

Birney M., 2014, "Decentralization and Veiled Corruption under China's Rule of Mandates," World Development, 53, pp. 55-67.

Caballero R. J. and A. Krishnamurthy, 2004, "Fiscal Policy and Financial Depth," NBER Working Papers No. 10532, National Bureau of Economic Research.

Calderón, C., Duncan, R., and Schmidt-Hebbel, K., 2004, "Institutions and Cyclical Properties of Macroeconomic Policies," Central Bank of Chile Working Paper. 285, Santiago, Chile.

Calderón, C., R. Duncan, K. Schmidt-Hebbel, 2012, "Do Good Institutions Promote Counter-Cyclical Macroeconomic Policies?" Globalization and Monetary Policy Institute Working Paper 118, Federal Reserve Bank of Dallas.

Carmignani, F. and J. S. Laurenceson, 2013, "Provincial Business Cycles and Fiscal Policy in China," Economics of Transition, 21(2), pp. 323-40.

Christiano, Lawrence, Eichenbaum, Martin, Rebelo, Sergio, 2011, "When is the Government Spending Multiplier Large?" Journal of Political Economy, 119(1), pp. 78-121.

Cole, M., R. Elliott, and J. Zhang, 2009, "Corruption, Governance and FDI Location in China: A Province-Level Analysis," Journal of Development Studies, 45(9), pp. 1494-1512.

Fan G., X. Wang, and H. Zhu, 2010. NERI Index of Marketization of China's Provinces—The Report on the Relative Process of Marketization of Each Region in China, Economics Science Press.

Fatás, A., and I. Mihov. 2001. "Government Size and Automatic Stabilizers: International and Intranational Evidence," Journal of International Economics 55 (1), pp. 3-28.

Fatás, A., and I. Mihov. 2003. "The Case for Restricting Fiscal Policy Discretion," Quarterly Journal of Economics 118 (4), pp. 1419-47.

Fatás, A., and I. Mihov. 2013. "Policy Volatility, Institutions and Economic Growth," Review of Economics and Statistics 95 (2), pp. 362-76.

Feltenstein, A. and S. Iwata, 2005, "Decentralization and Macroeconomic Performance in China: Regional Autonomy Has Its Costs," Journal of Development Economics, 76(2), pp. 481-501.

Frankel, J. A., C. A. Végh, and G. Vuletin, 2013, "On Graduation from Fiscal Pro-Cyclicality," Journal of Development Economics, 100(1), pp. 32-47.

Friedman, E., S. Johnson, D. Kaufmann and P. Zoido-Lobaton, 2000, "Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries," Journal of Public Economics, 76, pp. 459-93.

Galí, J. 1994. "Government Size and Macroeconomic Stability," European Economic Review, 38, pp. 117-32.

Gavin, M., and R. Perotti, 1997, "Fiscal Policy in Latin America," NBER Macroeconomics Annual, 12, pp. 11-72, MIT Press.

Ghura, D., 2002. "Tax Revenue in Sub-Saharan Africa: Effects of Economic Policies and Corruption," in G. T. Abed and S. Gupta (ed.), Governance, Corruption and Economic Performance, Washington DC: International Monetary Fund, pp. 369-95.

Ilzetzki, E., and C. A. Végh, 2008, "Pro-cyclical Fiscal Policy in Developing Countries: Truth or Fiction?" NBER Working Papers No. 14191, National Bureau of Economic Research.

Jia J., Q. Guo and J. Zhang, 2014, "Fiscal Decentralization and Local Expenditure Policy in China," China Economic Review 28, 107-122.

Kaminsky, G. L., C. M. Reinhart, and C. A. Végh., 2005, "When it Rains, it Pours: Pro-cyclical Capital Flows and Macroeconomic Policies,"NBER Macroeconomics Annual, 19, pp. 11-82.

Lane, Philip R., 2003, "The Cyclical Behavior of Fiscal Policy: Evidence from the OECD," Journal of Public Economics, 87(12), pp. 2661-75.

Li, Y. and F. Wu 2012, "The Transformation of Regional Governance in China: The Rescaling of Statehood," Progress in Planning, 78, pp. 55-99.

Montinola, G., Qian Y. and B. R. Weingast, 1995, "Federalism, Chinese Style: The Political Basis for Economic Success in China," World Politics, 48, pp. 50-81.

Naughton, B., and Dali Yang, ed., 2010, "Holding China Together: Introduction," In Naughton and Yang, ed., Holding China Together: Diversity and National Integration in the Post-Deng Era. New York: Cambridge University Press.

Qian Y. and B. R. Weingast, 1997, "Federalism as a Commitment to Reserving Market Incentives," Journal of Economic Perspectives, 11(4), pp. 83-92, fall.

Qian, Y. and Xu, C., 1993, "Why China's Economic Reforms Differ: the M-form Hierarchy and Entry/Expansion of the Non-state Sector," Economics of Transition, 1(2), pp. 135-70.

Ramey, G., and V. Ramey. 1995. "Cross-Country Evidence on the Link between Volatility and Growth." American Economic Review, 85 (5), pp. 1138-51.

Rodden, J. and Wibbels, E., 2010, "Fiscal Decentralization and the Business Cycle: An Empirical Study of Seven Federations," Economics and Politics, 22, pp. 37-67.

Rodrik, D. 1998. "Why Do More Open Economies Have Bigger Governments?" Journal of Political Economy 106 (5), pp. 997-1032.

Talvi, E., and C. A. Vegh, 2005, "Tax Base Variability and Pro-Cyclical Fiscal Policy in Developing Countries," Journal of Development Economics, 78(1), pp. 156-90.

Tanzi, V. and H. R. Davood, 1997, "Corruption, Growth, and Public Finances," in H. Shibata and T.

Thori (ed.), The Welfare State, Public Investment and Growth, Tokyo: Springer-Verlag, pp. 41-60.

Thornton, J., 2008, "Explaining Pro-cyclical Fiscal Policy in African Countries," Journal of African Economies, 17(3), pp. 451-64.

Tornell, A, and P R. Lane. 1999. "The Voracity Effect," American Economic Review, 89(1), pp. 22-46.

Whiting, S.H., 2010, "The Cadre Evaluation System at the Grass Roots", in Naughton, B.L. and D.L.Yang

Xu, C., 2011, "The fundamental Institutions of China's Reform and Development," Journal of Economic Literature, 49(4), pp. 1076-1151.

Appendix

Appendix: Cyclicality of Provincial Expenditure, 1978-2013

Filter		Generalized method of moments (GMM)		Within fixed effects	
		Difference	System		
		(1)	(2)	(3)	(4)
Hodrick-Prescott	Yit-Yit*	0.267**	0.254**	0.271***	0.240***
		(0.101)	(0.096)	(0.078)	(0.079)
	Git-1-Git-1*	0.440***	0.435***	0.134***	
		(0.075)	(0.079)	(0.031)	
Baxter-King	Yit-Yit*	0.301***	0.278**	0.296***	0.249***
		(0.106)	(0.105)	(0.084)	(0.082)
	Git-1-Git-1*	0.329***	0.323***	-0.033	
		(0.066)	(0.068)	(0.028)	
Christiano-Fitzgerald	Yit-Yit*	0.687**	0.304***	0.239**	0.223**
		(0.268)	(0.104)	(0.090)	(0.088)
	Git-1-Git-1*	0.526***	0.472***	0.048	
		(0.094)	(0.074)	(0.034)	
Province fixed effects		Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes
Observations		861	889	889	917
Provinces		28	28	28	28

Note: Intercept included. Arellano-Bond's (1991) difference and system generalized method of moments. Robust standard errors are in parentheses. The Hansen test evaluates the validity of the instrument set; that is, tests for over-identifying restrictions. AR (1) and AR (2) are the Arellano-Bond autocorrelation tests of first and second order (the null is no autocorrelation), respectively.Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.