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Inflation targeting and public deficit in emerging countries: A time varying treatment effect approach

Mohamed Kadria *, Mohamed Safouane Ben Aissa

LAREQUAD & FSEGT, University of Tunis El Manar, Tunisia

ABSTRACT

Several studies including Minea et al. (2012) and Lucotte (2012) emphasize that in emerging countries, the adoption of inflation targeting (IT) monetary policy and its discipline character allow intensifying their efforts to collect tax revenue and/or expenditure rationalization, and allows the reduction of their budget deficits (Kadria and Ben Aissa, 2014). Nevertheless, the lag in the effect of monetary policy contains vital information for the policy evaluation (Fang and Miller, 2011). Hence, our contribution to the previous literature is then to evaluate the time varying treatment effect of the IT's adoption by emerging countries on their budgetary discipline in terms of reducing or mastering the public deficit. To do this, we used the propensity score matching approach in order to take account of this "lag effect" or from this effect throughout time. Our empirical analysis, conducted on a sample of 41 economies (20 IT and 21 non-IT economies) for the period from 1990 to 2010, shows that the lag in the effect of IT on public deficit performance proves to be shorter and gradual for emerging countries that have adopted this monetary policy framework. Our conclusions corroborate the literature disciplining effect of IT on fiscal policy.

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1. Introduction

In recent decades, an extensive literature has focused on further analyzing the interactions that may exist between monetary and fiscal policies, mainly through the focus on the link between public deficit and inflation phenomenon. Amato and Gerlach (2002), Fischer et al. (2002), Vu (2004), Catao and Terrones (2005), and Wimanda et al. (2011) argue that the high rate of inflation, observed especially in many developing countries, is associated with important deficits, mainly financed by seigniorage revenue. Alesina and Tabellini (1987), Obstfeld (1991), Jensen (1994), Van der Ploeg (1995), Van Aarle et al. (1995) and Minea et al. (2012) agree on the fact that if the central bank decides to grant significant weight in its loss function to the price stability objective, it will reduce seigniorage revenue and compel the State to increase tax revenues through tax mobilization efforts. Therefore, valuable theoretical studies (see, e.g., Bernanke and Mishkin, 1997; Svensson, 1997; Bernanke et al., 1999) were motivated by the common finding in many empirical studies (see, e.g., Gonçalves and Salles, 2008; Lin and Ye, 2009), for, the inflation targeting (thereafter IT) policy has helped emerging inflation targeters (thereafter ITers) to have a significant improvement in macroeconomic performance which is mainly measured through the behavior of inflation, output, and interest rates. Nonetheless, this monetary strategy requires a

process of economic and institutional reforms which have a relatively large disciplining effect on the conduct of fiscal policy in avoiding seigniorage revenue and therefore opting for a tax mobilization/ government expenditure rationalization and public deficit reduction. However, developed ITers have become more fiscally disciplined in order to reach the target within the framework of the economic policy coordination.[1]

Recently, some empirical studies had an intense interest in verifying this link between the adoption of IT and the performance of fiscal policy indicators in emerging and developing countries. Indeed, works like Miles (2007) and Tapsoba (2010) have sought to test whether the IT policy, as a monetary policy framework aimed at stabilizing the inflation especially in emerging countries, could act positively on fiscal discipline. Firstly, Minea and Villieu (2008) and Minea et al. (2012) show that IT does produce an incentive for governments to improve institutional quality and this monetary strategy should encourage the government to reinforce its tax collection system and rationalize its public expenditures. Lucotte (2012) conducted an empirical analysis of 59 countries (40 non-ITers and 19 are ITers) covering the period between 1980 and 2009 via the method of propensity score matching. He concluded that on average, the adoption of IT, which involves strengthening the independence of the central bank and maintaining a low level of inflation, had a large and significant effect on the effort of tax revenue

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* Corresponding author.
  E-mail addresses: mohamed.kadria@gmail.com (M. Kadria),
safouane.benaissa@univmed.fr (M.S. Ben Aissa).

[1] Aktas et al. (2010) don't share this idea in the case of emerging market economies (in particular the Turkish economy as reference) and their results seem to validate the arguments of Blanchard (2004) and Favero and Giavazzi (2004).

mobilization or collection. Secondly, few empirical works have sought to investigate the effect of the adoption of inflation targeting on budgetary discipline in terms of the budget deficit performance. Abo-Zaid and Tuzemen (2011), using data from developed and developing countries covering the period from 1980 to 2007, with an econometric specification inspired by Ball and Sheridan (2005) and by adopting the strategy of "Diff in-Diff", have come to the conclusion that the developed ITers were leading a more disciplined manner of their fiscal policy after the adoption of IT. Furthermore, improvements in budgetary imbalances in some developing ITers may be partly due to attempts of achieving the inflation target. They conclude that these imbalances are significantly improved when countries, especially developed, explicitly target inflation. Thus, the non-ITers will greatly benefit from adopting the IT policy. More recently, Kadria and Ben Aissa (2014) tried to examine whether the implementation of IT monetary policy and its discipline character allow reducing the budget deficit in emerging countries. To do this, they used the propensity score matching methodology to evaluate the treatment effect of IT on fiscal discipline, in terms of budget deficit performance, in emerging countries that have adopted this monetary policy framework. Their empirical analysis, conducted on a sample of 41 economies (20 IT and 21 non-IT economies) for the period from 1990 to 2010, shows that on average IT adoption has had a considerable and significant effect in reducing the budget deficit. The results are confirmed by the robustness tests and corroborate the literature of disciplining effects of IT regime on the fiscal policy performance.

It must be noted, based on Brun et al. (2008), that the fiscal effort is indirectly influenced by monetary policy. More precisely and to the extent that there exists for many taxes a time lag between the date of taxation and the date of tax collection by the state, the real value of tax revenue collected is eroded by inflation (Keynes–Tanzi–Oliveira effect). When inflation reaches high levels, this effect constitutes a constraint for the mobilization of fiscal resources. The contemporary fiscal policy can be constrained by the monetary policy of previous years. Moreover, the lag in effect of monetary policy contains vital information for the policy evaluation (Fang and Miller, 2011). Time lags, thus, play an important role in evaluating this policy and its interactions with the other policies.

Hence, our contribution to the previous literature is (then) to evaluate the time varying effect of the IT's adoption by emerging countries on their budgetary discipline in terms of reducing or mastering the budget deficit, using the dynamic PSM used by Fang and Miller (2011)[2] to take account of "the lag effect" and the time varying effect of the IT's adoption on budget deficit performance in emerging countries and to stand out from the existing empirical literature while providing additional responses elements of economic policy.

The remainder of the paper is organized as follows: The second section presents the data used and some stylized facts. The methodology is described in Section 3. Section 4 discusses our econometric results. Section 5 concludes by highlighting the main policy implications of our empirical findings.

2. Data and stylized facts

We start from a set of annual data, a heterogeneous sample of 41 emerging countries, 20 are ITers (treatment group) and 21 non-ITers (control group), covering the 1990–2010 period. We retain here all emerging countries that have pursued an IT regime in the treatment group. In fact, we are based on the sample used in Lin and Ye (2009) and we added at targeters Guatemala, Romania, Slovakia and Turkey that have adopted IT between 2005 and 2006 and they were considered as non-IT countries (the control group) for these authors. We note that Serbia and Ghana have implemented the IT between 2006 and 2007 and

are not included in the list of ITers in Lin and Ye (2009). In addition, our control group was selected relying on the criteria defined by Lin and Ye (2009), based on the level of economic development and the size of the country.[3] Table 1 shows the sample of countries selected for this study, as well as the respective adoption dates for the ITers.

To examine in a preliminary manner whether the adoption of the IT policy has reduced the public deficit in the emerging targeters, we identified two key variables namely: the inflation rate calculated on the basis of the CPI and the budget deficit (% of GDP) as the state revenue (including grants) minus expense, minus net acquisition of non-financial assets. The data were obtained through various sources, including, particularly, the World Development Indicators (WDI) of the World Bank. The other variables so called "conditional" will be presented in the third subsection, after the explanation of the methodology of the work, noting that the definitions/sources of these variables and the descriptive statistics are in the appendices.

Fig. 1(a) and (b) provides respectively the average public deficit in emerging ITers before and after the adoption of IT as well as the time varying of their average budget deficit, since the date of IT's adoption[4] (PD0) and for four consecutive years (either PD1,...,4) as well as the level at the end (date) of the study period (PD2010). These figures emerge two preliminary results. Firstly, we note that the average budget deficit (% of GDP) was reduced at the emerging ITers after the application of IT, below 0.55%. Secondly and more interesting, we find that there has been no improvement in the fiscal balance in emerging countries after one year of its adoption and, more specifically, there have been an average slight deterioration of 0.5 percentage points. But from the second year following their adoption, we note that the level of the average budget deficit gets better over time attenuating low levels that can go up to − 1.5% and − 1.8% respectively in the fourth year of adoption and the last year 2010. Therefore, we can appreciate, statistically, the effect of the IT adoption on reducing the public deficit in emerging countries which have adopted this monetary policy framework and that this feedback effect is not immediate but rather comes with a delay of two years from the date of adoption. At this stage we cannot confirm whether this is the disciplining effect of IT on the performance of the budget deficit and/or the efficiency in the coordination between monetary and fiscal policy.

3. Methodology

In this section, indeed, we will try to define the econometric methodology to be used in order to empirically test the impact of the adoption of the IT policy on the performance of fiscal policy in emerging states, in terms of mastery or even budget deficit reduction. More specifically, our objective is to evaluate the time varying treatment effect of IT on the budget deficit in emerging countries that have adopted this monetary policy framework.

3.1. The propensity score matching method [5]

The principle of the PSM method consists of matching a treated observation with an untreated observation whose observable characteristics are comparable (and) considering the result Y_{i0} of the latter

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[2] These authors have sought, through the PSM method but takes into account the duration (in terms of years), to assess the impact of the IT's adoption on inflation performance, but assuming that this effect is not immediate.

[3] Given these two criteria, the authors do not include in the control group the countries with a GDP/capita at least as high as the poorest targeting country and having a population at least as important as the least populated targeting country.

[4] The date of 2000 is taken as a period of demarcation and more specifically, it is about the average dates of IT's adoption in emerging economies (see, e.g., Coulibaly and Kempf, 2010).

[5] This approach is initiated by Rubin (1977) and recently developed by Heckman et al. (1998) in the aim to solve the problem of selection on observables. That may be mentioned in recent macroeconomic studies using this method such as Vega and Winkelried (2005), Lin and Ye (2007, 2009), Walsh (2009), De Mendonça and DeGuimarães eSouza (2012), etc. Note that this approach is widely used in micro-econometrics as well as in different areas such as health, education, etc.