



# Inflation targeting and product market deregulation



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## ABSTRACT

I evaluate the effect of inflation targeting on inflation and how it interacts with product market deregulation during the disinflationary process in the 1990s. Using a sample of 21 OECD countries, I show that, after controlling for product market deregulation, the effect of inflation targeting is quantitatively important and statistically significant. Moreover, product market deregulation also matters in particular in countries that adopted an inflation targeting regime.

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## 1. Introduction

Inflation targeting (IT henceforth) has been adopted by an increasing number of central banks since the beginning of the 1990s. This new monetary policy framework requires a numerical objective for inflation, the absence of intermediate targets and a high level of transparency and accountability of the central bank.<sup>1</sup>

Extensive research has been conducted on various aspects of this regime.<sup>2</sup> Previous empirical studies report contrasting results regarding its effect on inflation: Wu (2003), Pétursson (2004), Vega and Winkelried (2005) and Batini and Laxton (2006) argue that it has been effective, while Ball and Sheridan (2003) and Willard (2012) provide evidence of the irrelevance of IT for OECD countries.

An aspect overlooked in the analysis of the effect of IT is the contribution of non-monetary factors to the disinflation of the 1990s. As pointed out in Rogoff (2003), the improvement in central banking institutions and practice has to be considered the major factor leading to the disinflation. However, he acknowledges that improved fiscal policy and increased com-

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<sup>1</sup> For a discussion on the features that characterize IT and the rationale for adopting the framework, see DeBelle (1997), DeBelle et al. (1998), Bernanke et al. (1999), Schaechter et al. (2000), Carare and Stone (2003), Mishkin (2004) and Roger (2009), among others.

<sup>2</sup> The empirical research areas include the effect on inflation rate (Laubach and Posen (1997), Neumann and von Hagen (2002), Wu (2003), Vega and Winkelried (2005), Ball and Sheridan (2003), Willard (2012), and with particular attention to emerging market economies: Mishkin (2000), Mishkin and Savastano (2001) and Schmidt-Hebbel and Werner (2002)), on the persistence of the inflation rate (Siklos, 1999; Corbo et al., 2002; Levin et al., 2004; Pétursson, 2004), on the sacrifice ratio (Bernanke et al., 1999; Corbo et al., 2002) and on the behavior of expectations (Johnson, 2002). See also Corbo et al. (2001), Mishkin and Schmidt-Hebbel (2007), and Walsh (2009) and the contributions in Bernanke et al. (1999), Bernanke and Woodford (2005), Mishkin and Schmidt-Hebbel (2001) and Cobham et al. (2010) for a broad overview of the IT experience.

petition, both in product and labor markets, resulting from the interaction of increased globalization, deregulation and a decreased role for the government in the economy, also played an important role. Gerlach et al. (2009) acknowledge the significant, although limited, influence of non-monetary factors in the general disinflation observed since 1990s.

In this paper, I contribute to the literature in two ways. First, I evaluate the effect of IT on the inflation rate for a sample of OECD countries, controlling for other important phenomena that contributed to the generalized disinflation observed in this period, with particular attention to product market deregulation. Doing so is important because it allows me to test whether the disinflation was due to the adoption of IT, product market deregulation or both these factors. Moreover, by improving the fit and reducing the error variance, it yields more precise estimates of the effect of IT. Second, I estimate carefully the effect using a Differences-in-Differences (DID) panel data model taking into account the high persistence of the dependent variable, which is essential for a correct inference when analyzing serially correlated time series with persistent treatment.

The analysis is performed on a sample of 21 OECD countries, of which eight<sup>3</sup> adopted IT during the period 1985–2007, to ensure a homogeneous sample in terms of inflation histories and economic and political structure. I focus on the role of product market regulation using the Indicators of Regulation in Energy, Transport and Communications (ETCR) coded by Conway and Nicoletti (2006). They provide the longest time-series currently available, to my knowledge, to compare product market regulations across countries in the non-manufacturing sectors, which constitute two-thirds of economic activity and are affected by import penetration only to a limited extent. Conway and Nicoletti (2006) take into account market characteristics such as barriers to entry, public ownership, excessive vertical integration and the presence of price controls. I further control for the government budget deficit as a percentage of GDP, to account for the stance of the fiscal policy, and for globalization using the index coded by Dreher (2006) and updated in Dreher et al. (2008). Using the ETCR indicator allows me to control for the impact on competition of domestic market policies in non-manufacturing sectors, while including the globalization index in the empirical part helps to control for the effect of international competition on tradable goods prices.

I estimate the effect of the adoption of IT on inflation using a panel DID estimator with country and time fixed effects in order to exploit both the time and country variation in the data. Given the autocorrelated nature of inflation rate and the persistence of the treatment variable, the standard errors of the OLS estimator are biased, as pointed out in Bertrand et al. (2004). However, OLS estimates with the inclusion of lagged dependent variables yield inconsistent estimates in the case of short time series. For these reasons I follow Hansen's (2007) methodology and I estimate the model using Feasible Generalized Least Squares (FGLS) with bias-corrected AR(2) coefficients of the error term.

I find that IT had both economically and statistically significant effect on inflation. On average it accounts for a reduction of over 1.5 percentage points of inflation<sup>4</sup> in the sample 1985–2007. Moreover, deregulation has also an important effect, a one point decrease in regulation leads to a decrease of about 0.8 percentage points in the inflation rate, while economic globalization has a small but statistically significant negative effect on inflation.

I further analyze whether the effect of product market deregulation on inflation targeters and non-inflation targeters differed. Interestingly, I find that deregulation has a larger impact on the inflation targeting countries than in the control group.

The rest of the paper is organized as follows: Section 2 briefly summarizes the related literature. Section 3 describes the sample. Section 4 explains the empirical methodology. Section 5 discusses the empirical results. Section 6 concludes.

## 2. Related literature

The popularity of IT has led to a growing number of studies evaluating the benefits of this regime. Ball and Sheridan (2003) use a cross-section DID with a sample of 20 OECD countries and show that countries that started with a higher than average inflation rate at the beginning of the sample tended to revert to the mean as time progresses. Thus, there is evidence of simple regression to the mean. Willard (2012) confirms Ball and Sheridan's results using a cross-section model for 22 OECD countries with quarterly data. However, the use of cross-sectional data limits the scope of the analysis since IT was adopted at different points in time and collapsing the data in pre- and post-IT periods leads to less precise estimates.<sup>5</sup> Willard (2012) estimates also a panel model using Arellano–Bond estimator, and confirms the absence of any significant effect for the OECD countries. However, as recognized by the author, the instruments used may be weak and the inclusion of 12 lags of inflation may lead to inefficient estimates.

On the other hand, Wu (2003), using a panel data DID methodology on the same sample as Willard (2012), shows that the IT countries experienced a decrease in their average inflation rates, with no evidence of mean reversion. However, he controls for time and country fixed effects and includes a lag of the dependent variable among the regressors, leading to potential bias in the estimates. Hyvonen (2004) studies the convergence of inflation across countries and concludes that it is the result of similar policies or common objectives. Pétursson (2004), using different samples for only IT countries, finds evidence of a disinflationary effect of IT. His results are confirmed also when using a panel data set including both inflation targeters and non-inflation targeters. Vega and Winkelried (2005), using a sample of 23 countries with IT and 86 without IT,

<sup>3</sup> Australia, Canada, Finland, New Zealand, Norway, Spain, Sweden and United Kingdom are characterized in having IT. Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Portugal and United States are characterized as not having IT.

<sup>4</sup> When using within-year percentage change.

<sup>5</sup> Inflation targeters adopted the new regime at different points in time, so the divide between the pre- and post-treatment periods can only be an arbitrary date and the variables' averages are computed over slightly different time ranges. Moreover, the estimates may be less precise because the data aggregation reduces the number of data points.

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