



CENTRAL BANK OF CYPRUS

EUROSYSTEM

## WORKING PAPER SERIES

# Conceptual note on inflation targeting types and their performance in anchoring inflation expectations

Lena T. Cleanthous

November 2020

Working Paper 2020-1

*Central Bank of Cyprus Working Papers present work in progress by central bank staff and outside contributors. They are intended to stimulate discussion and critical comment. The opinions expressed in the papers do not necessarily reflect the views of the Central Bank of Cyprus or the Eurosystem.*

**Address**

80 Kennedy Avenue  
CY-1076 Nicosia, Cyprus

**Postal Address**

P. O. Box 25529 CY-1395 Nicosia, Cyprus

**Website**

<https://www.centralbank.cy>

Papers in the Working Paper Series may be downloaded from:  
<https://www.centralbank.cy/en/publications/working-papers>

© Central Bank of Cyprus, 2020. Reproduction is permitted provided that the source is acknowledged.

# Conceptual note on inflation targeting types and their performance in anchoring inflation expectations

Lena T. Cleanthous\*

## Abstract

Since the early 1990s, inflation targeting has been widely adopted across the globe with the primary objective of maintaining price stability. Central banks formulate their inflation objective in a variety of ways: most of them use point targets, some use range targets, others a point with bands around it. A priori, the effect of adding tolerance bands or a range on how well inflation expectations are anchored is not clear. On the one hand, point targets are missed more often, which may undermine the public's confidence in the inflation target, especially if realised inflation deviates from the point target consistently. On the other hand, missing a target range or a band could be even more detrimental to the credibility of the target, whilst the increased flexibility from these types might lead to more uncertainty about the exact future path of inflation, leading to less firmly anchored inflation expectations. In the wake of persistently low inflation for over a decade, the type of inflation target has received renewed interest in the academia. A proposed solution to the persistence of inflation at low levels has been to replace point targets for target ranges. Recent evidence in the literature, however, has not been strong enough to overrule the central conclusion from the past international debate between point target and range target, that monetary policy flexibility could be achieved even without an interval.

**Keywords:** European Central Bank, price stability, monetary policy strategy, inflation targets, point target, range target.

**JEL Classifications:** E31, E52, E58

---

\* Economic Analysis and Research Department, Central Bank of Cyprus

**Corresponding author:** Lena T. Cleanthous, Economic Analysis and Research Department, Central Bank of Cyprus, 80 Kennedy Avenue, 1076, Nicosia, Cyprus. Email: lenacleanthousl@centralbank.cy  
Tel: +35722714425, Fax: +35722714984

This paper constitutes input to the report prepared by the Eurosystem Workstream on Price Stability Objective, which was later published as an Occasional Paper titled “The ECB’s price stability framework: past experience, and current and future challenges”. The report fed into the Governing Council’s deliberations on the monetary policy strategy review for 2020-21. The paper has been presented to the Eurosystem Workstream and is cited in the occasional paper. I take this opportunity to thank my Eurosystem colleagues for the insightful comments and suggestions they have offered.

This paper should not be reported as representing the views of the Eurosystem. The views expressed are those of the author and do not necessarily reflect those of the Eurosystem.

## **1. A review of the cases in favour of an explicit inflation-targeting regime**

**Since the early 1990s, inflation targeting, a policy that comes with an explicit numerical target for inflation, has been widely adopted across the globe with the primary objective of maintaining price stability.** Examples of inflation-targeting regimes are almost all of the OECD's 35 member countries and many emerging market economies, such as Ghana, Indonesia and the Philippines. In fact, about sixty countries use a quantified target for inflation in one way or another.<sup>1</sup> Indicatively, **Table 1** shows the level of inflation targets in selected countries.

**One of the main arguments for the adoption of an inflation-targeting regime in the literature is that it supports the anchoring of long-term inflation expectations by facilitating the long-term planning of price and wage setting.**<sup>2</sup> Indicatively, in a model of imperfect knowledge over the structure of the economy, and under the assumption of adaptive learning formation by agents, Orphanides and Williams (2003) analyse the effect of the announcement of an explicit numerical inflation target. They find that policies that combine tight inflation control and provide an explicit numerical inflation target reduce the costs of imperfect knowledge on macroeconomic conditions, facilitate the public in forming more accurate opinions over the long-run, promote stabilisation and increase economic growth potential.

**Nonetheless, despite the theoretical appeal of inflation targeting, empirical studies are not conclusive about the extent of the effect.** For example, Xu (2019) broadly supports the argument that those who follow an explicit inflation target exhibit better-anchored inflation expectations compared with non-explicit inflation targeters. Other studies detect the presence of such merits only for developing countries,<sup>3</sup> whilst Cecchetti and Hakkio (2009) found very limited effects of inflation targeting regimes on forecast dispersion. Crowe (2006) used inflation forecast data for 11 inflation-targeting countries, obtained from the Consensus Economics

---

<sup>1</sup> Apel and Claussen (2017a).

<sup>2</sup> Bernanke et al. (1999), Orphanides and Williams (2003), Mishkin (2008).

<sup>3</sup> Such as, Capistran and Ramos-Francia (2009).

dataset, to test whether inflation targeting enhances transparency. The author finds that although there is a mean-reversion convergence for all countries, the level of convergence increases if inflation targeting is in place.

**Table 1: Level of inflation targets in selected countries**

	<b>Target</b>
Australia	2%-3%
Brazil	4.5% ± 2 pp
Canada	2% (mid-point of 1%-3%)
Chile	3% ± 1 pp
Columbia	4% ± 0.5 pp
Czech Republic	2% ± 1 pp
Euro area <sup>1</sup>	Below, but close to, 2%
Ghana	6%-8%
Hungary	3% ± 1 pp
Hungary	3% ± 1 pp
Iceland	2.50%
Indonesia	5% ± 1 pp
Israel	1%-3%
Japan <sup>1</sup>	2%
Mexico	3% ± 1 pp
New Zealand	2% ± 1 pp
Norway	2.50%
Peru	2% ± 1 pp
Philippines	4%-5%
Poland	2.5% ± 1 pp
Romania	3.8% ± 1 pp
South Africa	3%-6%
South Korea	2%
Sweden	2%
Switzerland <sup>1</sup>	Below 2%
Thailand <sup>2</sup>	1%-3%
Turkey	5% ± 2 pp
United Kingdom <sup>3</sup>	2%
United States <sup>4</sup>	≈2%

Sources: Apel and Claussen (2017b), Roger and Stone (2005), Castelnuovo, Nicoletti-Altimari and Rodriguez-Palenzuela (2003), Little and Romano (2008), Hammond (2011), central banks' websites.

Notes:

1 The euro area, Japan and Switzerland are not full-fledged inflation targeters.

2 Thailand's new inflation target in operation since May 2020. It replaced the inflation target of 2.5% with a tolerance band of ± 1.5 percentage points, which was in place since 2015.

3 Although there is no official range, deviations of more than 1% from the target require official explanation.

4 As of August 2020, the FED signalled a major shift in its approach to managing inflation, by targeting an "average" of 2% inflation, rather than making 2% a fixed goal.

**In addition, Gürkaynak et al. (2007) examine the responsiveness of forward long-term inflation expectations to macroeconomic data releases and monetary policy announcements.** They conclude that the degree of anchoring in Canada and Chile, both explicit inflation targeters, was stronger than in the US, which had no such explicit inflation target. In comparison with the UK (after 1997) and Sweden, inflation expectations in the US are again found to be weaker in Gürkaynak, et al., (2010), indicating that the private sector's long-run inflation outcomes are better anchored with a well-known and credible inflation target. In a similar manner, Ehrmann (2015) reconfirms a low correlation between revisions in the inflation expectation and the surprise components contained in news releases in a low inflation environment.

**Empirical results from financial markets and survey data also point to the conclusion that long-run inflation expectations are better anchored in explicit inflation targeting countries, such as the euro area.** In fact, in countries such as the US, that did not have explicit inflation target until 2012, inflation expectations are found not to be as well-anchored. For example, Galati et al., (2011), euro area inflation expectations were well-anchored in the aftermath of the Lehman collapse, in contrast with US inflation expectations, which became less firmly anchored during the crisis.

**Similarly, Beechey et al. (2011) found that the Professional Forecasters' long-term inflation projections exhibited a greater dispersion to pre-crisis economic surprises in the US than in the euro area.** The authors attributed this to the announcement of a precise definition of price stability by the European Central Bank (ECB) and an extensive communication strategy in contrast to the vaguer Federal Reserve's monetary policy. One could thus say that the ECB had been more successful at the time in anchoring euro area inflation expectations.<sup>4</sup>

---

<sup>4</sup> Xu (2019).

**Over time, however, the anchoring of inflation expectations seems to change.** Using a structural VAR analysis, Nautz et al. (2016) show that the decrease in the US long-term inflation expectations can be attributed to downward adjustments of consumers' expected or perceived inflation targets rather than to the de-anchoring of inflation expectations. More recent studies find that euro area inflation expectations have been de-anchored since September 2011 using multiple endogenous break point tests.<sup>5</sup> Their findings are in line with Fracasso and Probo (2017), who tested the sensitivity of euro area inflation expectations to economic news, and affirmed a structural break in their anchoring in December 2011 with no signs of reversal. This coincides with a more generic conclusion by Xu (2019), who demonstrates that the degree to which monetary policy is able to condition inflation expectations changes across time and frequencies and varies for different groups of economic agents.

## **2. Types of inflation targeting**

**Inflation targets can usually be set in terms of one of the following ways: (i) a point target; (ii) a point target with a tolerance band; or (iii) a range target.** The point or midpoint of the ranges is generally around 2% and the target ranges are generally 2 percentage points wide – typically 1% to 3%.<sup>6</sup>

**The most common type of inflation target is the point target complemented with a tolerance band, given the difficulty in perfectly attaining a point target (Table 2).** This is the case in Chile, the Czech Republic and Hungary, for example. A notable number of countries choose to have a point target with no bands, as is the case for example in Norway, Sweden, the United Kingdom and the United States. The least chosen type appears to be the target range. Examples of countries following a target range are Australia, Israel and South Africa. The euro area follows a hybrid inflation target range, as its definition of inflation target of below but

---

<sup>5</sup> Such as Nautz et al. (2017).

<sup>6</sup> Meyer (2001).

close to 2% could be interpreted as a target range of 0% to 2%, but with the aim to being closer to the upper limit.<sup>7</sup>

**Table 2: Type of inflation target in various countries**

Type of inflation target	Countries or currency areas
<b>Point target</b>	Albania, Argentina, Bangladesh, Belarus, China, Georgia, India, Japan, Kyrgystan, Malawi, Mongolia Mozambique, Norway. Pakistan, Russia, Samoa, South Korea, Sweden, Ukraine, United Kingdom, United States, Vietnam, Zambia
<b>Point target with tolerance bands</b>	Armenia, Brazil, Canada, Chile, Colombia, Costa Rica, Czech Republic, Dominican Republic, Ghana, Guatemala, Hungary, Indonesia, Kenya, Mexico, Moldavia, New Zealand, Paraguay, Peru, Philippines, Poland, Romania, Serbia, Thailand, Turkey, Uganda, West African Economic and Monetary Union
<b>Target range</b>	Australia, Azerbaijan, Botswana, the euro area*, Israel, Jamaica, Kazakhstan, Nigeria, South Africa, Sri Lanka, Switzerland*

Source: Reproduced from Sneddon-Little and Romano (2008).

Notes: \* Inflation must be below 2% (but close to 2% in the euro area's case).

**In the academic literature, a point target is also perceived to be the norm.**<sup>8</sup> It provides a single focal point, which is easier to communicate to and be remembered by the public and aids to the agents' expectation formation and action coordination. By doing so, it probably increases the signalling properties of the announcement.<sup>9</sup> In fact, a crucial motivation for the announcement of a quantitative objective for inflation in the first place, is the capability of tightly anchoring inflation expectations, as it forms a more precise benchmark for price and wage formation.

**It is noted in the literature, however, that the possibility of a central bank perfectly hitting the point target is rather small.** This may seriously undermine the public's confidence in the

<sup>7</sup> Apel and Claussen (2017a).

<sup>8</sup> Beechey and Österholm (2018).

<sup>9</sup> Martínez (2008).

inflation target, especially if realised inflation deviates from the point target consistently. If the central bank loses its credibility over its monetary policy, this will be reflected in inflation expectations becoming less firmly anchored, leading to greater economic fluctuations.

**In general, a tolerance band around the point target can serve as a communication tool to highlight that moderate deviations from the point target are unavoidable, as inflation outcomes cannot be perfectly controlled.** The tolerance band specifies which deviations from the point target could be considered acceptable in normal times.<sup>10</sup> Furthermore, it allows for deviations from the midpoint or point inflation in the wake of temporary shocks without the need of an interest rate response by central banks. To support sound growth and allow agents to make long-term plan, the upper and lower bounds should be symmetric and central banks should place an equal weight on monitoring both inflationary and deflationary pressures. By doing so, this type of targeting smooths out the peaks and troughs of the business cycle.<sup>11</sup>

**Additionally, a tolerance band can provide more flexibility if it increases the credibility of the inflation target and minimises fluctuations in monetary policy that could be related to the volatile nature of some CPI items.**<sup>12</sup> On the other hand, it could also reduce flexibility if it creates more inflation uncertainty or if the costs of ending up outside the band are high. Naturally, this will also partly depend on the width of the band. In fact, there appears to be a trade-off over its choice. On the one hand, the width could be set tight or else “hard-edged”, indicating a stronger commitment to the inflation target, but could lead to a credibility loss if there are frequent breaches. If the width is set wider, however, then there is the risk of markets perceiving the central bank as being soft in its monetary policy, again with negative repercussions in the anchoring of inflation expectations.<sup>13</sup> As such, a tolerance band can increase room for manoeuvre only if it strengthens the confidence in the point target. If the

---

<sup>10</sup> Apel and Claussen (2017a).

<sup>11</sup> Dodge (2002).

<sup>12</sup> Martínez (2008).

<sup>13</sup> Debelle et al. (1998).

tolerance band creates more uncertainty regarding future inflation, the room for manoeuvre may instead decrease.

**On the other end of the spectrum is the inflation target range, whereby inflation is allowed to fluctuate around a predetermined band with no set midpoint level.** Generally, central banks that have adopted a target range have stressed that uncertainty over future price developments makes it difficult to fine-tune price developments with a high degree of precision, particularly at short horizons. As a result, they prefer to have some leeway in choosing their inflation target based on existing economic conditions. This is particularly important for central banks that place significant weight on macroeconomic stabilisation and prefer to avoid excessive output and employment fluctuations when responding to threats to price stability. It also gives them more freedom to pursue objectives other than inflation, such as output growth, in case they have multiple objectives in their mandates.

**In the post-financial crisis era, as central banks face an unusually low real equilibrium interest rate, those following a target range could aim at reaching the upper part of the interval.** As such, a target range can preserve flexibility in the conduct of monetary policy and can better accommodate possible moderate and gradual variations in the optimal inflation rate over time by aiming at different levels of inflation at different times.<sup>14</sup>

**In addition, inflation expectations could be better anchored due to a higher credibility over the success of the central bank's policies, given that inflation outcomes are less likely to fall outside the specified target ranges.**<sup>15</sup> The size of the range indicates the central bank's assessment of the uncertainty surrounding the effects of its policies. It is thus argued that, in an uncertain environment, a target range may be seen as preferable to a point objective for credibility purposes.<sup>16</sup>

---

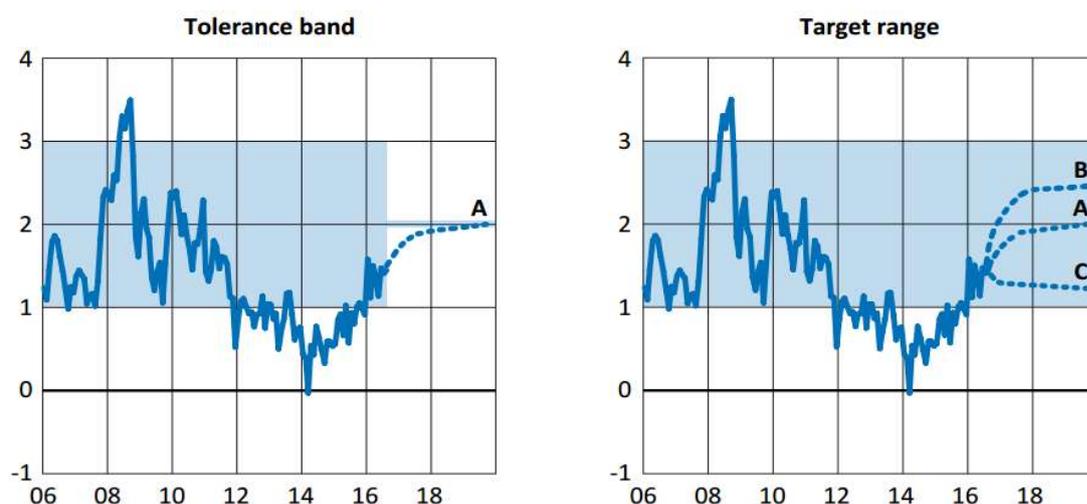
<sup>14</sup> Martinez (2008)

<sup>15</sup> Castelnuovo et al. (2003).

<sup>16</sup> Beechey and Österholm (2018).

**Although target ranges exhibit some similarities with tolerance bands, they are different in practice. Figure 1** underlines the distinction between a tolerance band and a target range. In the case of a tolerance band, the central bank will always have to work its way to bring inflation back to the specified midpoint A. In the case of a target range, there is no requirement for the central bank to do that, but can, in principle, aim for any level of inflation within the ranges of B and C.<sup>17</sup>

**Chart 1: Tolerance band versus target range**  
(Inflation and inflation forecasts)



Sources: Apel and Claussen (2017a) / Statistics Sweden and the Riksbank.  
Note: The broken line represents fictitious forecasts.

**Target ranges, however, were subject to great criticism in the past, particularly during the quite intensive international discussion on how an inflation target should best be designed.** Mishkin (2008) argued that target ranges are difficult to be communicated both within the central bank and to the general public, undermining the anchoring of inflation expectations and risking poorer economic outcomes. In the same vein, Svensson (2001) argued that a target range is a less precise anchor for inflation expectations than a point target. A failure in setting a precise anchor means that economic stabilisation becomes difficult and larger fluctuations in economic activity could take place.<sup>18</sup>

<sup>17</sup> Apel and Claussen (2017a).

<sup>18</sup> Beechey and Österholm, (2018).

**Although inflation outcomes will more often fall within a target range than hit a point target, this also comes at a cost.** Bernanke et al. (1999) suggested that missing a target range could be more detrimental to central bank's credibility than missing a point target. While agents understand and expect that a point target will never be exactly met, and that moderate deviations will always exist, the bands of the target range may be seen as implying "hard edges". Essentially, "hard edges" may be viewed as threshold values that can trigger actions in a quasi-automatic fashion, with agents perceiving any deviation outside the interval much more alarming and a serious failure of policy. This could lead, in turn, to central banks reacting in a non-linear manner, i.e. reacting relatively weakly to a shock that affects inflation but still stays just inside the interval, and strongly to a marginally greater shock causing inflation to move to just outside the interval.<sup>19</sup> Such policy reactions increase uncertainty and contribute to greater macroeconomic fluctuations.

**At the same time, the higher flexibility given by a range target may provide room for an excessive degree of discretion in the conduct of monetary policy.** In this respect, there is a trade-off between the benefit of having some flexibility in the conduct of monetary policy and the need to guard against the standard time inconsistency problem of creating unexpected inflation (à la Barro-Gordon). According to Athey et al., (2002), the optimal rule is achieved by specifying an inflation cap, in the form of the highest allowable inflation rate.

**From the few studies available, it seems that there is no major difference between the types of inflation targets.** Svensson (2011) argues that the differences between different types of inflation target "does not seem to matter in practice. A central bank with a target range seems to aim for the middle of the range." Martínez (2008) concluded after analysing the advantages and disadvantages of the different inflation target levels, that there is no material difference on their performance at anchoring inflation expectations. Castelnuovo et al., (2003) analysed how well central banks with a point target managed to anchor long-term inflation expectations

---

<sup>19</sup> Orphanides and Wieland (2000) and Orphanides and William (2003).

compared with central banks following a target range. They find no major difference between the types of inflation target in this respect.

### **3. Revisiting the choice of the type of inflation target in an era of persistently low inflation**

**The type of inflation target has received renewed interest in the wake of persistently low inflation for over a decade following the global financial crisis.**<sup>20</sup> Central banks have fought low inflation with a number of policy instruments, from low and negative policy-interest rates to asset purchases and direct funding of private sector borrowing. Yet, inflation has been stubbornly below target in many economies. Beechey and Österholm (2018) notes that some commentators have questioned the welfare distributional effects of low interest rates, whilst others have argued that financial stability risks increased in response to the continuous expansionary monetary policy pursued by central bankers in their effort to support inflationary pressures. In fact, talks on the need of greater flexibility to counteract the accumulation of financial imbalances are increasing in the literature.<sup>21</sup>

**A proposed solution according to these advocates has been to replace point targets for target ranges.** With a target range, the central bank can choose to aim for different inflation levels at different times. When inflation fluctuations are expected to be of a temporary nature, the central bank may avoid taking action when trade-offs become unfavourable or risky. That is, in the context of temporary global forces pushing down inflation, the central bank can (internally) aim for the lower region of the target range. Once the temporary forces pushing inflation away from its midpoint disappear, the central bank can slowly return to the middle of the corridor, without changing its target. In 2017, Kevin Warsh, former member of the Federal Reserve System Board of Governors, proposed a replacement of the Fed's current inflation

---

<sup>20</sup> Beechey and Österholm (2018).

<sup>21</sup> Apel and Claussen (2017a).

target set-up with “an inflation objective of around 1% to 2%, with a band of acceptable outcomes”.

**In a similar vein, Bank of Thailand switched from a point target with tolerance bands regime to a range target regime, in order to enhance monetary policy flexibility under the current volatile and uncertain global economic environment.** In this way, it is perceived that monetary policy will more effectively support growth and preserve financial stability. According to its statement explaining the change in its inflation regime, a central bank has more pressure to respond to short-run deviations of inflation under the point target (with tolerance band) system and this could have adverse side effects on other policy objectives. A range target system, on the other hand, alleviates the pressure to get inflation back to the target midpoint when short-run deviations are recorded. As a result, medium term inflation movements would reflect more of the prevailing structural changes at any given time periods.<sup>22</sup>

**However, it is not exactly clear in the literature why flexibility would increase with a target range.** Apel and Claussen (2017a) concluded that, “if the motivation for a target range is to be able to adjust for changes in the optimal rate of inflation, it seems more reasonable to discuss and evaluate the appropriate level of a point target.” This argument is becoming even more relevant as the global forces currently pushing down inflation persist for longer. A target range would lead to a complete change in the current monetary policy framework that can cause inflation expectations to become less firmly anchored and economic fluctuations to increase. In fact, from the analysts’ side, there is a general consensus that a point target is preferable to a target range when evaluating their pros and cons.<sup>23</sup>

**Beechey and Österholm (2018) used the imperfect knowledge model developed by Orphanides and Williams (2003) as the basis for its simulations to test the selection of inflation targeting regime in a stylised macro-economy.** He concluded that, “for many

---

<sup>22</sup> Bank of Thailand (2020).

<sup>23</sup> Apel and Claussen (2017a).

parameterisations of the economy, the preferred target type rests on the inflation-output stabilisation preferences of the central bank”. For balanced and “hawkish” central banks, the choice of a point target usually outperforms that of a range target, as it generally leads to lower inflation volatility and promotes better anchoring of inflation expectations. This argumentation is in line with Mishkin (2008) who argued that “...expressing an inflation objective in terms of a range makes it more difficult for a central bank to anchor inflation expectations, especially in the absence of any explicit emphasis on the midpoint.” In this respect, only central banks with a very high preference for output stability would at a more general level be willing to accept the costs of increased inflation variation and adopt a range target.

**A central bank with a highly credible point target will likely be faced with a material cost if the point target is replaced with a range target due to higher inflation volatility.** For these central banks, the target switch would most likely not alleviate the side effects of the currently ongoing expansionary monetary policy across the globe.<sup>24</sup>

**In general, there is no strong evidence in the literature to overrule the central conclusion from the international debate between point target and range target ten to fifteen years ago was that, monetary policy flexibility could be achieved even without an interval.** In general, there is limited empirical evidence in the literature that favours one particular inflation-target level over the other in anchoring long-term inflation expectations. The existing academic literature on range targets is mostly a descriptive analysis of the merits of using intervals. Studies that compare developments and long-run inflation expectations in different countries with different targets are even rarer.

---

<sup>24</sup> Beechey and Österholm (2018).

## References

- Apel, M. and Claussen, C. A. (2017a) "Inflation Targets and Intervals – An Overview of the Issues", *Sveriges Riksbank Economic Review*, Issue 1, pp. 83-103.
- Apel, M., Armelius, H. and Claussen, C. A. (2017b) "The level of the inflation target – a review of the issues", *Sveriges Riksbank Economic Review*, Issue 2.
- Athey, S., Atkeson, A. and Kehoe, P. J. (2002) "The optimal degree of discretion in monetary policy," *Working Papers*, No. 626, Federal Reserve Bank of Minneapolis, revised.
- Bank of Thailand (2020) "The medium-term inflation target and the target for 2020", *Policy Target Setting*.
- Beechey, M. and Österholm, P. (2018) "Point versus Band Targets for Inflation", *Working Paper*, No.8, Örebro University School of Business.
- Beechey, M. J., Johannsen, B. K. and Levin, A. T. (2011) "Are Long-run Inflation Expectations Anchored More Firmly in the Euro Area than in the United States?," *American Economic Journal: Macroeconomics*, Vol.3, No.2, pp. 104–29.
- Bernanke, B. S., Laubach, T., Mishkin, F.S. and Posen, A. S. (1999) "Inflation Targeting: Lessons from the International Experience", *Princeton University Press*, Princeton. Chapters 10 and 11.
- Capistrán, C. and Ramos-Francia, M. (2010) "Does inflation targeting affect the dispersion of inflation expectations?" in: *Journal of Money, Credit and Banking*, Vol. 42, No.1, pp. 113-134.
- Castelnuovo, E., Nicoletti-Altimari, S. and Rodriguez-Palenzuela, D. (2003) "Definition of Price Stability, Range and Point Inflation Targets: The Anchoring of Long-Term Inflation Expectations", In: *Issing, O. (ed), Background Studies for the ECB's Evaluation of Its Monetary Policy Strategy*, European Central Bank.
- Cecchetti, S., and Hakkio, C. (2010) "Inflation Targeting and Private Sector Forecasts", in *Twenty Years of Inflation Targeting*, ed. D. Cobham, Ø. Eitrheim, S. Gerlach, and J. F. Qvigstad, 306–36, Cambridge: Cambridge University Press.
- Crowe, C. (2006) "Testing the Transparency Benefits of Inflation Targeting: Evidence from Private Sector Forecasts", *IMF Working Paper*, No. 06/289.
- Crowe, C. (2010) "Testing the Transparency Benefits of Inflation Targeting: Evidence from Private Sector Forecasts." *Journal of Monetary Economics*, Vol.57, No.2, pp. 226–32.
- Debelle, G., Masson, P., Savastano, M. and Sharma, S. (1998) "Inflation Targeting as a Framework for Monetary Policy", *Economic Issues*, No.15, International Monetary Fund.
- Dodge, D. (2002) "Inflation Targeting during a Difficult Year", *remarks at the Saskatoon and District Chamber of Commerce*, Saskatoon, Saskatchewan, 29 January.
- Ehrmann, M. (2015) "Targeting Inflation from Below: How Do Inflation Expectations Behave?," in: *International Journal of Central Banking*, Vol.11, No.4, pp. 213-249.

- Fracasso, A. and Probo, R. (2017) “When did inflation expectations in the euro area de-anchor?”, *Applied Economics Letters*, Vol.24, No.20, pp. 1481-1485.
- Galati, G., Poelhekke, S. and Zhou, C. (2011) “Did the Crisis Affect Inflation Expectations?” *International Journal of Central Banking*, Vol.7, No.1, pp. 167–207.
- Grishchenko, O., Mouabbi, S. and Renne, J.-P. (2017) “Measuring Inflation Anchoring and Uncertainty: A US and Euro Area Comparison”, *Finance and Economics Discussion Series*, No.102, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board.
- Gürkaynak, R. S., Levin, A. T., Marder, A. N. and Swanson, E. T. (2007) “Inflation targeting and the anchoring of inflation expectations in the western hemisphere”, *Economic Review*, Vol.25, Federal Reserve Bank of San Francisco, pp. 39–47.
- Gürkaynak, R.S., Levin, A. and Swanson, E. (2010) “Does Inflation Targeting Anchor Long-Run Inflation Expectations? Evidence from the U.S., UK, and Sweden”, in: *Journal of the European Economic Association*, Vol. 8. No.6, pp. 1208-1242.
- Hammond, G. (2011) “State of the Art of Inflation Targeting.” *Centre for Central Banking Studies Handbook*, No. 29, London: Bank of England.
- Jahan, S. (1998) “Inflation Targeting: Holding the Line”, *Economics Concepts Explained*, Finance & Development, International Monetary Fund.
- Martínez, G. O. (2008) “Inflation Targeting”, *a Festschrift in Honour of David Dodge*, Bank of Canada, November.
- Meyer, L.H. (2001) "Inflation targets and inflation targeting," *Review*, Vol. 83, Issue November, Federal Reserve Bank of St. Louis, pp. 1-14.
- Mishkin, F. S. (2008) “Comfort Zones, Schmunfort Zones”, Speech given at the Sandridge Lecture of the Virginia Association of Economists and the H. Parker Willis Lecture of Washington and Lee University, Lexington, Virginia, March 27.
- Nautz, D., and Strohsal, T. (2015) “Are US Inflation Expectations Re Anchored?” *Economics Letters*, Vol.127, pp. 6–9.
- Nautz, D., Netšunajev, A. and Strohsal, T. (2016) “The anchoring of inflation expectations in the short and in the long run”, *SFB 649 Discussion Paper*, No.2016-015.
- Nautz, D., Pagenhardt, L. and Strohsal, T. (2017) "The (de-)anchoring of inflation expectations: New evidence from the euro area," *The North American Journal of Economics and Finance*, Elsevier, Vol. 40(C), pp. 103-115.
- Orphanides, A. (2009) “Reflections on inflation targeting”, speech at the *6th Norges Bank Monetary Policy Conference on Inflation Targeting Twenty Years On*, Oslo, 11 June.
- Orphanides, A. and Wieland, V. (2000) "Inflation Zone Targeting," *European Economic Review*, Vol. 44, Issue June, pp. 1351-87.
- Orphanides, A. and Williams, J. C. (2003) “Imperfect Knowledge, Inflation Expectations, and Monetary Policy”, *NBER Working Paper*, No. 9884.

- Orphanides, A. and Williams, J. C. (2007) “Inflation Targeting under Imperfect Knowledge”, *Economic Review*, Federal Reserve Bank of San Francisco, pp. 1-23.
- Roger, S. and Stone, M. R. (2005) “On Target? The International Experience with Achieving Inflation Targets”, *IMF Working Paper*, Vol. 05, No. 163.
- Sneddon-Little, J. and Romano, T. F. (2008) “Inflation Targeting—Central Bank Practice Overseas”, *Public Policy Briefs*, No.1, Federal Reserve Bank of Boston.
- Svensson, L. E. O. (2011) “Inflation Targeting,” In Friedman, B. M. and Woodford, M. (eds), *Handbook of Monetary Economics*, Volume 3B, North Holland, Amsterdam.
- Svensson, L. E.O. (2001) “The Fed Does Not Provide the Solution to the Eurosystem’s Problems”, Briefing Paper for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament, May.
- Warsh, K. (2017) “America Needs a Steady, Strategic Fed, Warsh Says”, *Economy*, Central Banks Commentary, The Wall Street Journal, 1 February.
- Xu, Y. (2019) “The anchoring of inflation expectations in time and frequency domains”, *Economic Research-Ekonomska Istraživanja*, Vol. 32, No. 1, pp. 2044-2062.