A well-timed increase in inflation targets

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Abstract

Higher inflation targets can create more room for conventional monetary policy, but they pose an immediate implementation problem near the zero lower bound. When a central bank raises the target through the aggregate-demand channel, it must initially lower the policy interest rate. We show that timing can resolve this problem. If the central bank raises the inflation target during a pickup in demand, stronger demand pushes the prescribed policy rate up while the higher target pushes it down; the two effects can offset each other. We use a simple New Keynesian semi-structural model to estimate the natural interest rate and other unobserved variables, including inflation expectations, for a group of advanced economies. We also use the model to explain how demand and monetary policy shaped inflation and the output gap. Our estimates show that a sizable decline in the natural rate pushed policy interest rates toward the zero lower bound. We therefore find that a higher inflation target is viable under conventional policy when the central bank implements the increase as demand picks up.

JEL classification: E58; E37; E43; Q43
Keywords: natural interest rate; zero lower bound; strategic policy; monetary policy stance; Taylor rule

Un aumento oportuno en las metas de inflación

Resumen

Metas de inflación más altas pueden ampliar el espacio para la política monetaria convencional, pero plantean un problema inmediato cerca del límite inferior cero. Cuando un banco central eleva la meta mediante el canal de demanda agregada, debe reducir inicialmente la tasa de interés de política. Mostramos que una implementación oportuna puede resolver este problema. Si el banco central eleva la meta durante un repunte de la demanda, la mayor demanda presiona al alza la tasa de política prescrita, mientras que la meta más alta la presiona a la baja; los dos efectos pueden compensarse. Utilizamos un modelo neokeynesiano semiestructural sencillo para estimar la tasa natural de interés y otras variables no observadas, incluidas las expectativas de inflación, para un grupo de economías avanzadas. También utilizamos el modelo para explicar cómo la demanda y la política monetaria influyeron en la inflación y la brecha del producto. Nuestras estimaciones muestran que una caída considerable de la tasa natural empujó las tasas de política hacia el límite inferior cero. Por tanto, encontramos que una meta de inflación más alta es viable bajo política convencional cuando el banco central adopta el aumento en el momento en que repunta la demanda.

Clasificación JEL: E58; E37; E43; Q43
Palabras clave: tasa natural; límite inferior cero; política estratégica; postura de la política monetaria; regla de Taylor

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1 Introduction

The steady decline in the natural interest rate has compressed the room for conventional monetary policy. At the beginning of the century, an expansionary stance in advanced economies implied policy rates below about 3.5 percent. By the end of the following decade, the corresponding threshold had fallen below about 0.5 percent. During the 2008 financial crisis, policy rates reached the zero lower bound in advanced economies and fell by about 2 percentage points in emerging economies. A lower natural rate therefore turns an ordinary downturn into a harder policy problem: the central bank has less room to reduce its instrument.[1]

Blanchard et al. (2010) and Ball (2014) propose raising inflation targets to 4 percent. Blanchard et al. discuss some costs of single-digit inflation and mention that policymakers could raise inflation during a pickup in demand. Ball argues that 2 percent targets are costly because economies hit the zero lower bound frequently. If the bound produces long recessions, those losses may exceed the costs of raising the target from 2 to 4 percent. Their proposal identifies the destination: a higher average nominal interest rate and more policy room.

The proposal nevertheless leaves an implementation instability. A higher target can raise the nominal rate in the long run, but the aggregate-demand channel calls for a lower policy rate while inflation moves toward the new target. Near the zero lower bound, the central bank may lack the rate reduction that launches the transition. The instrument intended to create future room may therefore require room that does not exist today. This is the policy problem that the paper addresses.

This paper argues that timing can stabilize that transition. A pickup in demand calls for a higher policy rate, whereas an increase in the inflation target calls for a lower one. If the central bank combines the two events, these opposing prescriptions can offset each other. Timing acts like a counterweight: stronger demand supplies the upward pressure on the policy rate that the target increase would otherwise remove. The central claim is thus not that any target increase is feasible, but that a well-timed increase can be feasible under conventional policy.

Inflation targets provide relevant cross-country context. In 2018, most advanced economies had targets at, centered on, or close to 2 percent. Emerging-economy targets were seldom below 3 percent and were commonly centered on 3 percent.[2] Consistent with these starting points, advanced-economy policy rates stood at or near the zero lower bound, while emerging-economy rates generally remained above it. A further recession and disinflation could nevertheless reduce the remaining room in emerging economies.

The analysis covers 31 economies: 16 advanced and 15 emerging.[3] At purchasing-power-parity

[1] Galesi et al. (2017) discuss explanations for the decline in the natural rate, including the balance between saving and investment, population aging, and slower total factor productivity growth.

[2] Advanced-economy examples included the United States, Japan, the United Kingdom, Canada, New Zealand, Sweden, Switzerland, Norway, Korea, Israel, the Czech Republic, the euro area, and Australia. Emerging-economy examples included China, Mexico, Colombia, Chile, the Philippines, Hungary, Costa Rica, Indonesia, India, Russia, Guatemala, South Africa, Brazil, and Turkey. The targets cited in the original study refer to 2018.

[3] The advanced economies are the United States, euro area, Japan, United Kingdom, South Korea, Canada, Australia, Switzerland, Singapore, Sweden, Hong Kong, Norway, Czech Republic, Israel, Denmark, and New Zealand. The emerging economies are China, India, Brazil, Indonesia, Mexico, Turkey, Thailand, Malaysia, the Philippines, South Africa, Colombia, Chile, Peru, and Bulgaria. Russia, Argentina, and Venezuela were excluded because complete time series were unavailable and hyperinflation episodes could distort weighted averages.

exchange rates, they accounted for about 80 percent of global output in 2015, divided roughly equally between the two groups. This broad sample describes the policy constraint, while the model focuses on the advanced economies that faced the zero lower bound.

The paper studies conventional interest-rate policy. It does not incorporate quantitative easing or the shadow rates associated with unconventional policy. Shadow rates are not mechanically constrained by zero; including them would therefore change the policy instrument under study. By excluding them, the analysis isolates whether conventional rate policy can implement a higher target when the observed policy rate is at or near its lower bound.

The paper proceeds as follows. Section 2 describes inflation and interest rates in advanced and emerging economies. Section 3 presents the semi-structural model. Sections 4 and 5 describe the data and parameter estimates. Section 6 reports the policy experiment, the estimated unobserved variables, and the historical decompositions. Section 7 concludes.

2 Inflation and interest rates

Inflation. Total inflation combines core and non-core inflation. The respective weights are 0.78 and 0.22 in advanced economies and 0.66 and 0.34 in emerging economies. Non-core inflation, in turn, combines food and energy inflation; their respective weights are 0.61 and 0.39 in advanced economies and 0.73 and 0.27 in emerging economies.[4] These weights allow volatile non-core prices to dominate short-run movements without determining the long-run mean of inflation.

Graph 1 reports PPP-weighted averages of total, core, and non-core inflation. Total inflation follows non-core inflation in the short run, but it moves more closely with core inflation over longer horizons. Core inflation in advanced economies fluctuates around 1.5 percent and declines mildly after the 2008 financial crisis. In emerging economies, core inflation gradually converges toward a long-run average near 3 percent. The contrast between short-run volatility and long-run persistence motivates the model's separate treatment of core and non-core inflation.

Graph 2 reports the median and interquartile range of core inflation. Advanced economies display both a lower median and less dispersion. Emerging economies display a higher median and wider dispersion, although their median moves gradually downward and falls again during the financial crisis. Core inflation therefore distinguishes the two country groups more persistently than temporary movements in food and energy prices.

Graph 3 reports the same statistics for non-core inflation. The median varies substantially in both groups, and emerging economies show greater variability and dispersion. Non-core inflation rises during the 2007–08 global food-price crisis, falls during the financial crisis, rebounds rapidly, and declines again with oil prices in 2015–16. In advanced economies, large oil-price declines push non-core inflation below zero. Non-core prices consequently explain much of the short-run movement in headline inflation.

Graph 4 combines these components in total inflation. Before 2008, median inflation in advanced economies remains within a narrow interval centered near 1.55 percent. After 2008, it becomes more variable and centers near 1.45 percent; oil-price declines in 2009 and 2015–16 bring it close to zero. Emerging economies show a higher median and wider dispersion: inflation rises sharply during the

[4]These are 2015 PPP-weighted averages based on OECD Statistics, Haver Analytics, and national statistical sources.

food-price crisis and falls after 2008, but higher core inflation keeps it broadly above zero. Total inflation thus inherits short-run volatility from non-core inflation and its longer-run level from core inflation.

Inflation targets may be points, ranges, or combinations of both. Point targets and range midpoints guide policy operations, while ranges acknowledge short-run inflation variability. A point or narrow range communicates the midpoint strongly but is difficult to hit exactly. A wider range absorbs more variation, but it can weaken the public's perception that the midpoint governs policy. The design problem is therefore to accommodate noise without obscuring the operational target.

Observed inflation variability shows how restrictive most ranges are. From 2010Q1 to 2017Q4, the average country-level standard deviation of total inflation was about 1.1 percent in advanced economies and 1.5 percent in emerging economies. A symmetric range that accommodated one standard deviation on either side would therefore span about 2.2 and 3.0 percentage points, respectively. Most published ranges were 2 percentage points wide or less, and point targets had no explicit range.[5] Most frameworks could therefore absorb only ordinary fluctuations before inflation moved outside the announced interval.

Interest rates. Graph 5 reports PPP-weighted policy, real, and natural interest rates for advanced economies. Policy rates reach historical lows during the 2015–16 oil-price decline. Under the Fisher relation evaluated at latent values, the real natural rate falls from about 2 percent to -1 percent after the turn of the century, while the natural nominal rate falls from about 3.5 percent to 0.5 percent. The 3-percentage-point decline measures the loss of conventional policy space at the center of the paper's problem.

Graph 6 reports the median and interquartile range of policy rates. In advanced economies, the distribution shifts toward the zero lower bound during the 2008 crisis; by 2015–16 even the third quartile approaches zero, and negative rates appear in the first quartile.[6] Emerging-economy rates remain above zero, although the median falls by about 2 percentage points during the crisis. Higher initial inflation and nominal rates preserved more room in emerging economies, but did not insulate them from the global contraction.

3 The model

The model belongs to the New Neoclassical Synthesis: monetary policy affects output in the short run but remains neutral in the long run. It contains a Phillips curve, an output-gap equation, and a policy rule. Semi-structural models of this kind follow McCallum and Nelson (2001) and Svensson (2000) and became central to inflation-targeting practice. Because advanced economies trade predominantly with one another, the paper uses a closed-economy aggregate and represents

[5] The original paper reports wider ranges for Thailand, South Africa, and India; 2-percentage-point ranges for Canada, New Zealand, the Czech Republic, Israel, Peru, Poland, Mexico, Colombia, Chile, the Philippines, Hungary, Guatemala, and Indonesia; 1-percentage-point ranges for Australia and Korea; proximate targets for the euro area, China, and Switzerland; and point targets for the United States, United Kingdom, Japan, Sweden, Norway, Russia, and Turkey.

[6] Within the sample, Switzerland adopted a negative policy rate in 2014Q4 and Sweden in 2015Q1.

transmission through the sequence from the real interest rate to the output gap and then to inflation. The model therefore provides the smallest structure needed to study the timing mechanism.

The model differs from the standard formulation by including an equation for unobserved inflation expectations. Expectations combine forward- and backward-looking core inflation. Because expected core inflation defines the real interest rate, non-core inflation does not directly affect the real rate or the other behavioral equations; it only helps explain total inflation. The policy rule responds to core inflation and the output gap. This separation prevents temporary food and energy shocks from driving the policy experiment.

The core block is

$$\pi_{C,t} = \nu_1 \pi^e_{C,t} + (1-\nu_1)\pi_{C,t-1} + \nu_y \hat{y}_t + \varepsilon^{\pi C}_t, \tag{1}$$
$$\pi^{NS}_{C,t} = \pi_{C,t} + \varepsilon^N_t, \tag{2}$$
$$\pi^e_{C,t} = \nu_1 \pi^4_{C,t+4|t} + (1-\nu_1)\pi^e_{C,t-1} + \varepsilon^{\pi e}_t. \tag{3}$$

Equation (1) is the core Phillips curve: expected inflation, lagged core inflation, the output gap, and a shock determine core inflation. Equation (2) separates observed core inflation into signal and noise; using the signal improves the Phillips-curve fit, projections, and impulse responses. Equation (3), adapted from Heinemann and Ullrich (2006), makes expectations a forward- and backward-looking combination of core inflation. Together, the three equations make persistent core inflation, rather than volatile headline inflation, govern the real rate.

The model deliberately omits a short-run credibility channel from the target to expectations. The target therefore does not move expectations immediately after an announcement. In the long run, however, core inflation converges to the target under every shock, and expectations converge with core inflation. This assumption makes the policy experiment conservative: the central bank must generate the transition through the demand channel rather than rely on an announcement alone.

The non-core and total-inflation block is

$$\pi_{NC,t} = \chi_1 \pi_{NC,t+1|t} + (1-\chi_1)\pi_{NC,t-1} + \nu_y \hat{y}_t - \chi_{\Delta q}(\pi_{NC,t-1} - \pi_{C,t-1}) + \varepsilon^{\pi NC}_t, \tag{4}$$
$$\pi_t = \omega_C \pi_{C,t} + \omega_{NC}\pi_{NC,t}. \tag{5}$$

Equation (4) summarizes commodity prices, oil prices, weather, and other omitted supply factors in the non-core inflation shock. Its relative-price term anchors non-core inflation to core inflation over time. Equation (5) forms total inflation as a weighted average of the two components. These equations allow supply shocks to dominate headline inflation temporarily without changing its long-run anchor.

Aggregate demand and monetary policy satisfy

$$\hat{y}_t = \sigma_1 \hat{y}_{t-1} - \sigma_r r_t + \varepsilon^{\hat{y}}_t, \tag{6}$$
$$i_t = \bar{\imath}_t + \delta_\pi \hat{\pi}_{C,t} + \delta_y \hat{y}_t + \varepsilon^i_t, \tag{7}$$
$$\bar{\imath}_t = \bar{r}_t + \pi^e_{C,t}, \tag{8}$$
$$r_t = i_t - \pi^e_{C,t}. \tag{9}$$

Equation (6) makes the output gap fall when the real interest rate rises; its shock also absorbs unconventional policy and financial-cycle influences. Equation (7) is a Taylor rule in which the policy rate follows the nominal natural rate and responds to the core-inflation and output gaps. Equations (8) and (9) connect nominal and real rates through expected core inflation. The block contains the paper's central mechanism: a higher target lowers the rate prescribed for the transition, whereas stronger demand raises it.

Potential output evolves as

$$y_t = \hat{y}_t + \bar{y}_t, \tag{10}$$
$$\bar{y}_t = \bar{y}_{t-1} + \tfrac{1}{4}\gamma_t^y + \varepsilon_t^{\bar{y}}, \tag{11}$$
$$\gamma_t^y = \gamma_{t-1}^y + \varepsilon_t^{\gamma y}. \tag{12}$$

Observed output equals the output gap plus potential output, while potential output follows a stochastic growth process. These identities let the model distinguish a cyclical contraction from a persistent slowdown in productive capacity.

The inflation target follows

$$\bar{\pi}_t = \bar{\pi}_t^{Det} + \bar{\pi}_t^{Trend}, \tag{13}$$
$$\bar{\pi}_t^{Det} = \rho_\pi \bar{\pi}_{t-1}^{Det} + (1-\rho_\pi)\bar{\pi}_{ss}^{Det} + \varepsilon_t^{\pi Det}, \tag{14}$$
$$\bar{\pi}_t^{Trend} = \bar{\pi}_{t-1}^{Trend} + \tfrac{1}{4}\gamma_t^\pi + \varepsilon_t^{\pi Trend}, \tag{15}$$
$$\gamma_t^\pi = \gamma_{t-1}^\pi + \varepsilon_t^{\gamma\pi}. \tag{16}$$

The target has deterministic and stochastic-trend components. The policy experiment introduces a transitory shock to the growth of the stochastic trend, which produces a permanent increase in the level of the inflation target.

Following Laubach and Williams (2003) and Holston, Laubach, and Williams (2016), the natural rate satisfies

$$\bar{r}_t = \gamma_t^y + r_t^{Trend}, \tag{17}$$
$$r_t^{Trend} = r_{t-1}^{Trend} + \tfrac{1}{4}\gamma_t^r, \tag{18}$$
$$\gamma_t^r = \gamma_{t-1}^r + \varepsilon_t^{\gamma r}. \tag{19}$$

Potential growth contributes directly to the natural rate, while the trend component captures other persistent fundamentals. This decomposition lets slower potential growth and other secular forces reduce the policy rate consistent with equilibrium.

4 The data

We calculate group aggregates with moving PPP weights. Fixed and moving weights yield similar aggregates for advanced economies, but they differ more for emerging economies because China's share rises over the sample. Moving weights therefore preserve the changing composition of global output while allowing consistent comparisons between the two groups.

Policy rates come from national central banks, the IMF's International Financial Statistics, and

OECD Statistics. Where a country changed its monetary regime or lacked an early policy-rate series, another short-term interest rate proxies for the instrument. GDP comes from national statistical agencies, central banks, OECD Statistics, Eurostat, and the IMF. Inflation comes from OECD Statistics, Haver Analytics, national statistical agencies, central banks, and Eurostat. For India, an error-correction model for the median relative price of core goods in emerging economies extends the early core-inflation series. Gómez-Pineda (2017) provides further source details.

5 Estimation and calibration

We estimate two parameters with Bayesian methods: the effect of the output gap on core inflation in equation (1), ν_y, and the effect of the real interest rate on the output gap in equation (6), σ_r. Priors reflect the behavior of the impulse responses, latent variables, and historical decompositions. Table 1 reports the priors and posterior means. The posterior estimates imply that demand affects inflation gradually and that the real interest rate has a measurable effect on activity.

We calibrate the remaining parameters. The degree of forward-looking behavior in the Phillips curve and the expectations equation follows the impulse responses and the estimated path of expectations. The other coefficients reflect the impulse responses, latent variables, and historical decompositions; shock standard deviations, not reported, reproduce plausible latent-variable paths. Table 2 reports the coefficient calibrations used in the policy experiment.

Table 1: Estimated parameters

Parameter	Prior mean	Lower	Upper	Prior s.d.	Posterior mean
σ_r	0.100	0.050	0.150	0.030	0.080
ν_y	0.150	0.050	0.200	0.022	0.168

Table 2: Calibrated parameters

Parameter	Value
ν_1	0.20
χ_1	0.20
σ_1	0.20
ω_C	0.71
ρ_π	0.70
δ_π	1.50
δ_y	0.50
$\chi_{\Delta q}$	0.05

6 Results

6.1 An increase in the inflation target

The first experiment raises the inflation target permanently. Under conventional policy alone, the transition is not feasible at or near the zero lower bound: for each 1-percentage-point increase in the target, the model calls for the policy rate to fall by about one-quarter of a percentage point (Graph 7, Panel A). The aggregate-demand channel transmits the change from the target to the policy rate, the output gap, and inflation. A target increase by itself therefore intensifies the immediate constraint that it seeks to relax in the long run.

Could credibility remove the constraint? A sufficiently strong announcement effect could raise expected and actual inflation without a rate reduction. Yet the persistence of the zero lower bound suggests that announcements alone cannot reliably create the required inflation, and Ball (2014) argues that expectations follow actual inflation more than announced targets. The model accordingly omits an immediate credibility channel. Without that shortcut, a target increase by itself remains unworkable near the bound because the prescribed rate still falls.

Timing resolves the conflict. The second experiment combines the permanent target increase with a transitory positive demand shock (Graph 7, Panel B). The target increase calls for a lower policy rate, but the demand pickup calls for a higher one. In the simulation, the two forces keep the prescribed rate from falling, so conventional policy can implement the higher target even near the zero lower bound.[7] The result establishes viability through timing rather than through a new instrument.

An inflation shock could in principle provide similar timing, but it offers a weaker foundation. Core-inflation shocks are generally small, while non-core shocks can be large but tend to reverse. An uncorrelated rise in food or energy inflation may therefore be followed by an offsetting decline. Demand provides the more durable and policy-relevant state in which to launch a permanent target increase.

6.2 The unobserved variables

The model estimates the output gap, potential growth, the natural rate, and inflation expectations for the advanced-economy aggregate. The output gap falls by about 5.5 percentage points from its 2008 peak to its 2009 trough and then closes gradually by 2015 (Graph 8, Panel A). This path identifies the financial crisis as a large and persistent contraction in demand.

Potential growth also declines. It falls by about 0.7 percentage points from the beginning of the century (Graph 8, Panel A). Productivity growth and population aging may help explain that change, but they lie outside this compact New Keynesian model. The estimate nonetheless matters because slower potential growth reduces the natural interest rate.

The natural real rate records the paper's largest persistent movement. It falls by about 3 percentage points from the start of the century (Graph 8, Panel B). The natural nominal rate falls with it (Graph 8, Panel C). By lowering the neutral level around which policy operates, this decline compresses the room for every conventional easing cycle.

[7]The simulation uses a 1-percent demand shock lasting one quarter. Its size is comparable to the sum of estimated output-gap shocks in 2005, half their sum in 2006, and one-quarter of their sum in 2007.

Estimated inflation expectations move with core inflation (Graph 8, Panel D). They decline mildly over the long run and fluctuate with core inflation in the short run. This comovement supports the model's conservative treatment of credibility: expectations remain anchored to observed core inflation rather than jumping mechanically with the announced target.

The Taylor rule provides a second measure of the monetary policy stance. Under the first measure, policy is expansionary when the observed rate lies below the natural nominal rate. Under the second, policy is expansionary when the observed rate lies below the rate prescribed by the systematic rule. Define that prescribed rate as

$$i_t^p = \bar{\imath}_t + \delta_\pi \hat{\pi}_{C,t} + \delta_y \hat{y}_t. \tag{20}$$

It combines the long-run nominal natural rate with short-run responses to the inflation and output gaps. This definition separates the systematic prescription from the discretionary policy shock.

The observed policy rate then satisfies

$$i_t = i_t^p + \varepsilon_t^i. \tag{21}$$

The stance is expansionary when $\varepsilon_t^i < 0$ and contractionary when $\varepsilon_t^i > 0$. The remainder of the paper uses this rule-based measure because it accounts for both equilibrium rates and cyclical conditions.

Graph 9 shows that the prescribed rate declines steadily with the natural rate and fluctuates with the inflation and output gaps. The observed rate follows the long-run decline but adjusts less in the short run. After 2008, the prescribed rate moves more than the observed rate, and the resulting gap identifies a contractionary stance. The lower bound therefore restricts not only the level of rates but also their cyclical flexibility.

6.3 Historical decompositions

The historical decompositions attribute movements in core inflation, total inflation, expectations, and the output gap to demand and monetary-policy shocks. In this model, "demand" is a broad residual category that includes omitted forces such as animal spirits and unconventional monetary policy. The decomposition asks which shocks propagated through the model, not which underlying institution generated every shock.

Demand raises core inflation during 2005–08 and lowers it sharply during and after the financial crisis (Graph 10, Panel A). The pre-crisis expansion was not used to raise inflation targets; after the crisis, policy rates in nearly all advanced economies approached the zero lower bound. In retrospect, the sequence illustrates the paper's timing claim: the demand pickup offered a transition window that disappeared once the contraction began.

Demand also lowers inflation expectations sharply during the crisis, despite some monetary stimulus (Graph 10, Panel B). Because expectations follow core inflation in the model, weak demand transmits persistent disinflation into expected inflation. Monetary stimulus offsets part, but not all, of that decline.

Supply shocks dominate total inflation in the short run (Graph 10, Panel C). Their effects can reverse quickly because food and energy prices often retrace earlier movements. Demand and monetary-policy shocks persist longer and therefore explain more of total inflation over longer horizons. The decomposition reinforces the distinction between a temporary headline-price movement and a durable transition to a higher target.

Demand, followed by monetary policy, explains most of the output gap (Graph 10, Panel D). The large estimated demand shocks also reveal the importance of forces that the parsimonious output-gap equation does not model separately. The model's simplicity concentrates those influences in one shock, but their combined effect is economically large.

Taken together, the decompositions assign demand a central role in the output gap and in the post-2008 decline in core inflation. They also show why the timing result is not merely mechanical. A sufficiently strong demand expansion occurred before the crisis, and a later collapse closed that opportunity. A future pickup in demand could provide another window in which to raise the target without requiring a further policy-rate reduction.

7 Conclusions

The decline in the natural interest rate has compressed the space for conventional monetary policy. Since the beginning of the century, the estimated natural rate for advanced economies has fallen by about 3 percentage points. Most advanced-economy policy rates consequently reached or approached the zero lower bound, while emerging economies retained more room but shared the effects of weak global growth. The policy constraint is therefore structural as well as cyclical.

Higher inflation targets can rebuild nominal interest-rate space, but the transition matters. A target increase implemented on its own calls for a lower policy rate through the aggregate-demand channel. Near the zero lower bound, that prescription may be infeasible. The conventional proposal for a higher target therefore contains an implementation problem that its long-run logic does not solve.

This paper's solution is a well-timed increase. If the central bank raises the target during a pickup in demand, the demand expansion calls for a higher policy rate while the target increase calls for a lower one. The two forces can offset each other, leaving the prescribed rate above the lower bound. A higher target is therefore viable under conventional policy when policymakers condition implementation on the state of demand.

The model also clarifies why demand, rather than a temporary supply shock, provides the relevant window. Non-core shocks dominate headline inflation in the short run but often reverse. Demand and monetary policy shape core inflation, inflation expectations, and the output gap more persistently. A durable change in the target should therefore begin when persistent demand pressure can support the transition.

The conclusion remains deliberately limited. The paper does not compare higher targets with quantitative easing, negative rates, forward guidance, or other unconventional instruments, and it does not model an immediate credibility channel. It establishes a narrower result: within a conventional interest-rate framework, timing can make a target increase implementable near the zero lower bound. That conditional result turns the debate from whether to raise the target in the abstract to when the transition can be carried out.

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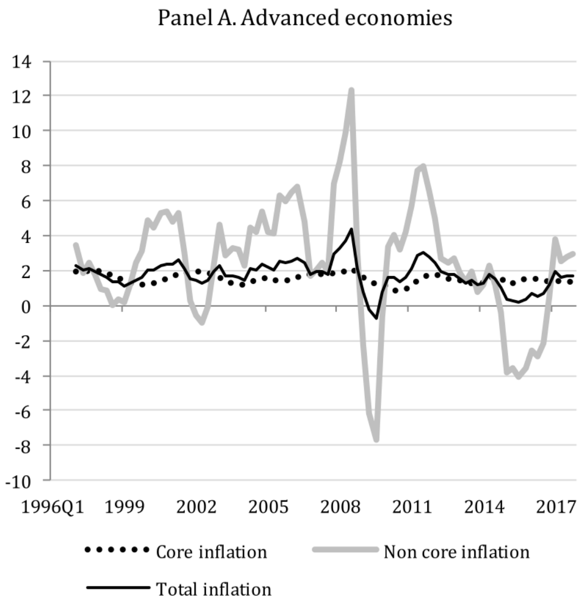
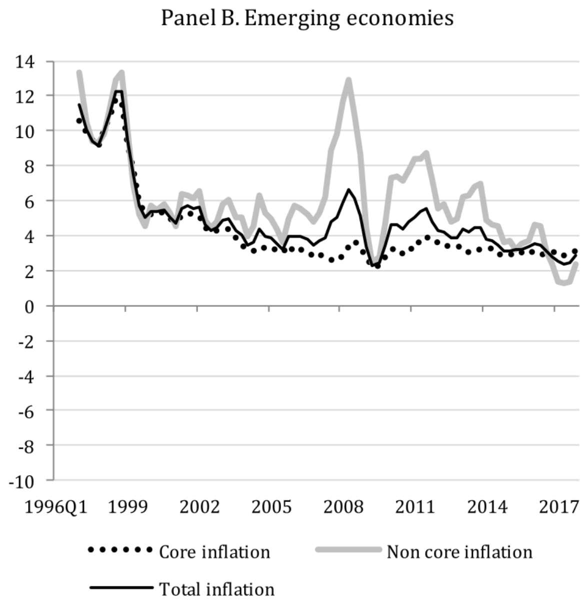
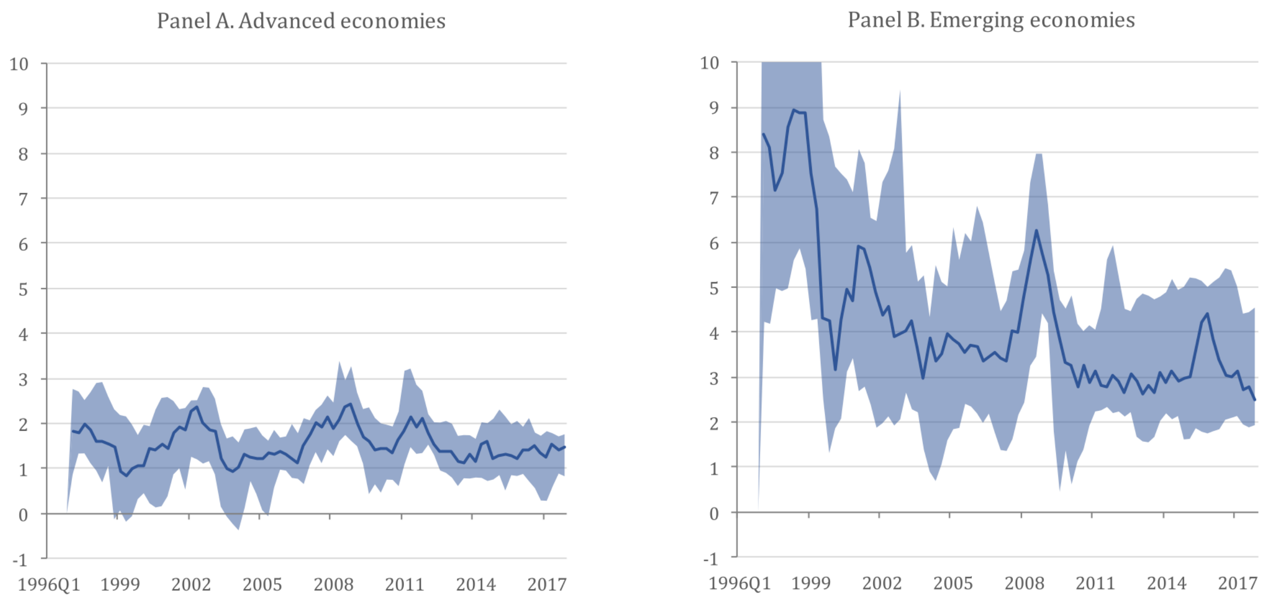
Graph 1. Total, core and non core inflation
(PPP-weighted average)





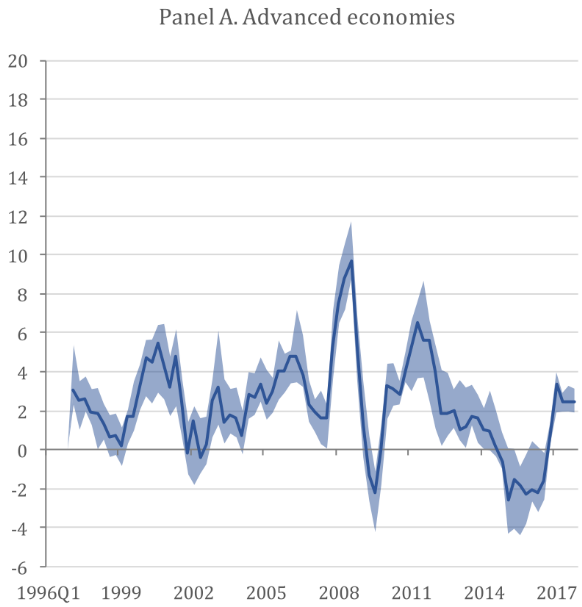
Notes: The graph shows lower inflation in advanced economies. Total inflation follows non core inflation in the short term, but in the long term moves less as it follows core inflation close behind.
The advanced economies are: the United States, the Euro zone (19 countries), Japan, the United Kingdom, South Korea, Canada, Australia, Switzerland, Singapore, Sweden, Hong-Kong, Norway, Czech Republic, Israel, Denmark and New Zealand.
The emerging economies are: China, India, Brazil, Indonesia, Mexico, Turkey, Thailand, Malysia, the Philippines, South Africa, Colombia, Chile, Peru, and Bulgaria.
Source: author's calculations on data from the OECD statistics, Haver Analytics country statistics departments, country central banks, Eurostats and the IMF.

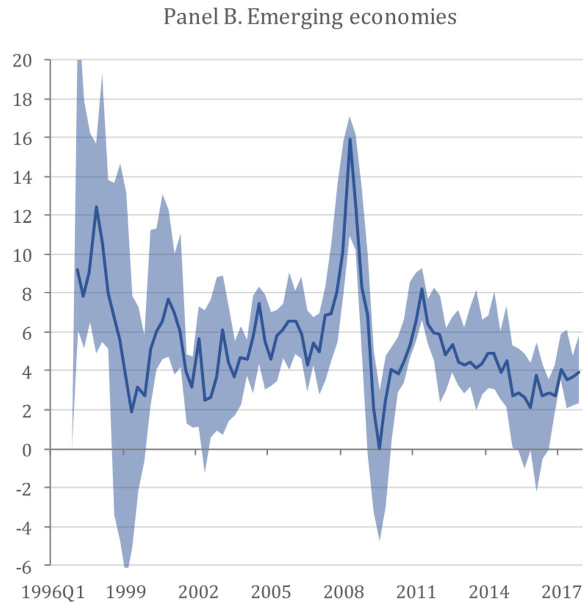
Graph 2. Core inflation
(Solid line: median; shade: interquartile range)



Note: Core inflation exhibits lower median and dispersion in advanced economies
Source: author’s calculations with data from the sources shown in the footnote to Graph 1.

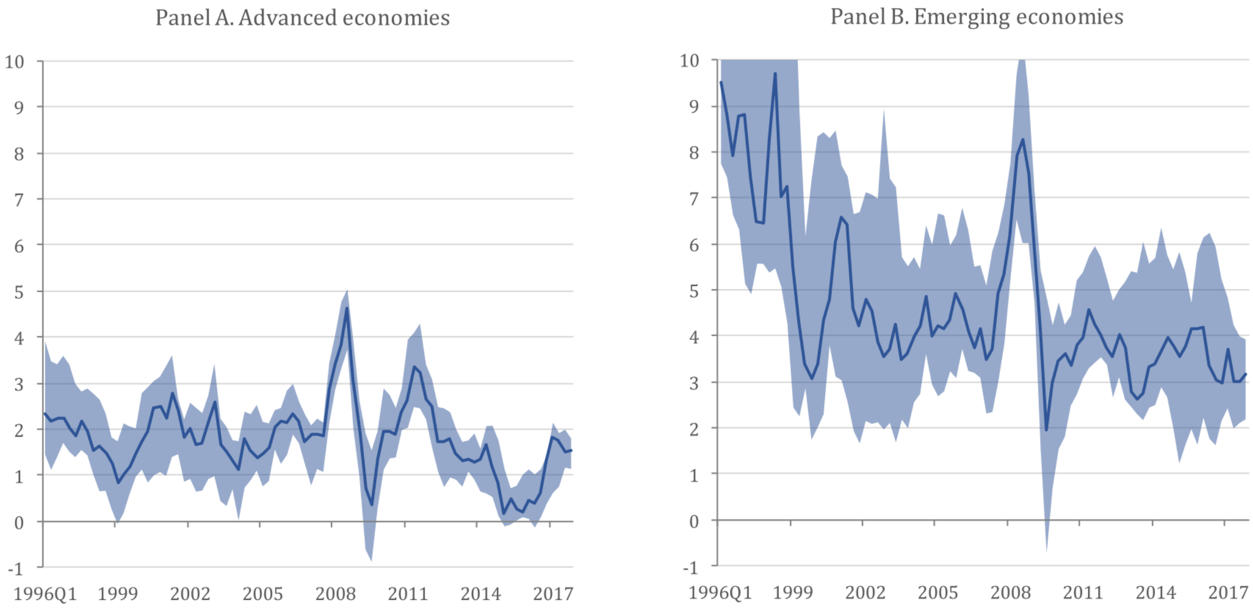
Graph 3. Non core inflation
(Solid line: median; shade: interquartile range)





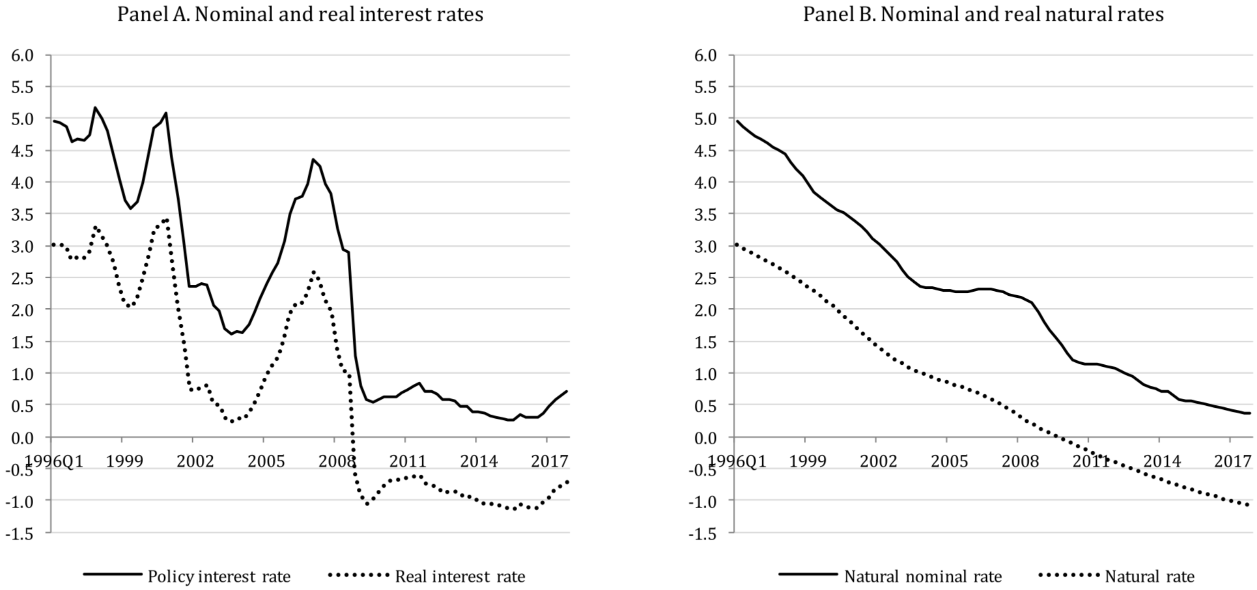
Note: non core inflation collapsed below zero in advanced economies
Source: author's calculations with data from the sources shown in the footnote to Graph 1.

Graph 4. Total inflation
(Solid line: median; shade: interquartile range)



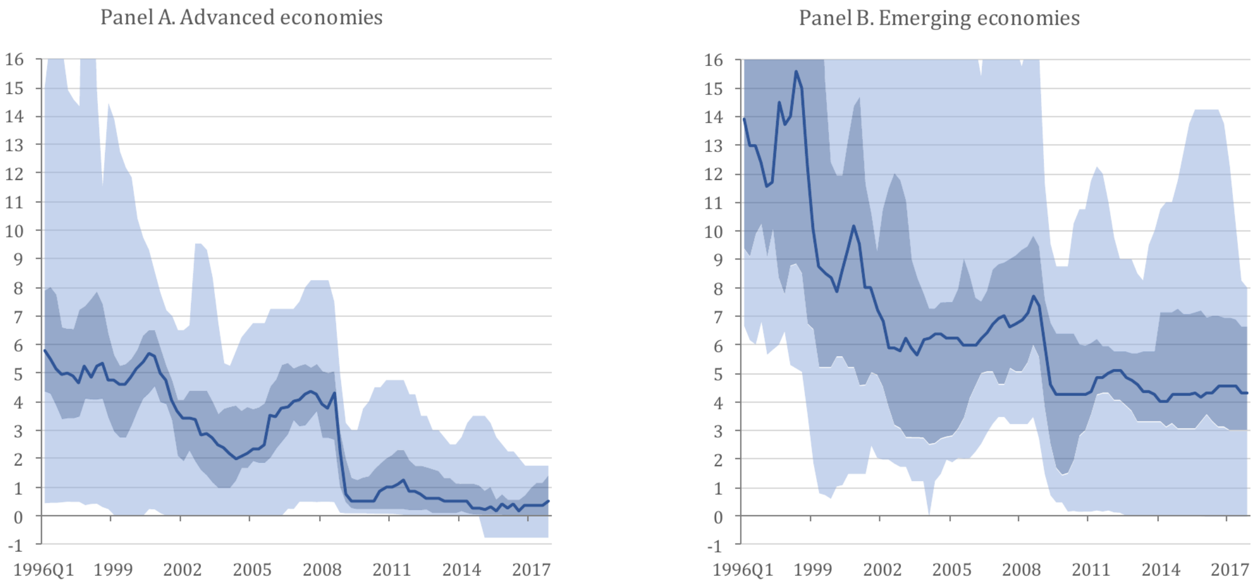
Note: total inflation dropped to about zero in advanced economies during 2008 and 2015-2016, episodes of large drops in oil prices. In emerging economies total inflation broadly remained above zero
Source: author's calculations with data from the sources shown in the footnote to Graph 1.

Graph 5. Adanced economies: Interest rates
(PPP-weighted average of observed and latent interest rates, in percent)



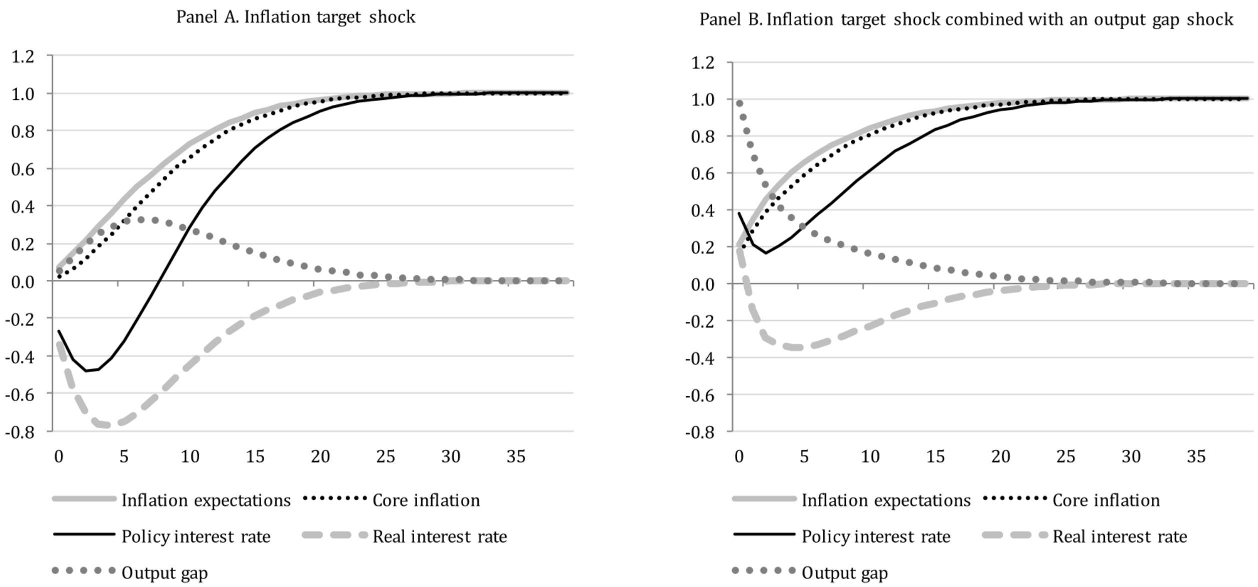
Note: the natural rate dropped about 3 percentage points since the turn of the century
Sources: the source for the observed rates are national central banks, IMF International Financial Statistics and OECD statistics. The source for the natural rates and the inflation expectations used to estimate the natural nominal rate is author's estimations based on the model in the text.

Graph 6. Interest rates
(Solid line: median; shade: quartile distribution)



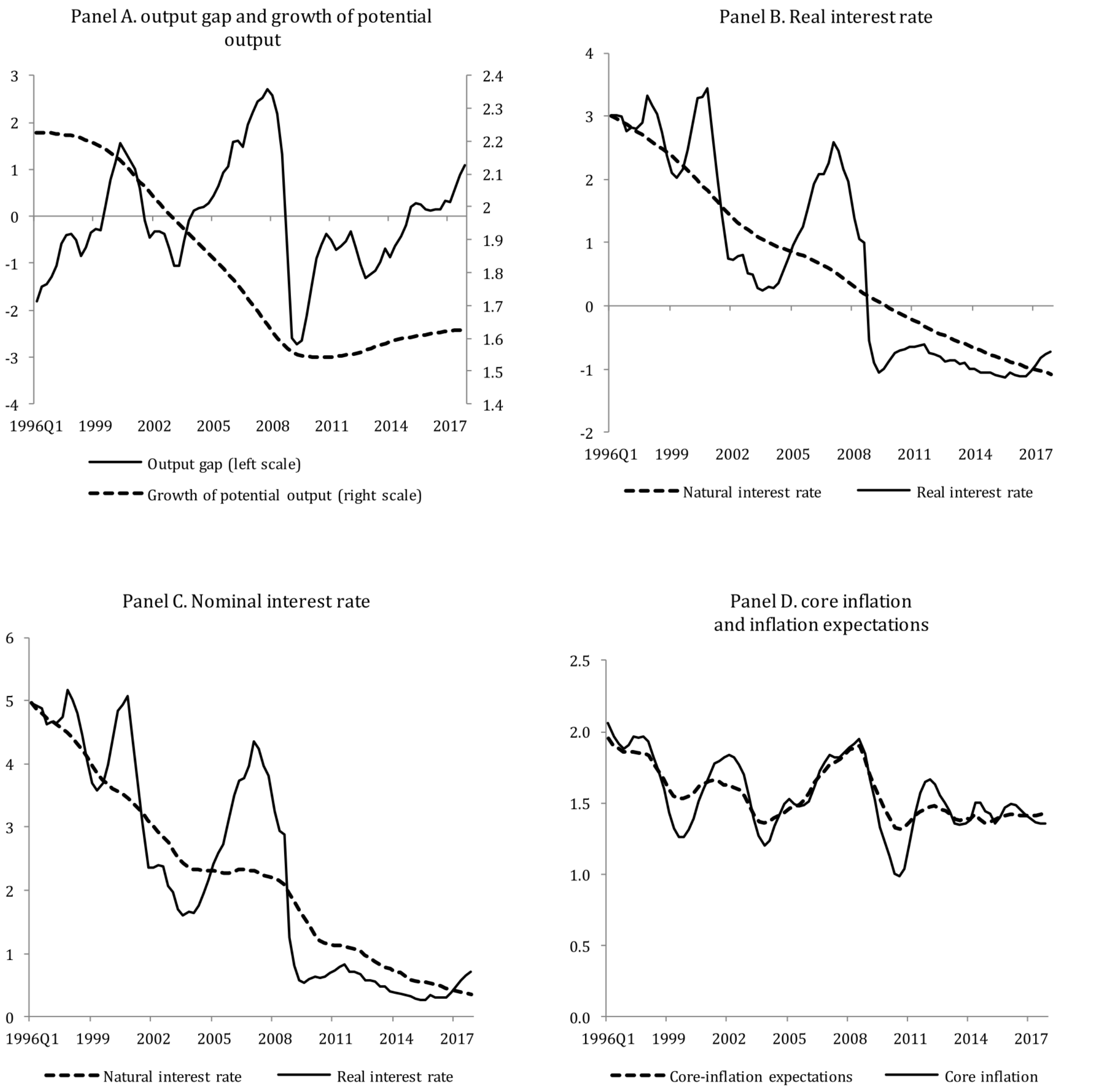
Note: during the 2008 financial crisis, policy interest rates dropped to or close to the zero-bound in advanced economies and dropped about 2 percentage points in emerging economies
Sources: national central banks, IMF International Financial Statistics and OECD statistics.

Graph 7. A raise in the inflation target
(Deviation from baseline)



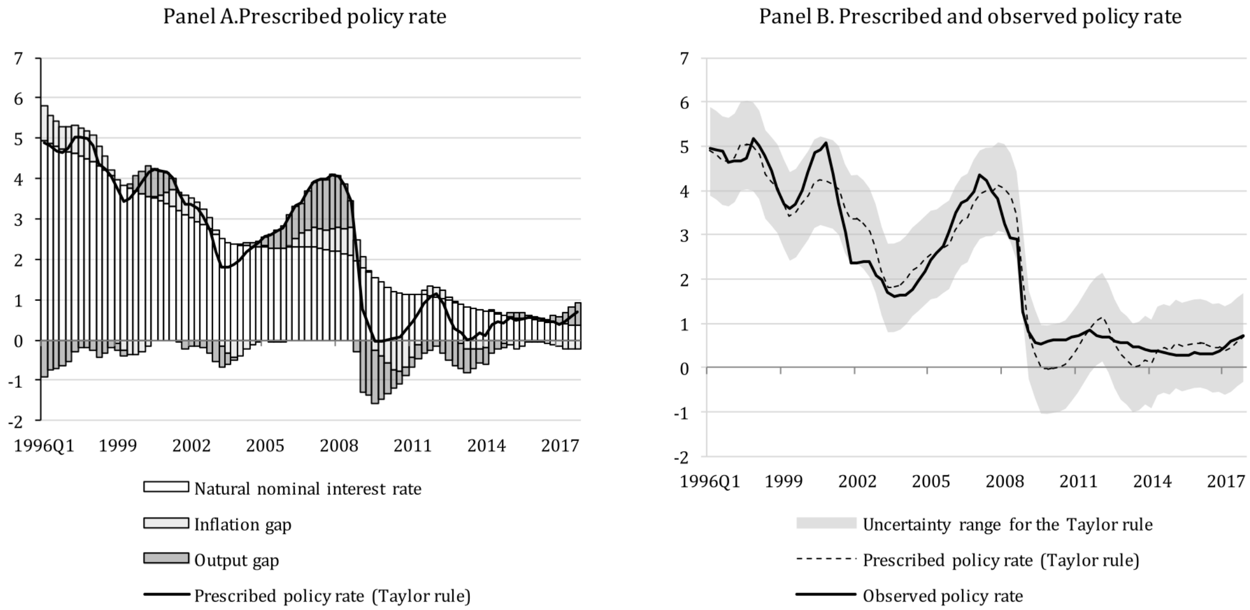
Note: a raise in the inflation target is unfeasible close to the zero-bound but viable if implemented during a pickup in demand
Source: author's simulations based on the model in the text

Graph 8. Advanced economies: Smoothing results
(Output gap in percent deviation from potential, inflation and interest rates in percent)



Note: potential growth declined about 0.7 percentage points contributing to a steady decline in the natural rate and limiting the space available for conventional expansionary monetary policy. The output gap closed in 2015 and inflation expectations followed core inflation
Source: author's estimations based on the model in the text.

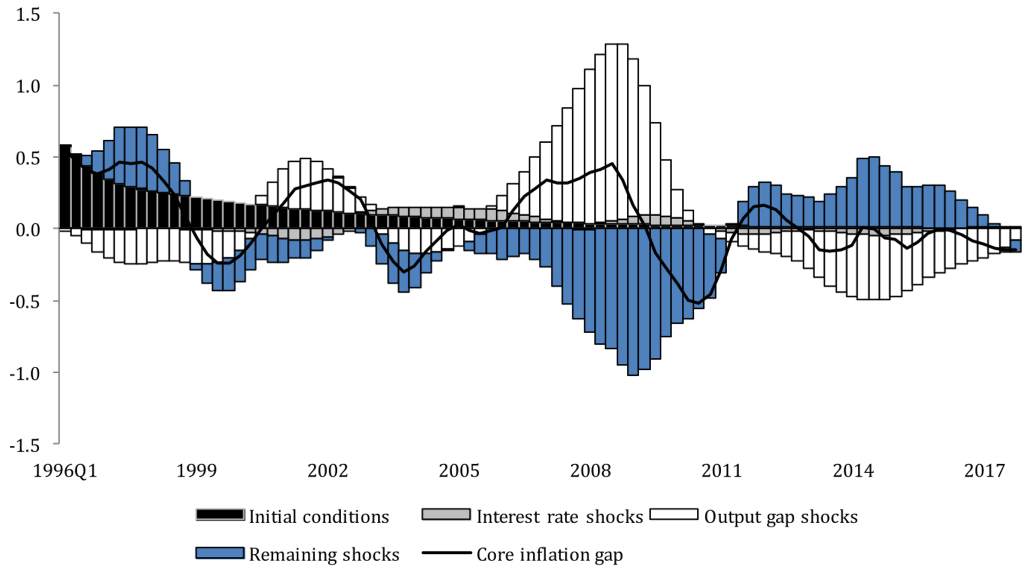
Graph 9. Advanced economies: The Taylor Rule and the policy interest rate
(Interest rates in percent)



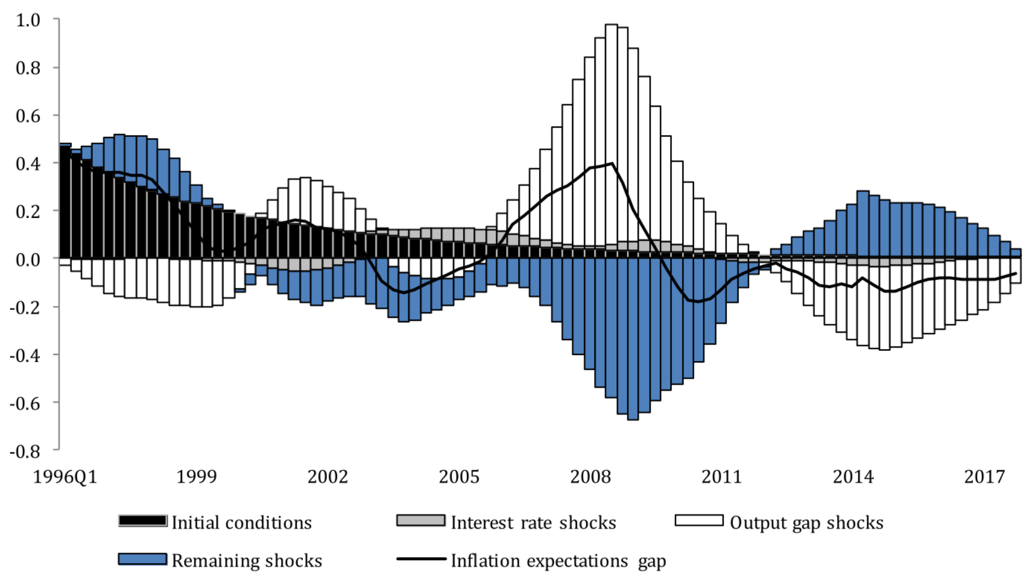
Note: the prescribed (Taylor) policy rate declined along with the natural rate constraining the space available for conventional expansionary monetary policy. Since the financial crisis of 2008, the prescribed rate is more flexible than the observed policy rate
Source: authors estimations based on the model in the text.

Graph 10. Advanced economies: Historical decompositions
(Contribution from shocks to the deviation from baseline)

Panel A. Core inflation gap

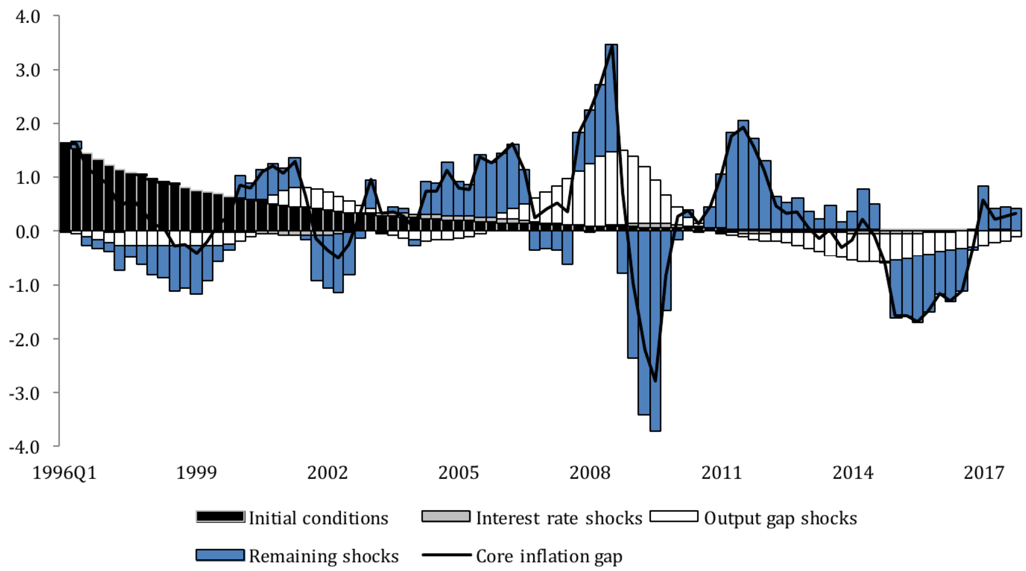


Panel A. Inflation expectations gap

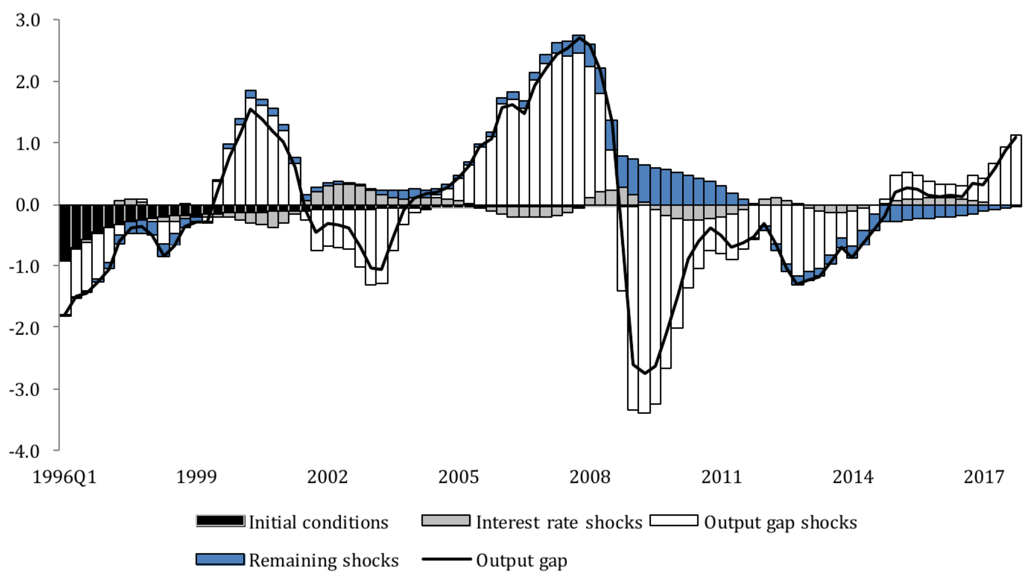


Graph 10. Advanced economies: Historical decompositions (continued)
(Contribution from shocks to the deviation from baseline)

Panel C. Total-inflation gap



Panel D. Output gap



Note: during 2005-2008 demand pushed core inflation and inflation expectations but the episode was not used strategically to help raise inflation targets. Demand explains the bulk of the output gap while supply shocks are the main drivers of total inflation
Source: author's estimations based on the model in the text.