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Weber, Henning

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One for all: The ECB's inflation target

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Kiel **Policy Brief**

One for all – The ECB's Inflation Target

Henning Weber

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Institut für Weltwirtschaft Kiel
Kiel Institute for the World Economy

One for all – The ECB's Inflation Target[1]

The ongoing sovereign debt crisis and the manifold attempts to resolve it imply the possibility that inflation rates in countries of the euro area will differ from one another for an extended period of time. For instance, some propose that the North should accept inflation rates above the euro-area average to ease the burden of adjustment in the South.[2] In order to understand better some of the welfare consequences of proposals like this one, this note looks into what rate of inflation a central bank should target in a monetary union and what determines a region's weight in this target.

Nowadays, the inflation target is a core component in the policy framework of a central bank mandated to achieve price stability. The inflation target allows the general public to easily judge the central bank's performance by holding the actual (or expected) inflation rate against the central bank's inflation target. If things work out nicely, the central bank gradually establishes a reputation for achieving price stability, and central bankers routinely exploit this reputation to move the markets and, thereby, to control the actual inflation rate.

In the real world, inflation targets vary systematically across countries. For instance, eyeball inspection of inflation targets shown in Table 1 reveals that emerging countries, which, among other things, tend to grow faster than industrial countries, also tend to have higher inflation targets than industrial countries.

This variation is in line with normative theory according to which the optimal inflation target depends on structural, or long-run, characteristics of the economy (see Schmitt-Grohe and Uribe (2011) for a survey); among them is the degree of stickiness in nominal product prices, the degree of downward stickiness in nominal wages, the likelihood to hit the zero lower bound on nominal interest rates, the opportunity costs of holding liquid rather than illiquid assets, the level and composition of sovereign debt, or the rate of productivity growth.

In a monetary union like, say, the euro area, there is only a common inflation target that is applied to all member countries jointly. In light of the theory, a common inflation target seems to be fine in the ideal case, in which all member countries display fairly similar economic characteristics and, hence, individually would select inflation targets that are close to one another anyway.

[1] I thank Sebastian Braun, Philipp Engler, Henning Klodt, Rolf Langhammer, Chris Reicher, Joachim Scheide, Mewael Tesfaselassie, and Maik Wolters for helpful comments. Any errors are mine.

[2] See, e.g., Financial Times, „Bundesbank signals softening on inflation", May 9th, 2012.

Table 1:
Inflation targets around the world. This table is Table 1 in Schmitt-Grohe and Uribe (2011).

Country	Inflation Target (percent)
Industrial Countries	
New Zealand	1 – 3
Canada	1 – 3
United Kingdom	2
Australia	2 – 3
Sweden	2 ± 1
Switzerland	< 2
Iceland	2.5
Norway	2.5
Emerging Countries	
Israel	1 – 3
Czech Republic	3 ± 1
Korea	2.5 – 3.5
Poland	2.5 ± 1
Brazil	4.5 ± 2.5
Chile	2 – 4
Colombia	5 ± 1.5
South Africa	3 – 6
Thailand	0 – 3.5
Mexico	3 ± 1
Hungary	3.5 ± 1
Peru	2.5 ± 1
Philippines	5 – 6

Source: World Economic Outlook 2005.

In practice, however, countries that form a monetary union are rarely as homogenous as one may wish they were. More often, these countries differ from one another, say, in their rate of productivity growth, so that the common inflation target is likely to fit some countries better than others. This possibility confronts the common central bank with a difficult policy conflict. Namely, no matter what common inflation target the central bank selects, the inflation target will be suboptimal at least for some countries in the monetary union.

In a recent paper, Weber (2012) illustrates the optimal resolution of a policy conflict of this type, using a stylized model economy with two sectors. The results in this paper can be extrapolated to the case of a monetary union with two countries (regions). In this case, the optimal common inflation target, π, solves the following equation:

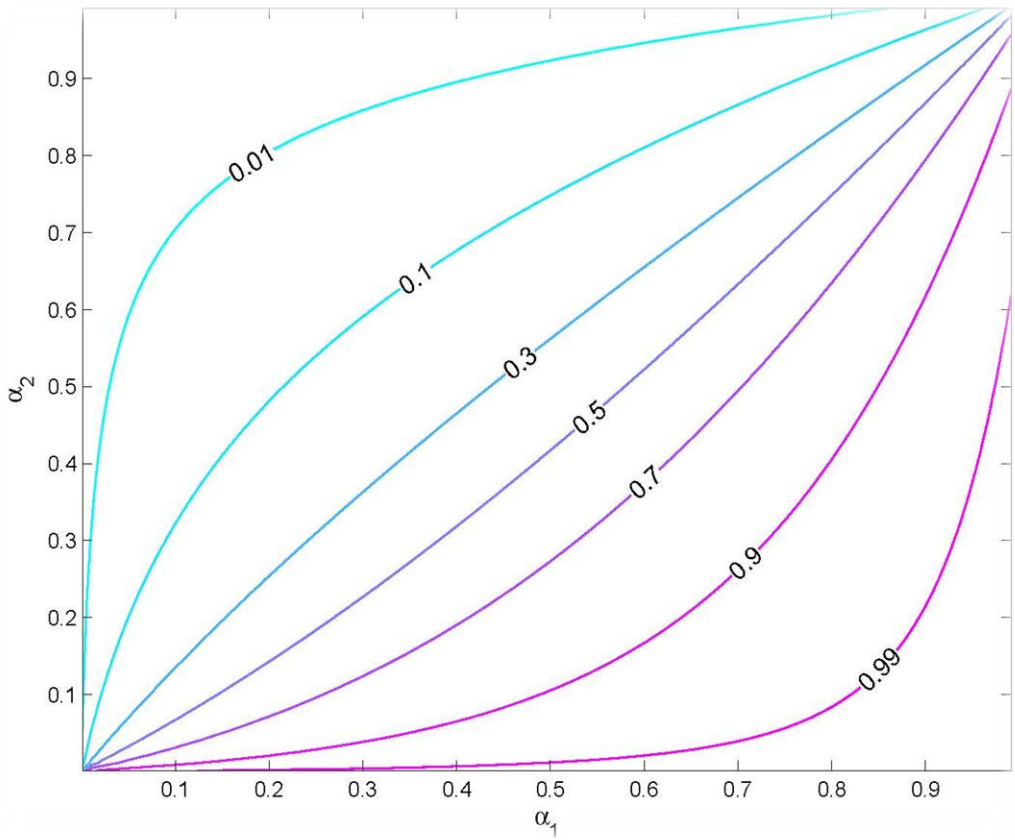
$$0 = \omega \frac{\pi - \pi_1^*}{\pi_1^*} + (1-\omega) \frac{\pi - \pi_2^*}{\pi_2^*} \tag{1}$$

π_1^* denotes the inflation target that is optimal in country 1 in the (counterfactual) case in which this country stands alone and, thus, pursues its own monetary policy. Further, ω denotes the weight on the percentage gap between the optimal common inflation target and the optimal stand-alone inflation target in country 1.

Equation (1) shows that the optimal common inflation target is a weighted average of the optimal stand-alone inflation target in country 1 and the optimal stand-alone inflation target in country 2. The weight ω turns out to predominantly depend on the degree of price stickiness, i.e., the speed at which prices adjust to changes in the economy, in one country relative to the degree of price stickiness in the other country. This is true despite the fact that the analysis also accounts for several other differences across countries (sectors), such as size, firm-level productivity growth, and firms' turnover rate.

Figure 1 shows that the weight ω is large if prices in country 1 are stickier than prices in country 2. In this case, the central bank tilts the common inflation target toward the inflation target that is optimal in country 1 in order to resolve its policy conflict optimally. This weighting scheme obeys what is known as the "stickiness principle": the optimal monetary policy weighs the economic sector, or country, with the stickier prices more heavily (Goodfriend and King (1997)).

Figure 1:
Weight ω as a function of the degree of price stickiness in country 1 and country 2, α_1 and α_2, respectively. Lines indicate the combinations of α_1 and α_2 that yield a particular value of ω. The figure is taken from Weber (2012).



By following the stickiness principle, the common central bank makes the firms in the country with the relatively flexible prices to adjust their prices more than the firms in the other country. This is optimal because firms with flexible prices find it easy to adjust their prices in line with the common inflation target. In contrast, firms with sticky prices find it difficult to adjust their prices in line with the target, which would lead to distorted relative prices and, thereby, to a suboptimal allocation of resource and depressed welfare. A central bank that follows the stickiness principle prevents these distortions to the greatest extent possible.

Initially, the stickiness principle was used to show how a central bank should handle temporary inflation differentials in a monetary union (Benigno (2004)) or, likewise, how a central bank should handle temporary movements in the relative prices across sectors in a single country (Aoki (2001), Mankiw and Reis (2003)).

Along these lines, Eusepi et al. (2011) apply the logic underlying the stickiness principle to the sectors of the US economy and construct a price index that is based on the costs of nominal distortions (CONDI). This index is a weighted average of sectoral inflation rates and weighs the inflation rate in each sector by its share of overall nominal distortions associated with the production in this sector. In contrast, standard price indices weigh the inflation rate in each sector by the sector's expenditure share.

The authors show that their CONDI inflation rate is only moderately correlated with a standard measure of inflation, but highly correlated with core inflation, i.e., a measure of inflation that excludes the highly flexible food and energy prices. Interestingly, central banks around the world find it useful to monitor core inflation. While the original motivation of central banks to monitor core inflation may or may not refer to the stickiness principle, the finding in Eusepi et al. (2011) suggests that what central banks actually do is consistent with this principle.

More recent work on the stickiness principle extends the earlier literature and derives the conditions under which this principle also determines the optimal inflation target in the case in which the optimal inflation target varies across economic sectors and/or countries (e.g., Weber (2012), Wolman (2011)).

According to this more recent work, using data on the degree of price stickiness is informative with respect to the weighting scheme that should be used to determine the optimal inflation target in a monetary union like, say, the euro area. The ECB's Inflation Persistence Network (IPN) produced a wealth of information on price stickiness in euro area. Table 2 shows some of this information, namely the (comparable) frequencies of price changes, i.e., the share of prices in the current month that changed relative to their value in the preceding month, in euro-area countries.

The table's second to last column shows that prices in Italy, Germany, and Austria are among the stickiest prices in euro area (results for Spain are biased downwards and thus not considered). In contrast, prices in Luxembourg, Portugal, and France are among the most flexible prices in euro area. Furthermore, differences in the frequency of price changes across countries are non-negligible. For instance, price changes in Luxembourg are roughly twice as frequent as price changes in Portugal.

Table 2:
Frequency of price changes by country and sector in euro area. This table is Table 3 in Dhyne et al. (2005)[a].

	Unprocessed food	Processed food	Energy (oil products)	Non-energy industrial goods	Services	Total[b] country weights	Total[c] euro area weights
Austria (AT)	37.5	15.5	72.3	8.4	7.1	15.4	17.1
Belgium (BE)	31.5	19.1	81.6	5.9	3.0	17.6	15.6
Germany (DE)	25.2	8.9	91.4	5.4	4.3	13.5	15.0
Spain (ES)[d]	50.9	17.7	n.a.	6.1	4.6	13.3	11.5
Finland (FI)	52.7	12.8	89.3	18.1	11.6	20.3	–
France (FR)	24.7	20.3	76.9	18.0	7.4	20.9	20.4
Italy (IT)	19.3	9.4	61.6	5.8	4.6	10.0	12.0
Luxembourg (LU)	54.6	10.5	73.9	14.5	4.8	23.0	19.2
Netherlands (NL)	30.8	17.3	72.6	14.2	7.9	16.2	19.0
Portugal (PT)	55.3	24.5	15.9	14.3	13.6	21.1	18.7
Euro area	**28.3**	**13.7**	**78.0**	**9.2**	**5.6**	**15.1**	**15.8**
US	47.7	27.1	74.1	22.4	15.0	24.8	–

[a]Figures presented in this table are computed on the basis of the 50 percent sample, with the only exception of Finland for which figures derived from the entire CPI are presented. Figures based on a larger coverage of the CPI for each individual country, when available, are presented in their respective national paper mentioned in Table 1. — [b]The total is calculated using country-specific weights for each item. — [c]The total is calculated using common euro area weights for each sub-index. No figures are provided for Finland because of the lack of comparability of the sample of products used in this country. — [d]In the Spanish database no energy products are included, which biases downwards the aggregate frequency.

Source: **NCBs calculations on NSIs data.**

This data suggests that Italy, Germany, and Austria should receive a relatively large weight in determining the common inflation target, whereas Luxembourg, Portugal, and France should receive a relatively small weight. Another way to interpret this data is that Italy, Germany, and Austria will experience a greater loss from the same percentage gap between their stand-alone inflation targets and the common inflation target than Luxembourg, Portugal, and France.

Table 2 also disaggregates the frequency of price changes for main sectors in euro area. The second to last row shows that (non-administered) prices in Services are the stickiest prices in the euro area (Technical Appendix 7.1 in Dhyne et al. (2005) shows the product categories included into Services). In contrast, prices in Energy and Unprocessed food are the most flexible prices. Accordingly, Energy and Unprocessed food should receive a relatively small weight in determining the common inflation target, a finding, which resembles the extensive use of core inflation to analyze temporary movements in the actual inflation rate.[3]

[3] The frequencies of price changes are considerably more dispersed across sectors than across countries. For instance, Energy prices change about 14 times more often than Services prices, whereas prices in Luxembourg change about twice as much than prices in Portugal. Hence, the weighting scheme determining the optimal common inflation target is likely to be more pronounced along the sectoral dimension than the country dimension.

Conclusion

A central bank in a monetary union is likely to pursue an inflation target that fits some member countries better than others. Somewhat surprisingly, the role of the common inflation target in a monetary union remains a fairly unexplored topic. While the literature did explore various costs and benefits of forming a monetary union (see, e.g., Beetsma and Giuliodori (2010)), the lack of research on what is the optimal common inflation target jars with the prominent role that price stability plays in the ECB's policy framework;[4] the ECB communicates essentially all its policy interventions by referring to its mandate to maintain an HICP inflation rate of close to but below two percent.

Recent work suggests that two types of data are required in order to quantify the ECB's optimal inflation target and the magnitude of the policy conflict that underlies it. The first type of data consists of country-specific data on how fast prices adjust; this data is available from the ECB's IPN. The second type of data consists of comparable estimates of countries' optimal stand-alone inflation targets. Deriving these estimates is a fairly ambitious project, which calls for a coordinated initiative, similar to the IPN, of the ECB and national central banks.

References

Aoki, K. (2001). Optimal Monetary Policy Responses to Relative Price Changes. *Journal of Monetary Economics* 48 (1): 55–80.

Beetsma, R., and M. Giuliodori (2010). The Macroeconomic Costs and Benefits of the EMU and Other Monetary Unions: An Overview of Recent Research. *Journal of Economic Literature* 48 (3): 603–41.

Benigno, P. (2004). Optimal Monetary Policy in a Currency Area. *Journal of International Economics* 63 (2): 293–320.

Dhyne, E., L.J. Álvarez, H. Le Bihan, G. Veronese, D. Dias, J. Hoffmann, N. Jonker, P. Lünnemann, F. Rumler, and J. Vilmunen (2005). Price setting in the euro area: some stylized facts from individual consumer price data. Working Paper Series 524, European Central Bank.

Eusepi, S., B. Hobijn, and A. Tambalotti (2011). CONDI: A Cost-of-Nominal-Distortions Index. *American Economic Journal: Macroeconomics* 3 (3): 53–91.

Goodfriend, M., and R.G. King (1997). "The New Neoclassical Synthesis and the Role of Monetary Policy". In B.S. Bernanke and J. Rotemberg (eds.), *NBER Macroeconomics Annual*, Vol. 12, 231–83. Cambridge, MA: MIT Press.

Mankiw, N.G., and R. Reis (2003). What Measure of Inflation Should a Central Bank Target? *Journal of the European Economic Association* 1 (5): 1058–1086.

Schmitt-Grohe, S.,and M. Uribe (2011). „The Optimal Rate of Inflation". In Benjamin M. Friedman, and Michael Woodford (eds.), *Handbook of Monetary Economics*, Vol. 3B, 653–722. San Diego CA: Elsevier.

Weber, H.(2012). The Optimal Inflation Rate and Firm-Level Productivity Growth. Kiel Working Paper 1773. Kiel Institute for World Economy, Kiel.

Wolman, A.L. (2011). The Optimal Rate of Inflation with Trending Relative Prices. Journal of Money, Credit and Banking, 43 2/3: 355–384.

[4] The literature also seems to ignore the potential cost of a common inflation target that is suboptimal from the point of view of individual countries.

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Hindenburgufer 66
D – 24105 Kiel
Phone +49 (431) 8814–1
Fax +49 (431) 8814–500

Editorial team: Margitta Führmann
Helga Huss
Prof. Dr. Henning Klodt
(responsible for content, pursuant to § 6 MDStV)
Dieter Stribny

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