ECONOMICS & Sociology

Helisek, M. (2015), Perspectives of the Accession of the Czech Republic to the Euro Area in Terms of the Price Level Convergence, *Economics and Sociology*, Vol. 8, No 2, pp. 28-35. **DOI: 10.14254/2071-789X.2015/8-2/3**

Mojmir Helisek,
University of Finance and Administration,
Prague, Czech Republic,
E-mail: mojmir.helisek@vsfs.cz

PERSPECTIVES OF THE ACCESSION OF THE CZECH REPUBLIC TO THE EURO AREA IN TERMS OF THE PRICE LEVEL CONVERGENCE

Received: May, 2015
1st Revision: June, 2015
Accepted: July, 2015

DOI: 10.14254/2071-789X.2015/8-2/3

ABSTRACT. The replacement of the national currency with the euro is subject not only to the nominal convergence, but also to the real convergence of the country acceding to the monetary union. By default, the price levels convergence criterion is expressed as a deviation of the acceding country's price level from the average price level of the euro area. However, this method is not well suited to measure price convergence. The weighted deviation of the Czech price level from the price level of the key trading partners of the Czech Republic is more appropriate. According to such new indicator, the Czech price level is 6.6 pp closer to the price level of the euro area compared to the traditional indicator.

JEL Classification: E31, F36, F45

Keywords: Euro area, real convergence, price convergence, comparative price levels.

Introduction

The accession of the Czech Republic to the European Union was also automatically associated with the obligation to replace the national currency (i.e. Czech koruna) with the single currency of the EU (i.e. euro). The euro introduction is subject to the fulfillment of convergence criteria set down by the Maastricht Treaty. In addition to these binding *nominal* convergence criteria, an economy acceding to the euro area should also monitor the fulfillment of the *real* convergence criteria. These criteria are not set down by European treaties; however, they result from economic rationality – from the calculation of costs and benefits of replacing the national currency with the single currency of the EU.

Mainly the following three real convergence criteria are most frequently assessed:

- Economic level alignment (GDP per capita) that shows converging competitiveness of integrating economies. The importance of this criterion consists in the fact that it is no longer possible to promote competitiveness through currency depreciation as national currencies cease to exist. Therefore, countries with similar economic level should integrate;
- Business cycle alignment (quarterly changes of the real GDP compared on a year-to-year basis) that expresses the current state of expansion/recession stages within individual monetary union countries. This development is beneficial due to the

disappearance of former national monetary policies and their replacement with the single monetary policy of the monetary union single central bank. Therefore, countries with synchronized business cycles should integrate;

- Price levels convergence, which is important in terms of the development of inflation. In case significant price levels differences exist, there is a risk of sudden surge of the low price level of the acceding member towards the higher euro area price level. Therefore, countries with the same price levels should integrate.

In terms of the perspective of the euro introduction in the Czech Republic, we find the last of the above mentioned real convergence criteria to be the most important. This results from concerns about a sudden price level hike following the euro introduction. This is also the main argument of opponents of the euro. This argument then affects views of both the political representation and the public on the euro introduction, with prevailing negative position.

In relevant literature (as detailed below), the price convergence criterion is interpreted as the comparison of the acceding country's price level with the average indicator for the euro area as a whole. The objective of the paper is to construct new indicator for this price level real convergence criterion that would be more appropriate compared to the traditional indicator. Then we compare the result of this new indicator with traditional indicator.The time series cover the period from accession to the European Union to 2013.

The aim of the paper is "only" to create an alternative way of measuring price convergence. Therefore, the paper does not cover either the mechanisms by which this convergence takes place (inflation channel, exchange rate channel), nor the dynamics of price convergence (and its barriers or even stop).

The first part of the paper presents the most significant literature in this area. It is followed by the description of applied methods. The third part of the paper assesses and discusses the measurement results. Finally, the key findings are summarized in the conclusions.

1. Literature review

The paper relies on conventional definitions of the economic convergence criteria (both nominal and real) of the monetary union member states, particularly from *Economics of European Integration* (Baldwin and Wyplosz, 2012) and *Economics of Monetary Union* (De Grauwe, 2007). Various findings relating to monetary integration were also drawn from *International Economics* (Krugman and Obstfeld, 2006).

Detailed assessments of nominal and real convergence of the Czech economy to the euro area are included in annual *Analyses of the Czech Republic's current economic alignment with the euro area* (Czech National Bank). These 2014 *Analyses* (p. 30) state that the price convergence was at 67.0% of the euro area average (18 members) in 2013. This is considered to be insufficient compared to the economic level indicator (GDP per capita) that was at 74.4% of the euro area average.

Moreover, the preparedness of the Czech economy for the euro adoption is subject to annual assessment in a study prepared by the Ministry of Finance of the Czech Republic and the Czech National Bank *Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area*. It states that the price convergence process has been interrupted as of 2009: "Owing to the crisis, the convergence process was also interrupted in the case of the price level of GDP, which has halted at around 70% of the euro area average" (Ministry of Finance, 2014, p. 11). Initially, the interruption had been caused by the depreciation of the CZK/EUR exchange rate during the crisis (late 2008 and early 2009). The exchange rate appreciation then followed;

however, it soon came to a halt. In November 2013, the Czech National Bank started to use nominal exchange rate as another instrument of its monetary policy. Aiming to increase inflation, the bank's foreign exchange market interventions caused sharp depreciation of the Czech koruna exchange rate from 25.8 to 27.0 and ultimately to 27.6 CZK/EUR in the period of November to December 2013.

The Convergence Report of the European Commission (European Commission, 2014) states the 2012 price level is at 71% of the euro area average, also expounding that: "This suggests potential for further price level convergence in the long term" (p. 60).

Moreover, the *Convergence Report* of the European Central Bank (European Central Bank, 2014) works with an indicator that compares the Czech price level with the euro area average. The Report states that: "Looking further ahead, the catching-up process may have a bearing on inflation and/or the nominal exchange rate over the coming years, given that GDP per capita and price levels are still lower in the Czech Republic than in the euro area" (p. 120).

Consequence of the introduction of the euro is transparency of the prices that were previously expressed in the national currency, and easier comparability of prices in the euro area. This leads to trade facilitation. This contribution explains Baldwin and Wyplosz: "Another important benefit is that goods prices become directly comparable across countries which are part of monetary union. […] There is evidence that the adoption of the euro has led small and medium size firms to engage in exporting throughout the area" (Baldwin and Wyplosz, 2012, p. 405; or Lacina *et al.*, 2007, p. 78).

Also the study *One market, one money* comes to the conclusion that price transparency (due to the introduction of the single currency) has strengthened competition in the single market: "Transparency of prices: as goods and services would be priced in the same currency this would further strengthen the pro-competitive effect of the single market" (Commission of the EU, 1990, p. 36).

In applying the presumption on the price level convergence through foreign trade, we refer to a study of Oesterreichische Nationalbank: "Removing trade barriers facilitates access to products across national borders, and enhances arbitrage that helps eliminate price differences" (Cuaresma *et al*., 2007, p. 100).

Also, De Grauwe (2007, p.64) explains the price equalization via trade (highlighted by the author) based on the price transparency: "The introduction of the euro should lead to more price transparency, i. e. consumers who now can see prices in the same currency unit are better able to make price comparison, and to shop around. […] In the end of this should benefit all consumers who will face same lower prices".

Lacina *et al.* (2010) expect this effect even in the case of the Czech Republic, but only after in a longer period. "Experiences of countries that have adopted the euro in 2002, but so far do not show substantial convergence of price levels […] We can expect a manifestation of the effect of higher price transparency in the longer term, once the traders register greater willingness of consumers to buy goods across the euro area Member States" (Lacina *et al*., 2010, pp. 44-45; Bilan, 2013).

2. Methods

The customary, traditional method for expressing the price level convergence of a new (prospective) monetary union member is the comparison of such member's price level with the average price level of existing monetary union members. This approach is used in the above mentioned analyses of the Czech Ministry of Finance and the Czech National Bank, as well as Convergence Reports of the European Commission and the European Central Bank.

The different approach we use only compares an acceding country's price level with the price levels of key trading partners of the given country (i.e. of the Czech Republic), who are members of the euro area. The reason for this approach consists in the fact that the so-called catching-up effect mostly takes place through comparison of prices of goods and services traded between an acceding economy and its key trading partners from the existing monetary union. However, the average price level indicator of the euro area disregards weights of trade relations with specific trading partners. To illustrate this, we look at the *Analyses of the Czech Republic's current economic alignment with the euro area* (Czech National Bank, 2014, p. 30) that state that the Czech price level "still lags well behind not only Austria and Germany, but also slightly behind Portugal and Slovenia". The latter two countries are compared to the Czech Republic due to their similar economic level. In 2013, the highest deviation of the Czech price level existed with regard to the price level of Luxembourg (-42.7%) and Finland (-42.8%). In terms of countries outside the euro area, the highest deviation existed in respect of Denmark (-49.4%).

In order to identify the main trading partners, we used the share of foreign trade with the given country in the total foreign trade turnover with the euro area. The foreign trade turnover corresponds to the sum of exports of goods and services and imports of goods and services, always shown in national currency (i.e. CZK). The total foreign trade turnover with the key trading partners is used to calculate shares of individual partners. These shares are then used as weights in the subsequent determination of price level deviations for the country in question (i.e. for the Czech Republic) from the price levels of the country's key trading partners.

The time series start with the accession of the Czech Republic to the EU (2004) and end in 2013, as this is the last year for which EUROSTAT data on comparative price levels are available.

3. Measuring and discussion

3.1. Foreign trade

The foreign trade data have been taken from the statistics of the Czech National Bank (balance of payment statistics). The key trading partners in terms of the foreign trade of the Czech Republic with euro area member states are Germany, Slovakia, France, and Austria, as shown in *Table 1*.

Table 1. Foreign trade of the Czech Republic (2013)

Country	Euro area (17)	Germany		Slovakia		France		Austria	
Exp. + Imp.	bn CZK	bn CZK	%	bn CZK	%	bn CZK	%	bn CZK	%
Goods	2 938.5	1 459.3	49.7	439.3	14.9	215.4	7.3	201.9	6.9
Services	469.4	188.5	40.2	69.5	14.8	33.9	7.2	39.8	8.5
Total	3 407.9	1647.8	48.4	508.8	14.9	249.3	7.3	241.7	7.1

Source: Czech National Bank (Balance of payments statistics). Own calculation.

For the purpose of further analyses, we find the share of these four countries (77.7%) to be sufficient. We consider the shares of the remaining 13 countries to be insignificant. Other important EU trading partners of the Czech Republic outside of the euro area member

states are Poland and Great Britain; China and Russia are important in terms of non-EU countries.

If we only take into account the trade of the Czech Republic with the four countries, their shares are as follows:

- Germany: 62.2%;
- Slovakia: 19.2%;
- France: 9.4%; and
- Austria: 9.1%.

These shares will be used as weights for the calculation of the price level convergence. Since the shares of the four countries do not significantly change, the 2013 weights will be used for the entire time series under review.

3.2. Price levels

The price levels data have been taken from the statistics of Eurostat that show the price levels as the prices of final consumption by private households including indirect taxes. The comparative price levels constructed from them represent the ratio between the purchasing power parities and the market exchange rate for each respective country. A price level indicator that relies on consumption is more appropriate than a GDP-based indicator, as we can assume that foreign trade that contributes to the price level convergence will mainly rely on the comparison of consumer prices. The European Commission also uses the same approach in its Convergence Reports.

Table 2 describes relations between the Czech price level and the price levels of Germany, Slovakia, France and Austria. In 2013, for example, the Czech price level was 32.8% below the German price level, 1% above the Slovak price level, etc. The last row of the table compares the Czech price level with the average price level of the euro area (33.2% below the euro area average in 2013). The average for group of countries is calculated as the weighted average of the national price level indices (PLIs), weighted by the expenditures corrected for price level differences (see Eurostat, Price level indices).

Table 2. Deviations of the Czech price level (in %)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
From Germany	-47.1	-43,8	-40.2	-38.6	-25.5	-31.7	-27.9	-27.9	-29.2	-32.8
From Slovakia	0.9	4.9	5.7	-1.3	10.6	-0.1	6.1	4.1	1.1	1.0
From France	-49.6	-46.3	-43.5	-42.2	-30.2	-34.9	-32.2	-32.9	-34.7	-37.4
From Austria	-46.4	-43.3	-39.9	-39.1	-26.5	-32.3	-29.0	-30.3	-32.6	-35.9
From euro area (17) average	-46.2	-43.1	-39.8	-38.4	-25.2	-30.9	-27.7	-28.7	-30.5	-33.2

Source: Eurostat (Comparative price levels). Own calculations.

The average annual deviation in respect of the euro area (simple arithmetic average) amounts to *-34.4%* for the entire period under review.

Table 3 presents information on price level deviations for the Czech Republic and the four given countries (from *Table 2*); however, multiplied by the weight determined as the foreign trade share. The last row shows the total deviation – i.e. the sum.

Table 3. Weighted deviations of the Czech price level (in %)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
From Germany	-29.3	-27.2	-25.0	-24.0	-15.9	-19.7	-17.4	-17.4	-19.7	-20.4
From Slovakia	0.2	0.9	1.1	-0.2	2.0	0.0	1.2	0.8	0.2	0.2
From France	-4.7	-4.4	-4.1	-4.0	-2.8	-3.3	-3.0	-3.1	-3.3	-3.5
From Austria	-4.2	-3.9	-3.6	-3.6	-2.4	-2.9	-2.6	-2.8	-3.0	-3.3
Total weighted deviation	-38.0	-34.6	-31.6	-31.8	-19.1	-25.9	-21.8	-22.5	-25.8	-27.0

Source: Eurostat (Comparative price levels). Own calculations.

The average annual deviation in respect of the key trading partners (simple arithmetic average) amounts to *-27.8%* for the entire period under review.

The data in *Table 2* and *Table 3* suggest the following:

- Average annual weighted deviation determined on the basis of the new method (-27.8%) is *6.6 pp lower* than the average annual deviation presented by means of the traditional method (-34.4%);
- In 2013, this difference amounted to *6.2 pp.*

The data from *Table 2* and *Table 3* are shown in *Figure 1*.

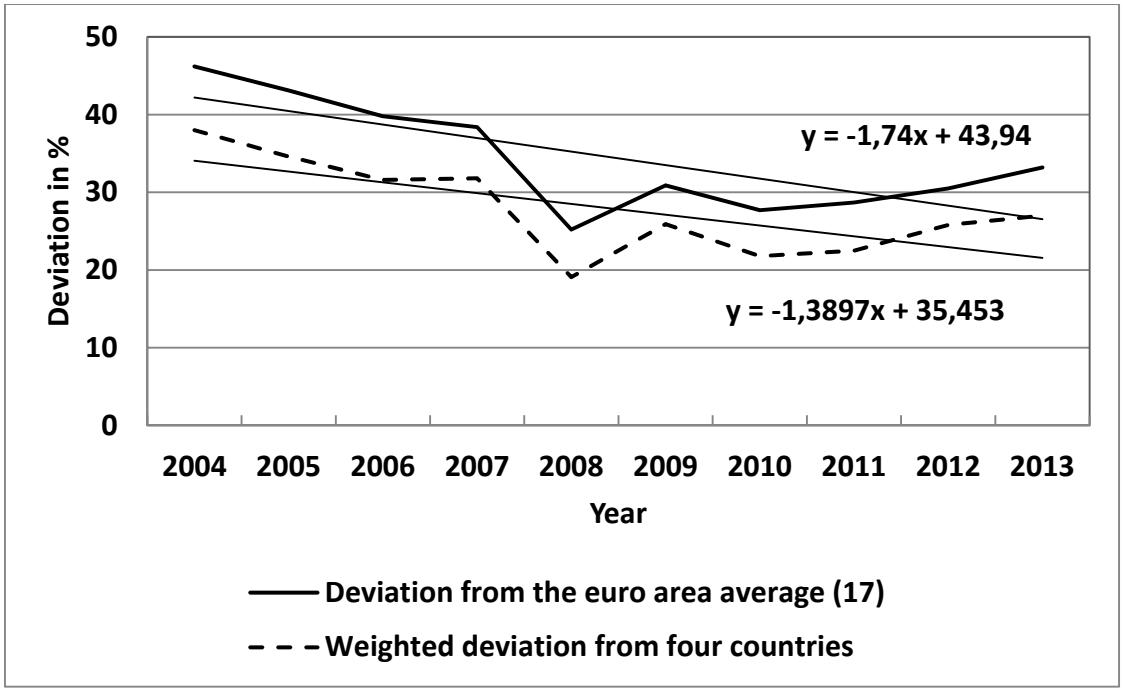

Figure 1. Deviations of the Czech price level (in %)
Source: Eurostat (Comparative price levels). Own elaboration.

The same declining trend of the negative deviation is apparent for the development of both indicators. In other words, both indicators show the price level convergence, thereby documenting the above mentioned catching-up effect.

Moreover, similar fluctuations can be observed in terms of the development of both indicators:

- Significant convergence of price levels in 2008 caused by strong appreciation of the CZK/EUR exchange rate (year-to-year appreciation from 27.8 to 24.9 CZK/EUR);
- Conversely, divergence of price levels in 2009 (i.e. short-term interruption of price convergence) resulting from depreciation of the CZK/EUR exchange rate (23% depreciation in the period of July 2008 – February 2009);
- This divergence reoccurred in 2013, as a result of the central bank's intervention towards the CZK/EUR exchange rate depreciation at the end of 2013 (7% depreciation in the period of November/December 2013).

Regression lines in *Figure 1* show the pace of price levels convergence. In terms of the annual average, the rates were as follows:

- 1.57% with regard to the average price level of the euro area;
- 1.25% with regard to price levels of the four countries.

Price level convergence to the average price level of the euro area therefore place more rapidly. At first glance, this seems surprising. It can be explained by the fact that the Czech price level is closer to the average price level of the four countries compared to the average price level of the whole euro area. The convergence is slower for lower starting-point deviation than for higher price deviation.

Conclusions

The replacement of the national currency with the euro is subject to sufficient nominal convergence to the euro area (fulfillment of the Maastricht criteria) as well as sufficient real convergence. The real convergence indicators mainly include the price levels convergence.

According to the traditional price convergence indicator, the Czech price level was 34.4% below the average price level of the euro area for the period of 2004 to 2013 (annual average). The gap went down to 33.2% in the last year of the period under review (2013). For the sake of comparison: the price level of the Slovak Republic was 32.3% below the average price level of the euro area one year prior to Slovakia's accession to the euro area, i.e. in 2008.

The objective of this paper is to construct a new, more appropriate indicator – specifically a weighted deviation of the acceding country's (Czech Republic) price level from the price levels of the country's key trading partners. According to this indicator, the Czech price level is 27.8% lower in annual average in the period under review (27.0% in 2013). Although the difference is not overly significant – mere 6.6 pp (6.2 pp in 2013), it shows better preparedness for accession to the euro area than the traditional indicator.

The convergence rate of the Czech price level to the average price level of the euro area is higher compared to the convergence rate to the average price level of the four countries.

Acknowledgements

The paper has been prepared under the project "Accession of the Czech Republic to the Euro area – preparations, procedures, and expected impact", supported by the funds for specific university research at the University of Finance and Administration (Vysoká škola finanční a správní, o.p.s.) in 2015.

References

Baldwin, R., Wyplosz, C. (2012), *Economics of European Integration*, Fourth edition, London, McGraw-Hill.

Bilan, Y. (2013), Sustainable development of a company: building of new level relationship with the consumers of XXI century, *Amfiteatru Economic*, 15, pp. 687-701.

Commission of the European Communities (1990), *One market, one money. An evaluation of the potential benefits and costs of forming an economic and monetary union*, http://ec.europa.eu/economy_finance/publications/european_economy/1990/ee44_1990 en/pdf (referred 1.10.2010).

Cuaresma, J. C., Égert, B., Silgoner, M. A. (2007), Price Level Convergence in Europe: Did the Introduction of the Euro Matter? *Monetary Policy & the Economy (Oesterreichische Nationalbank).* Vol. 2007, Issue 1, pp. 100-113.

Czech National Bank (2014), *Analyses of the Czech Republic's Current Economic Alignment with the Euro Area*, http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/en/monetary_policy/strategic_documents/download/analyses_of_alignment_2014.pdf (referred on 01/02/2015).

De Grauwe, P. (2007), *Economics of Monetary Union*, Seventh Edition, Oxford, Oxford University Press.

European Central Bank (2014), *Convergence Report, June 2014*, http://www.ecb.europa.eu/pub/pdf/conrep/cr201406en.pdf (referred on 01/10/2014).

European Commisssion (2014), *Convergence Report 2014*, European Economy 4/2014, http://ec.europa.eu/economy_finance/publications/european_economy/2014/pdf/ee4_en.pdf (referred on 01/10/2014).

Krugman, P., Obstfeld, M. (2006), *International Economics*. *Theory and Policy*, Seventh Edition, Boston, AddisonWesley.

Lacina, L. et al. (2007), *Měnová integrace. Náklady a přínosy členství v měnové unii (Monetary integration. Costs and benefits of the membership in the monetary union*. In Czech only), Praha, C. H. Beck.

Lacina, L., Rozmahel, P. et al. (2010), *Euro: ano/ne?* (*Euro: yes /no?* In Czech only) Praha, Alfa Nakladatelství.

Ministry of Finance of the Czech Republic and the Czech National Bank (2014), *Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area,* http://www.zavedenieura.cz/en/documents/fulfilment-of-maastricht-criteria (referred on 01/02/2015).

Internet Sources:

Czech National Bank: Balance of Payments Statistics, http://www.cnb.cz/cs/statistika/platebni_bilance_stat/publikace_pb/bezny_ucet_pb_tc/ (referred on 01/05/2015).

Czech Statistical Office: Inflation, http://www.czso.cz/csu/redakce.nsf/i/mira_inflace (referred on 01/05/2015).

Eurostat:

Comparative price levels, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00120 (referred on 01/05/2015).

GDP per capita, consumption per capita and price level indices, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Archive:GDP_per_capita,_consumption_per_capita_and_price_level_indices (referred on 01/05/2015).