Interspatial price relations and critique of mainstream approach to the monetary union

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Abstract

The paper focuses on the various theoretical, methodological, measurement and interpretational problems of the interspatial price differences. The spatial units of spatial price comparisons (the absolute price levels and the temporal change of absolute price levels) are arbitrary and modifiable and not natural given discreet units. There is not any theoretical justification to the practice which treats the country level investigations as primarily important. The special favor for country level is justified only by historical and political reasons but not theoretical ones.

The investigation of spatial differences of price levels is motivated often by monetary policy reasons. It will be shown that this type of reasoning is grounded on a false treatment of space and on the lack of distinction, on the one hand between the interspatial and temporal price level comparisons, and, on the other hand between the monetary (demand side) and production (supply side) reasons of differences in price level. Beside the pure price differences the compositional and weighting differences have to be taken into account also in the interpretation of spatial price level differences. However, there is a spatial matching problem also with those data which aim is to measure the temporal movements of average prices of various baskets of goods. "Price stability" convergence criterion can be considered as a practical manifestation of disregarding of various theoretical, methodological and measurement problems of interspatial price differences.

Introduction

Investigations concerning spatial price differences were until recently restricted mainly to intercountry comparisons of price levels, while countries are treated as a dimensionless point. However, countries, similar to regions, merge economical activities and factors, which are spatially, temporally, in their degree of quality, in quantity and in behavior, heterogeneous. The countries and regions have spatial extension and the price level can vary at different points within the countries.

Nowadays an increasing interest in the intracountry interspatial price comparison can be observed, partly thanks to the introduction of euro. There are two main motivations behind these researches: one is the pure descriptive statistical interest, the other is monetary policy reasons. As a typical example for the latter motivation, Beck et al writes: "It is highly important for the conduct of the ECB's monetary policy to investigate whether and to what extent heterogeneity of inflation and growth within the euro area has been declining due to the higher integration of labor, product and capital markets in the advent to the European Monetary Union (EMU) and after the introduction of the euro in 1999. In this context it is of interest to analyze regional inflation dynamics within as well as across euro area countries on a disaggregated level. Since large and persistent differences in regional inflation rates might lead to contradicting demands concerning the conduct of monetary policy, it is essential for policy makers to understand how and to what extent differences between inflation arise." (Beck et al. 2006, p. 5) We will see that this type of reasoning is grounded on a false treatment of space and on the lack of distinction, on the one hand between the differences of spatial and temporal differences in price levels, and, on the other hand between the monetary (demand side) and production (supply side) reasons of differences in price level.

The aim of this paper is to give a short outline and critique of treating spatial price differences and to investigate critically the reasons behind the "price stability" convergence criterion. Beside the historical interests, the calculation of spatial disparity in price levels enables us to establish the various real indicators, such as differences in real wages and real production not only temporally but spatially too.

1. Theoretical and methodological background of spatial price level comparison
1.1 Spatial units of spatial price comparisons

Spatial and temporal comparison of price level deals with comparison of aggregated macroeconomic indicators. Aggregated macroeconomic indicators do not have any basic unit. Macroeconomic indices are weighted and aggregated through time, space, individuals, quality and behaviour. If the spatial unit of comparison is too small (for example a village or a district in a city), then arises the problem of many lacking goods in the basket of good of comparison. If the spatial unit is too big (for example a country like United States of Germany), then crops up the problem of heterogenuity and price variability of goods in the basket of good of comparison.

The spatial units of spatial price comparisons (the absolute price levels and the temporal change of absolute price levels) are arbitrary and modifiable and not natural given discreet units like persons or cars. There is not any theoretical justification to the practice which treats the country level investigations as primarily important. The special favor for country level is justified only by historical, practical and political reasons but not theoretical ones. Historical interest focuses mainly on countries as a wholes and not parts of the countries. Practically, the structure of data collection systems favors also country level investigations. Politically, the

countries are treated often as a homogenous economical unit. in spite of the obvious failures of this approach. The price level of Bretagne or Paris in theoretical sense has the same importance and interest as the price level of France or Germany. The latter is more interesting only practically and economic politically.

1.2 Monetary and non-monetary reasons of "inflation"

The word "inflation" is in inverted commas because the original and non-contradictory meaning of inflation is referred to as the increase of money which goes usually together with increase of price level. Inflation in the original sense can be measured not by measuring the change of price levels but by measuring the change of the amount of money. The price level can be changed due to several non-monetary reasons. The changing structure of price system reflects the changing relative scarcity of products and this can lead to decreasing aggregated price level (for example because of technical progress in industry) and increasing aggregated price level (for example because of decreasing supply of raw materials due to barren mines, or poor crop due to the bad weather). The non-monetary changes of price level means first of all modification of relative prices and it does not imply a monetary disorder. The temporary changes of local price levels in case of events which attract great masses of people (the Olympic games, Formula 1) should neither be considered as a monetary disorder. This type of change in price level does not require monetary policy actions.

Temporal change of price level can be originated from monetary side and non-monetary side also. However, when there is just one currency, the spatial price differences, both in absolute level of prices and the temporal change of absolute level of prices, stem always from non-monetary reasons. There could be a deviation from monetary side only by the amount of transporting cost of money, but the spatial transfer of money can be considered as costless: thanks to the interlocal clearing system, money needs no transferring in reality between various locations.

1.3 Critique of the spatial interpretation of law of one price and the theory of purchasing power parity

The law of one price states that all identical goods must have only one price. This law is interpreted in spatial context often in a misleading way: "The law of one price establishes that the price of goods should equalize between economic areas" (Alberola-Marqués, 2000, p. 3). The fundamental problem of this interpretation is the imprecise definition of the term "good". A product with exactly the same physical-chemical characteristics but different location is a different economic good with different use-value. Of course, the price of a product in location A tends to equal the price of a same product in technical sense in location B minus the necessary cost of transport from location A to location B. However, it is impossible to give only one exact cost of transport. The identification of technical characteristics of products, which seem to be similar to each other, are not without practical problems, either. The temporal change of spatial price differences is an interesting historical research area, we can assess the changing importance of various factors which play a role in transportation costs, but it is senseless to test the validity of the law of one price with this historical data.

The Purchasing Power Parity theory (PPP) generalizes the law of one price to a basket of goods, therefore many new problems arise compared to the law of one price. PPP has been viewed as a theory of exchange rate determination. The modern form of the theory is generally attributable to Cassel who formulated the approach after the abandoning of gold standard during the World War I. (Cassel, 1922) The absolute version of PPP states that exchange rates between currencies are in equilibrium when their purchasing power is the same in each of the two countries. The relative version of PPP predicts that the rate of change in the nominal exchange rate is equal to the differential of price level changes. This theory can be read in every elementary textbook of international economics, supplemented by the mathematical form of the theory (which, being redundant, is not presented here). Commonly the price level is the effect and the exchange rate is the result, but seldom is assumed reversely the connection between the two phenomena.

The central problem of the theory is that it is based on unreal domain assumptions therefore it is easy to refute the theory only by examining its assumptions. After the tacit assumption of theory, the national economies are spaceless, dimensionless points. Inside the countries the price level (in absolute form of theory) or its change (in relative form) is constant everywhere. In reality the countries have spatial extension and the price level varied at different points within the countries and its temporal change is also different. In short, the theory would be valid only in a world where every commodity and service would be perfectly transferable without costs. As regards to general price level, it is only an abstraction. In fact only the individual prices exist, and one sort of general price level is extracted from the individual prices by the help of weighting, sampling and other auxiliary assumptions. In short, the theory would be valid only in a world where every commodity and service would be perfectly transferable without costs.

Purchasing power parity doctrine is examined by sophisticated statistical and econometric techniques. The time series of aggregated price levels and the nominal exchange rates are treated as a random sample. Most papers of this type deal with the technical properties of the slightly different data sets. To take some examples (at random): 'Two potential problems arise when working with nominal exchange rates and ratios of price levels. First, unit roots are possibly present in the logarithms of nominal exchange rates and price level ratios. If unit roots are present, then standard asymptotic theory for least squares estimators is invalid (…) A second potential problem is that nominal exchange rates are often characterized by more frequent outliers than would be expected if data are normally distributed.' (Crownover et al., p. 786) 'We present two asymptotically equivalent procedures for detecting a unit root in spot exchange rate and price level data: (1) the Augmented Dickey-Fuller (ADF) test, and (2) the Phillips and Perron Z_t statistic. Both procedures allow for fitted drift in the time series model.' (Corbae–Ouliaris, p. 509) 'In such a situation, it is essential to devise tests with increased power. This is achieved by extending the Dickey and Fuller tests to a system of univariate autoregression, estimated jointly by Generalized Least Squares (GLS).' (Abuaf–Jorion, p. 160) The emphasis is on technical questions and not the empirical and theoretical ones.

This 'testing' of purchasing power parity theory is very popular in mainstream journals. These examinations suffer a lack of support from the theory of statistics and probability.. Apart from the fact that the time series are not random samples, there is also an extra epistemological problem in this type of testing: the theory is based on unreal assumptions, which restrict the validity of the theory to a dimensionless imaginary world in which the transactions of goods are costless. In contrast to the theory, data employed in testing it originates from the real world, where the countries have extensions and the transport has cost. This situation makes the 'testing' worse and more unreasonable than one proving Pythagoras' theorem by measuring real triangles. The latter would also be unjustified, but in this case measurements can be made and the assumptions on which the theorem based can be treated as

intuitively true, because the connection between imaginary and real points, lines and circles can be created without a problem. In the case of PPP doctrine this is different: it is based on a false treatment of space and an unjustified aggregate view with immeasurable variables. This procedure is at the same time positivist (the test is grounded on observation statements) and strongly anti-positivist (the theory is grounded on unreal, unempirical assumptions).

There is an entirely different application of calculation of PPP. It is considered as an economic indicator and as a help of making intercountry comparisons of economic activities. This is harmless and contributes interesting information to economic history. This application does not have connection with monism, it provides only the empirical data for 'testing' the theory. In reality, this testing is only a complicated description of the difference between the actual exchange rates and PPP exchange rates. In PPP theory the following misconceptions are concerned: falsifibiality and testability of theories, econometrics as a tool for testing theories, the role of assumptions and false dichotomy between mathematical and literary economics.

Mises had presented the sources of the mistakes of purchasing power parity theory as early as 1912 in his fundamental but to the mainstream virtually unknown book about the theory of money (Mises, 1980, pp. 95-102; 195-203; 215-223). The theory was criticised by Ohlin also without any effect on mainstream theory (Ohlin, 1968). There is an entirely different application of calculation of PPP. It is considered as an economic indicator and as a help to making intercountry comparisons of economic activities. This is harmless and contributes interesting information to economic history. This application provides the empirical data for 'testing' the theory. In reality, this testing is only a complicated description of the difference between the actual exchange rates and PPP exchange rates.

1.4 The main problems of using official statistical data in interregional price comparisons

The geographical coverage of price collection of statistical offices for computing the consumer price index is mainly limited only to urban areas above a certain population size (OECD, 2002). In the majority of countries, the geographical coverage of weights of household expenditures is the whole country, but for example in USA, Korea, Australia, Mexico and Turkey only the households of urban areas are taken into consideration when counting the weights. (OECD, 2002)

The aim of price collection of statistical offices is to measure the temporal movements of average prices of various baskets of goods. The most important indicator of price movement is the consumer price index which is called mostly deceptive "inflation". The tool of measurement is the matched sample, that is, matching of item prices collected in one period to the prices of the same items collected in another period. There are always items that exist only in the reference period or in the current period, new items appearing after the reference period and old items that disappeared from the current period. To minimize the number of non-matched items, statistical offices define broadly the representative items. Thus, the concrete commodity which represents a product may be different in different stores and locations, according to local circumstances and differences in local supply. For example, the price of "beer" can be in one location a relatively cheaper type of beer and in an other location an expensive beer. It is impossible to match the samples between the geographical areas due to this way of price collection: the differences will show not the pure price differences but the differences of quality, technology, packing and other unidentifiable factors of different

commodities which represent the same items. This problem is of course very well-known for the statisticians, but it seems not known for all economists. Therefore we take a slightly dim view of works which aim is to analyze the spatial differences of prices but which are based on samples collected for temporal comparisons of price levels.

The problem of matching of samples can be overcome by specific price collection which takes the claim of spatial matching into account. In Hungary there exists no conducted spatial price survey by the Central Statistical Office yet. Therefore we conducted four spatial price collections in different points of time.

1.5. Urban-rural and locational differences of spatial price levels

It is useful to distinguish at least two types of differences in all spatial price comparisons, in urban-rural comparison also:

1. The differences in available/buyable products, that is compositional differences of basket of goods.

2. The differences in weights of goods, both in the consumption of households and the supply side.

This distinction means that the differences in price level can be originated from three different factors: compositional differences, weighting differences and pure price differences. For example, in rural areas there is no cost of parking or local public transport, because these elements are lacking in villages but important in cities. Many other goods and services are missing because they are concentrated in cities: theatres, medical services, clothes and footwear stores, furniture stores, higher education, book shops and so on. Therefore it is impossible to interpret the differences of general consumer price level between urban and rural areas. It is possible to count only the slices of price level which are available both in urban and rural areas. These differences in price level cannot be treated as regional or spatial price differences in the true sense. They are rather price differences due to locational or store type reasons.

Weighting differences means that it is possible that the same item has a different weight in the basket of rural and urban households. Pure price differences mean that the same item has different price in rural and urban areas. We focus only on this last factor. One sample was taken in 2006 October which covered the food and non-alcoholic beverages (20-21% of household consumption), alcoholic beverages and tobacco (about 7% of household consumption) and cosmetics (about 1.5% of household consumption). These items can be bought in "general" stores in cities and villages, too. Altogether 43 very general commodities got into the sample in 133 stores. The results can be seen in Table 1.

It can be seen very easily that not the urban-rural differences themselves are the most important but the differences in the size of stores. In villages the size of stores is mainly small and rarely medium. Small stores in cities have similarly high price level as the stores in villages, about 5-7% above the average prices. Of course the differences can be significantly higher on commodity level. The differences between the most expensive and the cheapest prices move between 40% and 80% of average prices in hypermarkets but in a wider interval in small stores. It means that a commodity can be purchased mostly by 70% of average price and 140% of average price also. If someone had time to collect the price information and bought each commodity in that store where it is the cheapest, one could save 30% of the direct costs of purchasing. However, the increase in indirect costs (time, petrol, wear of shoes and so on) can surpass the sparing of direct costs.

Table 1. Average prices of commodities (total average=100) (13-24 November 2006)

Type of store (Number of stores in parentheses)	Total	Groups of commodities				
		1	2	3	4	5
Hypermarkets in cities (37)	94,4	93,8	93,1	96,9	95,1	94,4
Medium size stores in cities (48)	100,2	100,3	100,2	99,0	99,7	102,7
Small stores in cities (11)	106,6	107,7	105,7	105,1	109,1	100,2
Number of commodities	43	19	7	5	8	4

Legend: 1: Basic food, 2: Sweets, 3: Beverages, 4: Alcoholic beverages, 5: Cosmetics

Our other surveys supplied similar results, therefore we do not present here its results in detail. We mention only one interesting side of locational price differences. We surveyed the prices of several brands of mineral water, beers and some other beverages in stores, petrol station shops and restaurants. The average prices of beers in petrol station shops were 60% higher (mineral waters 74% higher) than in stores. In restaurants the same differences were 91% and 80%. However, the prices in restaurants with cold buffet kitchen were only 74% and 33% higher, prices in restaurants with hot dishes 121% and 103% higher.

2. Some problems of mainstream approach to the monetary union
2.1 About the monetary sovereignty

There are four sources of power for the state derived from a monetary monopoly: political symbolism, seigniorage, macroeconomic management and monetary insulation. (Cohen, 1998, Helleiner, 2003) "It is easier to centralize political authority insofar as citizens all feel themselves bound together as members of a single social unit" (Cohen, 1998, p. 35). Seigniorage is the difference between the nominal value of a currency and its cost of production. As creation of money is a state monopoly, seignorage is a source of revenue for the state and can be treated as a form of inflation tax. Creating money does not add any new wealth to the society, it is just redistribute the wealth among the member of society according to the temporal order of obtainment to the money.

Macroeconomic management is treated mostly as a positive, effective opportunity for governments to contribute creating new wealth or being beneficial from the point of view of "social justice" (whatever is its meaning). The ideology behind the macroeconomic management emphasizes the positive side of the governmental interventions, for example referring to create new jobs by the help of an investment by the state and disregarding the terminated jobs because of taxation effects and the costs of administration.

Currency territoriality draws an economic boundary between the state and the rest of the world. This monetary insulation can be advantageous in the case of monetary crisis. For example, separation of Baltic countries from the ruble zone in 1991 was a successful action, because these countries isolated themselves from the monetary problems of ruble area. (see further details in Cohen, 1999)

2.2 The mainstream approach to the monetary integration

Mainstream approach to the monetary integration is based on two premises: firstly, macroeconomic management is possible and it has fruitful effects, and secondly, effective macroeconomic management is spatially different, when there are structural differences between the regions. The second premise is known also as the theory of optimal currency area. (Mundell, 1961) This theory suffers from the same deficiency as treating countries or regions as pointless macroeconomic entities: false treatment of space and focusing on the connection between aggregated indicators without sound attention to original particles. On top of this, it postulates the simple adjustment of monetary policy. (Block, 1999) The discussion about the theory after Mundell's article treats of matter of detail in first line and not of the conceptual mistakes. Labour and capital are not homogenous and labour is not mobile through space and through different branches of industry. Mundell's definition of region mixes the functional (factor mobility) and homogenous (uniform) elements. The interregional flows belong to functional elements. However, functional (nodal) regions, in the case of economics, do not have firm borders, the space divided to functional regions is continuous and it consists of overlapping regions. The modifiable areal unit problem is not mentioned, the very well-known fundamental problem in spatial data analysis, that all results of quantitative methods are potentially influenced by the method of spatial delimitation. (Dusek, 2005)

The negative consequences of this theoretical approach are manifested in Maastricht convergence criteria of Euro. First of all the "price stability" criterion is senseless. The long term interest rate criterion also problematic theoretically, but it is acceptable practically. In any case, Ecuador would not be able to declare the American Dollar as legal tender in 2000, when they have to wait for "price convergence" or lower long term interest rate of Sucre or stable exchange rate between American Dollar and Sucre or for any "real convergence". Interest rate can be different spatially because of different risk in different regions or countries. Further problems are not discussed here as the above should be sufficient to serve as a clear illustration of the point.

Conclusions

Spatial price differences stem from the differences in local supply and demand and thus it can be treated as an indicator of the local economic situation. The different local natural conditions and traditions lead to the differences of supply which is equalized by the transportation of goods from the places of production surplus to the places of consumption surplus. On the demand side the differences in local purchasing power lead to local price differences and to the deviation of real and nominal incomes. This type of deviation of price level is natural and does not require any monetary policy actions. Treating countries and regions as points leads to various inaccurate theoretical results and practical political proposals in the case of the research of spatial price differences also.

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