



Methodological Issues in the ICP Theory and Data Use*

Qiang Xu

Dongbei University of Finance and Economics, China – xuqiang@dufe.edu.cn

The ICP is not only one of economic theories, but also a statistical technique. Considering the methodology used in the ICP, there still exist some serious misunderstandings on ICP theory and data use. This paper discusses the following four questions: (1) What's the relationship between ICP and the law of one price? (2) What's the difference in consumption concepts between ICP and CPI? (3) Is the PPP only a currency conversion method? (4) Can the ICP data be used to study the changes in the industry structure of a country?

Keywords: ICP; law of one price; CPI; ICP data.

1. Introduction

Price and volume measurement is an important content of economic measurement, which is the foundation of macroeconomics and national accounts, as well as the basis of economic empirical research. ICP involves spatial price and volume comparisons between different countries and regions, and in essence, it is an index number problem. The pioneer of econometrics, Ragnar Frisch stated, "The problem of how to construct an index number is as much one of economic theory as of statistical technique." (Frisch, 1936). Considering the complexity of theory and methodology used in the ICP, there still exist some serious misunderstandings on ICP theory and data use. This paper discusses several methodological problems in ICP theory and data use.

2. What's the relationship between ICP and the law of one price?

Many people believe that the law of one price is the theoretical basis of purchasing power parity (PPP). The law of one price states, in the absence of transaction costs and official trade barriers, identical goods will have the same price in different markets when the prices are expressed in the same currency.

Firstly, let us review the theory of purchasing power parity. Swedish economist Gustav Cassel proposed the theory of purchasing power parity in 1922. Cassel's theory of purchasing power parity is a kind of exchange rate determination theory, which states: the exchange rate between two countries is decided by the purchasing power of currencies, equilibrium exchange rate is determined by the relative ratio of the price level between the two countries, and the change of the price level leads to corresponding changes in the exchange rate. As a theory of exchange rate determination, the theory of purchasing power parity bases on the law of one price. Let S_t denotes current exchange rate, P_t^i and P_t^{*i} denote local currency price and foreign currency price respectively for product i , and the law of one price can be expressed as:

$$P_t^i = S_t \cdot P_t^{*i}$$

* This paper is supported by Chinese national social science fund major project "The research on the theory and practice about China fully participating the International Comparison Program (ICP)" (13&ZD171), Chinese national social science fund project "The compilation method and international experience of services producer price indices (SPPI) and enlightenment to China" (09BTJ013), and the project of key research base in Dongbei University of Finance and Economics "International Comparison Program (ICP) and the consumer price index (CPI): systematic comparison, integration pathway and enlightenment to China" (DUFE2014J26).

In fact, it is necessary to distinguish two types of PPPs. One is a kind of exchange rate theory, which can measure the degree of imbalance in currency exchange rate. The other is a kind of conversion tool, which can be used to convert national economy value indicators in one currency into another currency. As a kind of exchange rate determination theory, its theoretical basis is the law of one price. But as a conversion tool, that is ICP, does it base on the law of one price? The answer is no. The ICP doesn't require the law of one price. Even if the law of one price does not hold, we still can calculate PPP under the ICP framework. In fact, the exchange rate has nothing to do with purchasing power parity. Only the equilibrium exchange rate is related to purchasing power parity, and requires the law of one price. Broadly stating the law of one price as theoretical foundation of purchasing power parity is inaccurate, and it confuses the two different PPPs.

3. What's the difference in consumption concepts between ICP and CPI?

Because CPI only involves household consumption, so we discuss household consumption in this section.

As to household consumption concept, there are three different interpretations:

(1) Household actual final consumption. It refers to the total value of household consumer goods and services acquired. The value of household actual final consumption is given by the sum of three components:

- a. The value of household expenditures on consumption goods or services;
- b. The value of the expenditures incurred by government units on individual consumption goods or services provided to households as social transfers in kind; and
- c. The value of the expenditures incurred by NPISHs on individual consumption goods or services provided to households as social transfers in kind.

(2) Household final consumption expenditure. It consists of the expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services.

(3) Household final monetary consumption expenditure (HFMCE). Some of the household final consumption expenditures belong to monetary spending, and some of them belong to non-monetary spending. HFMCE refers only to monetary transactions and includes neither consumption of own production or consumption of goods and services received as income in kind.

The consumption scope in the CPI depends on its measurement target.

- (1) If the CPI is mainly used to measure inflation, HFMCE should be used.
- (2) If the CPI is mainly used to adjust compensation or income, and maintain the purchasing power of money, HFMCE should be used too. The reason is that only the final monetary consumption expenditure is related to actual money expenditure.
- (3) If the primary purpose of CPI is to measure changes in the cost of living, the concept of actual final consumption should be used, because both social transfers in kind and final consumption expenditure of non-monetary are associated with welfare.
- (4) If the CPI is mainly used to deflate household final consumption expenditure in expenditure GDP, obviously, the most appropriate concept is household final consumption expenditure.

The ICP involves expenditure GDP comparison, so the consumption concept in ICP is household final consumption expenditure. In most cases, the consumption concept in ICP and CPI isn't consistent. So when trying to integrate ICP and CPI, the conceptual differences should be noticed.



4. Is the PPP only a currency conversion method?

If two countries use different currencies, when making international comparison, we can use either the exchange rate method (such as World Bank Atlas Method) or PPP method. If two countries use the same currency, GDP and other aggregates are measured using the same currency. Do we need ICP? Extending to the extreme case, if we imagine all the countries around the world use the same currency, do we still need ICP?

In this circumstance, it seems that these indicators are comparable because of using the same currency, and no conversion is necessary. For example, euro zone consists of 19 member countries, and another 10 countries and territories have adopted the euro as the single local currency. We can directly compare the GDP expressed in euro between Germany and France. But remember this comparison doesn't take account the price level difference in these two countries. To reflect the real size of these two countries' economy, we still need ICP to convert GDP to eliminate the price level difference.

What about the comparison between different regions in one country? For example, in 2013, Beijing's GDP is 1950.056 billion CNY, and Qinghai's GDP is 210.105 billion CNY. Are these two numbers comparable? The answer may be yes, and may be no. To reflect the price level difference in these two regions, we need PPP.

So we can come to the conclusion: The PPP is not just a currency conversion method. Whether using different currencies or the same currency, the PPP is necessary and useful.

5. Can the ICP data be used to study the changes in the industry structure of a country?

Some researchers used ICP data to study the industry structure of China. For example, Gang Li, Jianhui Liao, and Yini Xiang (2011) calculated China's industry structure of 2000-2009 with purchasing power parity data. Their results show that current prevailing industry structure data overestimated the secondary industry by nearly 14 percentage points.

Using the PPP data, we can calculate China's GDP share of the world, China's industry added value share of the world, and China's service added value share of the world. Is it appropriate to use PPP data for dynamic and structure comparison in one country, such as the change in the industry structure in China? Back to the purpose of the ICP. The purpose of the ICP is the spatial comparison of price and volume. Not all international comparisons require to use PPP data, such as the international comparison of economic growth rate, the international comparison of government debt to GDP ratio, etc. Excessive use of ICP data should be avoided.

References

World Bank, *Measuring the Real Size of the World Economy: The Framework, Methodology, and Results of the International Comparison Program (ICP)*, Washington D.C., 2013.

European Commission, IMF, OECD, United Nations and World Bank, *System of National Accounts 2008*, New York, 2009.

ILO, IMF, OECD, UNECE, Eurostat, and the World Bank, *Consumer Price Index Manual: Theory and Practice*, Geneva, 2004.