The Comparative Growth of Goods and Services Prices

Edith Gagnon, Patrick Sabourin, and Sébastien Lavoie, International Department

- *An analysis of movements in the prices of the components of the consumer price index (CPI) confirms that a widespread pattern has emerged in the industrialized world. Specifically, prices of services have increased faster than prices of goods.*
- *Since this divergence in price movements has persisted and is independent of the level of inflation, it cannot be said to influence the trend in the development of the overall price level.*
- *To a great extent, the gap between the growth rates of prices in the goods and service sectors is explained by the more rapid pace of productivity growth in the goods sector.*

Changes in the prices of the components of the consumer price index in recent years have attracted the attention of both economists and markets. While prices of services have been rising more rapidly than those of goods since the 1960s, the difference in the growth rates of prices between the two sectors widened considerably in 2002 in most industrialized countries.

Overall Context

An analysis of the two main components of the CPI, goods and services, clearly indicates that, for several decades, the prices of services have been rising more rapidly than the prices of goods. This trend has persisted in Canada and the other major industrialized countries, regardless of the inflation rate[1] (Table 1). For example, growth in services prices outpaced growth in goods prices as much during periods when inflation was relatively high (the 1970s and 1980s) as it did when inflation was low (the 1960s and 1990s).

The divergent rate of growth between services prices and goods prices became more pronounced in 2002, leading researchers to ask if this was the beginning of a trend.

1. The index (or measure) used for each country is represented by the general consumer price index: in Canada, the United States, and Japan, this is the CPI; in the euro zone, the Harmonized Consumer Price Index (HCPI); and in the United Kingdom, the Retail Price Index (RPI).

Table 1

Average Annual Changes in Consumer Price Indexes*

Per cent

	Canada	United States	Euro zone	United Kingdom	Japan
CPI					
1962–70	2.92	2.96	–	4.12	–
1970–90	6.84	6.28	–	10.02	5.59
1990–2002	2.27	2.91	2.52	3.35	0.75
Services					
1962–70	4.05	4.06	–	–	–
1970–90	7.07	7.72	–	7.31	6.47
1990–2002	2.69	3.64	3.27	4.66	1.39
Goods					
1962–70	2.31	2.36	–	–	–
1970–90	6.72	5.56	–	5.03	4.98
1990–2002	1.90	1.95	2.02	2.49	0.17

* The data for each country begin on the following dates: Canada and the United States, 1962; euro zone, 1991; Japan, 1971; United Kingdom, 1962 (RPI) and 1988 (RPI components).

Source: Thomson Financial Datastream and Statistics Canada

Table 2

Annual Changes in Consumer Price Indexes

Per cent

	Canada	United States	Euro zone	United Kingdom	Japan
CPI					
2000	2.7	3.4	2.4	2.9	-0.7
2001	2.5	2.8	2.5	1.8	-0.7
2002	2.2	1.6	2.2	1.6	-0.9
Services					
2000	2.3	3.4	1.7	3.5	0.0
2001	2.5	4.2	2.5	3.7	-0.1
2002	2.9	3.2	3.1	4.6	0.0
Goods					
2000	3.1	3.3	2.6	0.3	-1.3
2001	2.5	1.0	2.5	0.3	-1.4
2002	1.6	-0.6	1.7	-0.5	-1.8
Gap					
2000	-0.9	0.1	-0.9	3.2	1.2
2001	0.0	3.2	0.0	3.3	1.3
2002	1.3	3.8	1.4	5.1	1.8

Source: Thomson Financial Datastream and Statistics Canada

The gap between the growth rates for the prices of goods and services widened considerably in 2002 in Canada, the United States, the euro zone, the United Kingdom, and Japan (Table 2). Further, prices of services increased in some countries while those of goods fell. While no country other than Japan experienced deflation in 2002, the widening of the gap between the prices of the two components began to attract widespread attention.

Historical context

Though considerable, the widening of the gap in 2002 was not unusual in the industrialized countries under consideration here, since fairly large gaps have occurred in many different years (Chart 1). Further, in all the industrialized countries, the gap was in fact larger on several occasions than it was in 2002 and was even negative for short intervals, when the prices of goods increased more rapidly than those of services. Despite these short-term dynamics, however, changes in the prices of services relative to those of goods were positive, on average, over longer periods of time.

On that basis, the existence of a gap between the growth rates for the prices of the goods and services components of the CPI should not be a cause for concern, since the gap appears to be independent of the trend in the development of the overall price level. Similarly, a widening of this gap is not inherently worrisome, as evidence shows that it is eventually reabsorbed. Nevertheless, the question remains: Why have the prices of goods developed differently than the prices of services?

Why the Prices of Services Have Risen Faster

Various factors may explain the tendency of services prices to rise more rapidly than goods prices. First, it is possible that this trend is an artificial one, owing to the difficulty of accurately measuring prices in the service sector (see Box). If the difference really exists, however, it could be explained by several economic factors: in particular, by the more rapid productivity gains in the goods sector than in the service sector,[2] the greater openness of goods to foreign trade, and stronger growth in the demand for services as the population ages.

Productivity growth

According to Baumol (1967), the slower growth of productivity in the service sector is the underlying cause of the faster growth in the prices of services. To illustrate, he suggests that if productivity grows by

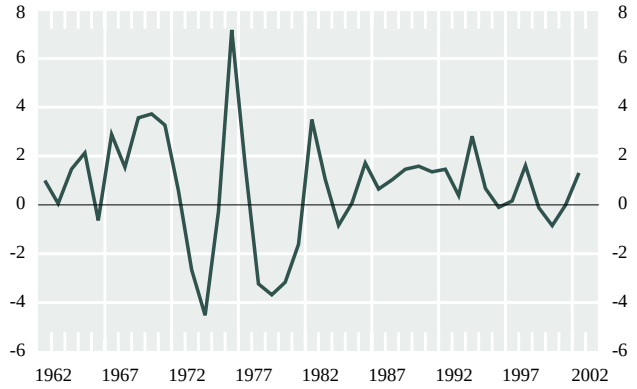
2. See Maclean (1996, 1997) for details on productivity growth in the service sector in Canada and Gordon (1996) for details on its develoment in the United States.

Chart 1

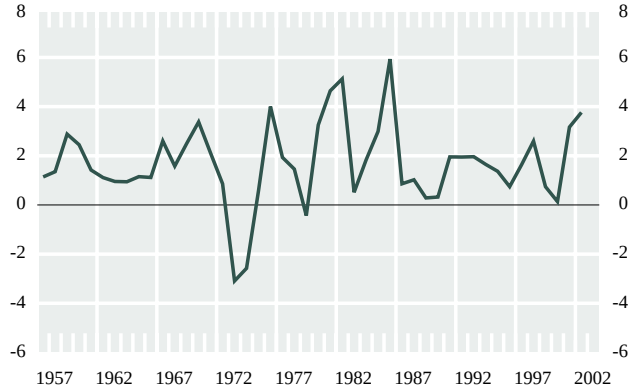
Gap Between the Growth Rates of Prices in the Services and Goods Components of the CPI

Percentages

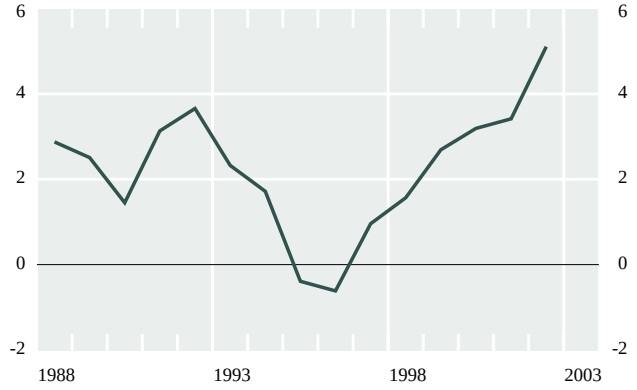
Canada



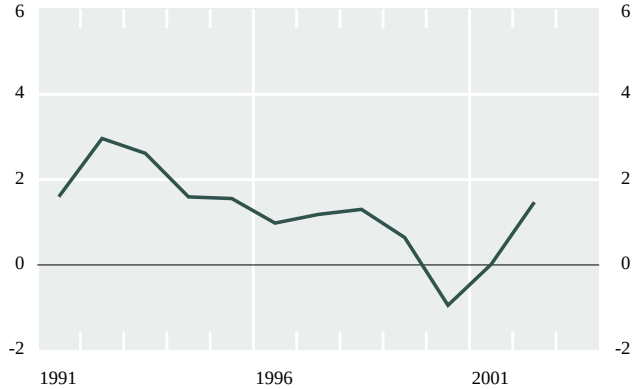
United States



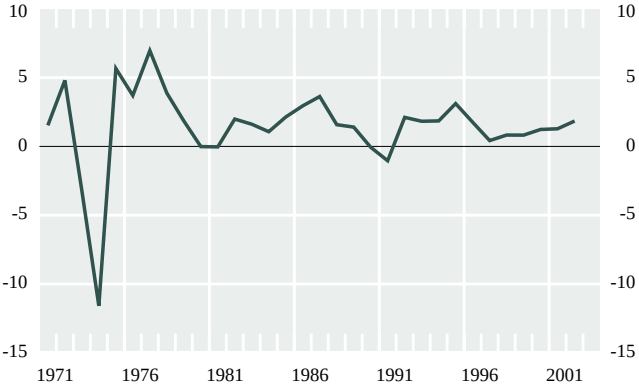
United Kingdom



Euro zone



Japan



Source: Thomson Financial Datastream and Statistics Canada

4.0 per cent in the goods sector, then firms can increase their employees' wages by an equal amount without raising prices. Yet some services, in particular, social services (e.g., health and education) and certain personal services (e.g., hairdressing) rely heavily on the worker's skill and do not leave much room for technological improvements. It is difficult, for example, for a hairdresser to increase productivity by reducing the amount of time spent with the client, since the tools and the opportunities for automating services are limited.

Under conditions of competition and labour mobility, wages should grow at approximately the same pace in both sectors, or a labour shortage will develop and widen in the service sector over time. If the cost of labour is comparable across both sectors—once differences in working conditions and skill requirements have been accounted for—and the return on capital is also the same, then faster productivity growth in the goods sector will drive down goods prices relative to services prices. The stiffer the competition in a sector, the faster a drop in production costs associated with productivity gains will be passed through to consumers.

The data in Table 3 support Baumol's thesis.[3] The growth of wages in the service sector between 1988

Explaining Measurement Errors

In some sectors, production is intangible, and not easily measured in quantifiable units (Maclean 1996). Quality improvements in the service sector are particularly difficult to measure since, in general, they depend on a wide range of factors (e.g., the client's convenience) that are not captured by the measures of production. By definition, an improvement in quality increases productivity (production) and reduces the effective price by an equivalent amount.

Sources of errors

The rate of change in the price of a good or service is overestimated if a quality improvement is not accounted for.[1] The price of a medical consultation, for example, is measured in terms of the rate charged.[2] Changes to the quality of medical care are difficult to quantify, since they essentially consist of contributions to the health of the patient (decreased side effects) and the speed of recovery, which are not accounted for in statistical data. In addition, in many service industries (e.g., financial, insurance, and real estate), it is unlikely that quality improvements resulting from new technologies can be captured by traditional measures. Automated teller machines (ATMs) are a good example: to the extent that ATMs have allowed banks to eliminate staff, banking statistics should reveal increased productivity. However, the increased convenience associated with such factors as the proximity of automated tellers and a reduction in time spent waiting in line is not reflected in data on productivity growth, even though clients clearly benefit.

The difficulties in measuring growth in production, productivity, and prices in the service sector (as in the goods sector) are also linked to the issue of how the value added is allocated among the sectors. For example, many services are not sold directly to consumers but serve as inputs in goods-producing industries. Underestimating this factor can lead to the risk of overestimating the value added that is generated by the goods sector and thus to overestimating productivity growth in that sector.

To summarize: it is widely accepted that measurement issues pose greater problems with respect to the prices of services than to the prices of goods, owing to the difficulty in capturing quantifiable improvements in the service sector, where there is less coverage and the quality of the data is more limited. According to numerous empirical studies, however, measurement errors alone cannot explain the gap between increases in the prices of services and those of goods. At most, they may explain half (Kostenbauer and Prud'homme 1999; Kroch 1991; Brauer 1993; Rappoport 1987).

1. Crawford (1998) provides an overview of the quality bias in the Canadian CPI. See also work by Shapiro and Wilcox (1996) for the United States and Cunningham (1996) for the United Kingdom.

2. Note that this example only applies to the United States. In Canada, fees for medical consultations are paid by the government and are excluded from the CPI.

Table 3

Average Gap Between the Growth in Prices, Productivity, and Wages in Industrialized Countries

Annual rate of change*

	Period	Ps – Pg	Prodg – Prods	Cg – Cs
Euro zone	1991–99	1.9	1.8	0.0
United Kingdom	1988–99	1.8	1.3	0.5
Japan	1988–98	1.3	1.4	1.0
United States	1988–2001	1.4	1.8	-0.3
Canada	1988–99	1.0	1.3	0.0

* Ps and Pg represent the growth rates of the prices of services and the prices of goods; Prodg and Prods, productivity growth in the two sectors; Cg and Cs, wage growth in the goods and service sectors.
Source: OECD STAN database (2002)

and 2001 was similar, on average, to that in the goods sector (except in Japan, where there was a 1-percentage-point difference). At the same time, productivity growth in the goods sector across the industrialized world systematically exceeded that in the service sector. A similar gap existed, on average, between the growth of prices and the growth of productivity in the two sectors.

Faster productivity growth in the goods sector will drive down goods prices relative to services prices.

These results are compatible with those obtained by Brauer (1993) for the United States and by Baldwin, Durand, and Hosein (2001) for Canada. These authors' results support the assumption that relative wages and relative productivity develop independently of one another. They also find a strong correlation between sectoral differences in productivity and real wage growth when these are expressed in terms of the prices in the sector involved (i.e., real wages from the perspective of the producer). However, it should be noted that the assumption of intersectoral mobility of labour is not consistent with the results obtained by Rappoport (1987) and Kostenbauer and Prud'homme (1999). These authors argue that the degree of substitutability between jobs in the goods and service sectors is low, while Baumol's theory suggests that it is very high. Despite this apparent contradiction,[4] the results in Table 3, along with most other empirical studies, tend to confirm that the faster rate of productivity growth in the goods sector relative to the service sector is an important contributor to the greater rise in services prices.

International trade . . . intensifies competition in the market for goods and limits the growth in the prices of goods compared with those of services.

Increased Openness to Foreign Trade

International trade is more focused on goods than on services, since goods are more tangible than services. This intensifies competition in the market for goods and limits the growth in the prices of goods compared with those of services.

While the degree of openness to foreign trade varies from one country to the next,[5] the industrialized nations have, overall, continually increased their integration into the global economy in recent decades (Table 4). As a result of this greater openness, countries are increasingly specializing in the production of goods in which they have a comparative advantage.

This ongoing expansion in foreign trade involves developing strong trade ties with rapidly growing markets, notably the emerging economies of Asia

3. Owing to the difficulties associated with measuring quality changes in the service sector, we should be cautious in interpreting the rates of relative productivity growth in industries in the goods and service sectors.

4. The contradiction may be more apparent than real. It is possible to have considerable ex ante substitutability even when there is no ex post substitutability; i.e., with limited intersectoral mobility. This type of substitutability may arise as new workers enter the labour force, without currently established workers needing to change sectors.

5. The degree of openness is represented by the share of goods (exports and imports) in total production. See Dion (1999–2000) for more details on recent trends in Canadian foreign trade.

Table 4

Openness to Foreign Trade

	Canada	United States	Euro zone*	United Kingdom	Japan
Average per cent of GDP					
1980–85	44	14	–	43	18
1986–90	52	17	–	48	19
1991–95	63	20	53	54	21
1996–2002	79	27	68	69	26

* Includes trade within the euro zone
Source: National accounts data for each country

Table 5

Trade Between Industrialized and Emerging-Market Countries

	Canada		United States		OECD-Europe*		United Kingdom		Japan	
	1980	2001	1980	2001	1980	2001	1980	2001	1980	2001
Share of imports of goods by region										
Asia	2.6	7.9	11.1	21.0	8.6	24.7	5.3	11.9	23.7	37.5
China	0.2	3.7	0.4	9.3	0.8	8.7	0.3	2.6	3.1	16.6
Latin America	5.7	5.5	15.4	17.4	7.1	6.1	2.7	1.8	4.1	2.7
Mexico	0.5	3.5	5.2	11.5	0.8	0.8	0.3	0.7	0.7	0.6

* Excludes trade within OECD-Europe, which consists of the 15 members of the European Union, the Czech Republic, Hungary, Iceland, Norway, Poland, Slovak Republic, Switzerland, and Turkey.
Source: WTO (2002), OECD

(Table 5).[6] Since these countries provide some goods at lower prices, they affect competition by putting downward pressure on the prices of these goods in the developed economies. Conversely, pressures on the prices of tradable goods produced in industrialized countries are mitigated when demand for these goods increases in emerging markets, or there is an appreciation of these countries' currencies.

According to Balassa (1964) and Samuelson (1964), the real exchange rate of a country will tend to appreciate if three factors are at work: productivity in its goods sector is growing faster than it is in other countries; the difference between the growth of productivity in the service sectors of the various countries is negligible; and the law of one price applies for comparable tradable goods.[7]

Increased international competition forces firms in the goods sector to increase their productivity in order to remain competitive. Consequently, their productivity will also increase relative to firms in the service sector. Thus, greater openness to foreign trade will maintain the gap in growth rates between the prices of services and the prices of goods.

Fluctuations in the real exchange rate that are induced by productivity shocks modify the relative prices of tradable goods vis-à-vis those of services, which are not traded.

Fluctuations in the real exchange rate that are induced by productivity shocks modify the relative prices of tradable goods vis-à-vis those of services, which are not traded.[8] Where a country benefits from productivity growth in the goods sector, a currency appreciation will exacerbate the gap in the growth of prices between the goods and service sectors. Yet the extent to which firms pass the impact of exchange rate fluctuations through to the prices of tradable goods is often limited, since it is usually costly to adjust prices in response to temporary fluctuations in the exchange rate. A sustained appreciation of the currency, however, will cause a drop in the prices of imported goods and, subsequently, a drop in production costs that is ultimately reflected in the prices of goods. The impact of exchange rate movements on the prices of goods also varies between countries.[9]

Table 6 shows the impact that fluctuations in the exchange rate may have on the prices of goods and services. In fact, the appreciation of the U.S. dollar and the pound sterling since 1995 have been accompanied by steep declines in the prices of goods compared with those of services. Conversely, during the same period, the fall in the prices of goods relative to services was much less pronounced in countries whose

6. An important step in the integration of the goods market was accomplished in December 2001, when China was admitted to the World Trade Organization (WTO).

7. Note, however, that Balassa and Samuelson's hypothesis is not fully supported by the data. This is notably explained by rejecting the law of one price in the tradable goods sector.

8. The real exchange rate may fluctuate for other reasons. Changes in the terms of trade resulting from an oil-price shock or a change in the composition of fiscal spending, for example, may also alter the real exchange rate.

9. The implications of variations in the exchange rate for consumer prices may vary over time, depending on the size of the output gap (Bank of Canada 2000).

Table 6

Changes in the Effective Exchange Rate and the Ratio of Goods and Services Prices, 1995–2002

	Ps – Pg[1]	Ps	Pg	e[2]
Euro zone	-0.1	-0.3	-0.2	-6.0
United Kingdom	5.5	2.0	-3.5	17.5
Japan	-1.3	-1.5	-0.2	-20.0
United States	2.4	-0.2	-2.6	23.0
Canada	0.6	0.4	-0.2	-6.0

1. Ps and Pg represent the movements in the prices of services and goods.
2. e represents the growth of the real effective exchange rate.
Source: Thomson Financial Datastream

Table 7

The Share of Services in Total Consumption

	In value		In real terms		Gap*
	1980	2000	1980	2000	1980–2000
United Kingdom	0.37	0.49	0.35	0.46	1.93
Japan	0.48	0.56	0.49	0.49	1.39
United States	0.48	0.58	0.52	0.56	1.98
Canada	0.43	0.51	0.44	0.51	0.61

* The price-growth gaps are taken from CPI indexes for purposes of illustration.
Source: OECD and Statistics Canada

currencies depreciated (Canada, Japan, and the euro zone). Indeed, since 1995, there has been a widening of the gap between the growth rates in the prices of goods and services in countries that experienced an appreciation of their currencies, concurrent with a levelling off of the gap in countries whose currencies fell (except Canada).

The Growing Demand for Services

The more rapid growth in the demand for services compared with that for goods is often cited in the literature as a cause of the more rapid growth in services prices. Various factors can explain why the demand for services continues to grow in industrialized countries. An aging population, for example, will tend to consume more and more personal services and health care.[10] Similarly, the income effect is stronger than the price effect, so that it will continue to operate even when services become more expensive, and a larger share of increasing incomes will be devoted to leisure, education, personal services, insurance, financial services, etc.

Möller (2001) uses estimates of income and of price elasticities of services to explain the more rapid rise in the demand for services and concludes that, in most cases, it is higher than 1 (for Germany, the United States, and the United Kingdom). His results also suggest that, since 1970, the income effect has trumped the price effect. Thus, a rise in consumers' incomes may compensate for an increase in the prices of services relative to those of goods, such that the demand for services will continue to grow. Möller also finds that the price elasticity of goods declined noticeably between 1960 and 1990.

The data in Table 7 confirm that, between 1980 and 2000, the consumption of services increased relative to that of goods in all the industrialized countries. During this period, the proportion of real spending on services generally grew, while their relative prices increased. Consequently, the demand for services has risen since the beginning of the 1980s.[11]

This faster growth in the demand for services relative to the demand for goods is another possible explanation for the trend of services prices to rise more rapidly than those of goods.[12]

Conclusion

The gap in the growth rates between the prices of services and the prices of goods seems to be independent of the inflation rate in Canada as well as the principal industrialized countries. The gap cannot therefore be said to influence the trend of inflation. While the gap in the growth rates of prices between the two components of the CPI may fluctuate significantly over short periods, as in 2002 for example, it generally fluctuates around a long-term positive average. The persistence of this gap is largely explained by the faster pace of productivity growth in the goods sector relative to the service sector. It is also related to increasingly open markets for tradable goods and to a growing demand for services as the population ages.

10. This example is particularly valid in the United States, where medical care is included in the CPI.

11. Clearly, the validity of this argument is contingent on a relatively small margin of measurement error.

12. In the literature, this simultaneous increase in the relative prices of, and the persistent demand for, services is generally called the Paradox of Services.

Literature Cited

Balassa, B. 1964. "The Purchasing-Power Parity Doctrine: A Reappraisal." *The Journal of Political Economy* 72 (6): 584–96.

Baldwin, J., R. Durand, and J. Hosein. 2001. "Restructuring and Productivity Growth in the Canadian Business Sector." Statistics Canada Catalogue No. 15-204–XPE (January).

Bank of Canada. 2000. "Technical Box 2: Reduced Pass-Through into the Core CPI." *Monetary Policy Report*, November.

Baumol, W. 1967. "The Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis." *The American Economic Review* 57 (3): 415–26.

Brauer, D. 1993. "Why Do Services Prices Rise More Rapidly than Goods Prices?" Federal Reserve Bank of New York Working Paper No. 9330.

Crawford, A. 1998. "Measurement Biases in the Canadian CPI: An Update." *Bank of Canada Review* (Spring): 39–56.

Cunningham, A.W.F. 1996. "Measurement Bias in Price Indices: An Application to the UK's RPI." Bank of England Working Paper No. 47.

Dion, R. 1999–2000. "Trends in Canada's Merchandise Trade." *Bank of Canada Review (*Winter): 29–41.

Gordon, R. 1996. "Problems in the Measurement and Performance of Service-Sector Productivity in the United States." National Bureau of Economic Research Working Paper No. 5519.

Kostenbauer, K., and M. Prud'homme. 1999. "Service Inflation: Why Is It Higher? A Partial Examination of the Causes." Statistics Canada Catalogue No. 62F0014MIB.

Kroch, E. 1991. "Tracking Inflation in the Service Sector." *Federal Reserve Bank of New York Quarterly Review* (Summer): 30–35.

Maclean, D. 1996. Productivity Growth in the Commercial Service Sector." *Bank of Canada Review* (Autumn): 3–18.

———. 1997. "Lagging Productivity Growth in the Service Sector: Mismeasurement, Mismanagement, or Misinformation?" Bank of Canada Working Paper No. 97–6.

Möller, J. 2001. "Income and Price Elasticities in Different Sectors of the Economy: An Analysis of Structural Change for Germany, the UK and the USA." In *The Growth of Service Industries: The Paradox of Exploding Costs and Persistent Demand*, 167–208, edited by T. ten Raa and R. Schettkat.

Rappoport, P. 1987. "Inflation in the Service Sector." *Federal Reserve Bank of New York Quarterly Review* 11 (4): 35–45.

Samuelson, P. 1964. "Theoretical Notes on Trade Problems." *The Review of Economics and Statistics* 46 (2): 145–54.

Shapiro, M.D. and D.W. Wilcox. 1996. "Mismeasurement in the Consumer Price Index: An Evaluation." National Bureau of Economic Research Working Paper No. 5590.