The operation of the Balassa-Samuelson effect in the Slovak economy

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The Balassa-Samuelson effect (hereinafter referred to as the "B-S effect") is based on the claim that a differing growth of productivity and a simultaneous identical growth of wages in the tradable and non-tradable sector cause a higher growth of the prices of services as compared to those of goods. The B-S effect theory assumes that a high productivity growth in the tradable sector enables to increase wages in that sector without any impact on the prices of goods, because the wage growth is compensated for by the growth of labour productivity. Due to the wage equalization mechanism, the wages in the non-tradable sector of the economy also increase. The non-tradable sector, however, has limited possibilities to raise labour productivity therefore it transmits the wage growth to an increase in prices.

The aim of this article is to identify and express in numbers the long-term B-S effect in the Slovak economy. In the first part of the material, the B-S effect is quantified on the national economy level, i.e. in terms of value-added deflators; in the second part, it is quantified in terms of consumer prices measured by means of the harmonized index of consumer prices (HICP) under a broad and a narrow definition. The third part contains a medium term forecast of the B-S effect till 2009.

NON-TECHNICAL SUMMARY

The material identifies the reasons of the B-S effect in the Slovak economy in the years 1997-2006 and compares the consequences of the effect with the grouping of EU-25 member states and with the 6 biggest trade partners of Slovakia, inclusive of transitional economies (new EU member states: the Czech Republic, Hungary, Poland), as well as industrially advanced countries (Germany, Italy, Austria).

In each economy, the B-S effect causes dual inflation, i.e. a higher growth of the prices of services as compared to the growth of prices of goods. The primary impulse for dual inflation is the lead of labour productivity growth in the tradable sector over labour productivity growth in the non-tradable sector. labour productivity in transition economies grows, from its relatively low initial levels, faster than in advanced countries, which creates a more considerable impulse for dual inflation. Dual inflation and the B-S effect are usually higher in transition economies than in industrially advanced economies, but this dif-

ference does not reach the intensity of the considerable lead of labour productivity in the tradable sector. The transmission of the primary impulse to the consumer prices is weakened.

In the years 1997-2006, among the countries under comparison, labour productivity of the tradable sector in Slovakia showed the fastest growth and at the same time the most considerable lead over the non-tradable sector, but at the cost of one of the highest dual inflations. The level of dual inflation, however, was quite low against the primary impulse (average labour productivity growth of the tradable sector of 10% a year). As a result, average annual inflation in Slovakia was only 0.9 percentage points above average inflation in the EU-25 countries and 1.2 percentage points higher than in the euro-area.

The transmission of the considerable primary impulse to the prices has been damped already in the process of generation of value added on the national economy level, measured by valued-added deflators. The damping factors were the following characteristics (the valuation is based on average annual data for 1997-2006) :
1. the wage growth in the tradable sector did not reach the growth rate of labour productivity, which created a gap between the slower wages and the faster labour productivity, which can damp the impact of a possible wage growth on the prices of goods produced by the tradable sector in the future,
2. imperfection of the wage equalization mechanism – wages in the non-tradable sector grew at a slightly lower rate than in the tradable sector,
3. the growth of labour productivity in the non-tradable sector compensated for a certain part of the sector wage growth, which implies that the non-tradable sector was not forced to pass on the whole wage growth to the prices of its products.

The above-mentioned deviations of the actual development from the theoretical assumptions of the B-S effect, and consequently variously sized gaps between the wage and labour productivity in each of the sectors were a reason for the calculation of the so-called B-S effect potential. In this material, the B-S effect potential is defined as the lead of unit labour cost (ULC) of the non-tradable sector over the tradable sector and it quantifies the size of the space creat-

ed for a faster growth of services than goods. The ULC in the non-tradable sector grew 9.2% faster than the ULC in the tradable sector. Almost 90% of this potential is reflected in prices of value added and 40%-60% in dual inflation on the consumer market; the rest has been absorbed by other factors. The wider span of the impact on the consumer market corresponds with the differing breadth of definition of dual inflation, which is measured by the HICP in the following.

After recalculation using the weight of total services in the consumer basket, dual inflation, defined as the ratio of the growth of prices of services to the growth of prices of industrial goods excluding energy, can be considered a B-S effect conceived in a broad sense (it includes administrative price adjustments and other influences). The long-term average contribution of the broadly defined B-S effect to headline inflation could be 1.8 percentage points; the contribution showed a downward trend in recent years and fell to 1 percentage point in 2006. The narrowly defined B-S effect takes no account of administrative changes and it could have contributed 0.9 percentage points to headline inflation in 2002-2006.

If we do not expect any considerable structural changes on a medium-term horizon, the narrowly defined B-S effect contribution should decrease from the level of 0.9 percentage points in 2006 to an average level of 0.7 percentage points. That means that the 0.7 percentage points higher average annual inflation by virtue of the B-S effect should correspond with the actual appreciation of the exchange rate. The results are a recalculation of the Medium term prediction P3Q2007 to a two-sector model of the economy. On a medium-term horizon, we expect a continuing influence of damping factors in line with the hitherto development: the growth of compensations in the tradable sector will not reach the growth rate of labour productivity, compensations of the non-tradable sector will be catching up with the tradable sector, but will not reach its growth rate, and the non-tradable sector will have non-zero labour productivity.

Ignoring other inflation risks, inflation in Slovakia should be 0.7 percentage points higher as a result of the B-S effect than in a hypothetical country with a zero B-S effect. This implies that the B-S effect does not have to be a threat to the fulfillment of the inflation criterion; the contribution of 0.7 percentage points is lower than the allowed deviation of 1.5 percentage points from the lowest inflation levels.

If we expect on a medium term horizon that the contribution of the B-S effect in the EU-25 member states will stay at its long-term level of 0.9 percentage points, then the inflation level should be 0.3 percentage points higher than in the EU-25 countries a result of B-S effect. The effect of the B-S effect should not represent a risk for the sustainability of inflation on a medium term horizon.

1. NATIONAL ECONOMY LEVEL

At the national economy level, the basic quantities of the B-S effect can be measured as follows:
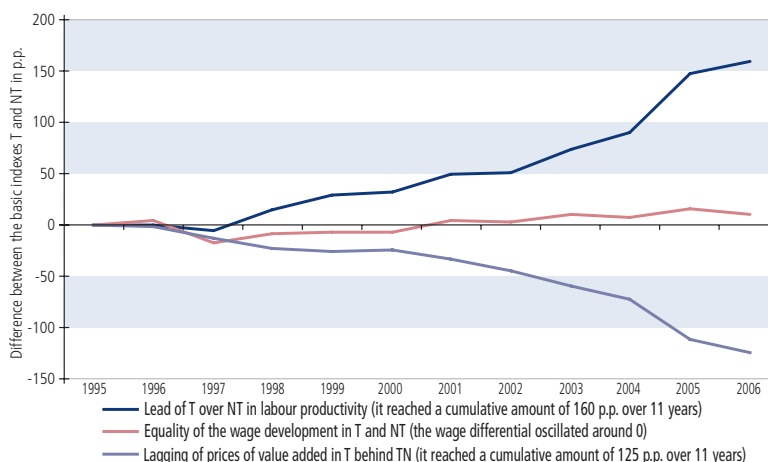- labour productivity as the ratio of value added at constant prices per employed person, the value added and employment being methodologically uniformly processed according to ESA 95 in a domestic concept;
- wage growth as compensation of employee at current prices in the ESA 95 methodology; in terms of methodology and concept, they correspond with value added and the number of employees in the corresponding economic activities; the compensation of employees according to ESA 95 include gross wages and pays in pecuniary and in-kind form and social insurance contributions paid by the employer; in its substance, the broad definition of "compensation of employees" as compared to the indicator "average gross nominal monthly wage" is closer to the cost of labour, which are taken into account in the pricing process.
- price growth as the value-added deflator.

The theoretical bases of the B-S effect assume a two-sector economy:
- the tradable sector produces commodities that face imported competing substitutes on the domestic market and foreign competition on the foreign market,
- the non-tradable sector produces commodities, whose main feature on the domestic market is their domestic origin and whose physical nature – non-tangible services – is, in general, an obstacle for their export.

The criterion for the division of economic activities into sectors has been the participation of a homogenous group of commodities in the foreign trade exchange of goods and services during input generation and the way of use of output in the Slovak economy from the input-output tables of the Statistical Office of the Slovak Republic for 2002. In the following:

Chart 1 Internal intersectoral differentials of the B-S effect on the national economy level (1995 = 100)

Legend:
— Lead of T over NT in labour productivity (it reached a cumulative amount of 160 p.p. over 11 years)
— Equality of the wage development in T and NT (the wage differential oscillated around 0)
— Lagging of prices of value added in T behind TN (it reached a cumulative amount of 125 p.p. over 11 years)

Source: Statistical Office of the Slovak Republic and NBS calculations.
Note: Internal differentials measure the intersectoral differences within the domestic economy.
T- tradable sector, NT- non-tradable sector

Table 1 Average annual growth rate of B-S effect indicators, 1996 – 2006

	Tradable sector (T)	Non-tradable sector (NT)	Average annual internal differential (T – NT)
Labour productivity	9.9%	1.7%	8.2 p.p.
Compensation of employee	9.3%	9.0%	0.3 p.p.
Deflators of value added	0.5%	7.8%	- 7.3 p.p.

Source: Statistical Office of the Slovak Republic and NBS calculations.

- the tradable sector is considered to be agriculture and fishing, mining and quarrying and industrial production
- the non-tradable sector is considered to be the rest of the economy, including production and distribution of energy and water, building industry and market (trade and financial) and non-market services (general government and defense, education, health care and social services, other services).

The long-term impulse and the subsequent price and wage impacts of the B-S effect at the national economy level is documented by Chart 1. Using basic indexes, it shows by how many percentage points the tradable sector differed from the non-tradable sector in selected indicators.

The lead of the tradable sector in labour productivity (amounting to 8.2 percentage points on average per year) was a natural consequence of competitive pressure on the domestic and foreign market with tradable output. By means of productivity growth, the tradable sector generated space for an economically justified growth of compensations per employee. The growth of compensations in the tradable sector (by 9.3% on average) was reacted to by compensations of the non-tradable sector (growth by 9.0%), predominantly by means of wage adaptation without an adequate labour productivity growth. The labour productivity growth in the non-tradable sector (by 1.7%) was not sufficient to cover the growing compensations, which had to be compensated for by a growth of prices of value added of non-tradable services (by 7.8%). The compensations have been reflected in the prices of non-tradable services primarily as a result of the absence of imported competitive production, but also of a higher wage intensity of non-tradable output. Thus, labour productivity in the tradable sector rose quite quickly, but ultimately at the cost of a faster growth of the prices of value added of non-tradable commodities (by 7.3 percentage points) as compared to tradable commodities.

The labour productivity differential (8.2 percentage points) was almost 1 percentage points higher than the price differential on the national economy level (7.3 percentage points), meaning that the primary impulse of the B-S effect has not been reflected in the prices of value added in full. It was damped in each phase of transmission to the prices of value added:

1. The growth of compensation in the tradable sector (9.3%) stayed at a lower level than the growth of labour productivity (9.9%). There can be a variety of factors for the wage growth being below the economically justified level (from historically given low wage levels and a weakened influence of the trade unions, the educational structure of industrial employees up to the long-term existence of a high unemployment level). In the case of an accelerated wage growth in the future, the tradable sector has a set stage for maintaining its competitiveness and profitability even without increasing prices. Thanks to the lead of labour productivity over the wage growth (especially in the last two years), the tradable sector gained wage savings. This cushion of resources was used either for investments, i.e. to increase the effectiveness of the sector in the future, or it increased financial assets, which can be gradually released in cases of occurring tensions. The relation between the wage savings and gross fixed capital formation in the tradable sector from 2002 is almost a unit correlation. Wage savings were thus directed to investments and set the stage for effective industrial production in the future.

2. The growth of compensation in the tradable sector (9.3%) was not passed on to the non-tradable sector (9.0%) in full. Beginning with 2001, the wages of the non-tradable sector started to lag behind the tradable sector (in the field of market services, the wage lag increased considerably in the years 2005 and 2006, which can be associated with the decrease in the B-S effect at the end of the period under review). The non-tradable sector was proba-

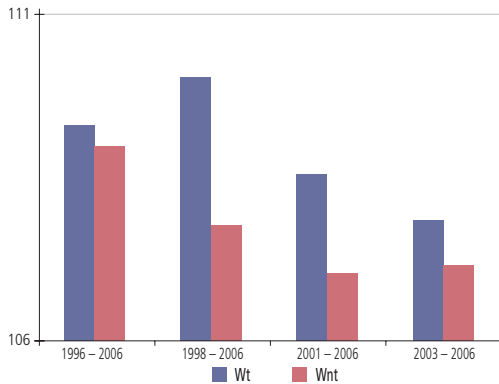*Chart 2 Lead of labour productivity over the wage growth in the tradable sector*
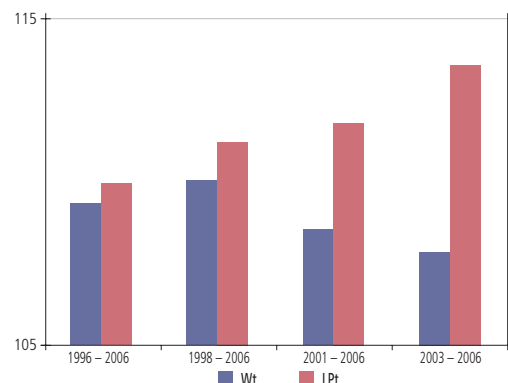
Source: Statistical Office of the Slovak Republic and NBS calculations.
Wt – average annual wage growth in the tradable sector
LPt – average annual labour productivity growth in the tradable sector
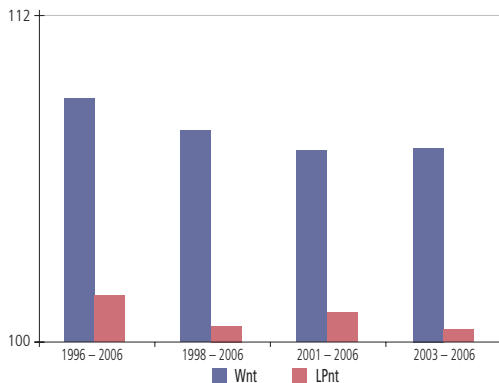
Chart 3 Imperfect wage equalization mechanism

Source: Statistical Office of the Slovak Republic and NBS calculations.
Wt – average annual wage growth in the tradable sector
LPt – average annual wage growth in the non-tradable sector

Chart 4 Compensation of a part of the wage growth by labour productivity growth in the non-tradable sector

Source: Statistical Office of the Slovak Republic and NBS calculations.
Wnt – average annual wage growth in the non-tradable sector
LPnt – average annual labour productivity growth in
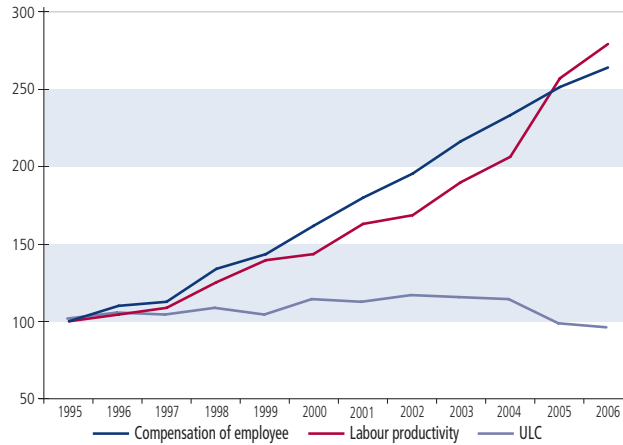   the non-tradable sector

bly not able to finance the wage growth generated by the more productive tradable sector, also due to the continuing relatively low purchasing power of the households.
3. The growth of compensation of the non-tradable sector (9.0%) did not manifest itself fully in the prices of value added of non-tradable output (7.8%), because a part was compensated for, in places, by a more significant labour productivity growth, especially as a result of structural changes in trade and financial intermediation.

There was a gap of a differing size between the compensation and labour productivity in each of the sectors. Unit labour costs, defined as compensations paid to the employee in relation to work done, which the employee has really produced (ULS = nominal compensations 1 employee/real labour productivity), can be used to quantify the gap.
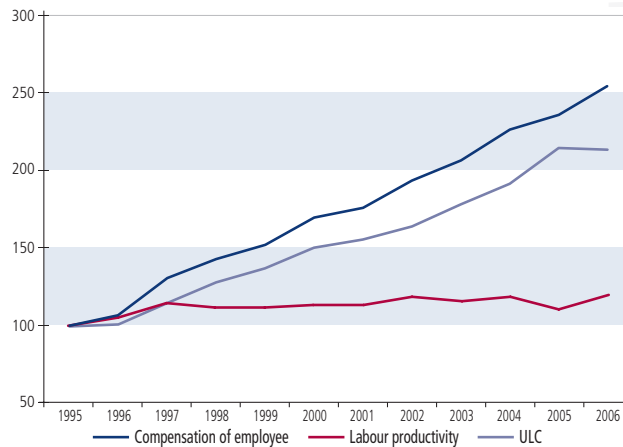
The ULC in the tradable sector have stagnated in the long run, while they have been constantly growing in the non-tradable sector. Intersectoral differences regarding the development of

Chart 5 Tradable sector (indexes 1995 = 100)

Source: Statistical Office of the Slovak Republic and NBS calculations.

Chart 6 Non-tradable sector (indexes 1995 = 100)

Source: Statistical Office of the Slovak Republic and NBS calculations.

ULC can be interpreted as a B-S effect potential that arose on the national economy level, because the B-S effect describes the intersectoral differentials in labour productivity in relation to a balanced wage growth. In the following, we will express those intersectoral differences by means of relative ULC (ULC in the NT sector / ULC in the T sector*100 – 100). Relative ULC express the size of the potential created on the national economy level for a higher growth of prices of non-tradable services than prices of tradable output (ceteris paribus).

The extent, to which this potential has been used, i.e. the extent to which the lead of the ULC has been reflected in the lead of prices of value added of services, is determined by comparing the relative ULC with the relative prices of value added:

$$\frac{iVA_{NT}}{iVA_T} = \frac{ULC_{NT}}{ULC_T} \cdot B,$$

where
iVA – prices (deflators) of value added
ULC – unit labour costs
B – other factors

The calculations imply that the ULC in the non-tradable sector has been growing some 9.2%

Table 2 Ratio of the non-tradable sector to the tradable sector (average for the time period)

Time period	Relative ULC (B-S effect potential)	Other factors (B)	Relative prices of value added	Ratio of relative prices of value added and relative ULC
1997 – 2006	9.2	-0.8	8.2	90%

Source: Statistical Office of the Slovak Republic and NBS calculations.

faster than the ULC in the tradable sector. Almost 90% of the said B-S effect potential, i.e. 8.2%, have been passed on to the prices of value added; the rest was damped by the influence of other factors (various influences of the domestic and foreign economic environment). The long-term influence of the relative ULC was the decisive factor of the development of the long-term relation of prices of value added.

2. CONSUMER MARKET

By means of distribution channels (trade) and along with the impact of imported inflation, the identified relative prices of value added of domestic branches (production) have been subsequently reflected on the consumer market of goods and services (consumption). The HICP consumer prices of the non-tradable sector have grown faster than the HICP consumer prices of the tradable sector. „Industrial goods excluding energy" represent the tradable sector. Energies have been removed from the tradable sector, because their price development is not directly related to the principles of the B-S effect. The non-tradable sector is represented by „services" under the broad definition and „market services" under the narrow definition.

Broadly defined contribution of the B-S effect to the HICP

The advantage of the broad definition of the B-S effect, under which the non-tradable sector

is represented by total services, is its international comparability. The results of this approach can be considered close to the maximum values of the estimated B-S effect on inflation.

The average annual lead of consumer prices over consumer prices of industrial goods excluding energy can be again measured by means of relative prices (HICP of services/ HICP of industrial goods excluding energy * 100 – 100). Table 3 shows a comparison of the relative ULC, relative prices of value added and relative consumer prices for the entire and narrow time series.

Calculations for the 1997 – 2006 period imply that on average the ULC in the non-tradable sector grew 9.2% faster than the ULC in the tradable sector per year. This lead of the non-tradable sector was only 8.2% at the level of prices of value added and 5.3% at the level of HICP consumer prices. On average, consumer prices of services grew 5.3% a year faster than prices of industrial goods excluding energy. This implies that out of the said B-S effect potential, 90% were passed on to prices of value added and subsequently 58% to consumer prices; the rest has been absorbed by other factors.

Table 4 Ratio of absorption of relative ULC in dual HICP inflation

Country	Ratio of HICP relation to ULC relation	Average for the period of available statistical data
Germany	90%	1997 – 1999
Austria	75%	1997 – 1999
Czechia	64%	2001 – 2005
Hungary	55%	2002 – 2004
Poland	48%	1997 – 2006
Slovakia	**58%**	1997 – 2006

Source: Eurostat (April 2007) and NBS calculations.

The rate of absorption in Slovakia is comparable to that of Visegrad countries, but it is considerably lower as compared to advanced economies. The lower level is due to a high ULC relation in the new EU countries, i.e. due to an excessive lead of the ULC of the non-tradable sector over the tradable sector. That lead is the result of an insufficient productivity growth of the non-tradable sector, the productivity of the tradable sector growing relatively fast starting from low initial levels.

Chart 7 Comparison of the development of HICP by sectors
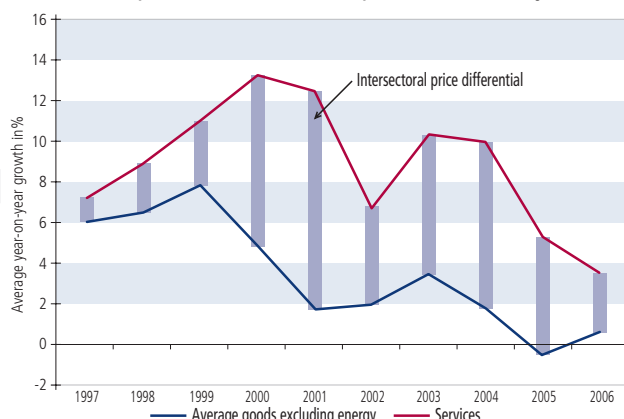
Source: Statistical Office of the Slovak Republic and NBS calculations.

Table 3 Ratio of the non-tradable sector to the tradable sector (average for the time period)

Time period	Relative ULC (B-S effect potential)	Relative prices of value added	Relative HICP consumer prices	Ratio of relative HICP prices and relative ULC
1997 – 2006	9.2	8.2	5.3	58%

Source: Statistical Office of the Slovak Republic and NBS calculations.

Box 1

Transmission of relative ULC to relative prices of value added and subsequently to HICP consumer prices

The B-S effect assumes that the relation of prices in the NT sector to prices in the T sector is given by the intersectoral relation of wage growth and the intersectoral relation of labour productivity growth; the remaining part of the price relation is formed by "other" factors:

$$\frac{iVA_{NT}}{iVA_T} = \frac{W_{NT}}{W_T} \cdot \frac{PP_T}{PP_{NT}} \cdot B, \text{ i.e.}$$

$$\frac{iVA_{NT}}{iVA_T} = \frac{ULC_{NT}}{ULC_T} \cdot B, \text{ where}$$

iVA – value-added deflator,
W – compensation of employees,
PP – labour productivity,
ULC – unit labour cost measured by means of compensation of employees,
B – other factors,
NT – non-tradable sector,
T – tradable sector.

A comparison of the year-on-year development of relative prices in the process of generation of value added is shown in chart A.

Chart A Development of relative value-added prices (VA) and relative unit labour costs (ULC)
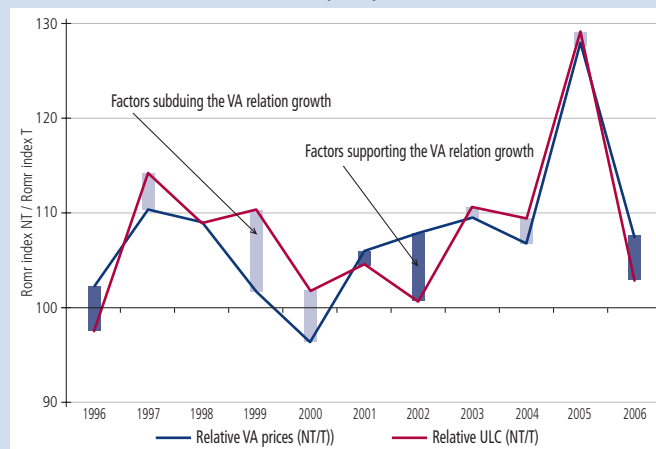
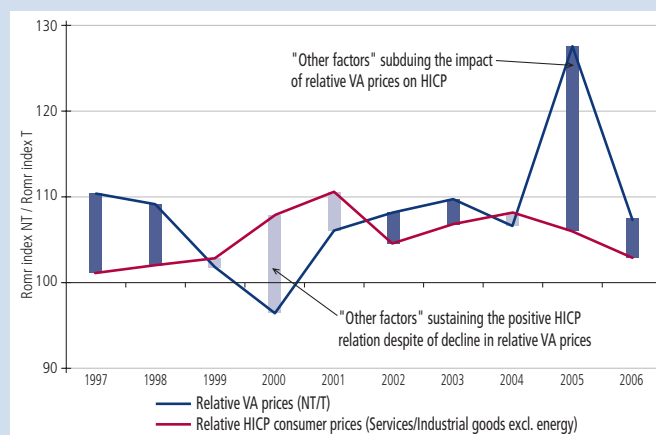*Source: Statistical Office of the Slovak Republic and NBS calculations.*

The price relations are transmitted from the process of value added generation to the consumer market into relative consumer prices of goods and services under the influence of transmission factors:

$$\frac{HICP_{NT}}{HICP_T} = \frac{iVA_{NT}}{iVA_T} \cdot D, \text{ where}$$

$HICP_{NT}$ – consumer inflation of the non-tradable sector measured by total services,
$HICP_T$ – consumer inflation of the tradable sector measured by industrial goods excluding energy,
D – transmission factors of relative value-added prices into relative consumer prices ("other factors" in the chart).

The transmission of relative value-added prices into consumer market is shown in chart B.

Chart B Development of relative consumer prices (HICP) and relative value-added prices (VA)

Source: Statistical Office of the Slovak Republic and NBS calculations.

In the long-run, the low rate of absorption of the B-S effect potential on Slovakia's consumer market is an expression of the fact that the consumer prices of services provided to Slovak households have been approaching the average EU-25 level more slowly than labour productivity.

Principal factors maintaining a low transmission level of the relative ULC to dual inflation include (without claiming to be complete):
1. the relatively low purchasing power of the Slovak household sector; the B-S effect, i.e. the cost impulse of inflation, is not supported by demand impacts like in advanced countries,

– which is also documented by a lower pace of wage convergence as compared to performance and price convergence in Slovakia in the long run, caused by all factors slowing down the pace of wage convergence (especially the hitherto high unemployment rate, continuing long-term unemployment, higher level of social protection and protection of employer-employee relationships reinforcing labour market inflexibility),
– which is also promoted by a low income differentiation of Slovak households, which inhibits the demand impulse to inflation

Box 2

Selected characteristics
of the non-tradable sector in Slovakia

Imported non-tradable commodities' share of total non-tradable commodities resources
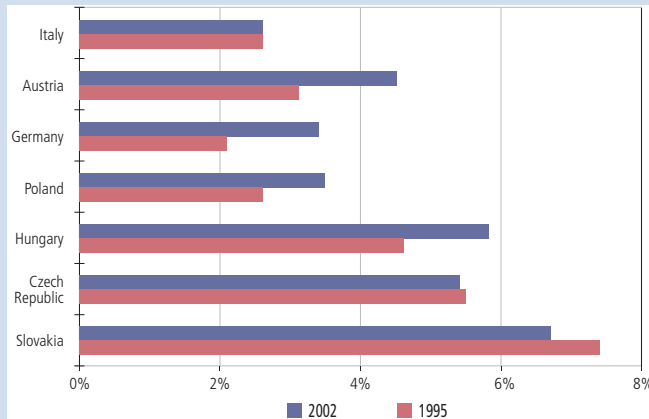
Source: Statistical Office of the Slovak Republic: Supply and Use Tables By Commodities and Industries, calculations of NBS for the years 1995 and 2002, except for Hungary (years under comparison: 1998 and 2001) and Poland (years under comparison: 1995 and 2000).
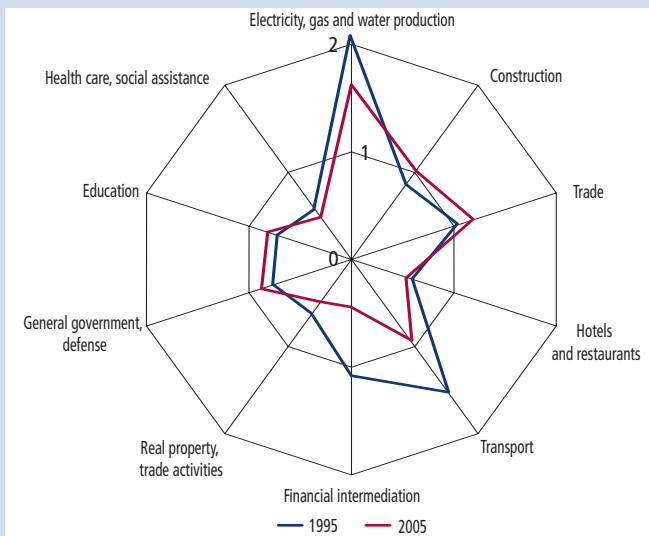*Note: The supply and use tables by commodities and industries are an integral part of the system of national accounts. They show flows of goods and services in the domestic economy and their exchange with foreign countries and at the same time the use of all resident entities during the given period. Methodologically, they have been processed according to the methodology of the European system of national and regional accounts 1995 (ESA 95).*

Concentration indexes of Slovakia in relation to EU-25

Source: Statistical Office of the Slovak Republic and NBS calculations.

A. THE NON-TRADABLE SECTOR OF THE SLOVAK ECONOMY FACES STRONGER FOREIGN COMPETITION

The available data from tables of commodities and industries for 1995 and 2002 imply that the Slovak non-tradable sector is more considerably exposed to competitive imported production, and has a higher import intensity, which weakens its basic initial property – the non-existence of imported competitive production on the domestic market. The share of imports of the following non-tradable commodities increased in 2002 against 1995:
– services of hotels and restaurants (from 0 in 1995 to 28% in 2002),
– water transport services (from 36% to 69%)
– recreational, cultural and sport services (from 2% to 12%),
– also retail, computer, education, health care and social services

B. THE CONCENTRATION OF THE NON-TRADABLE SECTOR IN SLOVAKIA, WHICH HAS BEEN LOW ON A LONG-TERM BASIS, HAS DECREASED OVER THE LAST 10 YEARS

The total concentration level of the non-tradable sector has decreased in Slovakia. The non-tradable sector (except the energy, construction and trade sector) is undersized more than the EU average and it does not participate in the consumer market to the extent (e.g. diversity of services offered) prevailing in advanced countries. What follows is a graphical representation of concentration indexes (expressing the Slovak industry's share of value added of the given EU industry, in relation to Slovakia's valued added's share of EU value added; the value of the index equals 1 meaning that the concentration of the Slovak industry is identical to that of the EU average).

The more the index value is higher than 1, the more the measured Slovak industry is concentrated compared to the EU average. Values below 1 mean that the Slovak industry is undersized compared to the EU average.) The indexes have been calculated from the actual value added valued at basic prices, i.e. excluding taxes and subsidies.

and not even in the medium run sets stages for a rapid shift from the consumption of goods – as a result of saturation of consumption – to the consumption of services associated with a growth of real income of the population;

2. the position of the non-tradable sector in the Slovak economy (box 2), which can weaken the effect of the B-S effect on the consumer market:
• lower concentration of the non-tradable sector in the value added of the Slovak economy,

- higher share of non-tradable imported services as compared to advanced economies

The low level of absorption, however, does not ensure the same dual inflation to Slovakia or to other transitional economies as the dual inflation reached by advanced economies. For example, long-term dual inflation in Germany was 1.2%. Dual inflation in transition economies is usually higher than in advanced economies, as a result of higher relative ULC. On average, Slovakia had the highest relative ULC during the 1996- 2006 period, i.e. the ULC in the non-tradable sector marked the most considerable inflation impulses in the non-tradable sector out of all six countries under comparison (the 6 biggest trade partners). That corresponds to the highest dual inflation with the countries under comparison in the long run. Dual inflation in Slovakia (5.3%) during the 1997-2006 period was on average 3 percentage points annually higher than the average dual inflation in the EU-25 (2.3%).

The above-mentioned lead expresses that the prices of services against goods are growing faster in Slovakia than in the EU-25, but it does not take into account that the share of services in the consumer baskets of the individual countries differs. Hence it does not contain information as to what is the impact of dual inflation on headline inflation. The impact of dual inflation on headline inflation and consumer spending is higher in a country with a higher services' share of consumption than in transitional economy with a lower services' share of the consumer basket.

After recalculation using the weight of services, the long-term average contribution of the broadly defined B-S effect to headline inflation was 1.8 percentage points. In the long run, Slovak inflation has been 0.9 percentage points higher than average inflation in EU-25 countries and 1.2 percentage points higher than in the euro-area, by virtue of the effect of the B-S effect.

Dual inflation has thus contributed to headline inflation on average by 1.8 percentage points annually. It reached its highest contribution in 2001, which however was not due to an accelerated growth of prices of services, but due to a more considerable slowdown of the price growth of goods – factors in the tradable sector. A more considerable slowdown of the growth of prices of services in the following year caused the difference between services and goods to get narrow and the contribution of the B-S effect fell to 1.5 percentage points. The growth rate of the prices of services has been gradually decreasing to its current minimum level in 2006. The slowdown of the growth of prices of services and a parallel slight recovery of the growth of goods prices caused the contribution of the B-S effect to fall to 1 percentage point in 2006, i.e. almost to the level of EU-25 countries (0.9 percentage points), but it slightly exceeded the euro-area level (0.6 percentage points).

Table 5 Average annual dual inflation of selected countries and groupings, 1997 – 2006

	Dual inflation (ratio of services to ind. goods excl. energy within the HICP)	Broadly defined contribution of the B-S effect to HICP in p.p.[1]
EU-25	2.3	0.9
Euro-area (Ea-12)	1.5	0.6
The 6 biggest trade partners:	2.7	1.1
Czech Republic	5.3	1.7
Germany	1.2	0.5
Italy	1.1	0.4
Hungary	4.6	1.4
Austria	2.0	0.9
Poland	2.9	0.8
Slovakia	5.3	1.8
	Long-term lead of Slovakia	
	in dual inflation	in the B-S effect contribution
over EU-25	3.0	0.9
over the euro-area	3.8	1.2

Source: Eurostat (up-date 15. April 2007) and NBS calculations.
1) Contribution after recalculation using the weight of the non-tradable sector of each country or of country grouping (34.1% in Slovakia, 40.7% in the EU-25).

Chart 8 Contribution of the B-S effect to the HICP in p.p.
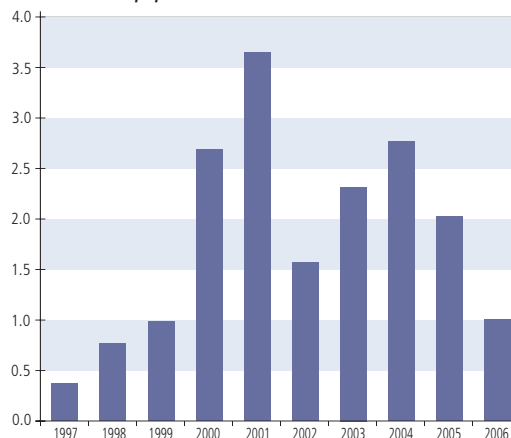
Source: Statistical Office of the Slovak Republic and NBS calculations.

Narrowly defined contribution of the B-S effect to the HICP

The price development of total services within the HICP also reflects administrative price adjustments, which the narrowly defined B-S effect does not take into account, and the non-tradable sector is represented by „market services". The available data regarding HICP in the CPI structure imply that the prices of market services have grown more slowly than prices of total services. The total growth rate of prices of services was thus facilitated by a higher price growth in the field of regulated services.

If we compare the 2002 – 2006 period, the narrowly defined B-S effect contribution to inflation reached the average level of 0.9 percentage

1 Modified approaches to the narrow definition of the contribution of the B-S effect yielded the same result of 0.9 percentage points:
– if it is assumed that the prices of the whole non-tradable sector would have the same development as the „demand services" (as the net representant of the B-S effect),
– as well as in the case of recalculation of the B-S effect for the consumption group „furnishings, household equipment and routine maintenance of the house", which contains both non-tradable and tradable commodities, and which can be considered a possible indicator of demand pressures on the price growth during a period of development of the real estate market and construction boom in the household sector.

points ; the contribution under the broad definition having reached 1.9 percentage points (chart 9). There is no reason for a similarly broad span of the interval of the estimated contribution of the B-S effect in countries with a low intensity of administrative adjustments.

3. MEDIUM-TERM FORECAST OF THE INFLUENCE OF THE BALASSA-SAMUELSON EFFECT (2007-2009)

Reflections whether the B-S effect will increase or decrease in the future, are generally linked to the growth of labour productivity in the tradable sector. These reflections imply that the B-S effect will increase in parallel to a fast productivity growth of the tradable sector. The development so far, however, has not confirmed such a direct connection. In order to achieve an increase of the B-S effect, the other condition must be fulfilled, too – the productivity growth of the tradable sector must be accompanied by an equally fast wage growth in the whole economy, not only in the tradable sector. The wage growth so far has not even reached the growth rate of labour productivity in the tradable sector, which has inhibited the B-S effect. Although wages present a serious risk to future development, it can be expected that they will not reach the productivity growth rate in the tradable sector until 2009. Should the said risk come true, it can be moderated on the consumer market by factors of transmission of negative unit labour cost of the domestic non-tradable sector to consumer prices. The development so far implies that the rate of transmission of relative ULC to dual inflation fell at a single blow during the period of considerable inflation impulses on the part of ULC.

If the B-S effect increased temporarily, that does not mean necessarily that the lead of Slovak dual inflation over dual inflation of advanced countries does have to grow at the same rate. The development so far has featured:
- a period when the B-S reflection in consumer prices rose, but inflation did not rise, e.g. dual inflation went from 6.7% in 2003 to 8.1% in 2004, while inflation measured by the HICP fell from 8.4% to 7.5% in the same period.
- a period when the B-S reflection in consumer prices decreased, but inflation, nevertheless, increased, e.g. dual inflation fell to 2.9% in 2006 from 5.8% in 2005, while inflation measured by the HICP grew from 2.8% to 4.3% in the same period.
- a period when the B-S reflection in consumer prices in Slovakia increased in parallel to the EU-25 and the lead of Slovak dual inflation decreased, e.g. in 2001.

If we assume a continuing effect of the damping factors identified above on a medium-term horizon, the narrowly defined contribution of the B-S effect to inflation measured by HICP should decrease from the level of less than

Chart 9 Contribution of the B-S effect to the HICP (in p.p.)
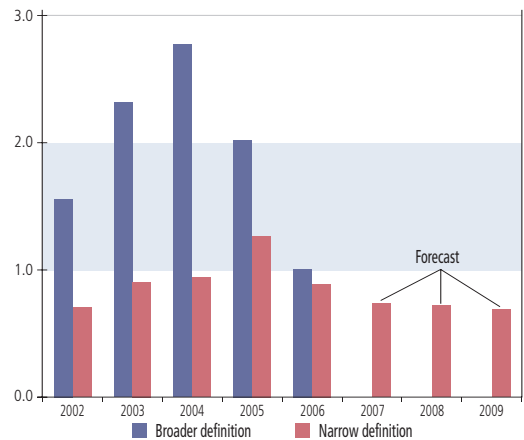
Source: Statistical Office of the Slovak Republic and NBS calculations.

1 percentage point in 2006 to a level of 0.7 percentage points in 2007-2009 (the real HICP development from January to September 2007 showed 0.6 percentage points).

The results are a recalculation of the Medium-term prediction P3Q2007 (GDP, employment, compensations) to a two-sector model of economy under the following assumptions:
- a continuing growth of the tradable sector's actual share of value added
- a decreasing tradable sector's share of employment, which implies
- a higher labour productivity growth in the tradable sector than in the non-tradable sector in each single forecast year, whereby
- the results for the non-tradable sector represent a recalculation to the level of the whole economy.

The forecast of the growth of compensation in the sectors keeps the trends of the hitherto development:
- the growth of compensation in the tradable sector does not reach the growth rate of labour productivity,
- the growth of compensation in the non-tradable sector catches up with the tradable sector, but does not reach its growth rate.

CONCLUSION

The growth of prices caused by the B-S effect is not the result of an inadequate economic, fiscal or monetary policy, but the result of labour productivity growth in the tradable sector. The B-S effect in a low-inflation environment is not a manifestation of a disequilibrium in the economy, because it does not weaken the competitiveness of tradable goods on foreign markets, since inflation grows as a result of the growth of prices of consumption services, which form a negligible part of the foreign trade exchange. The part of the appreciation of the real exchange rate that is caused by the B-S effect does not worsen the competitiveness of domestic exporters.

From the perspective of the household sector, the B-S effect is even a manifestation of a growth of the standard of living, because the prices of services can grow only in the circumstances of sufficient income and of a growing consumer demand. Growing prices of services can set the stage for a development of the service sector and for employment growth, i.e. a convergence of the characteristics of the domestic non-tradable sector towards the euro-area level.

Considerable impulses of the B-S effect were generated in the Slovak economy in the 1997-2006 period. The labour productivity growth in the tradable sector indicated a fast growth of the prices of services. Nevertheless, the real impact of the B-S effect on inflation was relatively low compared to the primary impulse, although it caused inflation in Slovakia to be 1.2 percentage points higher as compared to the euro-area countries and 0.9 percentage points higher as compared to EU-25 countries.

The transmission of considerable impulses to prices has been inhibited both at the value-added deflators level and at the consumer prices level. The damping factors in the production process were a lower growth of wages than growth of labour productivity in the tradable sector, an imperfect mechanism of wage equalization between the tradable and non-tradable sector and the ability of the non-tradable sector to compensate for the wage growth by a labour productivity growth. The relatively low purchasing power of Slovak households and the import of services into the "non-tradable" sector in the Slovak economy can be considered damping factors on the consumer market.

Provided that the intensity of the effect of the damping factors will remain unchanged in the medium run, the average contribution of the B-S effect to inflation could be 0.7 percentage points in 2008-2009.

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