PRICES FOR WELFARE
OR Another way to distribute growth

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1) A <u>RETROSPECTION</u> OF THE BELGIAN ECONOMY <u>FROM 1954 TO 1992</u>

- <u>A) The growth :</u>

In Belgium, during the period from 1954 to 1992, the Gross Domestic Product (GDP) was multiplied by 16 but the price level increased too.

During this period, the price level (p) was multiplied by 5.

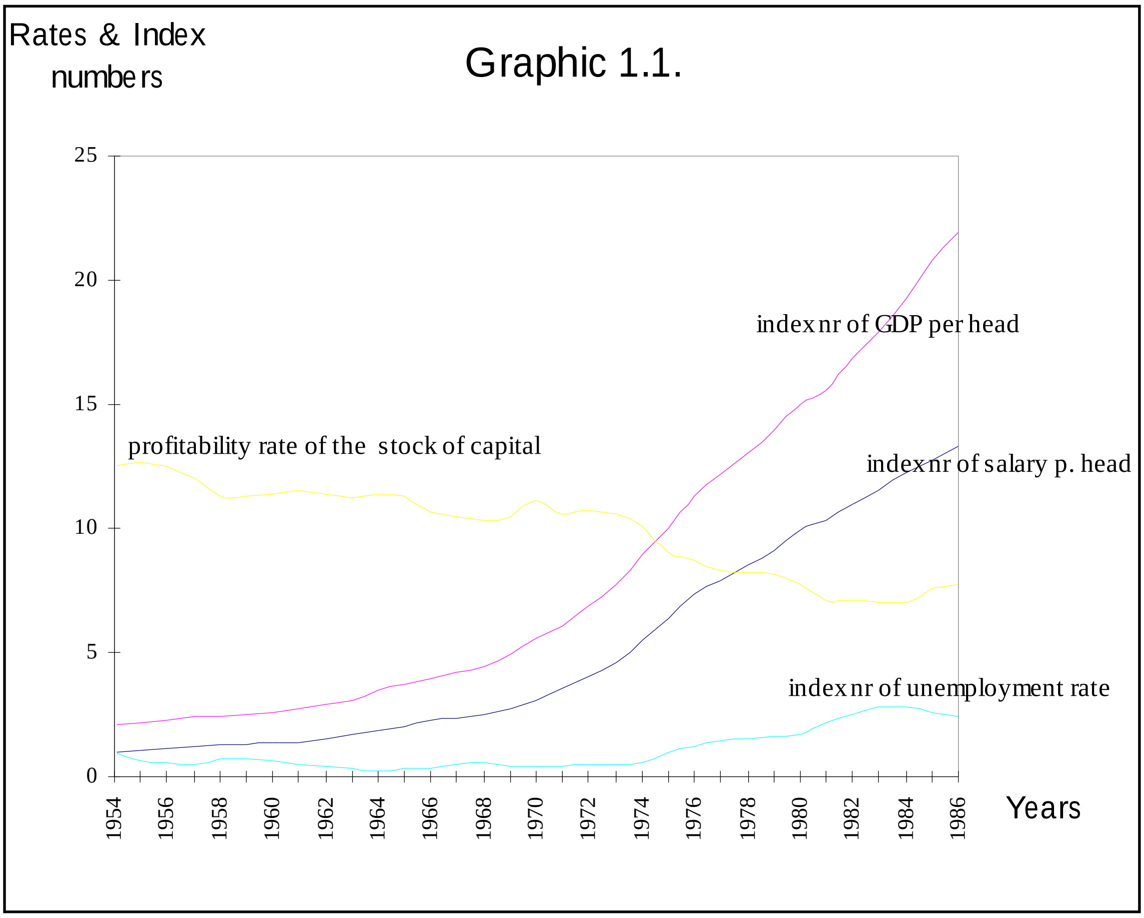
Subsequent to this increase, the real GDP (GDP/p) that gives a better figure of the growth of the real product was multiplied by 3,3.

The total produced wealth that trebled during this period led depending on the participants to a big increase of the wealth of some ones, a lesser increase of some others and a decrease for another part of the participants.

It is then useful to analyse the way growth was distributed during this period. We do not aim here at observing a complete distribution of the revenues but only the great trends. We conclude that it is very difficult to avoid growth to generate inequality and exclusion.

- <u>B) The distribution of growth:</u>

<u>GDP, salaries, profitability of enterprises and unemployment</u>



Evolution of the cake and the way it is shared out from 1954 to 1986
Data from : INS, BNB, Bureau fédéral du Plan

In 1954, the index number of salary per head was 1 when GDP index number was twice this level.

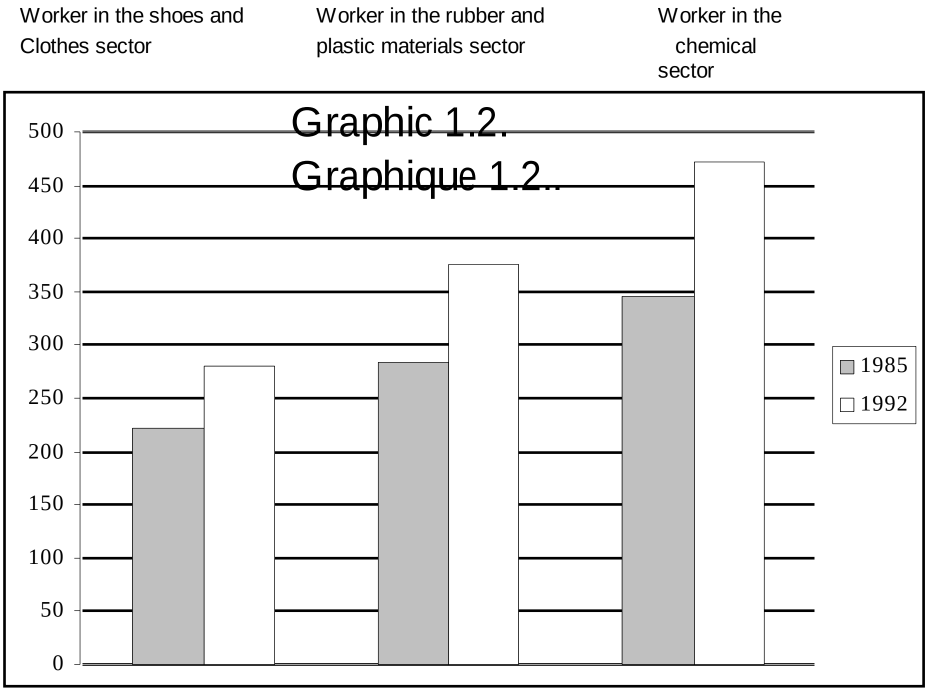
In 1986, salaries were 13 times what they were in 1956 when the GDP being the total of inland revenues reached only a multiple of 10 of what it was in 1956. Subsequently, the GDP was in 1986 only 1,6 times the salaries level.

During this period, *R*, which is the rate of profitability of the stock of capital, HAS FALLEN. Look at the decreasing curve on the graph.

The rising curve at the bottom of the graph figures the unemployment rate. The unemployment rate index number that was 1 in 1954 attained 2,5 in 1986.

Furthermore, as we will be shown hereunder, the decrease of the rate of profitability led to some extent to an investment crisis.

2nd reason for difficulty : Not everybody got the same part of the growing cake

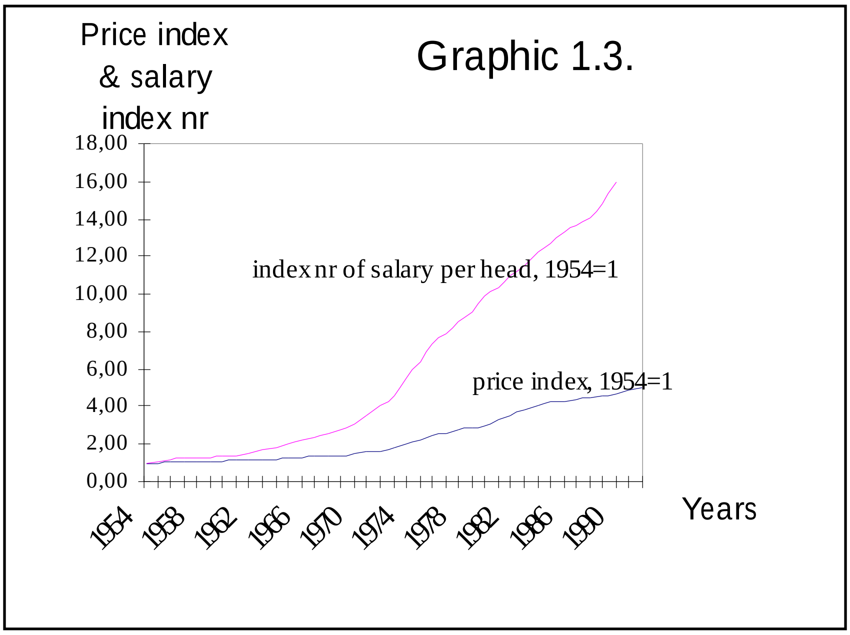


Gross hourly wages differences depending on the industry (BEF per hour)
Data from : INS

On the graph, we compare the evolution from 1985 to 1992 of the revenue of the worker in the shoe and clothes sector on the one hand with the one of the worker in the rubber and plastic materials sector on the second hand and with the one of the worker in the chemical sector on the third hand. We must state that the worker of the chemical sector has been able to increase his share in the growth more than a proportioned part of his starting revenue and more than the part of the other workers.

3rd difficulty : Salary level and price level are closely linked together

Several theories clearly showed the link between salary level and price level *(1)*. In fact, we observed in Belgium during the period 1954-1992 a very strong correlation that is quite evidence. The correlation coefficient reached 0,996 *(2)*.



Evolution of salaries and prices in Belgium from 1954 to 1992
Data from: BNB, INS

4^{th} difficulty Link between Inflation, Interest rate and Money value

Some correlation coefficients can show as well as graphic 1.1. the consequences on the competitiveness of enterprises and on the unemployment generated by a loss of control over salaries.

Price level	VERSUS Interest rate	= 0,83.
Interest rate	VERSUS Profitability of enterprises	= -0.82
Salary per head level	VERSUS Profitability of enterprises	= -0,82
Profitability of enterprises	VERSUS Unemployment rate	= -0.91

For the links with the money market, see the reference book *(3)*.

5th difficulty : Crisis seems to be unavoidable

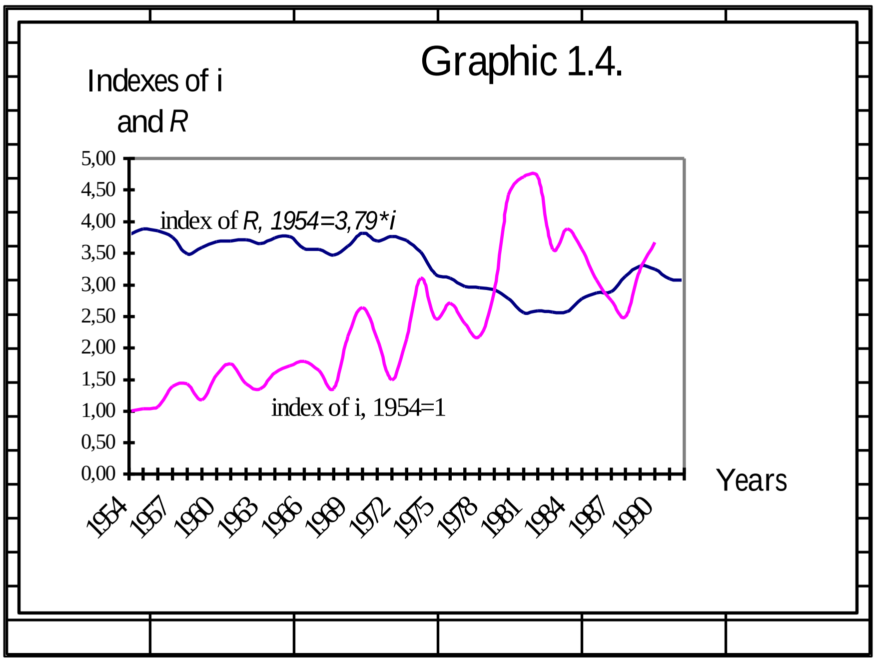
When the costs approach or go beyond the profitability of enterprises, a crisis occurs. The quotient: *Profitability of enterprises (R)* over the *Interest rate (i)* is a good crisis indicator as is underlined by the hereunder table and graph. (A theoretical quotient *R*/i=1 means that the profitability hardly covers the interest expense. This quotient must be handled with the same caution as would be with a ratio).

The period 1954 to 1992 is spread in the following table over small periods of 8 years each.

TABLE 1.1.

		R/i	Invest.	
Average	1955-1963	2,69	6,46%	
Annual value	1964-1972	2,03	4,15%	
of the period	1973-1981	1,04	-0,95%	Invest (1981)= -20,21%
	1982-1990	0,91	5,28%	Invest (1991)= -5,06%

During the last two periods of 8 years, the profitability of enterprises has been strongly weakened to the extent that in 1981, the quotient *R/i* reached only 0,54. The investment has been strongly affected by the situation and knew in 1981 a decrease of 20%. A severe drop happened in 1991 too. The following graph that shows the evolution of the profitability of enterprises on the one hand and the evolution of the rate of interest on the other hand can even be more speaking to us. Each time the rate of profitability of enterprises was overtaken by the rate of interest, a crisis occurred.



Evolution of the rate of interest and the rate of profitability of capital from 1954 to 1990
Data from : INS, BNB, Bureau Fédéral du Plan

C) Conclusions

- The framework of the analysis is the monopolistic competition with the presence of *overpaid factors* due to wage-setters and price-setters behaviours.
- The real economic universe is called Antagonistic Distribution because individuals behave on different ways to raise their revenue depending on the power they have when negotiating the share of the growing cake. With some consequences (see above). Indeed, they want to increase their purchasing power (R/p) by having their revenue increased (R, i.e. the numerator part of the purchasing power) but they trigger off an inflationist phenomenon.
- They expect $E(R^{\nearrow}/p)$ but get in reality $R^{\nearrow}/p^{\nearrow}$ +unemployment

2) MOTIVATIONS

The above shows that there were big incentives to achieve this research. The aims of the research were to find out a model that distributes growth without involving crisis by itself and that brings with it stability of macro-economic parameters (money value, interest rate, budget surplus, competitiveness).

- A fictitious model was proposed by the searcher and compared with the results of the real universe.
- The retrospective way of analysing avoid taking prospective hypothesis, by example about the tax level or about parameters that are outward the inland production process. This retrospective research can be easily applied thanks to the used methodology (see hereunder).

3) COMPARISON OF A REAL UNIVERSE WITH A FICTITIOUS MODEL in a retrospective analysis

- We demonstrate *(4)* that the comparison between both models can be made equally by comparing for a given individual either his utility or his purchasing power.
- The alternative model is called Uniform Distribution because revenues are held constant while price level decreases. We demonstrate *(5)* that, for each individual, it is the same as to multiply his starting purchasing power by the rate prices are reduced.
- They would then obtain $R^{\rightarrow}/p^{\searrow}$
- It could seem paradoxical to talk both about a fictitious model and about a retrospective research. It is the used methodology we present hereunder that allows the searcher to achieve this challenge.

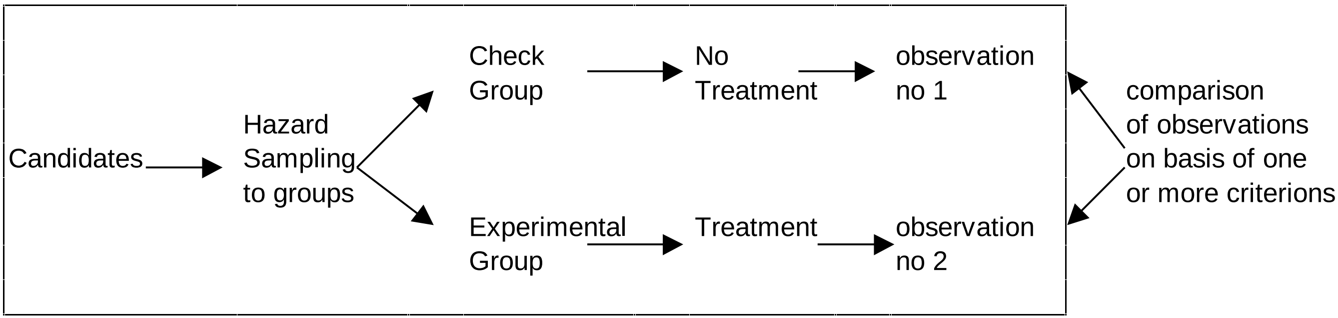
4) METHODOLOGY

The comparison uses a methodology that is very similar to experimental research (see hereunder)

A) Experimental research

During an experimental research, a medicine is tested. Nevertheless, only the experimental group gets the treatment. The check group receives the placebo. The effectiveness of the treatment is judged by comparing both groups on basis of one or more criterions.

TABLE 1.2.



In our analysis, the check group is the real universe and the experimental group is the fictitious model. The treatment is made up of a formula that allows us to extract the endogenous effect on prices. The endogenous effect (*e*) is the increase in price level due to the antagonistic behaviour of production factors. The comparison criterion is as we already said the purchasing power.

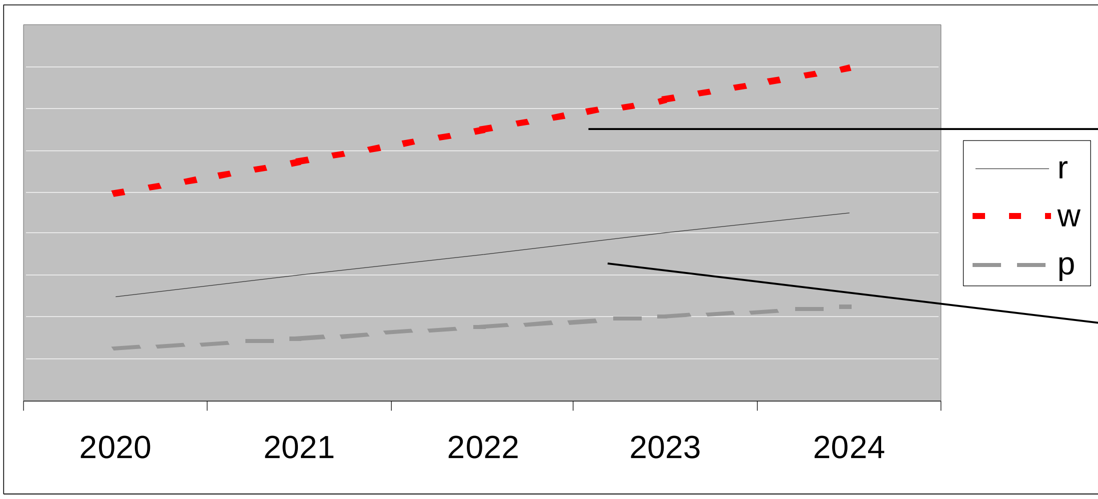
B) The formula (treatment)

- We get the formula by theoretically converting growth in decrease of prices rather than an increase in revenues.

- Simplified Graphical presentation of the formula that aims at making the process clearer

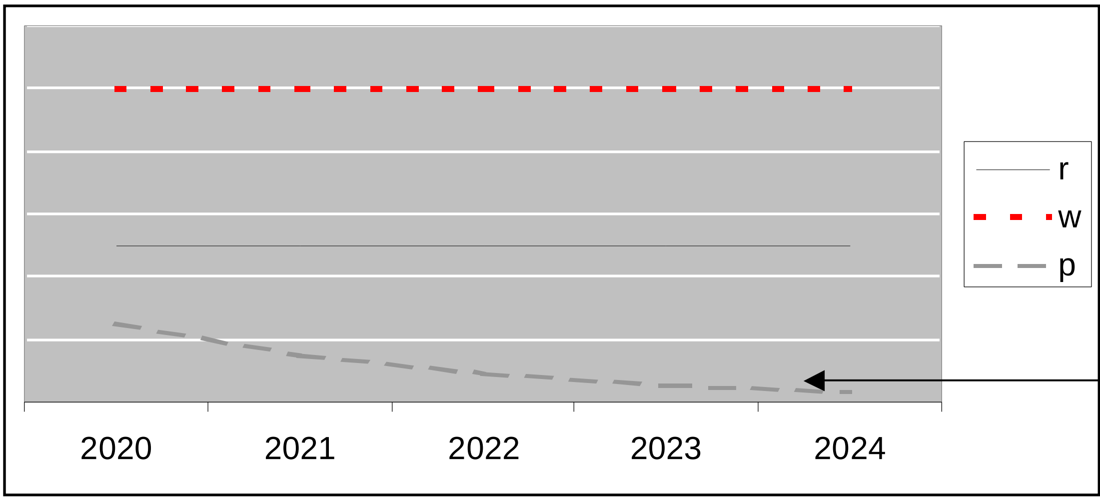
  Let w be the hourly wage of workers, r, the revenue per capital stock unit and p, the price level.

  Antagonistic distribution : Individuals try to get the higher possible share in the growth and prices increase.



Uniform distribution : Revenues are held constant and prices decrease

FORMULA



GRAPHIC 1.5. and 1.6.
Graphical presentation of *antagonistic distribution* and *uniform distribution*

- Simplified mathematical presentation of the formula

Let L be the number of workers in the economy, K, the stock of capital and Y, the real product of the economy. Y*p is the production converted at the current selling prices, i.e. the net receipt *(6)* to distribute. w*L are the total gross wages paid and r*K are the gross revenues of enterprises.

At the beginning of a period, we then get the following distribution function.

Y*p = w*L + r*K 1.1.
The « net receipt » is distributed between salaries and gross revenues of enterprises.

Let's write Δ before a variable when it changes as time goes on, by example ΔL is the increase or decrease in the working population. Let *e* be the endogenous effect on prices and let *x* be the exogenous effect *(7)* on prices.

As times goes on,

In the *Antagonistic distribution,* equation 1.1. becomes the following one.
(Y+ΔY)*(p+*e*+*x*) = (w+Δw)*(L+ΔL)+(r+Δr)*(K+ΔK) 1.2.
The price level, p, knows an increase of *e* because of the individuals behaviour and a further increase of *x*.
In the *Uniform distribution,* the equation is converted into a new one
(Y+ΔY)*(p-*e*+*x*) = w*(L+ΔL)+r*(K+ΔK) 1.3.
The endogenous effect is transferred to prices (p-*e*) by neutralizing the antagonistic behaviour.
The difference between both models (equation1.2. less equation 1.3.) makes equation 1.4.
2*e*(Y+ΔY)=Δw*(L+ΔL)+Δr*(K+ΔK) 1.4.

We could extract the endogenous effect *e* from equation 1.4. but this would give wrong figures, see hereunder (*)

Furthermore, we can deduce from 1.2. and equation 1.3. the following equality that is right.
Uniform price = antagonistic price - 2*e
(p-*e*+*x*) = (p+*e*+*x*) -2*e

(*) This presentation is still a simplified one because it does not take into account the interactions between Capital and Labour *(8)*. Because the formula aims at determining an endogenous level of price, many precautionary measures have to be taken when handling price indexes *(9)*. By example, Y, the real product is a macro-economic calculus obtained by dividing the GDP with the current level of price. The last one includes therefore an endogenous effect and an exogenous effect as well *(10)*. Furthermore, the gross revenue capital, r, must keep a sustainable level not to handicap growth. *(11)*. This is not an exhaustive list of precautions.

5) SOME RESULTS

During the period from 1955 to 1963, the aggregate level of price would have known a 75% reduction thanks to the uniform model.
During the period from 1964 to 1972, a further decrease of 55% could have occurred.
During the period from 1973 to 1981, period with two petroleum prices booms, the uniform model would not have been able to prevent price levels to increase on average of 2,5% a year. Nevertheless, the very strong enrichment that has come in the former periods would have made bearable this impoverishment. Subsequently, the period thereafter would have been very promising.

After having computed the price levels we can compare the purchasing powers at the end of each period. We tough have to include in the comparison the decrease that has occurred in the average conventional working time. Indeed, the leisure makes part of the individuals' utility.

We conclude that the less powerful individual as well as the medium individual will indisputably choose the «uniform distribution». The most powerful individual will also, as we showed it *(12)*, prefer it if he can consider his revenue on a long-term basis.

6) IN THE REFERENCE BOOK *(13)*

We demonstrate that

1) The uniform model keeps the advantages of a monopolistic competition but with a level of production and of welfare that is nearer to the one of the pure competition. It takes also into account some given ethical and governmental constraints (retrospective analysis).

2) Each individual, how powerful he can be, is keen to prefer « uniform distribution » if he can consider his revenue evolution on a long-term basis.

3) Utility and purchasing power are equal criterions to judge the difference between an uniform model and an antagonistic one.

4) The « uniform distribution » accounts for :

    - Stability of exchange rate, interest rate and money supply
    - A better competitiveness of the Nation.
    - An improvement of the State budget.
    - An automatic transfer to poor countries
    - A relative stability of the prices of raw materials

5) The « uniform distribution » returns a superior level of welfare owing to the fact that it favours the consumers' surplus rather than the producers' one.

6) The formula that accounts for the reduction of price uses the following effects
    - The output effect of productivity gains (a larger production with the same resources level)
    - The substitution effect of productivity gains (a same level of production is obtained with less resources)
    - It takes into account the transfer of workforce from a sector to another

We give an handbook *(14)* to allow anybody to calculate the reduction of prices and use this method of comparison on other periods or other countries

SEE APPENDIX: HOW TO CALCULATE THE REDUCTION OF PRICES

Notes

(1) Layard Richard & Nickell Stephen & Jackman Richard, (1991), *Unemployment Macroeconomic performance and the Labour Market*, Oxford University Press, New-York
(2) The correlation coefficient measures to which extent the evolution of two variables goes in the same way or in an opposite way or if they are not correlated together. A coefficient near to 1 indicates a similar evolution. A coefficient near to –1 indicates a totally opposite evolution. A coefficient near to 0 indicates that both variables have no correlated evolution.
(3) See Berti (2001, p 95-109)
(4) See Berti (2001, p 289-293)
(5) See Berti (2001, p 287)
(6) i.e. net of intermediate consumption as we are talking about added value.
(7) The exogenous effect generated by factors that are external to the production process, by example petroleum prices booms, the increase or decrease of the VAT rate.
(8) These interactions are spread in the reference book between « output effect », « substitution effect » and « transfer of workforce from a sector to another ».
(9) See Berti (2001, p 197+209+353+356+363+393)
(10) See Berti (2001, p 369-370)
(11) See Berti (2001, p 197-200)
(12) See Berti (2001, p 300-311)
(13) Luciano M. BERTI, (2001), *Le prix pour le bien-être ou une autre manière de répartir la croissance*, Publibook, Paris
(14) See Berti (2001, p 407-409)

Le prix pour le bien être (2001) de BERTI Luciano M., Publibook, Paris
May be obtained (French version only)

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Any question, do not hesitate to contact me at luciano.berti@belgacom.net
(also if you need a French translation of the herewith presentation)

APPENDIX: HOW TO CALCULATE THE REDUCTION OF PRICES

There is a second approach, which takes into account the Fisher effect (i.e. the decrease in interest rate following a decrease in prices that can account for a further endogenous decrease in prices) but it will not be shown hereunder. Anyway, the impact of the second approach is very weak.

Just a foreword: The subscript 0 indicates the starting year of the period so that t_0 is the starting year, the subscript t indicates the current year and the subscript n indicates the ending year of the period so that t_n is the ending year

1) Index base period: In the formulae we had to change the price index at start (p_0) obtained in a base period ($t_{*=100}$) into a price with base period $t_{0=100}$ so that $p_{0(t0=100)}$ is equal to 100. We then had too to change in the formulae the other price indexes into prices where base period is $t_{0=100}$. By example, if we look at a period of eight years from 1955 to 1963, $P_{1955(1980=100)} = 33$ makes $P_{1955(1955=100)} = 100 = p_0$ and $P_{1963(1980=100)} = 38$ makes $P_{1963(1955=100)} = 38*100/33 = 115.15 = P_n$. This changeover allows us to express the difference between the price level at start and the ending price level obtained by the uniform distribution ($P_n^@$ - p_0) in a percentage of price reduction.

   By example, if the fictitious model gives $P^@_{1963(1955=100)}$ = 26.69 then the price reduction would be (26.69-100)/100 = -73.31%.
2) The period under review: We must use short periods (not longer than 8 years but not shorter than 2) because the more the period is long the more some approximations in the calculus are big. If we want to study longer periods, we would better combine consecutive percentages of reduction of prices in the following way. Let Red_{perp} be the price reduction percentage and let p be the period for periods amounting from 1 to N, we get.

   $p0*(1+Red_{per1})*(1+Red_{per2})*\ldots*(1+Red_{perN})$

   or

   $p0*\prod_{p=1}^{N}(1+Red_{perp})$

   By example, we know that from 1955 to 1963, thanks to the uniform distribution prices could have been granted a reduction of 73.31% and that from 1964 to 1972 a further reduction of prices of 54.19% could have happened we can calculate the price level we would have known at the end of 1972 in the following way, $P^@_{1972(1955=100)}$ =100*(1-0.7331)*(1-0.5419)= 12.23 i.e. a total reduction of prices of 87.77%.

3) The formulae: On the one hand, we have built the main formula, which produces the endogenous effect, and on the other hand, we get the derivative formulae that are provided by using the main one. The theoretical background that led to the conception of those formulae is completely explained in the reference book.

a) The content of the formulae:

- R_0 is the rate of profitability of enterprises (stock of capital) at the beginning of the period (%).
- GRE_t are the Gross revenues of enterprises at the current price of year t (million BEF).
- GWP_t are the Gross wages paid to workers at the current price of year t (million BEF).
- GDP_t is the Gross domestic product at factor cost and at the current price of year t ($GDP_t = GWP_t + GRE_t$ – million BEF).
- I_t are the total of the investments at current price of year t (million BEF)
- StK_t is the stock of capital of year t expressed in BEF of year Y (million BEF).
- N_t is the total employment measured in amount of employed workers in the year t (thousand of persons).
- H_t is the average and contractual yearly total of working hours per worker (hours)
- t* is the index base period from which P_n is initially produced (remember that P_n and p_0 are thereafter brought into an index base period t_0=100). If the initial index base period of P_n is 1980=100 then t* is 1980=100 and so on…
- B is any index base period (1980=100 or 1988=100 or 1995=100,…).
- XX and P_n' are 2 intermediate values.
- P_n is the ending price level in the real world. It is brought back to an index base period t_0=100, p_0 is the starting price level in both models =100
- $P_n^{@}$ is the ending price obtained by the uniform distribution, x is the exogenous choc on prices and *e* is the endogenous one.

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b) The main formula:

$$e = \frac{p_{0(t0=100)} + (P_{n(t0=100)} - p_{0(t0=100)}) * \dfrac{XX}{GDP_n * P_{n(t0=100)} / P_{n(t^*=100)}} - P_n'}{1 + \dfrac{XX}{GDP_n * P_{n(t0=100)} / P_{n(t^*=100)}}}$$

(2.1.)

see NOTE 1 below.

with

$$P_n' = \frac{P_{n(t0=100)}}{GDP_n * P_{n(t0=100)} / P_{n(t^*=100)}} * XX$$

(2.2.)
See NOTE 1 below

And

$$XX = R_0 * \sum_{t=1}^{n} \left(I_t * p_{0(B)} * (n-t+0.5) / P_{t(B)} \right) - GWP_0 * (1 - N_n * H_n / N_0 * H_0) + GDP_0$$

(2.3.)
see NOTE 2 below

where

$$R0 = \frac{GRE_0}{StK_{t-1(BEF\_of\_yearY)} * p_{0(B)} / P_{yearY(B)}}$$

(2.4.)
see NOTE 3 below

NOTE 1: P'_n is an intermediate value because calculated as if P_n only held in the endogenous choc but in fact it contains also the exogenous choc. Therefore it led us to build the intricate formula for calculation of e (2.1.). We were shown that P_n is brought from a t* base index period into a base period index t_0=100. It means that we performed following multiplication $P_{n(t0=100)} = P_{n(t^*=100)} * P_{n(t0=100)} / P_{n(t^*=100)}$. In order to let P_n/GDP_n keep the same value, we have to multiply GDP_n by $P_{n(t0=100)}/P_{n(t^*=100)}$. This holds for equation 2.2. but for equation 2.1. (which comes from the former one) too.
NOTE 2: As P_0/P_t is a quotient of indexes we only need to make sure that the index base period of both indexes is the same to get a right figure.
NOTE 3: As P_0/P_{yearY} is a quotient of indexes we only need to make sure that the index base period of both indexes is the same to get a right figure.

c) The derivative formulae:

Now that we know the endogenous effect e, we are able to calculate the exogenous effect x and the reduced price level obtained by the uniform distribution i.e. $P_n^{@}$

$$x = P_{n(t0=100)} - p_{0(t0=100)} - e \quad (2.5.)$$

$$P_n^{@} = P_{n(t0=100)} - 2*e \quad (2.6.)$$

4) <u>An example:</u>

Let's give an example for a better understanding of the above calculus. We examine the period from 1955 to 1963 in Belgium. Basic data will be in BEF even if this currency is no more a legal tender. This allows us to be coherent with the collected data in the reference book that was written in 2001 before the Euro went in current use (data from INS, BNB, Bureau Fédéral du. Plan).

Let's calculate:

$R_{1955} = GRE_{1955}/(StK_{1954(BEF\ of\ 1990)}*P_{1955(1980=100)}/P_{1990(1980=100)})$

$R_{1955} = 209{,}751/(9{,}107{,}328*33/156) = 10.89\%$

Let's calculate now:

$XX = R_{1955} * \big(I_{1956}*P_{1955(1980=100)}*(8-1+0.5)/P_{1956(1980=100)} + I_{1957}*P_{1955(1980=100)}*6.5/P_{1957(1980=100)} + I_{1958}*P_{1955(1980=100)}*5.5/P_{1958(1980=100)} + I_{1959}*P_{1955(1980=100)}*4.5/P_{1959(1980=100)} + I_{1960}*P_{1955(1980=100)}*3.5/P_{1960(1980=100)} + I_{1961}*P_{1955(1980=100)}*2.5/P_{1961(1980=100)} + I_{1962}*P_{1955(1980=100)}*1.5/P_{1962(1980=100)} + I_{1963}*P_{1955(1980=100)}*0.5/P_{1963(1980=100)}\big) - GWP_{1955} * (1-N_{1963}*H_{1963}/N_{1955}*H_{1955}) + GDP_{1955}$

XX = 10,89% * (92,100*33*7.5/34+97,700*33*6.5/35+86,400*33*5.5/36+97,100*33*4.5/36 +107,407*33*3.5/36+125,547*33*2.5/37+134,725*33*1.5/37+143,286*33*0.5/38) -199,304* (1-3,656.6*2,098/3,660.9*2,255) +409,055 = 718,568

Let's calculate then:

$$P_{1963}' = \frac{P_{1963(1955=100)}}{GDP_{1963}*P_{1963(1955=100)}/P_{1963(1980=100)}}*XX$$

P_{1963}' = [115.15/(613,312*115.15/38)]*718,568 = 44.52

Let's calculate finally:

$$e = \frac{p_{1955(1955=100)} + (P_{1963(1955=100)} - p_{1955(1955=100)}) * \dfrac{718{,}568}{GDP_{1963} * P_{1963(1955=100)} / P_{1963(1980=100)}} - 44.52}{1 + \dfrac{718{,}568}{GDP_{1963} * P_{1963(1955=100)} / P_{1963(1980=100)}}}$$

$$e = \big(100+(115.15-100)*718{,}568/(613{,}312*115.15/38) - 44.52\big)/\big(1+718{,}568/(613{,}312*115.15/38)\big) = 44.23$$

Now,

$$x = P_{1963(1955=100)} - p_{1955(1955=100)} - e = 115.15 - 100 - 44.23 = -29.08$$

And,

$P^{@}_{1963} = P_{1963(1955=100)} - 2*e = 115.15-2*44.23 = 26.69$ i.e. a reduction in price level of 73.31%

5) Comparison of purchase power for the former example

The purchase power is the criterion on which the comparisons are based to judge the fictitious model (uniform distribution) against the real model (antagonistic distribution). In order to look at what the ending purchase power becomes in each model for the period 1955-1963, we use the index of the gross hourly wage of the mean worker (data from BNB). Let GHW be this value. Catching it from an index base period 1980=100, we write $GHW_{1955}=11$ and $GHW_{1963}=17$. The utility contains the purchase power but also leisure. To be complete, we must take into account the reduction of contractual yearly working hours. We look at two cases. The mean case= the leisure of the worker has the same utility than the wage he receives. We then do not have to take into account the reduction of working time. The worse case= the leisure brings an utility=0. We then have to reduce the worker's gain proportionally to the reduction of working time, i.e. multiply it by H_{1963}/H_{1955} (with $H_{1963} < H_{1955}$). With the uniform distribution, at the end of the period, the mean worker will get a gain of $GHW_{1955}=11$ with a price level $P^{@}_{1963} = 26.69$ when with the antagonistic distribution he would get $GHW_{1963}=17$ with a price level of $P_{1963}=115.15$

In the mean case,

The antagonistic purchase power index= $GHW_{1963}/P_{1963}=17/115.15=0.148$
That is far lower than
The uniform purchase power index= $GHW_{1955}/P^{@}_{1963} =11/26.69=0.412$

In the worse case (leisure=0 and the worker may in the antagonistic distribution refuse any reduction of his working time when in the uniform distribution he may not. These are very strong hypotheses), The antagonistic purchase power index = 0.148

And the uniform purchase power index = $0.412*H_{1963}/H_{1955}$=0.412*2,098/2,255=0.383

Even in the worse case, the deal is won.

6) A good historical knowledge of the economy under review is necessary.

It is not possible to achieve the research without some historical knowledge of the economy under review. By example, in Belgium from 1973 to 1981, the exogenous effects due to the petroleum price booms would have triggered off an increase of the price level even in the uniform distribution to a lesser extent nevertheless. Despite those rising prices, the won benefits of the model would have been widely saved.
In the period 1982-1990, the purchase power of the mean worker fell on average of 0.15% a year. So, if one wanted to apply an uniform distribution to this period and maintain his revenue at the same level it was at the beginning of the period, a price increase would not have been avoidable. Though, this bad situation would not have been necessary if at the beginning of former periods an uniform distribution was in use. More details about this analysis can of course be found in the reference book.

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