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Technological Change and Employment – Technological Unemployment. Quantitative Investigation based on Input - Output Tables

by
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Introduction[1]

Since the 1970s, technological unemployment has gradually become a serious threat in developed countries. During this period, all OECD countries began recording a high rate of unemployment. The greatest technological change took place in manufacturing, resulting in a sharp reduction in employment.[2] Subsequently, in a number of countries the increase in employment seen in the services sector, which absorbed the labour displacement in manufacturing, began to slacken off. It has since been ascertained that the new information technologies gradually lead to significant labour displacement also in the services sector[3].

The issue of technological unemployment is an important one in the present period for Greece also. According to some views, a considerable percentage of unemployment is technological unemployment, while according to others technological unemployment does not constitute a significant problem. There are also some who believe that technological unemployment in Greece is not important, given that the technological

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1. J would like to thank the assistant professor Th. Mariolis for his valuable advice in performing this study.

2. "They cannot provide a final answer to the long run question of how to enable a modern industrial society to derive the benefits of continued technological progress without experiencing involuntary technological unemployment and resulting social disruption". Leontief, W., Input-Output Economics, Oxford University Press, 1986, pp. 372

3. Erturk, K. *Heterodox Theories of Technological Unemployment: Towards a Synthesis*, in Competition, Technology & Money: classical and Post-Keynesian Perspectives (New Directions in Modern Economics Series), Edited by Mark A. Colich, Edward Elgar Publishing Company, 1994.

change which has taken place in the country in recent years has not been substantial.

For the purpose of this investigation, it is necessary to define and empirically determine the concept of technological unemployment within the context of the Greek economy. Generally speaking, technological unemployment is considered to be all unemployment resulting from the direct replacement of human labour by machinery. However, this simple definition creates certain important conceptual problems with respect to the notion of technological change:[4]

In every case, technological unemployment depends on the factors, which determine the rates and extent of technological change.

According to Neoclassical economists, even if technological change reduces labour demand in a number of branches, through the price mechanism and above all wage flexibility, the unemployment is absorbed in other branches of the economy. According to certain classical economists[5], technological change leads, first of all, to unemployment but also to an increase in the rate of profit and accumulation, which ultimately results in the absorption of unemployment. However, this process does not take place

4. According to the literature, although technological change is usually incorporated in new machinery, the concept of technological change also includes changes in the organisation of production as well as in economic activity, which may be accompanied by the use of new machinery, but not necessarily. Second, for technological unemployment to be caused, the discovery of some new machine, material or technique is not enough. Even its limited practical application is not enough. The innovation in question must be used widely in order for there to be significant results at the level of employment in the companies of the various branches. This dimension can be seen in the distinction made between 'invention', 'innovation' and 'diffusion of new technology'. Third, the diffusion of new technology must take place in a short space of time, so as to create impacts without allowing slow processes of adjustment to be completed.

5. Ricardo argues that technological change can indeed lead to a reduction of the wage fund. Ricardo, D., *On the Principles of Political Economy and Taxation.* "The works and correspondence of David Ricardo", edited by Pierro Sraffa, Cambrigde University Press, 1975, chapter '*On Machinery*'. Marx too notes that the increase in the number of employed workers depends on the proportionally much more rapid growth of the total capital invested in factories. This process takes place however only in the context of the ebb and flow of the industrial cycle. Moreover, it is constantly interrupted by the technical progress that at one time virtually supplies the place of new workmen, at another, actually displaces old ones. Marx, K. " Das *Kapital*' I , Verlag Ullstein GmbH,1969, p. 409.

automatically and without friction: The accumulation of capital is the most important factor for the absorption of labour that has been displaced, due to the increased capital intensity and productiveness of labour. Labour productivity increases unemployment in the short run, but in the long run it increases the rate of profit and accumulation. The accumulation of capital goes through crises from time to time and creates structural transformations. Workers are displaced from older branches that are replaced by new ones, which, however, generate a new absorption of labour.

The issue regarding the appearance of innovations is one that involves the development of innovations, which create new branches or modernise old ones. Few innovations are introduced in periods of expansion of the economy – recession sparks radical innovations (new products), which temporarily increase unemployment, but create possibilities for the re-absorption of unemployment. Thus, recession creates conditions for a long-term recovery and leads to changes in the structure of production. While it is recognised that two different types of innovation may be similar to one another in the way they displace labour, the process of labour re-absorption, which is associated with these types of innovations differs substantially. When technological innovation is concentrated in 'old' branches, it causes a major displacement of labour and creates only a slight or even no absorption of labour in those branches. In contrast, technological innovation in new products and services, with its proactive and retroactive effects, gives rise to significant labour absorption. The main problem is that with the ongoing creation of new specialisations and the superseding of old ones, technology itself places limits on the possibility of the direct replacement of labour by capital.

Overall, one could venture the conclusion that technological unemployment is caused by a deceleration of growth, which is then followed by a series of 'modernising' innovations, which have only a weak effect on the absorption of labour. At the same time, there is a massive increase in products and fixed capital, which fall into disuse, the productiveness of labour rises and new specialisations are created. Together, all the above factors eventually increase unemployment further[6].

It is clear from the above that technological unemployment does not exist in a pure form: it is always accompanied by other forms of

6. Erturk K. Ibid, p. 87.

unemployment, such as structural unemployment and cyclical unemployment.

Technological unemployment should not be confused with structural unemployment. As noted previously, according to the literature the former is due to the replacement of human labour by machinery, on a significant scale and at fast rates. It may create forms of structural unemployment, since it generates needs for new specialisations and labour skills, but then again this may not happen. In contrast, structural unemployment is due to the lack of correspondence between the labour skills and qualifications of the unemployed on the one hand, and the demand of employers for skills and qualifications in order to fill job vacancies on the other.

Technological unemployment differs qualitatively from cyclical unemployment, which, according to the literature, is due to the tendency of companies, in periods of prolonged economic recession, to resort to lay-offs because of the decline in demand for their products. Indeed, while in the case of cyclical unemployment companies respond to the increase in demand which accompanies the forthcoming recovery by rehiring personnel, in the case of technological unemployment they do not respond with new hirings, because there is already additional production capacity due to the increased productivity resulting from the adoption of new technologies and new forms of organisation and management.

It should be stated at this point that the empirical determination of technological unemployment in a specific country presents serious problems, which this paper does not tackle in their full extent. The aim of this paper is to empirically examine the prerequisites for determining technological unemployment in Greece and provide a initial answer to the problem in order to facilitate its further investigation.

The problem of measuring technological unemployment

Looking at the literature, one can see a number of indicators, which approximate an empirical measurement of technological unemployment.

a) The methodology of Input-Output Tables determines the direct labour coefficient resulting from the ratio of the labour used in each branch to the gross value of production of each branch.

Usually, labour coefficients are expressed in thousands of persons per production value of one million. Direct labour coefficients generally tend to

decline over the course of time. This tendency stems not only from the increase in the intensity of fixed capital, but also from the increased productivity in the economy[7].

The approach applied in this study also uses the indicator of the direct labour coefficient from the Input-Output Tables methodology.

This indicator is the inverse determination of labour productivity based on the calculation of gross production, gross output to labour input. Consequently, these two determinations pertain to the same phenomenon and are influenced by the same variables, which is why extensive reference is made below to the determination of labour productivity and its relationship with technological change, since this relationship has been studied more in the literature.

b) Examining the relationships between labour productivity and the other coefficients which determine it –according to the OECD[8]– the following points emerge:

The objectives of productivity measurement include technology, efficiency, real cost savings, benchmarking production processes and living standards.

Specifically, in the case of technology, the objective of measurement of productivity growth is often the determination of technological change.

According to the OECD[8], technology has been described as the currently known ways of converting resources into outputs desired by the economy, and appears either in its disembodied form (such as new blueprints, scientific results, new organisational techniques) or embodied in new products (advances in the design and quality of new ranges of capital goods and intermediate inputs).

The OECD[9] notes further that despite the frequent explicit or implicit

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7. Aggregate labour coefficients can also be calculated. The aggregate labour coefficient for a branch denotes the amount of labour required for the production of one unit of finished product of a branch, not only directly but also indirectly, on account of the inputs that are used for the production of the final product of the branch. Just like direct coefficients of labour, the aggregate coefficients also tend to decline over the course of time. Skountzos, T., *Intersectoral Relations in the Greek Economy*, KEPE, Athens, 1975, (In Greek), p.109. Platt, H., *Input-Output Analyse*. Verlag Anton Hain KG, Meisenheim am Clan, 1957, p. 105.
8. OECD, Productivity Manual: A Guide to the Measurement of Industry-Level and Aggregate Productivity Growth – OECD, Paris, 200, p. 9.
9. OECD, ibid. p. 12.

association of productivity measures with technological change, the link is not straightforward.

The OECD's definition of labour productivity, based on the calculation of gross output, is described as the ratio of the quantity index of gross output to the quantity index of labour input.

Changes in labour productivity reflect the joint influence of changes in capital, intermediate inputs, as well as technical, organisational and efficiency change within and between firms, the influence of economies of scale, varying degrees of capacity utilisation and measurement errors.

Because labour productivity measures reflect the combined effects of changes in capital inputs, intermediate inputs and overall productivity, they do not leave out any direct effects of technological change, either embodied or disembodied. The former operates via capital goods and intermediate inputs and thus affects labour productivity; the latter generally enhances production possibilities for a given set of inputs and so also affects labour productivity.

With respect to drawbacks and limitations, it is noted that labour productivity is a partial productivity measure and reflects the joint influence of a host of factors. It is easily misinterpreted as technical change or as the productivity of the individuals in the labour force.

c) The empirical measurement of the evolution of productivity in major industry in Greece in the period 1980-1993 shows that following a seven-year stagnation (1980-1987) productivity has constantly increased. However, it appears that the high rates recorded between 1990-1993 were mainly due to the closure of loss-making businesses, on account of the recession rather than the technological and organisational modernisation of manufacturing. Therefore, technological and organisational modernisation is the main cause of productivity growth only in certain periods. It also emerges from the aforesaid measurement, as has been observed in recent years, that another reason for the growth of labour productivity is its intensification.

According to a recent study (2003) by the Centre of Planning & Economic Research (KEPE) on the evolution of productivity in the economy as a whole, following a stagnation in the 1980s and an average annual increase in the rate of change of labour productivity in the first half of the 1990s lower than unit (0.75%), the average annual rate of increase of gross labour productivity, based on the number of employed, reached 2.8% in the

period 1995-2000, rising further to 3.75% in the five-year period 1998-2002[10].

d) In the literature, four indicators are used in the analysis of employment: The rate of accumulation of capital (which is the rate of change of the capital stock), the rate of capacity utilisation, working time and the rate of change of capital intensity (i.e. the speed at which labour is replaced by capital). This latter indicator is considered also to be the main indicator of technological unemployment. It can be seen that the number of employed is first of all directly proportional to invested capital stock and its rate of use, and secondly, inversely proportional to the replacement of labour by capital (technological unemployment) and to the duration of working time.[11]

In the period 1984-1994, of the above four indicators, the replacement of labour by machinery (technological unemployment) was the most important in Greece.

e) Another indicator of technological unemployment is the type of investment. According to available data, investments to replace existing capital equipment and to expand production capacity account for the majority. Both these categories are ahead of investments to rationalise the production process. Data on type of investment can be used only as an indication of the quality of technological modernisation, given that the investment categories 'replacement' and 'expansion' are too broad for reliable conclusions to be drawn about the direction of technological renewal (e.g. growth of production capacity, for products already being manufactured or the production of new ones).

A method of calculating technological unemployment

In order to approach the problem of technological unemployment in

10. KEPE, *Labour productivity developments and growth prospects,* Economic Developments, issue 2, April 2003 (In Greek) p. 34.
11. In his examination of the effect of labour productivity on unemployment, Erturk finds that technological change does not lead to a drop in demand for labour only if the rate of accumulation of capital is higher or equal to the aggregate of the percentage increase of the capital/output ratio and the percentage increase in labour productivity.
He also ascertains that labour productivity, which may grow with the increase in capital intensity, acts on both sides of the inequality. This increases the replacement of labour directly in the short run and possibly also the absorption of labour indirectly in the long run, through the effect on the rate of profit. Erturk, K., ibid. p. 80.

Greece, empirically, a method was used which emerges from the analysis of Input-Output Tables.

Let L95 be the total number of workers in the economy as a whole in a certain year, e.g. 1995. Then, the following holds

$$L95 = \ell_1 x_1 + \ell_2 x_2 + \ldots + \ell_n x_n \qquad (1)$$

where $\ell_1, \ell_2, \ldots, \ell_n$ are the employed per unit of product by branch for a specific year, e.g. 1995 and $x_1, x_2, \ldots, x_n$ are the production units of branches $1, 2, \ldots, n$ in the same year.

The change in employment from 1995 to 1996 will be:

$$\begin{aligned} \Delta(L96 - L95) &= (\ell_1 + \Delta\ell_1)(x_1 + \Delta x_1) + \\ &+ (\ell_2 + \Delta\ell_2)(x_2 + \Delta x_2) + \ldots + \\ &+ (\ell_n + \Delta\ell_n)(x_n + \Delta x_n) \end{aligned} \qquad (2)$$

Performing the calculations in (2) we get:

$$\begin{aligned} \Delta(L96 - L95) &= (\Delta\ell_1 x_1 + \Delta\ell_2 x_2 + \ldots + \Delta\ell_n x_n) + \\ &+ (\ell_1 \Delta x_1 + \ell_2 \Delta x_2 + \ldots + \ell_n \Delta x_n) + \\ &+ (\Delta\ell_1 \Delta x_1 + \Delta\ell_2 \Delta x_2 + \ldots + \Delta\ell_n \Delta x_n) \end{aligned} \qquad (3)$$

Consequently, the change in employment is due to changes in technology,[12] which are presented in the first aggregate of (3), to changes on account of the increase in output, which are presented in the second aggregate and to changes that are due to the combined effect of output and technology, which are presented in the third aggregate of (3).

For the specific calculation of the above components of equation (3), data were used from the National Accounts of Greece 1990-2000 and more particularly, the data on the gross output value of goods and services in the period 1990-2000 for 31 branches which make up the entire economy. The data on gross output value were converted into constant prices 1990 in order to eliminate the effect of inflation.[13] Data on the employed in each branch for the period 1990-2000 were also used.

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12. According to the preceding chapter, it is not just change in technology, but a combined change. For simplicity's sake, it is considered here to be a simple change in technology.
13. The conversion to constant prices for 1995-2000 was performed using the branch price indices for products due to a lack of production price index data.

The technological influence for the years 1990-2000 was then isolated using the formula $[N_t / (\text{OUTPUT}_t \text{ at prices } 90)] * \text{OUTPUT}_{90}$ where t = 1990, ..., 2000. That is, the number of employed is calculated in relation to output, for each year, at 1990 prices and multiplied by 1990 output. This percentage is the labour coefficient, for each year, which when multiplied by the output of the given year 1990 gives the number of theoretically necessary employed, on the basis of the technology of each year, when production (output) is given.

Consequently, by deducting these employed from those actually employed in 1990, we get the unemployment that is caused by change in technology: 'technological unemployment'. As emerges from the calculations, this follows an upward trend, and with a different evolution in each branch.

The next step is to isolate the influence of the output by using the formula $(N_{90} / \text{OUTPUT}_{90}) * (\text{OUTPUT}_t \text{ at 1990 prices})$ where t = 1990, ..., 2000.

The number of employed in relation to production, that is, the labour coefficient, for 1990, is kept constant and multiplied respectively by the gross value of output, for each year, at constant prices 1990. This gives the number of employed who are necessary on the basis of technology in 1990 to produce the increased annual output. So, if this number of employed is deducted from those actually employed in 1990, we get the number of additional employed, due to the increase in output. As emerges from the calculations, this number is positive and shows an increasing trend - although with a different evolution, for each branch.

The combined influence of technology and output is derived as a residual - the third component of equation (3). As emerges from the data, the combined influence is negative and decreasing.

Regarding the number of employed per unit of production unit -or the coefficient of labour- as calculated here, and on the basis of which 'technological unemployment' is calculated, the following observations can be made:

a) This index combines the rate of accumulation of capital, the degree of capacity utilisation, working time and the rate of change of capital intensity. In other words, it is an index that may be considered broader than the one rendered by the notion of replacement of labour by machinery. In addition, the index calculated on the basis of output takes into account the growth of

production as a result of the accumulation of capital and the increase of demand.

b) Because the labour coefficient that is calculated here may be considered as an index which approximates the concept of labour productivity, the observations made in the preceding chapter concerning labour productivity should be taken into consideration.

c) The formula $[N_t / (OUTPUT_t \text{ at prices } 90)] * OUTPUT_{90}$ measures the annual change in technology, keeping output constant. Therefore, the unemployment resulting from application of the formula measures the unemployment from the change in technology, for each year, and consequently has an aggregating effect on the calculation of the theoretical number of unemployed, for each year.

d) It is clear that the calculations performed here, on the basis of national accounting data, are based on the established principles of National Accounts.

Conclusions

a) It emerges from the calculations that for the economy as a whole, 'technological unemployment' grew from -190,889 in 1990 to -1,711,915 in 2000. At the same time, the increase in employment, due to the growth of output, rose from +88,902 in 1990 to +3,548,216 in 2000. In addition, the combined influence of technological unemployment and output ranged from +41,970 in 1990 to -1,007,603 in 2000.[14]

The change in employment in the period 1990-2000 with 1990 as base year is -65,898 in 1991, -12,712 in 1992, +18,300 in 1993, +88,450 in 1994, +74,823 in 1995, +59,688 in 1996, +38,685 in 1997, +195,038 in 1998, +164,524 in 1999 and +152,219 in 2000. That is, the change in unemployment in 1991 and 1992 was negative, while in 1993 through to 2000 it was positive. This fact must be taken into consideration when evaluating the above three coefficients of change in employment.

The conclusion is that while the reduction of employment caused by

14. In the calculation tables, the calculation of the combined influence of 'technological unemployment' and output growth for the economy as a whole cannot result from the aggregate of the branches as Sum 1 and for this reason Sum 2 was calculated, which involves the separate calculation of the aforementioned aggregate magnitude.

technological change is significant, the influence of output is clearly greater, which however is diminished by the combined influence of the two.

b) The levels of 'technological unemployment', as these emerge from the above analysis, underline its important in the shaping of total unemployment. Regarding the share of 'technological unemployment' in total unemployment, the data are as in the following table[15]:

Year	(1) 'Technological unemployment' (On the basis of the employed in 1990)	(2)* Total unemployed	(3)* Labour force	(4)* Employed	(5) N (Employed according to National Accounts data)
1996	-1,475,221	446,700	4,318,960	3,871,900	3,805,032
1997	-1,543,351	440,300	4,294,400	3,854,100	3.784,037
1998	-1,536,387	478,000	4,445,000	3,967,100	3,940,390
1999	-1,615,490	523,000	4,463,000	3,940,000	3,909,876
2000	-1,711,915	491,000	4,437,000	3,946,000	3,897,571

*Source: National Statistical Service of Greece: Labour force surveys
The figures in column (1) are extracted from the calculations sheet as exhibited in the appendix to this study.

c) Generally speaking, the phenomena evident in the economy as a whole are the same at the level of individual branches, that is, employment is reduced by technological unemployment and increased by output.

The branches with the highest technological unemployment are: agriculture, food products, textiles, other manufacturing activities, electrical energy, construction, commerce, hotels, transport, financial organisations, real estate management, public administration, education, health and production of other services.[16]

15. The problem that arises is the extent to which it is possible to establish that in the percentage of unemployment ascertained in the economy, a proportion, e.g. 35%, is technological unemployment and the remainder is caused by other reasons, such as structural unemployment, frictional unemployment, etc.
16. For the purpose of comparing and verifying these results, the KEPE study on developments in labour productivity found that high rates of productivity growth (above the average) in the period 1995-2001were recorded in the branches of transport/

d) As emerges from the above analysis, the unemployment caused by change in technology –'technological unemployment'– is very often fully offset by the increase in production (output).

Therefore, an important prerequisite for the reduction or even the elimination of technological unemployment is the increase of production and consequently of demand also. A further very important parameter thus arises in the analysis, namely demand, which however will not be analysed here.[17]

Bibliography

Erturk, K., *Heterodox Theories of Technological Unemployment: Towards a Synthesis*, in Competition, Technology & Money: Classical and Post-Keynesian Perspectives (New Directions in Modern Economics Series), Edited by Mark A. Colich, Edward Elgar Publishing Company, 1994.

Kalmbach, P. and Kurz, H.D., *Microelectronics and Employment: A Dynamic Input-Output Study of the West German Economy*, in Structural Change and Economic Dynamics, vol. 1, no. 2, 1990, Oxford University Press, 1990.

KEPE, *Labour productivity developments and growth prospects*, Economic Developments, issue 2, April 2003 (In Greek).

Leontief, W., *Input-Output Economics*. Oxford University Press, 1986.

Leontief, W., Duchin, F., *The Future Impact of Automation on Workers*. New York Oxford, Oxford University Press, 1986.

Marx, K., Das Kapital, I, Verlag Ullstein GmbH,1969.

National Statistical Service of Greece. National Accounts of Greece, 1988-1997, Athens, 1998.

National Statistical Service of Greece. National Accounts of Greece, 1995-2000, Athens, 2001.

OECD, Technology and Industrial Performance, OECD, Paris, 1996.

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communications (6.95%), fishing (5.2%), commerce (4.96%), electricity (4.88%), hotels/restaurants (3.33%), construction (3.24%), other activities (3.37%) and mines (3.10%). KEPE, ibid. p. 35.

17. The long-period extension of Mr. Keynes's theory brings the problem of the reserve army of labour into the foreground of the picture. The propensity to save and the rate of investment determine the level of real output, at any moment. As time goes by, the productivity of labour increases and the amount of employment corresponding to a given level output declines. Thus the technique of production plays an important part in determining the level of employment. Finally, Mr. Keynes justifies Marx's intuition that the chronic conflict between productive and consumptive power is the root cause of crises. Robinson, J., *An essay on Marxian economics*, The McMillan Press Ltd, 1965.

OECD, Productivity Manual: A Guide to the Measurement of Industry-Level and Aggregate Productivity Growth, OECD, Paris, 2001.

Platt, H., *Input-Output Analyse*. Verlag Anton Hain KG, Meisenheim am Clan, 1957.

Ricardo, D., *On The Principles of Political Economy and Taxation.* The works and correspondence of David Ricardo, edited by Pierro Sraffa, Cambrigde University Press, 1975

Robinson, J., *An essay on Marxian economics*, The McMillan Press Ltd, 1965.

Skountzos, T., *Intersectoral Relations in the Greek Economy*, KEPE, Athens, 1975 (In Greek).

APPENDIX

INDUSTRIES CLASSIFICATION CODES

A: Agriculture, hunting and forestry
B: Fishing
C: Mining and quarrying
CA: Mining and quarrying except energy producing materials
CB: Mining and quarrying of energy producing materials
D: Manufacturing
DA: Manufacture of food products, beverages and tobacco
DB: Manufacture of textiles and textile products
DC: Manufacture of leather and leather products
DD: Manufacture of wood and wood products
DE: Manufacture of pulp, paper and paper products, publishing and printing
DF: Manufacture of coke, refined petroleum products and nuclear fuel
DG: Manufacture of chemicals, chemical products and man-made fibres.
DH: Manufacture of rubber and plastic products
DI: Manufacture of other non-metallic mineral products
DJ: Manufacture of basic metals and fabricated metal products
DK: Manufacture of machinery and equipment n.e.c
DL: Manufacture of electrical and optical equipment
DM: Manufacture of transport equipment
DN: Manufacturing n.e.c.
E: Electricity,gas and water supply
F: Construction
G: Wholesale and retail trade, repair of vehicles and household goods

H: Hotels and restaurants
I: Transport, storage and communication
J: Financial intermediation
K: Real estate, renting and business activities
L: Public administration and defence, compulsory social security
M: Education
N: Health and social work
O: Other community, social and personal services
P: Private households with employed persons activities
Q: Extra-territorial organisations and bodies

cup: current accounting prices
coppy: cost on prices previous year
Ntecm: theoretical necessary

Industry	Outp90cap	Outp91cap	Outp92cap	Outp93cap	Outp94cap	Outp95cap	Outp96cap	Outp97cap	Outp98cap	Outp99cap	Outp00cap
A	1787500	2363877	2409630	2549573	3023342	3315288	3503032	3636135	3714504	3757235	3881296
B	97582	108568	112646	122540	138006	149402	172119	170868	169670	178510	192493
CA	77886	82326	83833	109949	117953	136873	130328	135878	132982	136873	148492
CB	73410	84411	91789	97510	107020	109079	141586	157355	178914	176945	202334
DA	1890189	2412759	2580743	2719327	2989124	3041316	3658290	3652747	3815398	3910183	4096895
DB	1016539	1144493	1283499	1288077	1393618	1558338	1641034	1604657	1736974	1665288	1720759
DC	133671	144080	168239	183364	188747	207892	224973	201568	209858	193649	201341
DD	150455	160472	185466	207127	197248	229127	242606	228660	235147	223232	251648
DE	273354	306234	364449	378417	433433	581850	629280	609936	652026	689360	764402
DF	467837	497740	524983	527873	567767	711045	903736	972240	769027	826109	1603171
DG	374045	403616	453563	495453	561529	642764	681013	691126	732142	757653	790413
DH	164101	178785	199772	204247	235805	285437	284641	274020	290883	303371	340306
DI	318218	358061	388944	399598	414908	450320	521745	589056	659670	672263	723261
DJ	617421	654107	729994	674971	810866	1005563	975392	1022419	1105118	1126211	1250193
DK	175224	179577	210903	216084	262275	298426	345040	323826	338557	317015	358562
DL	152692	191594	221603	267488	260230	292647	280859	299652	355299	353583	456062
DM	174167	211976	230693	233007	231343	232645	255261	257090	304192	270869	282313
DN	200129	230592	291961	301117	335457	370651	393768	394756	423267	455951	500378
E	447386	525396	619158	672637	726243	813140	937615	977974	1083538	1146469	1168143
F	2198306	2688916	2773044	2997792	3171369	3482938	3970394	4341100	4927902	5416409	5774707
G	2804856	3346108	3830367	4399449	4980090	5472367	6116436	6758898	7074194	7594463	8654821
H	1241821	1482404	1898021	2369174	2708871	3081424	3377340	3989183	4309549	4322746	4533899
I	1059486	1202639	1433202	1628321	1912626	2240937	2636614	2968837	3374035	4060234	5224543
J	488782	696167	872627	766382	967561	1165738	1640201	1811305	2172058	2530682	2804272
K	2059288	2692732	3237621	3750607	4296185	4857786	5461646	6047595	6565772	6856991	7421215
L	1318269	1555262	1752680	2109652	2325885	2983654	2829059	3277910	3552646	3769473	4170711
M	613396	761579	890109	1002193	1153190	1266189	1365148	1612197	1748218	1868775	2024787
N	734114	865667	1040752	1251776	1576251	1762179	1916723	2067223	2307285	2435194	2445959
O	387502	528335	641118	730441	862405	947178	1056705	1121308	1245562	1334363	1407026
P	24777	29051	32641	35541	44293	55390	72737	90723	105411	124162	134393
Sum 1	21522403	26087524	29554050	32689687	36993640	41747583	46365321	50286242	54289798	57474261	63528795

Outpcoppy91 90	Outpcoppy92 91	Outpcoppy93 92	Outpcoppy94 93	Outpcoppy95 94	Productcoppy96 95	Productcoppy97 96	Productcoppy98 97	Productcoppy99 98	Productcoppy00 99
2002061	2370756	2392517	2684387	3148227	3268152	3390944	3589105	3671600	3653057
107788	110593	126909	121434	132162	159515	167837	158475	170032	184258
70898	78745	93211	109753	120076	105343	120859	125116	119635	131135
72561	83667	89698	99681	105230	124444	138130	161671	148723	172182
2029972	2398334	2501130	2761556	2952768	3455751	3750548	3843093	3914642	4126780
1013357	1125493	1155436	1314039	1432294	1550455	1558423	1683320	1642766	1670020
128430	150009	163244	172724	193913	215303	194478	208747	192992	197937
141622	157314	185320	188569	215916	220062	220925	227149	223233	246490
262814	312922	337879	405964	510555	542950	545838	580409	657235	695700
425221	517785	468072	554972	635177	769128	872902	808700	662876	972452
347140	400207	457887	509574	580374	577627	624202	640181	691709	715587
152522	180484	190950	216433	259164	278958	268202	274458	297228	311178
296923	340815	373958	384427	415782	484408	547408	617439	654587	687449
593052	645389	631608	753039	896129	930229	986417	1060042	1152444	1219184
155693	181657	200672	243073	275264	335923	330488	327681	313623	356509
176330	193375	243537	253080	267913	270068	283001	332333	334720	413226
187414	210796	205408	218459	219801	224419	237503	262134	240161	241614
207836	253084	274994	318510	347676	414959	436646	457893	513027	548110
455443	550271	619404	709431	753513	903148	964903	1075254	1190974	1215147
2266957	2473981	2631963	2893527	3227235	3828480	4196457	4879039	5432011	5797781
2843631	3396953	3813014	4554963	5177444	5768664	6586706	7147981	7646906	8316641
1225469	1575213	1960447	2458750	2749806	3077883	3762190	4141089	4173457	4330037
1056885	1245722	1462788	1633386	2069823	2386356	2766688	3036210	3885478	5053990
554753	752679	673816	849618	1065433	1472611	1705451	2003337	2314307	2678556
2121905	2741574	3135987	3774743	4378160	5081421	5715740	6343281	6822201	7231528
1308445	1522923	1844651	2134001	2487035	2750800	2834235	3192309	3424761	3715758
629430	752090	877412	1050727	1185829	1263227	1380660	1620557	1768775	1913394
726439	901731	1035747	1439739	1584188	1736594	1960756	2105047	2304443	2373484
447948	533516	634376	796488	899907	962383	1077315	1184430	1294547	1356435
24331	28557	34273	40303	50937	63809	76956	101065	117744	127266
22033270	26186635	28816308	33645350	38337731	18659322	19836111	21312239	22224218	23555796

PriceInd 90	PriceInd 91	PriceInd 92	PriceInd 93	PriceInd 94	PriceInd 95	PriceInd 96	PriceInd 97	PriceInd 98	PriceInd 99	PriceInd 00
1.000	1.181	1.016	1.066	1.126	1.053	1.041	1.038	1.002	0.991	1.029
1.000	1.007	1.019	0.966	1.136	1.130	1.079	1.018	1.073	1.052	1.047
1.000	1.161	1.065	1.180	1.075	1.140	1.170	1.049	0.980	1.042	1.033
1.000	1.163	1.097	1.087	1.074	1.037	1.032	1.066	0.963	1.034	1.033
1.000	1.189	1.076	1.087	1.082	1.030	1.080	0.999	1.013	1.018	1.011
1.000	1.129	1.140	1.115	1.061	1.088	1.050	1.018	1.018	0.999	1.015
1.000	1.122	1.122	1.123	1.093	1.072	1.040	1.027	0.999	0.997	1.010
1.000	1.133	1.179	1.118	1.046	1.061	1.088	1.024	1.021	0.985	1.009
1.000	1.165	1.165	1.120	1.068	1.140	1.101	1.044	1.074	1.006	1.055
1.000	1.171	1.014	1.128	1.023	1.119	1.165	1.109	0.947	1.240	1.646
1.000	1.163	1.133	1.082	1.102	1.107	1.055	1.012	1.046	1.004	1.040
1.000	1.172	1.107	1.070	1.090	1.101	1.025	1.036	1.060	1.023	1.036
1.000	1.206	1.141	1.069	1.079	1.083	1.066	1.058	1.052	1.012	1.036
1.000	1.103	1.131	1.069	1.077	1.122	1.038	1.036	1.050	0.990	1.038
1.000	1.153	1.161	1.077	1.079	1.084	1.067	1.005	1.052	1.018	1.014
1.000	1.087	1.146	1.098	1.028	1.092	1.008	1.023	1.033	1.020	1.072
1.000	1.131	1.094	1.134	1.059	1.058	1.062	1.014	1.056	1.001	1.031
1.000	1.109	1.154	1.095	1.053	1.066	1.054	1.031	1.036	0.991	1.017
1.000	1.154	1.125	1.086	1.024	1.079	1.049	1.020	1.025	0.978	0.977
1.000	1.186	1.121	1.139	1.096	1.079	1.071	1.064	1.051	1.041	1.039
1.000	1.177	1.128	1.154	1.093	1.057	1.089	1.049	1.013	1.015	1.062
1.000	1.210	1.205	1.208	1.102	1.121	1.100	1.061	1.041	1.036	1.047
1.000	1.138	1.150	1.113	1.171	1.083	1.068	1.052	1.066	1.004	1.000
1.000	1.255	1.159	1.137	1.139	1.094	1.094	1.045	1.070	1.079	1.033
1.000	1.269	1.181	1.196	1.138	1.110	1.088	1.071	1.053	1.022	1.044
1.000	1.189	1.151	1.144	1.090	1.200	0.993	1.111	1.069	1.057	1.079
1.000	1.210	1.184	1.142	1.098	1.068	1.080	1.168	1.079	1.057	1.058
1.000	1.192	1.154	1.209	1.095	1.112	1.103	1.053	1.095	1.054	1.028
1.000	1.179	1.202	1.151	1.083	1.053	1.091	1.040	1.044	1.024	1.030
1.000	1.194	1.143	1.037	1.099	1.087	1.140	1.179	1.043	1.055	1.056

PrInd90(base90)	PrInd91(base90)	PrInd92(base90)	PrInd93(base90)	PrInd94(base90)	PrInd95(base90)	PrInd96(base90)	PrInd97(base90)	PrInd98(base90)	PrInd99(base90)	PrInd00(base90)
1.000	1.181	1.200	1.083	1.200	1.186	1.234	1.281	1.283	1.271	1.308
1.000	1.007	1.026	0.983	1.097	1.285	1.386	1.411	1.514	1.593	1.668
1.000	1.161	1.236	1.256	1.268	1.225	1.434	1.504	1.474	1.535	1.586
1.000	1.163	1.276	1.193	1.167	1.113	1.148	1.224	1.179	1.219	1.260
1.000	1.189	1.279	1.170	1.177	1.115	1.204	1.203	1.218	1.241	1.254
1.000	1.129	1.288	1.271	1.182	1.154	1.212	1.234	1.256	1.255	1.275
1.000	1.122	1.258	1.260	1.227	1.172	1.219	1.252	1.251	1.247	1.260
1.000	1.133	1.336	1.318	1.169	1.110	1.207	1.236	1.262	1.243	1.254
1.000	1.165	1.357	1.304	1.196	1.217	1.339	1.398	1.501	1.510	1.593
1.000	1.171	1.187	1.143	1.154	1.145	1.334	1.480	1.401	1.738	2.860
1.000	1.163	1.318	1.226	1.192	1.220	1.287	1.303	1.363	1.369	1.424
1.000	1.172	1.297	1.184	1.165	1.200	1.230	1.274	1.351	1.382	1.432
1.000	1.206	1.376	1.219	1.153	1.169	1.246	1.318	1.387	1.404	1.454
1.000	1.103	1.248	1.209	1.151	1.208	1.255	1.300	1.366	1.352	1.404
1.000	1.153	1.339	1.250	1.162	1.170	1.249	1.255	1.321	1.345	1.364
1.000	1.087	1.245	1.259	1.129	1.123	1.132	1.159	1.197	1.221	1.308
1.000	1.131	1.238	1.241	1.201	1.121	1.190	1.207	1.275	1.275	1.315
1.000	1.109	1.280	1.263	1.153	1.123	1.184	1.220	1.264	1.253	1.275
1.000	1.154	1.298	1.222	1.112	1.105	1.158	1.182	1.211	1.184	1.156
1.000	1.186	1.330	1.277	1.248	1.183	1.267	1.348	1.417	1.475	1.533
1.000	1.177	1.327	1.301	1.261	1.156	1.258	1.319	1.336	1.356	1.441
1.000	1.210	1.458	1.456	1.331	1.235	1.358	1.441	1.500	1.554	1.628
1.000	1.138	1.309	1.281	1.303	1.268	1.353	1.424	1.518	1.524	1.524
1.000	1.255	1.455	1.319	1.295	1.246	1.363	1.425	1.525	1.646	1.700
1.000	1.269	1.499	1.412	1.361	1.263	1.374	1.472	1.550	1.584	1.654
1.000	1.189	1.368	1.316	1.246	1.308	1.298	1.443	1.542	1.630	1.759
1.000	1.210	1.432	1.352	1.254	1.172	1.266	1.478	1.595	1.685	1.783
1.000	1.192	1.375	1.395	1.323	1.218	1.343	1.415	1.550	1.633	1.678
1.000	1.179	1.417	1.384	1.247	1.140	1.244	1.294	1.351	1.382	1.425
1.000	1.194	1.365	1.185	1.140	1.195	1.362	1.606	1.675	1.766	1.865

Outp90(const pr 90)	Outp91(const pr 90)	Outp92(const pr 90)	Outp93(const pr 90)	Outp94(const pr 90)	Outp95(const pr 90)	Outp96(const pr 90)	Outp97(const pr 90)	Outp98(const pr 90)	Outp99(const pr 90)	Outp00(const pr 90)
1787500	2002061	2007887	2353919	2519026	2795271	2837658	2838977	2894447	2955328	2966779
97582	107788	109798	124596	125764	116292	124164	121075	112054	112054	115416
77886	70898	67814	87554	93045	111728	90907	90355	90239	89176	93655
73410	72561	71921	81761	91695	98014	123299	128565	151774	145112	160633
1890189	2029972	2017836	2324348	2539971	2727968	3038019	3036383	3132312	3151898	3265930
1016539	1013357	996534	1013195	1178725	1350507	1354185	1300638	1382723	1326531	1349919
133671	128430	133715	145555	153771	177451	184591	161018	167739	155290	159817
150455	141622	138835	157190	168716	206416	200937	185029	186297	179566	200612
273354	262814	268554	290109	362475	478198	469927	436180	434291	456580	479865
467837	425221	442346	461654	492101	620863	677298	656819	548752	475261	560502
374045	347140	344208	404022	470937	526675	528969	530526	537108	553451	554969
164101	152522	153971	172514	202343	237873	231339	215056	215351	219556	237713
318218	296923	282622	327683	359760	385237	418764	446844	475629	478824	497398
617421	593052	585148	558406	704661	832221	777406	786411	809173	832705	890624
175224	155693	157496	172845	225736	255111	276330	257939	256312	235718	262814
152692	176330	177969	212515	230419	260552	248048	258603	296791	289674	348684
174167	187414	186371	187692	192583	207560	214469	212957	238610	212363	214760
200129	207836	228108	238376	290878	330112	332627	323478	334734	363988	392587
447386	455443	477006	550490	653286	736070	809376	827608	894724	968389	1010102
2198306	2266957	2085751	2348115	2540422	2944499	3133252	3219244	3477182	3672635	3767489
2804856	2843631	2886841	3381564	3947798	4735470	4861190	5123033	5294421	5599255	6007696
1241821	1225469	1302192	1627022	2034569	2495905	2486170	2768335	2872889	2781317	2785130
1059486	1056885	1094747	1271438	1467338	1767633	1948156	2085027	2222631	2664558	3427483
488782	554753	599786	581196	746998	935560	1203215	1271237	1424534	1537541	1649564
2059288	2121905	2160393	2655512	3156168	3846768	3974656	4109126	4237032	4327732	4488116
1318269	1308445	1281238	1602838	1865941	2281856	2179685	2272292	2304284	2313031	2371385
613396	629430	621588	741362	919903	1080466	1078419	1090561	1096150	1108897	1135328
734114	726439	756703	897395	1191272	1446989	1426769	1460704	1488376	1490826	1457307
387502	447948	452341	527906	691737	831124	849509	866633	922191	965188	987650
24777	24331	23917	29985	38865	46348	53393	56490	62930	70293	72050
21522403	22033270	22113634	25528754	29656904	34866735	36132724	37137142	38561679	39732737	41911978

N90	N91	N92	N93	N94	N95	N96	N97	N98	N99	N00
886376	787346	822677	776123	778684	719749	708318	684966	685141	659100	626801
23007	24315	23623	23150	23019	29222	28659	26894	24696	25993	24207
14399	12461	10206	10107	9673	7374	7859	7665	7489	7135	8263
7974	7991	7577	8573	7150	9455	9441	8885	8966	9300	9214
132910	133935	133519	131299	131417	129386	130787	129943	130595	128857	131559
182716	180321	176062	155535	148166	147678	145044	136011	138167	136309	135724
21545	21233	21456	20528	19944	20089	20279	17015	17252	17022	15767
36994	32809	31144	31210	29285	29521	30893	29441	29364	28973	27591
37473	37697	38849	38903	37928	39618	40200	40319	41785	41229	40020
8663	7990	7858	7843	8916	9738	9371	8649	9427	9302	8270
27875	27179	26155	24675	24371	23652	23202	23250	23893	23578	23205
18469	17867	18004	17140	17197	17230	17248	16731	16939	16713	16023
36300	34897	33755	32167	30247	30522	30915	30900	32692	32258	30688
55848	54696	54763	53971	57632	57414	57735	55742	59245	58457	57984
31067	27744	27641	25598	29027	28944	29964	28977	30548	30142	30582
15868	14662	14348	13508	13463	13505	14942	14318	15465	15259	14393
35484	33463	33047	29638	29185	29113	27433	26209	26845	26488	24641
46278	47424	50043	46980	48809	48626	47784	47925	49364	48776	47453
37418	37458	37507	40753	41284	41647	43166	42935	42693	44120	41859
239579	241295	243295	261438	261166	252288	251809	249003	275229	269993	278158
469428	477571	487569	526549	544889	553409	540489	556393	583228	579561	586434
179273	183017	187049	203362	211960	223676	224326	229886	238651	239948	246946
242309	251433	248181	259013	263333	263657	261860	255477	266699	264126	262549
67543	69938	63835	66750	71735	82285	76366	84154	87311	87248	94976
141431	153083	165685	167352	176775	183607	177995	184160	216011	216960	215918
280279	281164	273979	276143	276335	272298	276266	272332	270897	275482	280979
179954	184746	190638	200699	213846	219964	224257	229981	237065	238093	240525
139335	143449	148474	154968	161244	163067	170543	170036	182765	186759	182850
122458	125660	129542	132209	136057	139305	138559	134234	145618	140908	140919
27099	26610	26160	27468	31155	34136	39322	41606	46350	51787	53073
3745352	3679454	3732641	3763652	3833892	3820175	3805032	3784037	3940390	3909876	3897571
Change in empl.	3679454	3732641	3763652	3833892	3820175	3805032	3784037	3940390	3909876	3897571
Base 90:										

(N91/Out91cpr)*Out90)	(N92/Out92cpr)*Out90)	(N93/Out93cpr)*Out90)	(N94/Out94cpr)*Out90)	(N95/Out95cpr)*Out90)	(N96/Out96cpr)*Out90)	(N97/Out97cpr)*Out90)	(N98/Out98cpr)*Out90)	(N99/Out99cpr)*Out90)	(N00/Out00cpr)*Out90)
702966	732379	589366	552554	460260	446184	431274	423117	398650	377651
22013	20995	18131	17861	24521	22524	21676	21506	22636	20467
13689	11722	8991	8097	5140	6733	6607	6464	6232	6872
8084	7734	7697	5724	7082	5621	5073	4337	4705	4211
124712	125073	106774	97798	89651	81373	80891	78807	77275	76141
180887	179596	156048	127779	111159	108879	106302	101576	104455	102205
22099	21449	18852	17337	15133	14685	14125	13748	14652	13187
34855	33751	29873	26115	21518	23132	23940	23715	24276	20693
39209	39543	36656	28603	22647	23384	25268	26301	24684	22797
8791	8311	7948	8476	7338	6473	6160	8037	9157	6903
29286	28422	22844	19357	16798	16407	16392	16639	15935	15640
19223	19188	16304	13947	11886	12235	12767	12908	12492	11061
37400	38006	31238	26754	25212	23492	22005	21872	21438	19633
56944	57783	59675	50497	42595	45854	43764	45206	43344	40197
31224	30752	25950	22532	19880	19001	19685	20884	22406	20390
12696	12310	9705	8922	7914	9198	8454	7956	8043	6303
31098	30883	27502	26394	24429	22278	21435	19595	21724	19983
45665	43905	39442	33581	29479	28750	29650	29514	26818	24190
36795	35178	33120	28272	25313	23860	23210	21348	20383	18540
233988	256424	244758	225995	188353	176670	170035	174002	161608	162303
471059	473722	436749	387136	327789	311857	304625	308980	290322	273793
185459	178377	155216	129372	111288	112049	103122	103158	107134	110107
252052	240187	215835	190139	158031	142410	129818	127130	105022	81158
61621	52021	56136	46938	42990	31022	32357	29958	27736	28142
148566	157931	129778	115339	98290	92220	92292	104986	103237	99070
283275	281898	227116	195228	157311	167085	157993	154979	157006	156198
180040	188126	166057	142594	124877	127556	129355	132659	131703	129951
144965	144042	126772	99366	82730	87749	85456	90145	91964	92110
108703	110973	97046	76217	64949	63203	60021	61188	56571	55289
27098	27100	22697	19862	18248	18247	18249	18249	18254	18251
3554463	3587783	3124278	2748786	2342812	2270131	2202001	2208965	2129862	2033437

NTeem91-N90	NTeem92-N90	NTeem93-N90	NTeem94-N90	NTeem95-N90	NTeem96-N90	NTeem97-N90	NTeem98-N90	NTeem99-N90	NTeem00-N90
-183410	-153997	-297010	-333822	-426116	-440192	-455102	-463259	-487726	-508725
-994	-2012	-4876	-5146	1514	-483	-1331	-1501	-371	-2540
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(N90/Out90)*(Out91-cpr 90)	(N90/Out90)*(Out92-cpr 90)	(N90/Out90)*(Out93-cpr 90)	(N90/Out90)*(Out94-cpr 90)	(N90/Out90)*(Out95-cpr 90)	(N90/Out90)*(Out96-cpr 90)	(N90/Out90)*(Out97-cpr 90)	(N90/Out90)*(Out98-cpr 90)	(N90/Out90)*(Out99-cpr 90)	(N90/Out90)*(Out00-cpr 90)
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NTecm91(output)-N90	NTecm92(output)-N90	NTecm93(output)-N90	NTecm94(output)-N90	NTecm95(output)-N90	NTecm96(output)-N90	NTecm97(output)-N90	NTecm98(output)-N90	NTecm99(output)-N90	NTecm100(output)-N90
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comb techn and output 91	comb techn and output 92	comb techn and output 93	comb techn and output 94	comb techn and output 95	comb techn and output 96	comb techn and output 97	comb techn and output 98	comb techn and output 99	comb techn and output 00
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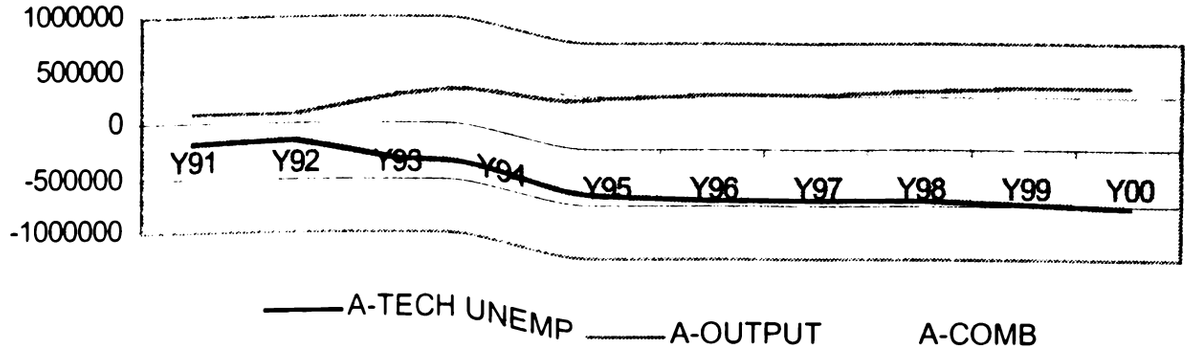
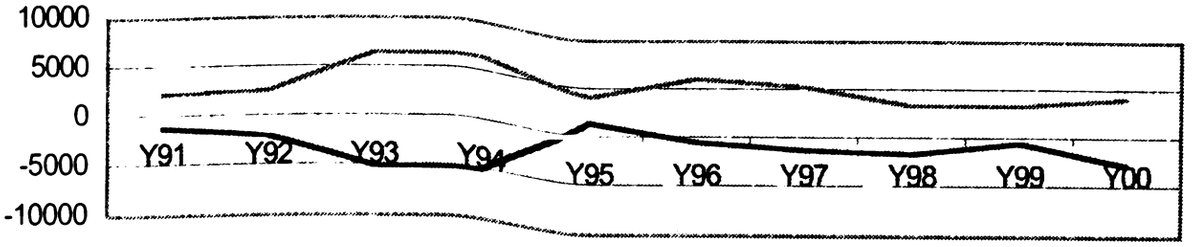


A-TECH UNEMP A-OUTPUT A-COMB



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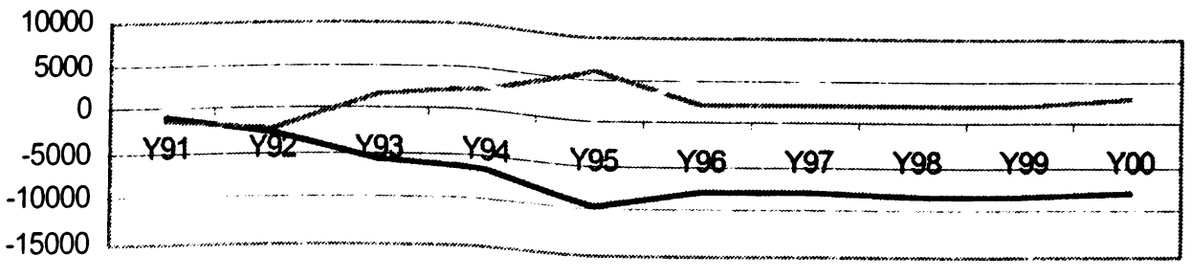
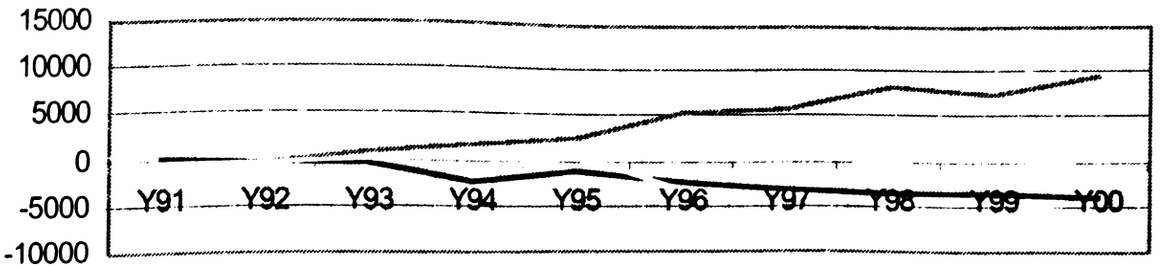


CA-TECH UNEMP CA-OUTPUT CA-COMB



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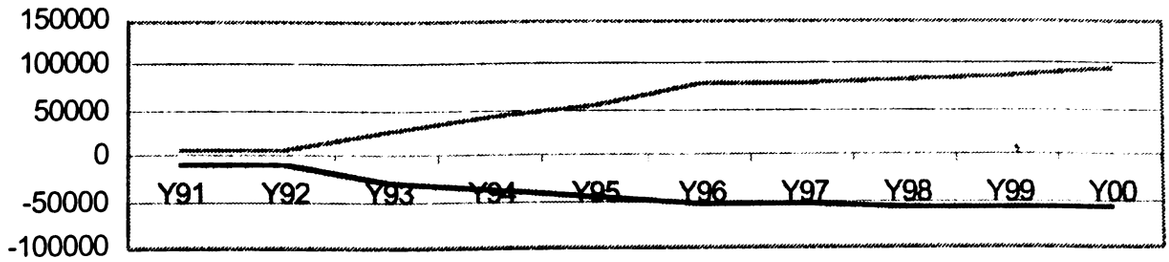

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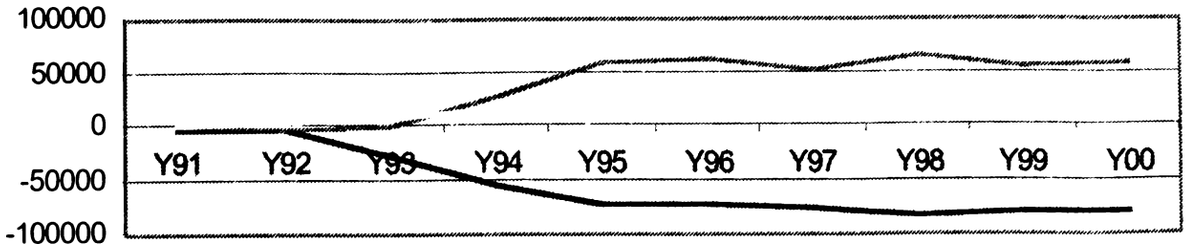

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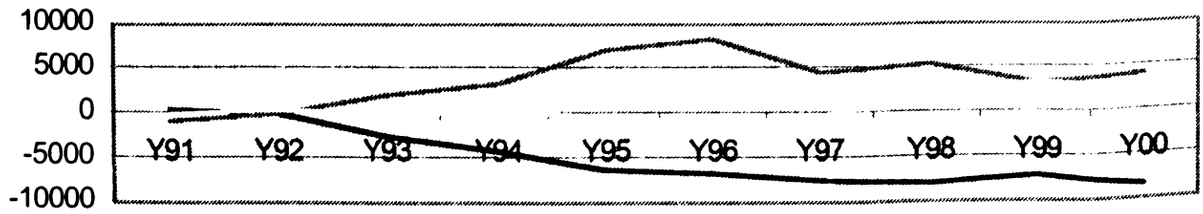

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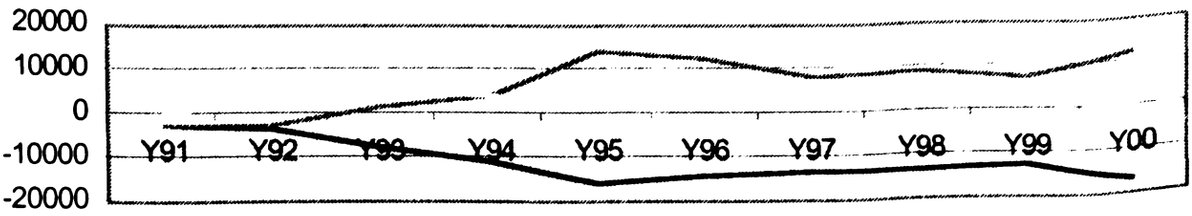

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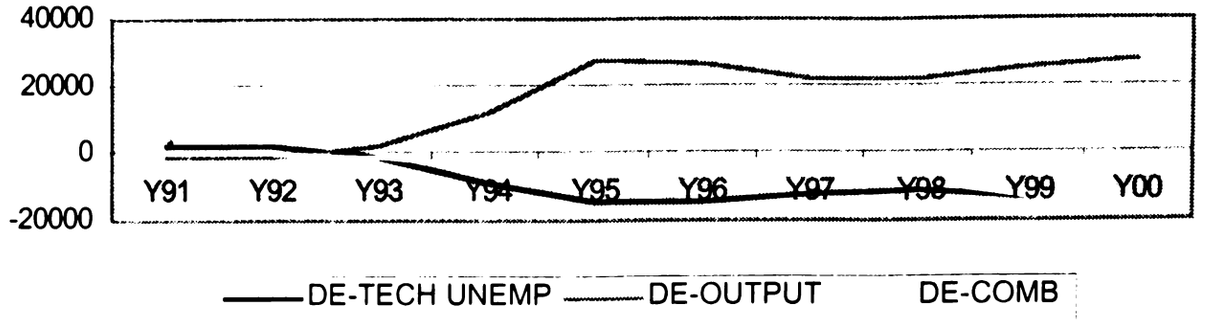
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Y92
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Y95
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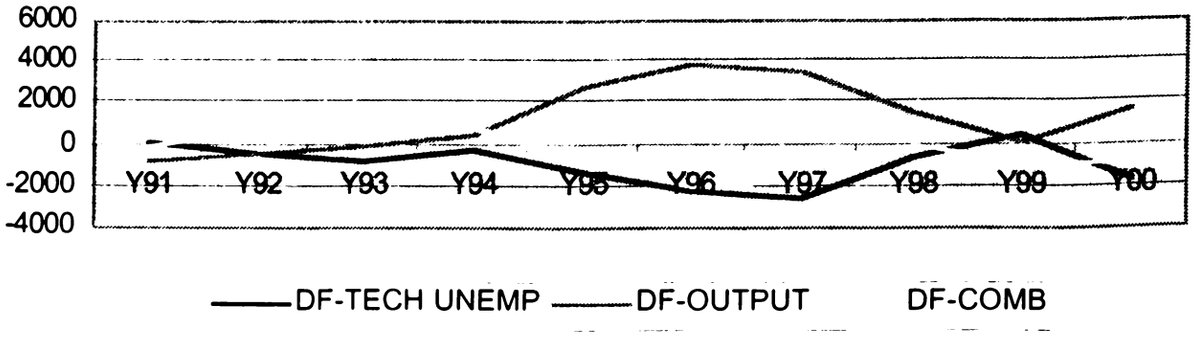
DE-OUTPUT
DE-COMB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Y95
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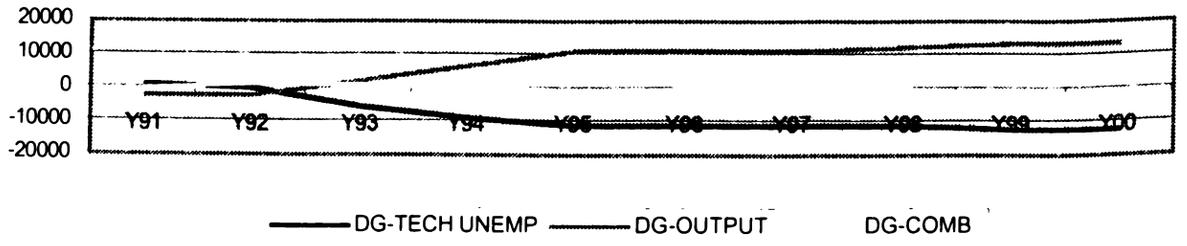
DF-OUTPUT
DF-COMB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DG-OUTPUT
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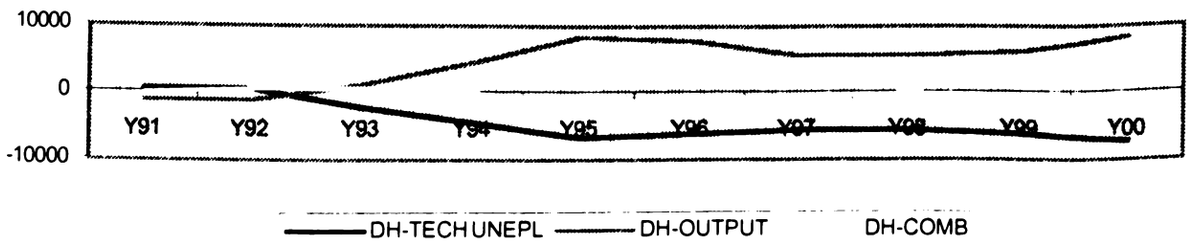
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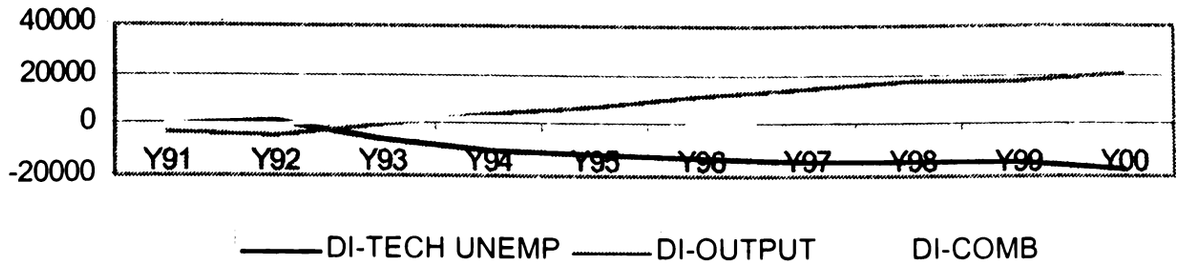
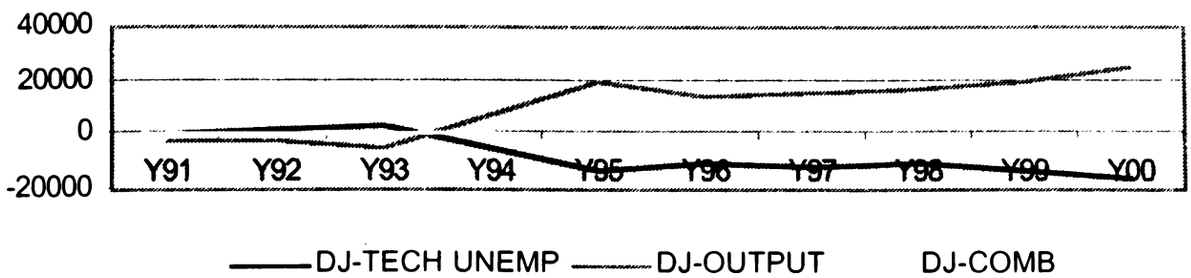
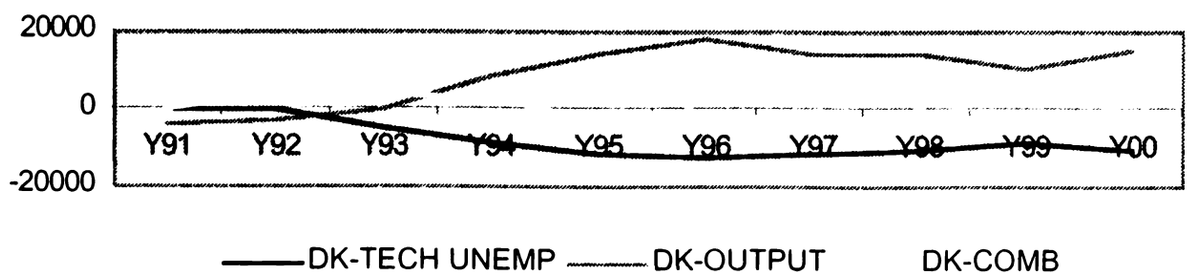
DH-OUTPUT
DH-COMB



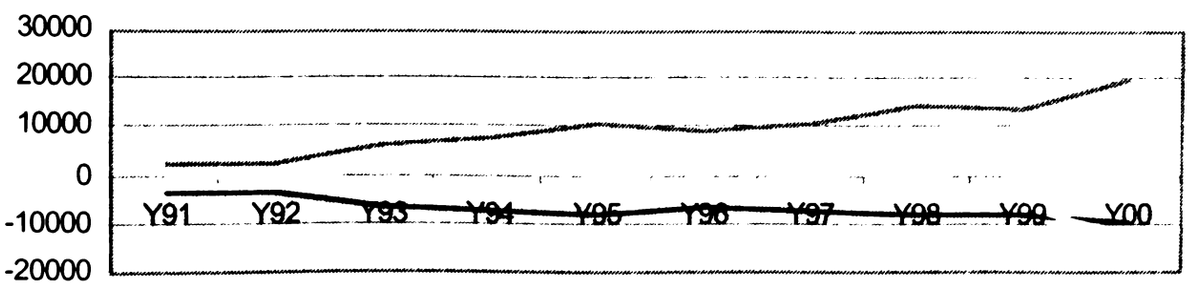
DI-TECH UNEMP DI-OUTPUT DI-COMB



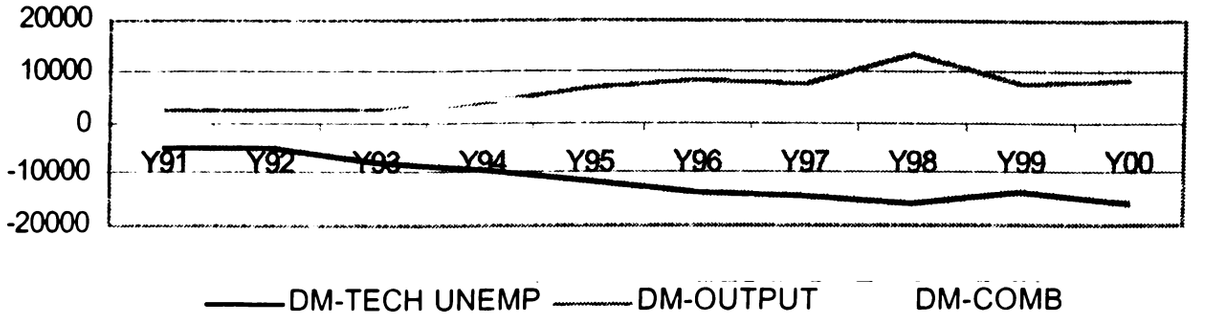
DJ-TECH UNEMP DJ-OUTPUT DJ-COMB



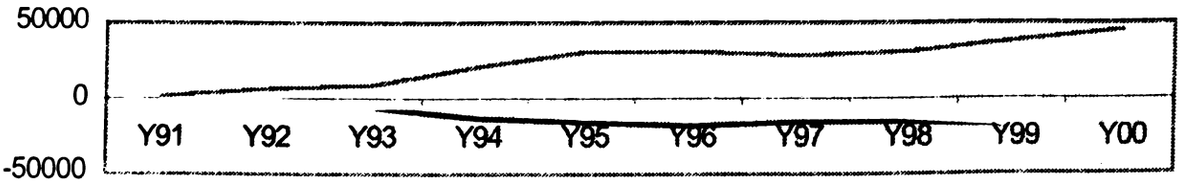
DK-TECH UNEMP DK-OUTPUT DK-COMB



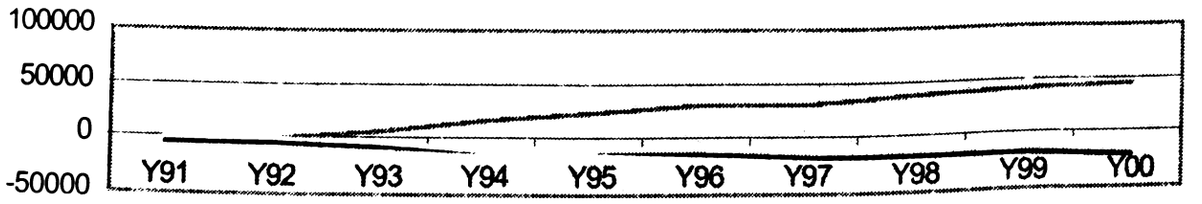
DL-TECH UNEMP DL-OUTPUT DL-COMB



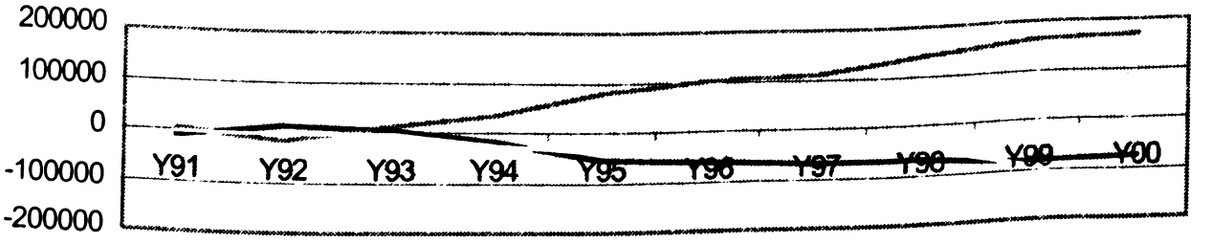
DM-TECH UNEMP —— DM-OUTPUT —— DM-COMB



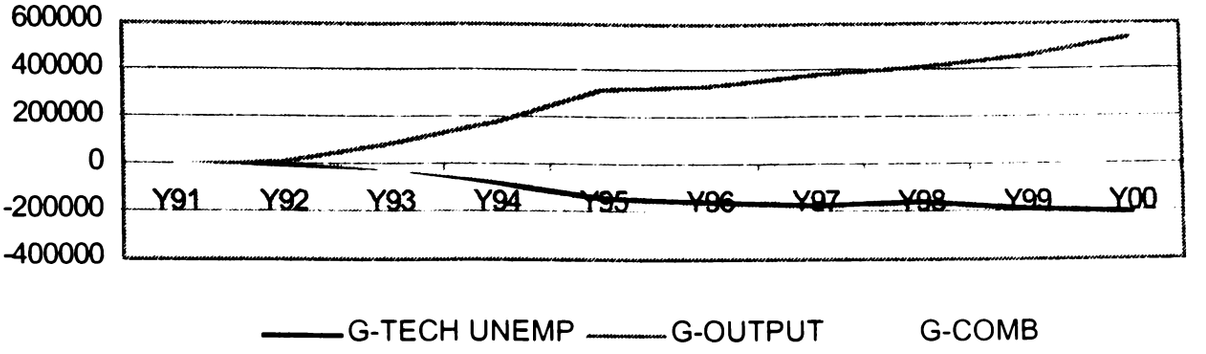
DN-TECH UNEMP —— DN-OUTPUT —— DN-COMB



E-TECH UNEMP —— E-OUTPUT —— E-COMB



F-TECH UNEMP —— F-OUTPUT —— F-COMB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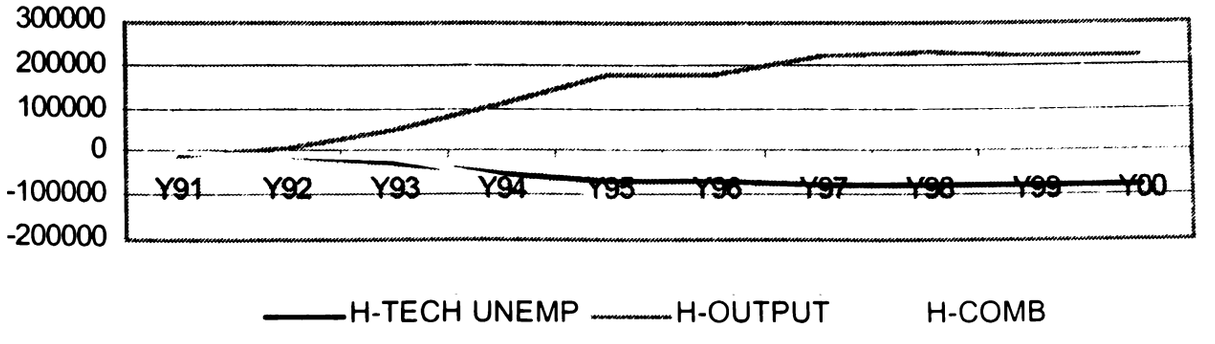
Y00
G-TECH UNEMP
G-OUTPUT
G-COMB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Y91
Y92
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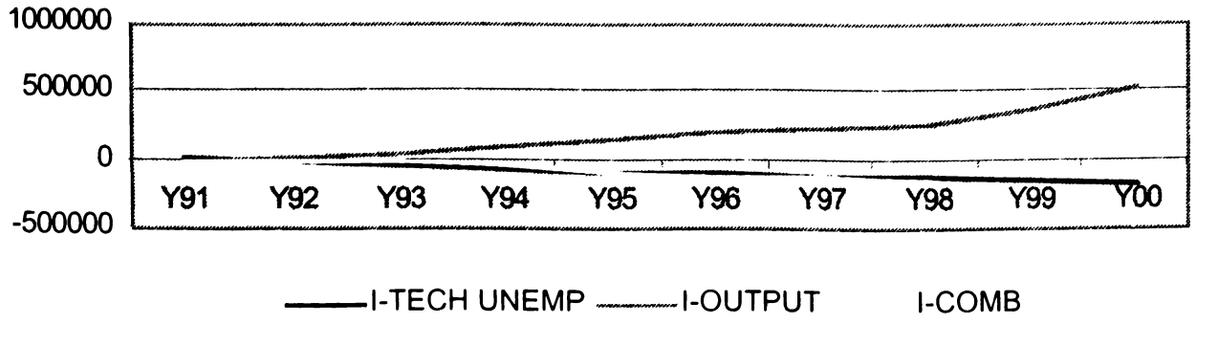
Y94
Y95
Y96
Y97
Y98
Y99
Y00
H-TECH UNEMP
H-OUTPUT
H-COMB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Y91
Y92
Y93
Y94
Y95
Y96
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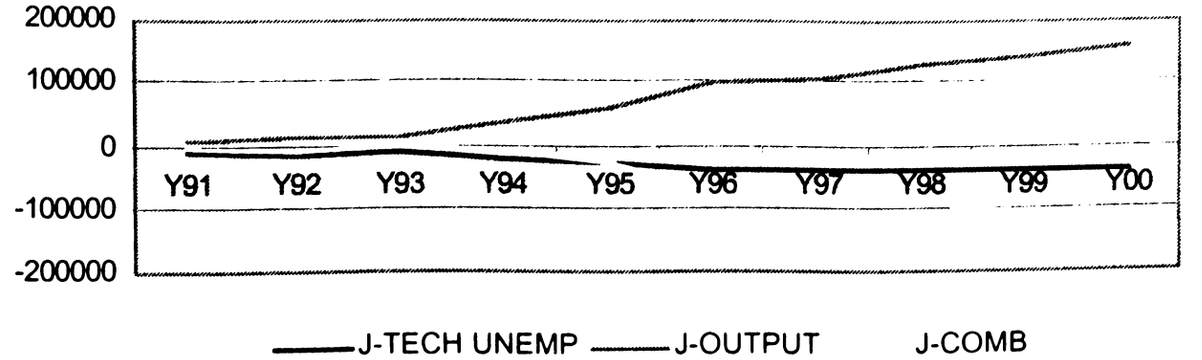
Y98
Y99
Y00
I-TECH UNEMP
I-OUTPUT
I-COMB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Y91
Y92
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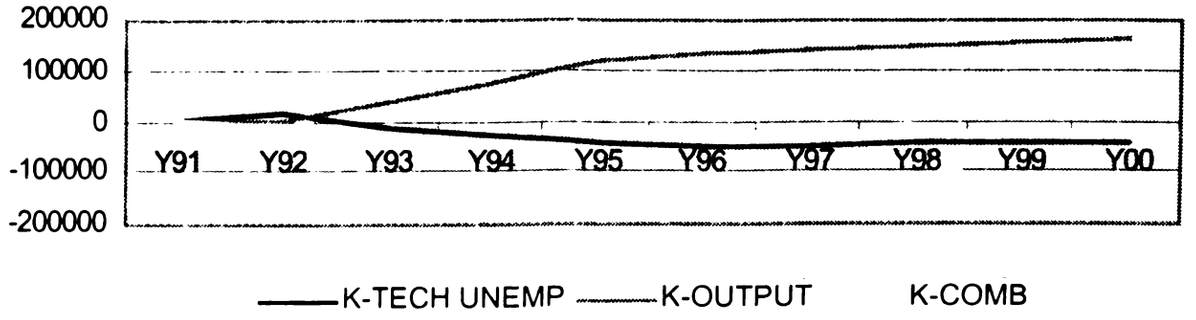
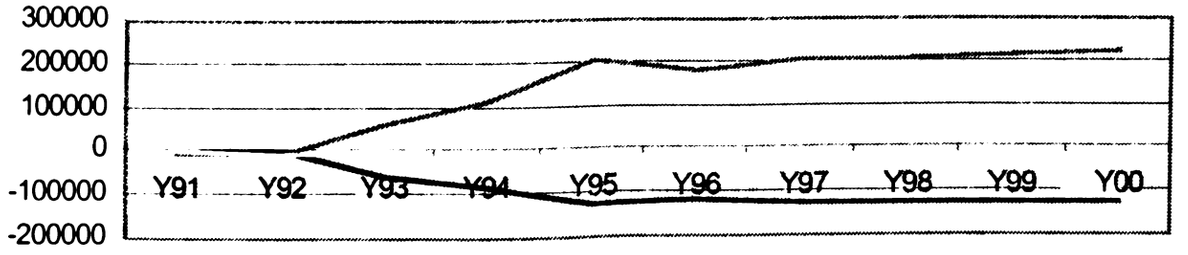
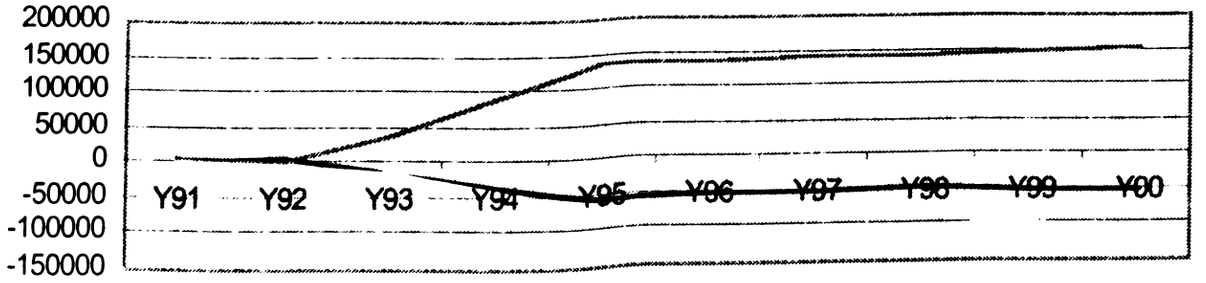
Y95
Y96
Y97
Y98
Y99
Y00
J-TECH UNEMP
J-OUTPUT
J-COMB



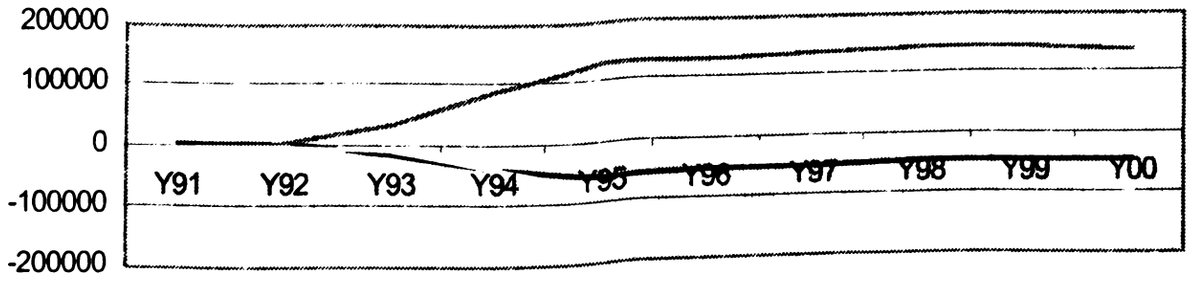
K-TECH UNEMP K-OUTPUT K-COMB



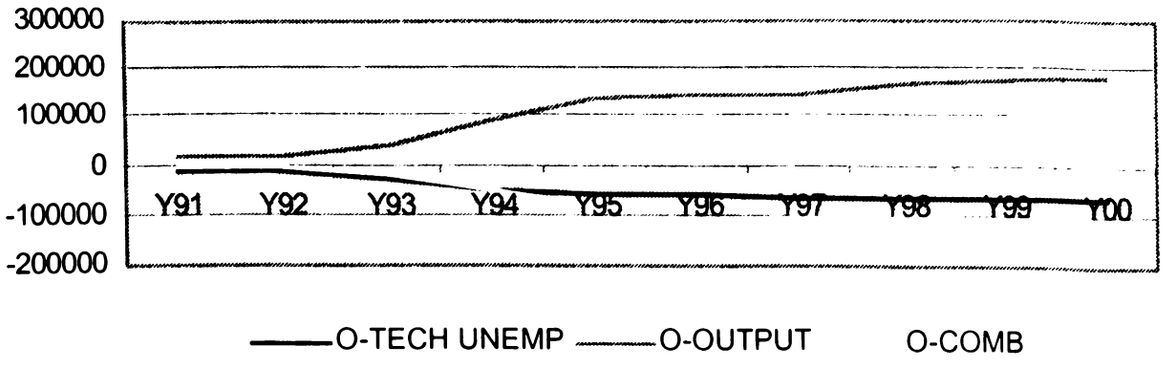
L-TECH UNEMP L-OUTPUT L-COMB



M-TECH UNEMP M-OUTPUT M-COMB



N-TECH UNEMP N-OUTPUT N-COMB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200000
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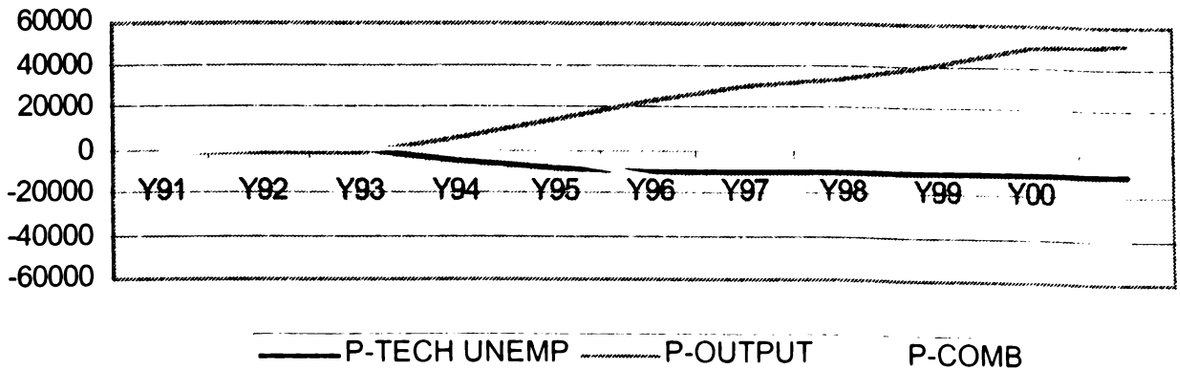
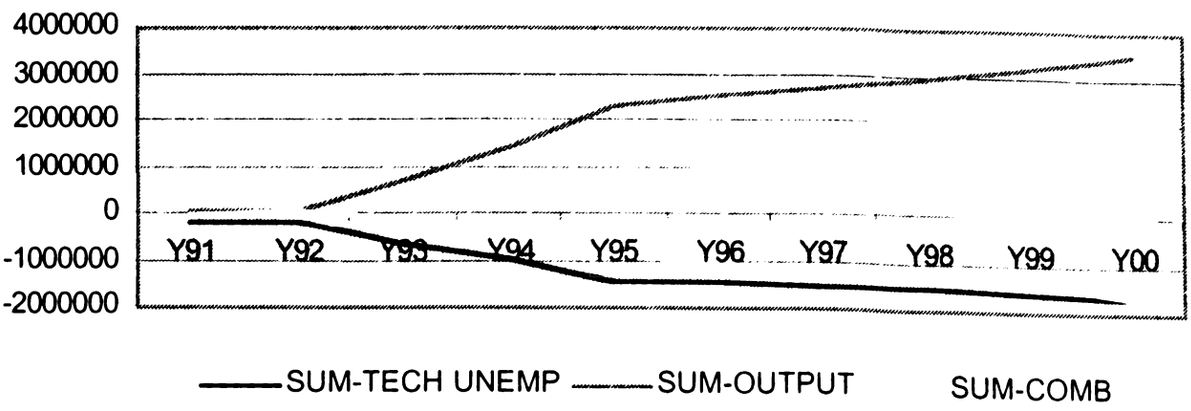
0
-100000
-200000
Y91
Y92
Y93
Y94
Y95
Y96
Y97
Y98
Y99
Y00
O-TECH UNEMP
O-OUTPUT
O-COMB


60000
40000
20000
0
-20000
-40000
-60000
Y91
Y92
Y93
Y94
Y95
Y96
Y97
Y98
Y99
Y00
P-TECH UNEMP
P-OUTPUT
P-COMB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Y91
Y92
Y93
Y94
Y95
Y96
Y97
Y98
Y99
Y00
SUM-TECH UNEMP
SUM-OUTPUT
SUM-COMB