A Cybernetic Approach to Reduce Unemployment in Spain

by

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Introduction

Unemployment is so high in Spain (22 per cent of the active population, about double that of the European average), that it can be considered as the major national problem. Spain has implemented the same policies as other industrialised countries in order to reduce unemployment or create new jobs. All these policies (early retirement, professional readjustment, subsidies to enterprises, youth employment, programmes for developing local activities, advance payment of social security programmes, etc.) have been of little use. Now, it is clear that the problem of unemployment has to be set within the framework of the complex sociopolitical system if a serious solution is to be found. A cybernetic approach is going to be set up which will prove the usefulness of integrating political and economic variables and control their results.

The first prerequisite for such an endeavour would be planning. But planning does not have a good reputation nowadays, due mainly to the growing neo-liberal context. Also some vested interests of the élite tend to be against big national plans. The second prerequisite is the need for modelling the complex sociopolitical system, which is not always easy[1], together with the need for its validation[2]. Nevertheless many writers[3-8], and in general the Bachue family of ILO have proved that modelling and planning at the macro level is an essential political instrument for tackling unemployment and development. Wery *et al.*[8], Sachs[1] and Choukroun[2], are especially aware of the role of systems theory in complex modelling.

Quantification of the Spanish Case

As we have seen, Spain has a serious problem of unemployment. But at the same time, two other issues are also involved. The first is the lack of basic infrastructure such as motorways, roads, forestry, etc., as well as public services (medical, sanitary, legal, and so on). Several studies reveal that in Spain there is much to be done if Spaniards really want to compare themselves against European standards. Common sense would dictate that if there are more than three million unemployed and so many things needed, why not employ these people in satisfying those needs.

The first obstacle is, of course, financial. Where is the money to pay the people and for the equipment? Strangely enough, there seems to be a solution

to the financial problem: Spain has one of the lowest taxpaying levels among the EC countries. According to the authors' estimates, Spain is nine points below the theoretical curve which measures fiscal effort in Europe. At the same time, the removal of other government irrationalities could release the necessary financial means sufficiently to create more than one million productive jobs in the Spanish economy, as described below.

What does this mean from the point of view of systems theory? It means that these three disequilibria: (1) higher unemployment; (2) fewer services, and (3) lower taxpaying effort, offer the possibility of achieving a higher degree of synergetic organisation; or, in other words, the simultaneous existence of these three "European differentials" makes it possible to eliminate them. In Spain's case, it is not desirable just to apply the economic policies of other more developed countries, but to adjust them to Spanish possibilities and needs. The SOSISGEM model is a first proof that it can be done.

The SOSISGEM model is composed of three main parts:

(1) the inputs or additional financial resources obtained;

(2) the distribution of these resources among strategic economic sectors (public works, ecology, industry and services) and some key factors (i.e. less social security to be paid by enterprises);

(3) the outcome or final results of the model.

On the basis of this model, a simplified operative model (Figure 1) was set up which has only 31 variables related through the same number of equations (Tables I and II). This model has been run dynamically for the three-year period (1987-1989).

Let us first make clear the forecast volume of incoming and outgoing financial flows. Input or additional resources to be obtained during the three-year-period 1987-89 and based on given estimates*, the flows for 1987-89 have been calculated to be as shown in Table III. Outputs or distribution of additional resources during 1987-89 are shown in Table IV. It is assumed that this distribution of available financial means will activate the economic system. The problem now is to check against a macroeconomic model to see what the global socioeconomic effects of such a policy will be. The economic and social hypotheses are as follows:

Economic Hypothesis

A given redistribution of the available financial resources, as well as the utilisation of new ones in certain sectors, will generate the following changes in the overall economy:

- Increase of employment
- Increase of GDP
- Decrease of public deficit
- An acceptable degree of inflation

*The estimates are given in Chapters 2-3 of the draft of the SOSISGEM model (not published), editors: F. Parra-Luna and J.A. Garmendia, Universidad Complutense, 1987.

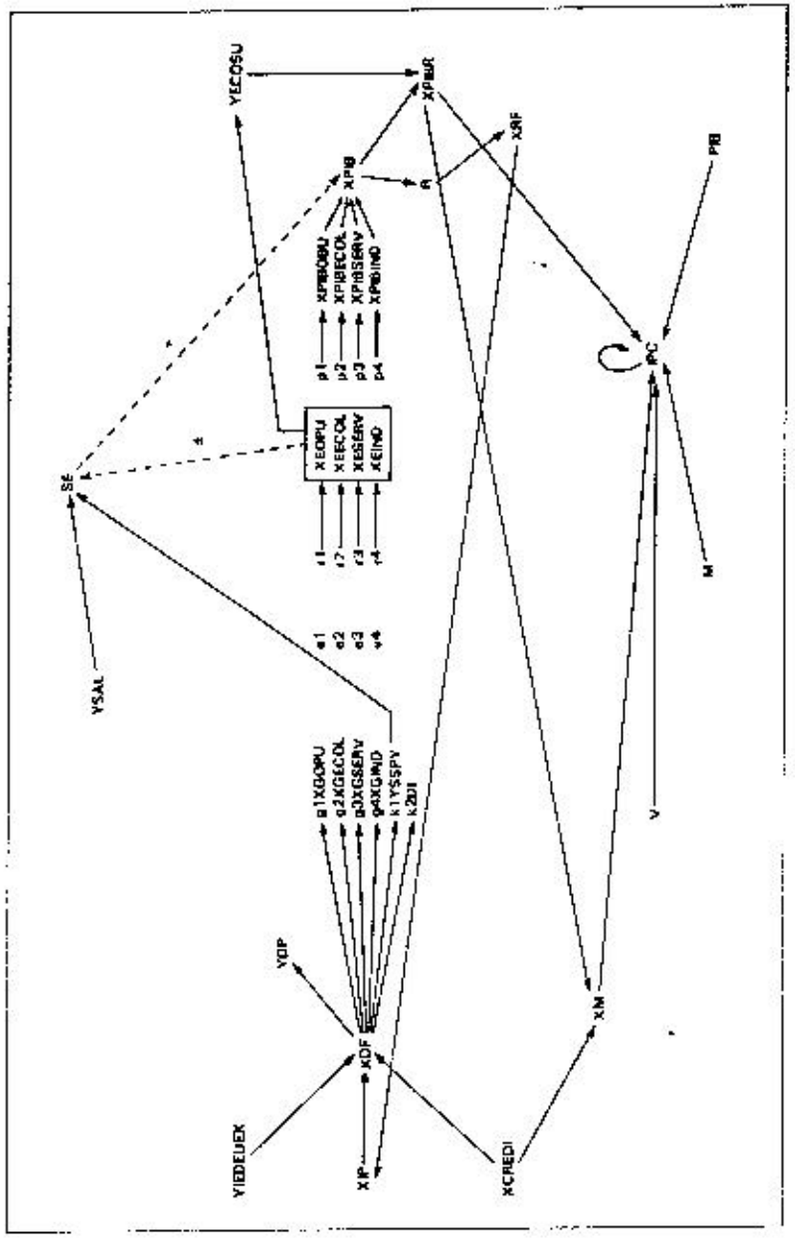

Figure 1.
Simplified
SOSISGEM Model

YIDEUEX	Decrease of Interests of Foreign Debt
XIP	Increase of Tax Revenue
XCREDI	Increase of Loans for Industrial Investments
XDF	Increase of Total State Budget
YDP	Decrease of Public Deficit
M	Money Supply
XM	Increase of Money Supply
YSAL	Decrease of Salaries and Wages
SE	External Sector
XGOPU	Increase of Investments in Public Works
XGECOL	Increase of Investments in Ecological Sector
XGSERV	Increase of Investments in Public Sector
XGIND	Increase of Employment in Public Works
XEECOL	Increase of Employment in Ecological Sector
XESERV	Increase of Employment in Public Services Sector
XEIND	Increase of Employment in Industrial Sector
XPIBOPU	Increase of GDP in Public Works
XPIBECOL	Increase of GDP in Ecological Sector
XPIBSERV	Increase of GDP in Public Services Sector
XPIBIND	Increase of GDP in Industrial Sector
YECOSU	Decrease of Black Economy
XRF	Increase of Tax Revenue
IPC	Consumption Price Index
PIB	Gross Domestic Product (GDP)
V	Velocity of Money
DI	Differential of Loan Interests
R	Tax Coefficient on GDP
YSSPY	Decrease of Social Security Paid by Enterprises
Other Variables:	
XPIBC	Increase of Officially Recorded GDP
XPIBR	Increase of Actual GDP
ECOSU	Black Economy
PPIBC	Percentage Increase of GDP (Officially Recorded)
PPIBR	Percentage Increase of GDP (Actual)
XTG	Increase of Total Expenditure

Table I.
Variables of the Reduced SOSISGEM Model

1. XTIP + XCREDI + YIDEUEX = XDF
2. I = g1 + g2 + g3 + g4 + k1 + k2
3. XDFg1 = XGOPU
4. XDFg2 = XGECOL
5. XDFg3 = XGSERV
6. XDFg4 = XGIND
7. k1 = YSSPY
8. k2 = DI
9. XTG = XGOPU + XGECOL + XGSERV + XGIND + YSSPY + DI
10. YDP = XDF − XTG
11. e1 (XGOPU) ET_i = XEOPU
12. e2 (XGECOL) ET_i = XEECOL
13. e3 (XGSERV) ET_i = XESERV
14. e4 (XGIND) ET_i = XEIND
15. XETOTAL = XEOPU + XEECOL + XESERV + XEIND
16. p1 (XEOPU) = XPIBOPU
17. p2 (XEECOL) = XPIBECOL
18. p3 (XESERV) = XPIBSERV
19. p4 (XEIND) = XPIBIND
20. XPIBC = XPIBOPU + XPIBECOL + XPIBSERV + XPIBIND
21. $XPPIBC = (XPIBC \times 100)/PIB_{T-1}$
22. $XPPIBR = (XPIBR \times 100)/PIB_{T-1}$
23. XRF = XPIBC × R
24. XIP = XRF
25. ECOSU = PIB (7)/100
26. YECOSU = ECOSU (10)/100
27. XPIBR = XPIBC − YECOSU
27.a. XPIBR = XPIBC − YECOSU − XPIBECOL − XPIBSERV
28. $XM = XCREDI + (XPIBR \times M_{T-1}/PIB_{T-1})$
29. $IPC = \left[\frac{(M_{T-1} + XM)V}{(PIB_{T-1} + XPIBR)(1 - IPC_{T-1})}\right] - 1$
30. $M = M_{T-1} + XM$
31. $PIB = PIB_{T-1} + XPIBC$

Table II.
Equalities and Equations of SOSISGEM Model

Resources obtainable	Pesetas (billions)
Increase of taxes	1.628
Decrease of tax fraud	1.736
Decrease of "tax expenditure"	0.900
Rationalisation of the Social Security System	0.300
Decrease of unemployment social security benefits	0.920
Reduction of civil service salaries	0.170
Anticipated amortisation of foreign debt	0.450
Loans for housebuilding	0.798
Loans to industrial and other activities	0.690

Table III.
Estimated Financial Inflows, 1987-89

	Pesetas (billions)
Loan interest differential	0.161
Construction and public works	2.182
Development of public services	1.575
Development of industrial and other economic activities at the local level	0.690
Development of the ecological system	1.374
More social security paid by the State (and less by enterprise)	2.126

Table IV.
Estimated Financial Outflows, 1987-89

Social Hypothesis
This redistribution of financial resources would imply the following changes:

- An improvement of the ecological sector
- A decrease of the black economy
- A more rational tax policy
- A higher degree of worker participation in the enterprise
- A decrease in labour disputes
- A decrease of absenteeism
- A higher degree of enterprise security
- A decrease of criminality
- An increase of the cultural level

We shall see to what extent these forecasts could materialise, especially the economic ones.

Results
A first application of the reduced SOSISCEM model was made with the following variations or scenarios:

(1) Hypotheses 1, 2 and 3 depending on the percentage of investment and expenditure initially foreseen (see Table III).

(2) Deducting, or not, from the annual increase of GDP, the decrease of the black economy brought about by the application of the model.

(3) Deducting, or not, from the annual increase of GDP, the part produced by the ecological and services sector which might be considered little "productive" (i.e. streetcleaning or increasing the number of health inspectors). This deduction is made only in the quantitative formula of money in order to estimate the rate of inflation and thereby take more completely into consideration the additional inflationist tension which results from adopting the model.

(4) Considering that the assumed profitability of investment might be retarded or displaced. Naturally it is not realistic to assume that each year's investment will prove to be 100 per cent operationally profitable (producing real GDP) from the very first moment, as under this first hypothesis. That is why the model was simulated on a more realistic assumption, that is, in the first year, investment is considered to be only one-third profitable, the second two-thirds profitable, and the third 100 per cent profitable.

	1987	1988	1989
		Hypothesis 1	
OPU-CONS	0.75	0.85	0.90
ECOL	0.50	0.75	0.75
SERV	0.75	0.85	0.90
IND-IL	0.25	1.00	1.00
		Hypothesis 2	
OPU-CONS	0.85	0.95	1.00
ECOL	0.75	0.90	1.00
SERV	0.85	0.95	1.00
IND-IL	0.70	1.00	1.00
		Hypothesis 3	
OPU-CONS	1	1	1
ECOL	1	1	1
SERV	1	1	1
IND-IL	1	1	1

Table V.
Scenarios on Proportions of Investment and Expenditure

The most favourable and the least favourable hypotheses have been picked out from among the 24 simulated assumptions. The former is based on the following premises: (1) using hypothesis 3 of Table V, in which 100 per cent investment is achieved; (2) without deducting the black economy (reduced by the model's action); (3) without deducting the GDP produced by the Ecological and Services Sectors; (4) by assuming that GDP will be 100 per cent during each period. Under this more favourable assumption, the results would be:

- The additional tax collection or that resulting from the model supposes 335 billion pesetas the first year, 374 billion the second, attaining 438 billion in the third.
- A total of 924,000 jobs are created during the first year, which builds up to 1.265 million the last year.
- Public deficit falls by 164 billion pesetas the first year and 216 billion during the last year.
- Economic growth (additional or due to the model) is 4.5 per cent during the first year, almost two negative points the second, and nine negative points the last.

On the contrary, the most unfavourable of the 24 hypotheses would be the one based on the following premises: (1) use of hypothesis 1 of Table V; (2) deducting the black economy; (3) deduction of GDP generated by Ecology and Services; and (4) the assumption that one-third of GDP is produced each year. Under the worst assumption, the results would be:

- the additional tax collection or that generated by the model is 207 billion pesetas the first year, 323 billion the second, and 395 billion the third.
- Public deficit falls by 36 billion pesetas the first year, 204 billion the second, and 173 billion the third.
- The total number of jobs created is 579,000 the first year, 884,000 the second, building up to 1.11 million in the third.
- Additional economic growth, or growth due to the model, is 0 per cent the first year, 1.7 per cent the second, and 2.3 per cent the third.
- Lastly, the level of (non-additional) inflation reached by the Spanish economy is close to 8 per cent the first year, 10 per cent the second and 11 per cent the third.

The complete intermediate results between these two extremes can be seen in the 24 scenarios developed by the original model. It would be illogical to think that the appropriate adoption of this model in Spain would produce results closer to the average of the 24 variations, than to any of the two best/worst extremes shown. This average outcome is shown in Table VI.

Conclusion

The solutions adopted outside the framework of national policies have proved to be insufficient. Since 1978 Spain has adopted the same specific, isolated

	1987	1988	1989
(1) Public deficit (billion Ptas.)	0.1	0.2	0.2
(2) Employment created (accumulated number of jobs, thousands)	752	968	1,188
(3) Percentage additional GDP (officially accounted)	3.6	4.3	4.8
(4) Percentage additional GDP (actual)	2.6	3.2	3.8
(5) Inflation (%)	5.1	4.1	1.0

Table VI.
The Average Outcome

policies as other European countries (early retirement, less working hours, etc.) but unemployment has been constantly increasing. In contrast, a systemic approach proposes the SOSISGEM Model which integrates economic with social and political variables and tries to optimise the best possible combination of them (some 35 variables are treated through a system of 31 equations). The model developed pinpoints ways of reducing unemployment in Spain substantially. Its main results are:

- the creation of more than one million jobs;
- an additional 3 per cent increase in GNP;
- the reduction of Public leficit by about one-third; and
- maintaining inflation around two points on the "normal level", that is to say, without application of the model.

Politically speaking, nevertheless, the main drawback of the model is the need to increase public expenditure in Spain, which is tabu for the right-wing political forces. Therefore, the key variable of the model is a political agreement between these forces and the government. According to this systemic model, the problem of unemployment is not of an economic but a social nature and hence must be tackled sociopolitically.

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