Part VIII: Development of Data

CHAPTER 34
BOLIVIAN PUBLIC EXPENDITURE AND THE
ROLE OF DECENTRALIZED AGENCIES:
A TEST OF THE WILKIE VIEW
by
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Introduction

The public decentralized sector in Latin America, which includes mixed corporations, development corporations, state banks, public institutes, and public enterprises, has recently experienced accelerating rates of growth and investment activity. The accumulated power of the decentralized sector can pose a threat to the political authority of the central government, especially to the president and his ministers. James W. Wilkie has argued that the growth of the decentralized sector in Latin America in general (and in Costa Rica, Mexico, and Bolivia in particular) has weakened the ability of central governments to exercise political leadership.[1]

This paper assesses by means of quantitative analysis of 1977 budgetary data the relevance of the Wilkie view with respect to relations between the central and decentralized sectors in Bolivia. First, the growth of decentralization of the Bolivian government is examined in light of the Wilkie perspective.

Bolivian Decentralization and the Wilkie View

The Bolivian economy was not integrated into the international commercial system for most of the nineteenth century. Silver, quinoa, and rubber were exported, as were nitrates and guano from the Pacific littoral, but to no signifi-

cant extent. The loss of its Pacific seacoast to Chile during the War of the Pacific (1879-83) deprived Bolivia of participation in the nitrate and guano booms of the latter part of the century, and her resulting landlocked position only increased Bolivia's isolation from the international commercial system. In addition, the population was sparse, subsistent, mainly rural, and entrenched in the feudal latifundio system. As a result, investment opportunities were limited and foreign capital was scarce. The landowners and silver-mining elites represented the essential elements of power, the landowner's base resting on social control systems embedded in the latifundio and that of the silver elites on economic control. The political "system" operated on the edges of these dual domains of control. The government did not interfere with them, as it supervised administrative functions and land auctions,[2] and served as the political "prize" for successful contestants in sundry power struggles among caudillos.

The international economic position of Bolivia changed drastically toward the end of the nineteenth century with the international commercialization of tin, a mineral with which Bolivia was, and is, richly endowed. The old silver-mining elite was replaced by a new and more capitalist tin elite, as Bolivia prepared to develop its tin resources and began a period of economic growth and integration into the international commercial and capital systems. The type of growth Bolivia experienced, however, was of the "dependent" variety; although the three main tin enterprises were owned by private Bolivian interests, they were all capitalized abroad. Moreover, "downstream" activities in the commercial cycle of tin—refining, marketing, pricing, and distribution—were located abroad and were operated by foreign monopolies.

In this situation the state played a passive role, supplying administrative and political support for the "dependent" growth system. The best evidence of the fundamental economic weakness of the state was its recurrent deficits (requiring external borrowing and domestic financing) during the bonanza years of tin exports (1920-27). The state lacked sufficient leverage to tax the mining industry or to lay claim to its foreign exchange accumulation. Caught in the 1920s between demands of a rising middle class anxious to increase its income by participating in the expansion of public activi-

[1] James W. Wilkie, "Recentralization: The Budgetary Dilemma in the Economic Development of Mexico, Bolivia, and Costa Rica," in David T. Geithman, ed., *Fiscal Policy for Industrialization and Development in Latin America* (Gainesville: University of Florida Press, 1974), pp. 200-247, reprinted in *SNP*, ch. 6. See also James W. Wilkie, *The Bolivian Revolution and U.S. Aid Since 1952* (Los Angeles: UCLA Latin American Center Publications, 1969).

[2] The decrees of 1868-69 fall into this category. These nullified communal Indian ownership of land and allowed the state to auction it off to private investors, who came to constitute a new latifundio class. The older landowning class in Bolivia, the *terratenientes*, derived their ownership of land from colonial titles, or encomiendas. They were allied with the silver-mining elites. The newer latifundio class allied itself with the emergent tin-mining elites, to form a new axis of power.

ties and a mining sector opposed to expanded state authority, the state yielded to the latter. Though there were signs of the increasing political articulation of the state in the 1920s, it had little impact on the operation of the economy. According to the "Liberal" model, which supplied the ideology of the Bolivian state from the 1890s to the Chaco War (1933-35), the state would play an administrative and quasi-political role, but the principles of laissez-faire, rationalized in terms of positivism, would govern its relationship to the economy.

In most Latin American countries the expansion of the economic role of the state began with the emergence of the import substitution cycle in the 1930s. In Bolivia, however, although the effects of the Depression weakened the laissez-faire foundations of the Liberal state, the essential changes in the role of the state evolved from the Chaco War against Paraguay. As a result of the war and the popular reactions to the human slaughter and official ineptitude that it generated in Bolivia, the social and political systems of the country were questioned. The nationalistic activities of post-Chaco governments in Bolivia were reflections of a new revolutionary mood, especially among the junior military. The thrust of these activities was to increase the role of the state in the economy and to allocate to it responsibility for social reform. The new economic responsibilities were vested in several decentralized corporations: the State Mining Bank (1936), the State Oil Corporation (YPFB, 1936), the State Agricultural Bank (1942), and the State Development Corporation (1942). During the Busch government (1938-39) an effort was made to bring the foreign exchange operations of the three large private tin companies under government control.

These steps in the expansion of the role of the state in the economy coincided with the grass-roots organization of the rural population into peasant and mining syndicates in a context of sharpening social class conflict. The popular revolt that grew out of the Chaco War culminated in the 1952 Revolution whose somewhat ambivalent standard-bearer was the Movimiento Nacional Revolucionario (MNR) and Víctor Paz Estenssoro. The MNR was eventually trapped between the effort to create developmental state capitalism and the political pressures generated by a populist revolt.[3] In his second presidential term, Paz Estenssoro, an economist, adopted the view that the purpose of the Revolution was to permit a technocratic elite to use the state to foster economic development rather than to perpetuate the conditions of political and social revolution. Paz's model was the Mexican Revolution, not the Cuban Revolution. His ultimate tactic was to ignore the populist-left sector of the MNR, based in the highly politicized tin unions, while encouraging the creation of a professional stratum that saw the state not as a source of political and social rewards, but as an instru-

ment of economic development and capital accumulation. Paz tried to base this new group in the professional sectors of the military and the government bureaucracies, especially in the decentralized sector.

For Wilkie the expansion of the decentralized sector initiated under the MNR as part of the development strategy has weakened the political authority of the presidency and ministries and has fragmented the government's overall role in society. Wilkie uses aggregate budgetary data to show that in fact a divergence of roles between the central and decentralized entities has characterized the public sector in Bolivia. He analyzes the historical patterns of public expenditure on public administration and economic and social programs to trace the origin of this divergence.[4]

Wilkie's figures[5] show that Bolivia's departure from the Liberal pattern of the purely administrative state began immediately after the Chaco War when administrative allocations were temporarily increased to meet the costs of the war. With the Toro government (1936) one notices the beginning of a secular decline in central government spending on public administration and a pronounced acceleration of the rates of spending for social and economic programs. During the MNR period (1953-64) the ratio of administrative to social outlay shifts in favor of the social, but the rate of increase in economic spending is not rapid (except during 1957 when Bolivia launched a massive monetary stabilization program). Under the MNR, the state opted for an essentially social and administrative role rather than an economic one, and this pattern continued after the MNR period as well. This may seem curious since the Paz Estenssoro branch of the MNR leadership was committed mainly to economic development, not social revolution. An understanding of this anomaly, according to Wilkie, lies in the role assumed by the decentralized sector under the MNR.

Paz evidently reasoned that economic development was *too* important to be handled by the central government where populist politics were intensive. (On the other hand, it was necessary to focus *social* outlay there to furnish visible demand-satisfaction by the MNR leadership.) The tactic, therefore, was to increase the number of entities in the decentralized sector so that economic spending could be delegated to them, as well as to the U.S. Agency for International Development (US AID). In this manner, economic policy decisions and planning strategies would be formulated in a technocratic environment, while the central government attended to political functions through its administrative and social expenditures. The result of this policy, Wilkie observes, was the "small role [of the central government] in economic development."[6] The post-MNR governments expanded the number of decentralized entities and allowed them to monopolize economic spending. (The shift of US AID from

[3] James Malloy, *Bolivia: The Uncompleted Revolution* (Pittsburgh: University of Pittsburgh Press, 1970), especially pp. 167-188 and 280-316.

[4] Wilkie, ''Recentralization,'' pp. 127-224, and Wilkie, *Bolivian Revolution*.
[5] Wilkie, *Bolivian Revolution*, p. 55.
[6] Wilkie, "Recentralization," p. 218.

economic to social programs in the early 1960s served to accelerate the tendency of the decentralized sector to dominate public economic spending.) According to Wilkie, by 1970 a trade-off seems to have occurred. Despite some effort in 1970 to increase economic spending, the central government would emphasize social and administrative outlay while the decentralized sector would focus on economic outlay.

In his analysis of the political effects of this trade-off, Wilkie doubts whether, in developing countries, the national leadership can allow the role of the central government in economic development to be abdicated to the more efficient decentralized sectors and still expect to maintain its political authority through the exercise of administration and social functions: "If the central government is to be socio-administrative in nature in contrast to the economically oriented decentralized sector, then societies [where this occurs] will lack strong leadership. . . ."[7]

Methodological Statement of the Problem and Data

The Wilkie view raises an empirical question: to what degree do the verifiable behaviors of the central and decentralized sectors in Bolivia still reflect role divergence? Does the evidence still warrant the conclusion that the entities in the central sector are committed as a whole to administrative and social activity, while the decentralized entities as a whole are committed to economic matters? That is, are the behaviors of the central and decentralized entities statistically separable from one another on the basis of their expenditures on social, administrative, and economic programs? The Wilkie view suggests that based on the premise of role divergence the central sector entities will have higher levels of administrative and social outlay, whereas the decentralized entities will have higher levels of economic outlay.

Methodologically, the primary purpose here is to measure the *discriminant* power of the social, economic, and administration expenditure variables. How adequate is the information contained in these variables as a basis for discriminating between the *group* behaviors of the central and decentralized entities?

The secondary purpose is to classify the departmental and local governments into central and decentralized sectors. After a discriminant function has been derived from the data which optimally discriminates between the central and decentralized entities, that function will be used as a basis for categorizing these local governments into either the central or the decentralized sector. The question asked is whether the spending patterns of these departmental and municipal entities resemble more closely the central entities' behavior or the decentralized entities' behavior, after these latter behaviors have been optimally separated from one another.

The data used in this analysis were collected from the budgets of each of the entities that compose the public

sector in Bolivia. The budgets of all public sector entities are contained in the multivolume *Budget of the Public Sector*, published annually by the Ministry of Finance. This study uses the data in the 1977 budget volumes.

In the Bolivian scheme, expenditures are classified into functional categories for all entities (current and capital accounts) and into program categories. The data used here are taken from the latter. Program expenditures of individual entities were classified into three rubrics—public administration, and economic and social programs, according to the scheme shown in table 3400. (See Appendix A for a more detailed breakdown of the economic and social rubrics.)

The Bolivian Public Sector

Public Sector Structure

The Bolivian public sector is structured in accordance with the Law of Administrative Organization of the Executive Power[8] which was promulgated by the military government of Hugo Banzer on September 12, 1972. The government budgetary organization is shown in table 3401. (See Appendix B for the total number of entities in the public sector.)

According to Article 69 of the administrative reform law, "decentralization is an administrative action by which

Table 3400

BOLIVIAN BUDGET CLASSIFICATION SCHEME

Public Administration
  Diplomacy, foreign policy, decree publication and distribution
  Public sector budget control, revenue (taxes and custom administration)
  Studies of the maritime problem
  Treaties and policy research
  Administration of justice, migration, and police
  Armed forces and defense
  Planning and coordination of government agencies
  Public debt
  Fiscal control
  Land titles and agrarian reform
  Collection of statistical information
  Law enforcement, protection of citizens' rights, and public order
  Retirement funds

Economic
  Agricultural
  Mining
  Energy and hydrocarbons
  Industry, commerce, tourism
  Transport and communications
  Public works

Social
  Housing, urbanization, hygiene
  Education and culture
  Social welfare and public health
  Labor

SOURCE: Bolivia, Ministerio de Finanzas, *Presupuesto del Sector Publico,* 7 vols. (La Paz, 1977). Hereafter cited as *PSB, 1977.* The classification categories shown under the economic and social headings are those used in the Bolivian budget. There is no category of public administration as such. This was constructed following Wilkie, *Bolivian Revolution,* pp. 65-66, and James W. Wilkie, *The Mexican Revolution,* revised edition (Berkeley: University of California, 1970), p. 13. The only exception is land titles and agrarian reform which he classified as economic.

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[7] Ibid., p. 243.

[8] Text of Decree Law 1046, *Gaceta Oficial de Bolivia,* September 14, 1972. This law supersedes that of April 30, 1970.

Table 3401

BOLIVIAN GOVERNMENT BUDGETARY ORGANIZATION

Category	Number of Entities
Central Government	
The presidency	3
The ministries	18
Decentralized Administration	
(Administración Decentralizada)	
Development corporations	10
Public institutes	84
Public enterprises	33
Mixed enterprises	6
Deconcentrated Administration	
(Administración Deconcentrada)	
Departmental governments	9
Municipal governments	9

SOURCE: Appendix B.

the central government delegates to the public institutes and public enterprises and mixed enterprises, the faculty of decision [making] in the technical, economic, and administrative domains, for the execution of specific works and public services." The term 'deconcentration' (*desconcentración*) differs from 'decentralization' (*decentralización*) in that it implies a more geographic reference. According to Article 70, "deconcentration" is "the administrative action by which the organs of the Executive delegate the necessary operational and decisional capability to administrative entities located in diverse geographic points around the country, in order to facilitate the solution of matters within their competencies."

The public institutes are by far the most numerous entities in the decentralized group. The Administrative Reorganization Law of 1972 increased the public institute component of the decentralized group in two ways. First, many service entities which were external dependencies of central ministries, but which lacked a decentralized status, were elevated to the rank of a decentralized entity (with budgetary autonomy) by their legal incorporation as public institutes. Secondly, forty-five public institutes were created in the 1970s. This aggregation of new and old entities into the public institute sector accounts for the overall increase in the total number of public entities from 108 in 1970 to 172 in 1977.[9]

Thus, when Wilkie collected his data, before the Administrative Reorganization Law of 1972, the public institutes did not occupy the prominent position in the decentralization landscape that they do today in Bolivia. The presence of the public institutes in the decentralized sector has offset the exclusively economic character previously imparted to that sector by the mixed and public enterprises. According to Article 78 of the 1972 law, whereas the public enterprises "are organs constituted in order to develop economic activities that are profitable in the industrial, commercial, and service sectors," the public institutes "are decentralized enti-

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[9] This paragraph is based on the descriptions of the legal status of each of the public sector entities, reported in volumes 3 and 3a of the 1977 *Budget*.

ties created in order to attend to programs as services that may be for development, education, health, social security, and others" (Article 75). A perusal of the names of the public institutes (see Appendix B) confirms their essentially service and social character.

According to Articles 85 through 88 of the 1972 law, the development corporations are regionally based entities responsible for the formulation and supervision of economic and social development projects, without prejudice to the departmental political demarcations.

The departmental governments are representatives of the president and are accountable to the Ministry of the Interior. They are responsible for maintaining order and internal security, controlling immigration, and enforcing the resolutions of the central government. The municipal governments are more autonomous; the alcaldes (mayors) are the "maximum authority" in the municipality. In addition to its political functions, the municipal government "will coordinate its plans, programs, and projects in relation to the regional development, jointly with the Development Corporation" and the president's office (Articles 100-102).

The departmental and municipal governments thus represent an anomaly in the classification of government into central and decentralized sectors. They do not belong to the central sector because they are geographically decentralized ("desconcentrados"); but because of their political character they do not belong to the decentralized sector.

Public Sector Spending

Table 3402 shows the social, economic, and administration budgeted outlay for 1977 for all government entities, the central entities, the decentralized entities, and the "unclassified" entities (the departmental and municipal governments). The figures seem to support Wilkie's view that the thrust of spending by the central entities is socioadministrative, whereas the decentralized entities place primary emphasis on economic expenditure. With regard to the unclassified entities, the departmental governments are more administrative than social or economic. The municipal governments are not economic at all. They assume exclusively socioadministrative roles and are much larger spenders in each of these roles than their departmental counterparts.

Table 3403 compares the contributions made by each

Table 3402

ALLOCATION OF EXPENDITURES BY ENTITY GROUP (1977)

Entity Group	Amount (T Pesos)	Economic (%)	Social (%)	Administrative (%)	Total (%)
All	45,238,772	69.8	20.3	9.9	100.0
Central	7,759,164	5.1	45.6	49.3	100.0
Decentralized	36,118,943	86.2	12.6	1.2	100.0
Unclassified					
Departmental	79,794	31.2	27.9	46.9	100.0
Municipal	1,280,871	0	81.1	18.9	100.0

SOURCE: *PSB, 1977.*

Table 3403

CONTRIBUTIONS TO TOTAL PUBLIC EXPENDITURES
BY ENTITY GROUP

Entity Group	Public Administration		Economic		Social	
	T Pesos	%	T Pesos	%	T Pesos	%
Totals	4,472,488	100.0	31,584,978	100.0	9,181,306	100.0
Central	3,831,051	85.7	391,881	1.4	3,536,232	38.5
Decentralized	366,415	8.2	31,168,284	98.6	4,584,244	49.9
Unclassified						
Departmental	32,652	.7	24,813	.1	22,329	.3
Municipal	242,370	5.4	0	0	1,038,501	11.3

SOURCE: *PSB, 1977.*

group of entities to the total public sector spending in the three areas. With regard to public administration, the central entities' contribution dominates that of the decentralized entities. In the economic program area, decentralized expenditure is even more dominant over central government outlay. On the other hand, in the social area decentralized expenditure (even though it accounts for 12% of the group's outlay) accounts for a larger share of public social outlay than does central expenditure. Clearly, the central entities cannot be said to monopolize public social spending.

Comparisons of means is useful for analyzing further the spending patterns of the two groups. To compute the mean expenditure for each group, the absolute amount of the entity's outlay for administration and social and economic programs was recomputed to a *percentage* of its total outlay. The score for each entity on the new variables represents the amount spent, expressed as a percentage of that entity's total budgeted outlay. The means indicate what part of its total income the average entity in each group will spend in the three areas. The means are shown in table 3404.

Table 3404

MEAN EXPENDITURES BY ENTITY GROUP
(1977)

Entity Group	Public Administration	Economic	Social	Other	Total
All	14.3	35.8	38.4	11.5	100.0
Central	43.8	10.8	22.1	23.3	100.0
Decentralized	4.9	44.3	41.5	9.3	100.0
Unclassified					
Departmental	81.8	5.2	9.4	3.6	100.0
Municipal	16.9	0	68.7	14.4	100.0

SOURCE: Computed from data in *PSB, 1977.*

The greatest divergence between the means of the central and decentralized group expenditures occurs in the administration variable where the proportion of its income that the average central entity spends is more than eight times larger than the average decentralized entity's outlay. On the economic variable the average decentralized entity spends four times more of its income than the average central entity. On the social variable the average decentralized entity spends two times more of its income than the average central

entity. It is evident that optimal discrimination of the behaviors of the two groups of entities will have to rely heavily on the administration variable, since it is there that the groups' mean behaviors differ most. The divergence is less clear with respect to the economic and social variables, though clearer on the economic than the social one. Administratively, the mean behaviors of the departmental and municipal entities resemble that of the central sector, but economically and socially the similarity is less distinct. For example, for social expenditure, the municipal mean approximates the decentralized mean more than the central sector mean.

The standard deviations of the variables in table 3404 were uniformly high, indicating wide dispersion of the data around the means. The means are therefore not totally reliable indicators of the distribution of entity scores on each variable. In order to examine graphically these distributions, the frequencies with which the entities in the groups score in the high, medium, or low ranges on each variable were computed. For this purpose, the variables were recorded in this form: 0 to 30% = 1 = low; 31% to 60% = 2 = medium; 61% to 100% = 3 = high. If an entity budgeted, for example, 15% of its total outlay for social expenditure, it would score in the low range ("1") on the social variable.

A comparison of the frequency means (fig. 1) indicates central group dominance on the administrative variable (1.91 to 1.01). Figure 1 clearly shows, however, that there is very weak cohesion of the central sector entities on this variable. Half of the entities score low and half score high, creating a bimodal type of distribution around the mean as reflected in the kurtosis statistic (-2.110). This makes it difficult to contend that the central sector is uniformly committed to emphasis on public administration. On the other hand, there is a much stronger cohesion around the (low) mean in the decentralized spending on public administration. Placing emphasis on the administrative variable to achieve an optimal discrimination of the central and decentralized groups will therefore effectively define the decentralized entities as a group (95.5% of the entities score low) but will much less accurately define the central entities as a group because of the split in its administrative expenditure behavior. On the economic variable (see fig. 2), 75 decentralized entities (56% of the total number) scored *low* while 51 (37.6%) scored high. This creates another bimodal situation and a weak central tendency, reflected in the kurtosis (-1.814) and standard deviation (.958) statistics. Thus it is difficult to contend that the decentralized sector is essentially economic, as Wilkie did in 1970. On the social variable (see fig. 3), neither the group means nor the frequency distributions are widely dissimilar. Both sectors show weak cohesion (though the decentralized sector is more bipolarized) as the kurtosis statistics and standard deviation reflect. We would expect, then, that the social variable is going to contain the least discriminant information of the three variables. The discriminant technique is described below and is applied to the data to further define the central/decentralized relationships.

Central Sector Entities

```
Code
      I
Low    1  ••••••••••••••••••••••• (      11)
      I
      I
      I
Medium 2  •••• (     1)                        .
      I
      I
      I
High   3  ••••••••••••••••••• (      9)
      I
      I
      I.........I.........I.........I.........I.........I
       0        4        8       12       16       20
       Frequency
```

Mean	1.905	Std Err	.217	Median	1.455
Mode	1.000	Std Dev	.995	Variance	.990
Kurtosis	−2.110	Skewness	.206	Range	2.000
Minimum	1.000	Maximum	3.000		

Decentralized Sector Entities

```
Code
      I
Low    1  •••••••••••••••••••••••• (     127)
      I
      I
      I
High   •••  (     6)
      I
      I
      I.........I.........I.........I.........I.........I
       0       40       80      120      160      200
       Frequency
```

Mean	1.090	Std Err	.036	Median	1.024
Mode	1.000	Std Dev	.417	Variance	.174
Kurtosis	17.926	Skewness	4.434	Range	2.000
Minimum	1.000	Maximum	3.000		

Figure 1. Frequency distributions of central and decentralized entities on public administration outlay variable (1977).

SOURCE: Computed from *PSB, 1977.*

Central Sector Entities

```
Code
      I
Low    1  ••••••••••••••••••••••••••••••• (    19)
      I
      I
      I
Medium 2  •••••• (    2)
      I
      I.........I.........I.........I.........I.........I
       0        4        8       12       16       20
       Frequency
```

Mean	1.095	Std Err	.066	Median	1.053
Mode	1.000	Std Dev	.301	Variance	.090
Kurtosis	7.562	Skewness	2.975	Range	1.000
Minimum	1.000	Maximum	2.000		

Decentralized Entities

```
Code
      I
Low    1  ••••••••••••••••••••••••••••• (    75)
      I
      I
      I
Medium 2  ••••• (    7)
      I
      I
High      •••••••••••••••••••• (    51)
      I
      I
      I
      I
      I
      I.........I.........I.........I.........I.........I
       0       20       40       60       80      100
       Frequency
```

Mean	1.811	Std Err	.083	Median	1.380
Mode	1.000	Std Dev	.958	Variance	.918
Kurtosis	−1.814	Skewness	.390	Range	2.000
Minimum	1.000	Maximum	3.000		

Figure 2. Frequency distributions of central and decentralized entities on economic outlay variable (1977).

SOURCE: Computed from *PSB, 1977.*

The Discriminant Analysis Technique

The concept of discriminant analysis can be illustrated by an example involving the scores of 28 entities plotted in a space defined by the axes representing the variables X_1 and X_2. Fourteen of the data points belong to entities in group A and 14 to group B. It is helpful for discriminant purposes to think of the scores of the cases belonging to each group as occupying distinct regions in the space defined by the variables. Each will have a scatter pattern with contours; moreover, each group has an average score on both variables. The average group score is the centroid, the point from which the scores of the members of the group of entities in A and B balance in all directions. Figure 4 shows a hypothetical scattering of scores and indicates the centroids for each group.

Central Sector Entities

```
        Code
          I
Low     1 •••••••••••••••••••••••••••• (    15)
          I
          I
          I
Medium  2 •••••• (    2)
          I
          I
          I
High    3 ••••••••• (    4)
          I
          I
          I.........I.........I.........I.........I.........I
          0      4      8     12     16     20
          Frequency
```

Mean	1.476	Std Err	.178	Median	1.200
Mode	1.000	Std Dev	.814	Variance	.662
Kurtosis	-.042	Skewness	1.316	Range	2.000
Minimum	1.000	Maximum	3.000		

Decentralized Entities

```
        Code
          I
Low     1 ••••••••••••••••••••••••••••••• (    73)
          I
          I
          I
Medium  2 •••••• (    10)
          I
          I
          I
High    3 •••••••••••••••••••••• (    50)
          I
          I
          I.........I.........I.........I.........I.........I
          0     20     40     60     80    100
          Frequency
```

Mean	1.827	Std Err	.082	Median	1.411
Mode	1.000	Std Dev	.950	Variance	.902
Kurtosis	-1.813	Skewness	.354	Range	2.000
Minimum	1.000	Maximum	3.000		

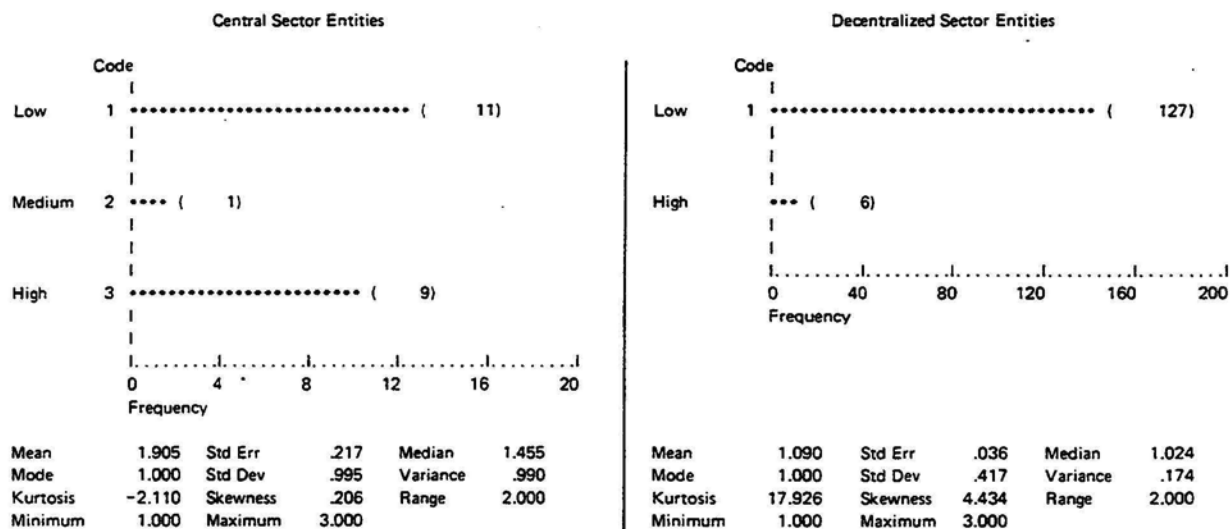Figure 3. Frequency distributions of central and decentralized sector entities on social outlay variable (1977).
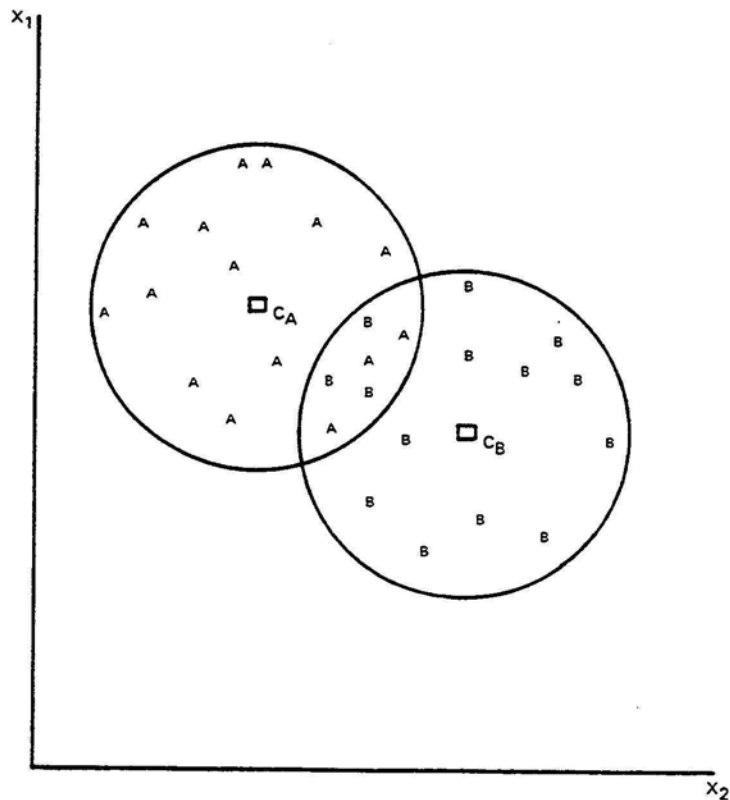
SOURCE: Computed from *PSB, 1977.*

Figure 4. Scatter regions and centroids of cases belonging to groups A and B. C_A, average score (centroid) of entities in Group A; C_B, average score (centroid) of entities in Group B.

SOURCE: Adapted from John C. Nunnally, *Psychometric Theory* (New York: McGraw-Hill, 1967), p. 390.

The overlapping of the scatter regions defines the extent to which the two variables do *not* discriminate the groups; in this area the behavior of the cases cannot be distinguished on the basis of their group identification. The purpose of discriminant analysis is to reduce this "indiscriminant" area as much as possible by weighting the information contained in variables X_1 and X_2. More technically, this involves the derivation from the original variables X_1 and X_2 of a new function that defines a new space in which the original case scores can be replotted in a fashion that results in the maximum reduction of the overlap of the scatter regions of the groups. Call this derived function Y. It is defined by

$$Y = a_1 x_1 + a_2 x_2,$$

where the *as* are weighting coefficients and X_1 and X_2 are the raw scores of the original variables. In discriminant analysis, Y is drawn (i.e., the coefficients are given that set of weights) so that the distance on Y between the intersection points of lines drawn orthogonally from the centroids in the original variable space will be greater than the distance between such points if Y were drawn with coefficients having any other weights. The line Y having this property is called the *discriminant function*. Figure 5 shows that the new group scatter regions on the discriminant function (defined by the normalized distributions of the case scores around the
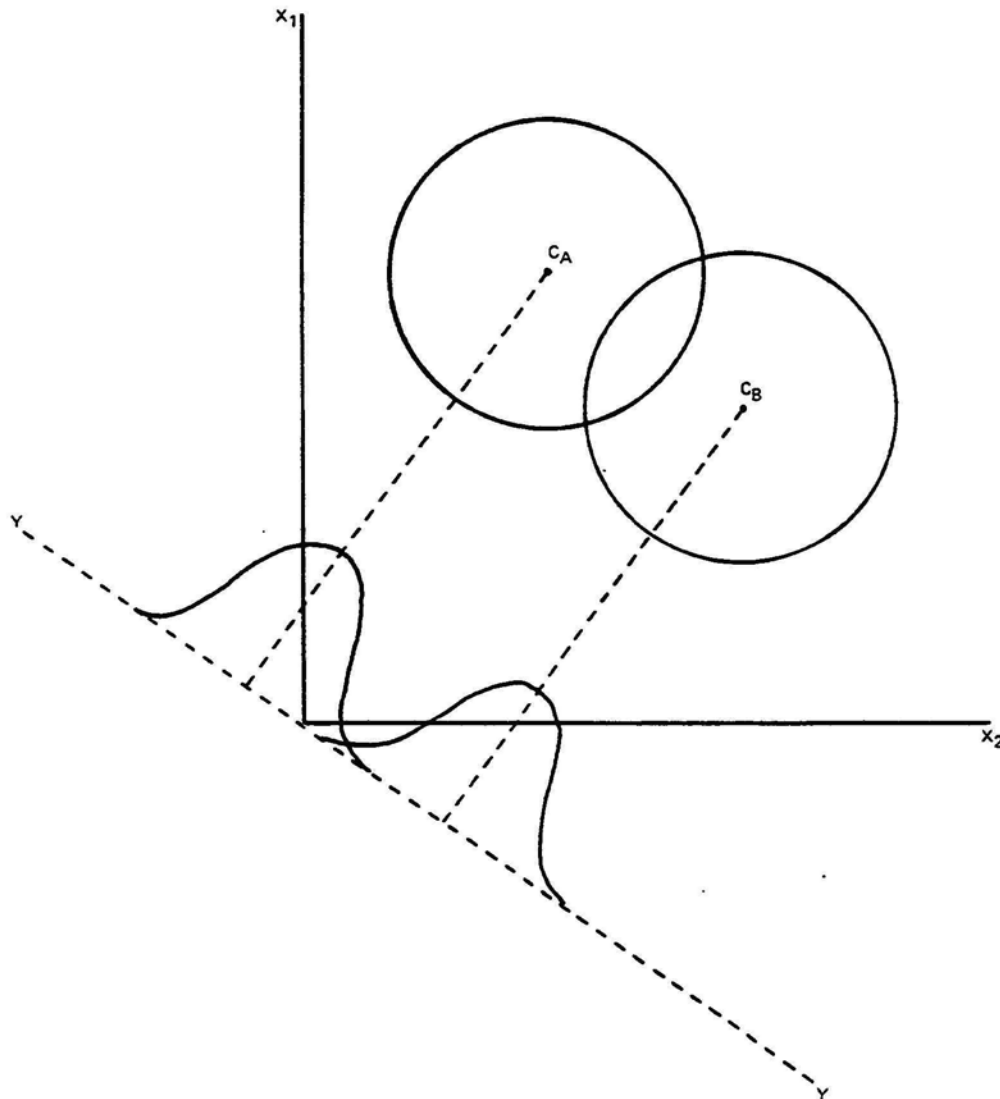

Figure 5. Projection of scores onto discriminant function Y.

SOURCE: Adapted from John C. Nunnally, *Psychometric Theory* (New York: McGraw-Hill, 1967), p. 391.

group's mean score on the function) are more clearly separated than were the scatter regions in the original two-variable space.

The problem in discriminant analysis is therefore to select a weighting of the raw scores of the original variables that will produce an *optimal separation* of the groups in the space defined by the discriminant function. The rule for optimization in this case is to maximize the distance *between* group means while simultaneously minimizing the distance between cases *within* groups, thus statistically maximizing intragroup cohesion *and* intergroup distance. By using the statistical concept of variance, the rule of optimization in the selection of weights for the discriminant function Y is to maximize the proportion

$$\frac{\text{variance between group means on } Y}{\text{variance within groups on } Y}$$

otherwise known as the F-ratio.

Each case will have a score on the discriminant function which is simply a transformation of its score in the original variable space. The case score on the discriminant function is computed by multiplying the case score on each variable by the coefficient assigned to that variable by the discriminant function, and summing these products. In the SSPS Discriminant Program used in this analysis,[10] the scores of cases on the discriminant function are standardized, as are the coefficients of the function itself, such that scores of all the cases on the function will have a mean of 0 and a standard deviation of 1. Each individual case score is therefore the number of standard deviations that case is away from the zero mean.

The scores of the cases can be plotted as a frequency distribution, or histogram, on the discriminant function. The average group score, or centroid, on the function is also computed. The distance on the function between the centroids of the groups indicates how well they have been discriminated by the function; the farther apart the centroids, the better the discrimination.

Often discriminant analysis reveals differences in group behaviors not evident from the plotting of the raw scores of the cases on the original variables. In such cases the variables contain "latent" discriminant information that is exposed by the discriminant technique. The discriminant information was "latent" in the sense that certain variables contained significant discriminant information but this was obscured by the presence of data in other variables that contained little or no discriminant data. By weighting the variables according to the amount of *unique* discriminant information each variable contains, the discriminant function exposes the latent discriminant power of the variables. Variables that contain

relatively more discriminant information with regard to the group being analyzed will be weighted more heavily than variables whose information is less discriminant. By inspecting the weighting coefficients assigned by the discriminant function to the variables, we can learn which variables explain more about the difference in group behaviors. The variables can then be ordered according to their discriminant power. For example, from the weighting coefficients assigned by the discriminant function to the administrative, social, and economic expenditure variables we can determine the relative strengths of the variables in discriminating between the group behaviors of the central and decentralized entities.

In addition to its analytic value, discriminant analysis is a useful tool for classification. It can be used to classify those entities in the analysis that do not formally belong to the groups. In order to classify such ungrouped entities, discriminant analysis computes a "classification function." The values of the coefficients for the group's classification function are derived from the covariance matrix of the case scores of the groups on the discriminant function. The classification coefficients will therefore be different for each group. A new or ungrouped case will have a separate "classification score" for each group. This is computed simply by multiplying the case's raw scores on the variables by the weighted coefficients assigned to these variables by the classification function of the first group and summing these products. This is repeated for each classification function of each group. The case is assigned to that group on whose classification function it has the highest score.

In this analysis, we want to know whether departmental and municipal entities will be classified into the central or decentralized groups by the classification functions generated for these groups in the discriminant analysis. This will tell us whether the behavior of these entities more closely resembles that of the central or decentralized sector, after the variables in the analysis have been weighted by the discriminant function.

In addition to identifying the probable group membership of the ungrouped cases, the discriminant analysis program uses the classification function to "predict" the group membership of all the cases which already belong to groups. By comparing the *predicted* group membership to the *actual* group membership, the accuracy of the discriminant function as a classification technique can be evaluated. A large percentage of misclassified cases indicates a weakness in the discriminant function (that is, the variables contain inadequate discriminant information). Clearly, discriminant functions that are not able to separate the group centroids do not generate reliable classification functions.

Direct Discriminant Analysis

The discriminant function derived from the data contained in public administration and economic and social program outlay variables developed above assigns to these three variables the weights shown in table 3405. Table 3405

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[10] See William R. Klecka, "Discriminant Analysis," in Norman H. Nie et al., *Statistical Package for the Social Sciences*, 2d ed. (New York: McGraw-Hill, 1975), pp. 434-467.

shows that the function, as expected, is hardly weighting at all the information contained in the social variable; the slight negative weighting of this variable indicates there is only some residual discriminatory information in the social data. It is not, therefore, very helpful in separating the group behaviors of the central and decentralized entities.

Table 3405

DISCRIMINANT FUNCTION WEIGHTING COEFFICIENTS
(1977)

Variable	Score
Public Administration Outlay	.98424
Economic Outlay	-.15010
Social Outlay	-.03422

SOURCE: Computed by SPSS Discriminant Analysis Program.

There is evidently greater asymmetry between groups in relation to their economic spending. More precisely, there is five times more discriminatory information contained in the economic data than in the social data. Thus the economic variable "contributes" five times more to the derivation of the discriminant function than the social variable does. By far the greatest discrimination between the group behaviors occurs in regard to administration outlay. The weighting of this variable indicates that it contains six and one-half times as much discriminant information as the economic variable contained.

Figure 6 is a histogram of the distribution of all entity scores on the discriminant function. The ones (1) represent central sector entities and the twos (2) represent the decentralized sector entities. The symbol # represents the unclassified entities. The intersection of a line drawn horizontally from the tip of each column to the vertical axis indicates the approximate number of entities of that column. The base of the column indicates the score of the entities in that column on the discriminant function. The scoring pattern of the decentralized entities shows strong cohesion but this is not true for the central entities; in fact, the scores for the central entities are spread out and some of them cause the central entities to be misclassified into the decentralized group. Moreover, the centroids (or average scores) of the two groups are relatively close together, indicating a somewhat weak discrimination. All the ungrouped cases (except one) score in the central group's classification domain.

Table 3406 gives the exact classification results. It tells us how "successful" the discriminant function is, that is, how

Table 3406

CLASSIFICATION RESULTS OF THE DISCRIMINANT FUNCTION
(1977)

Actual Group	Number of Actual Members	Predicted Group Membership[1]			
		Central		Decentralized	
		N	%	N	%
Central	21	11	52.4	10	47.6
Decentralized	133	8	6.0	125	94.0
Unclassified	18	17	94.4	1	5.6

1. Percent of central and decentralized entities correctly classified: 88.31%.

SOURCE: Computed by SPSS Discriminant Analysis Program.

N = 133

Figure 6. Distribution of scores for all entities on the discriminant function A (1977).
1, central entities; 2, decentralized entities; =, unclassified entities (departmental and municipal governments).

SOURCE: Computed by SPSS Discriminant Analysis Program.

much the predicted group membership coincides with the actual group membership. The percentage of cases correctly classified, 88.31%, is relatively high. This high rate of accuracy, however, applies mainly to the decentralized entities. The discriminant function correctly predicts the group membership of 94% of the decentralized entities. But the function is not very accurate in predicting the group membership of the central entities: 47.6% (ten entities) were misclassified. In the case of the departmental and municipal entities, 94.4% are classified into the central sector. Examination of the discriminant scores of the individual entities in each group offers some insight into the nature of the function and can establish a basis for its interpretation.

Appendix C lists the scores of each of the decentralized entities on the discriminant function and gives the predicted group membership. The classification scores of the cases are expressed as probability of membership in either group. The group in which the case has the highest probability of membership is represented as the case's *predicted* group membership. The misclassified cases are noted and include State Comptroller, Superior Institute of Public Administration, Autonomous Administration of La Paz Airport Customs, Agricultural Customs of La Paz, Agricultural Customs of Cochabamba, National Agrarian Reform Council (all public institutes); National Computer Center; Superintendency of Insurance (public enterprises). These particular entities are predominantly administration oriented. Table 3407 gives the social, economic, and administrative outlays for the misclassified entities.

Table 3407

EXPENDITURES OF MISCLASSIFIED DECENTRALIZED ENTITIES (1977)

	Entity	Public Administration (T Pesos)
32.	State Comptroller	63,820,500
43.	Superior Institute of Public Administration	7,937,000
45.	La Paz Airport Customs	155,456,200
46.	Agricultural Customs of La Paz	5,523,800
47.	Agricultural Customs of Cochabamba	898,800
91.	National Agrarian Reform Council	34,406,500
117.	National Computer Center	83,592,000
120.	National Superintendency of Insurance	5,207,000

SOURCE: *PSB, 1977.*

The misclassified decentralized entities scored in the high positive region of the function because of their exclusive involvement in administration programs (fig. 6). Their scores were driven out of the zero region in the discriminant function, whereas the other decentralized entities scored in that region heavily and cohesively owing to their lack of administration programs.

Interestingly, the mean scores on the function of the subgroups in the decentralized sector (development corporations, public institutes, public enterprises, mixed enterprises) are approximately the same, that is, they are "stacked up" (fig. 6). It is thus the common absence of administrative

activity that defines these scores: the divergences we know to exist between these subgroups with regard to mean social and economic expenditure (especially between the public institutes and the public enterprises) is neutralized by the function's almost exclusive reliance on the administrative variable.

We now examine the causes for decisive classification of the ungrouped entities into the central group. Table 3408 lists their scores on the discriminant function. Unlike the decentralized scores which were "stacked up" on the function, there is a bipolar situation with respect to unclassified entities. The departmental entities have a much higher (6.0595) mean score than the municipal entities (1.0792). Although both groups are classified into the central sector (with the exception of the Chuquisaca municipal government), clearly this classification is much more decisive with regard to the departmental entities. As the means in table 3404 showed, the departmental governments are essentially administration oriented with some secondary activity in social and economic programs,[11] driving their scores well into the positive region in the discriminant function, which is weighting heavily the administration variable. On the other hand, the municipal governments are directed toward social programs with secondary emphasis on administration. They do generate enough administration activity to have a scoring pattern on the function that is separate from the scoring pattern of the decentralized entities. But their social outlays

Table 3408

SCORES OF UNCLASSIFIED ENTITIES ON DISCRIMINANT FUNCTION (1977)

	Entity	Actual Group	Code and Highest Probability Group[1]	Discriminant Score
Departmental				
155.	Chuquisaca (Sucre)	Unclassified	C (1.0000)	7.4509
156.	La Paz	Unclassified	C (.5121)	.7097
157.	Cochabamba	Unclassified	C (.9998)	5.2512
158.	Potosí	Unclassified	C (1.0000)	7.2205
159.	Oruro	Unclassified	C (1.0000)	7.4509
160.	Santa Cruz	Unclassified	C (1.0000)	6.8609
161.	Tarija	Unclassified	C (1.0000)	7.4509
162.	Beni	Unclassified	C (1.0000)	6.6119
163.	Pardo	Unclassified	C (.9999)	5.5294
Municipal				
164.	Chuquisaca (Sucre)	Unclassified	D (.6654)	.3056
165.	La Paz	Unclassified	C (.7778)	1.3710
166.	Cochabamba	Unclassified	C (.7011)	1.1510
167.	Potosí	Unclassified	C (.6972)	1.1408
168.	Oruro	Unclassified	C (.6535)	1.0314
169.	Santa Cruz	Unclassified	C (.6801)	1.0972
170.	Tarija	Unclassified	C (.6763)	1.0876
171.	Trinidad	Unclassified	C (.7299)	1.2288
172.	Cobija	Unclassified	C (.7545)	1.2995

1. Code: C, central government; D, decentralized government.

SOURCE: Computed by SSPS Discriminant Analysis Program.

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[11] The La Paz departmental government is an exception; it more closely resembles the municipal governments by virtue of its relatively heavy involvement in social programs, in addition to its public administration role. It is also heavily involved in economic programs.

dilute their administrative role. They are "somewhat" like the decentralized sector (i.e., their scoring region is contiguous to that of the decentralized sector) in that their main emphasis is *other* than administrative. The differentiation of the departmental governments from the decentralized sector, however, is much clearer.

Table 3409 gives the scores on the discriminant function of the central entities. There is also a bimodal distribution of the scores of the central entities on the discriminant function. The mean score of these misclassified central sector entities on the discriminant function is virtually the same as the mean score of the bulk of decentralized entities. Evidently it is the absence of administrative programs that accounts for the scoring pattern of these misclassified central entities,[12] although their involvement in economic programs, since these are negatively weighted by the function, was a contributing factor.

Table 3409

SCORES OF CENTRAL SECTOR ENTITIES ON DISCRIMINANT FUNCTION

(1977)

Entity	Actual Group Code	Code and Highest Probability Group	Discriminant Score
Presidency			
1. Presidency	C	C (.8599)	1.6794
2. National Board For Social Action	C⁰	D (8410)	-.2317
3. National Maritime Council	C	C (1.0000)	7.4509
Ministries			
4. Foreign Relations	C	C (1.0000)	7.4509
5. Interior	C	C (1.0000)	6.8526
6. Defense	C	C (1.0000)	6.9113
7. Planning and Coordination	C	C (.9618)	2.4536
8. Finance	C	C (.9999)	5.5554
9. Education and Culture	C⁰	D (.8391)	-.2240
10. Transportation and Communications	C⁰	D (.8219)	-.1568
11. Industry, Commerce, and Tourism	C⁰	D (.8260)	.1723
12. Labor	C⁰	D (.8293)	-.1857
13. Social Welfare and Public Health	C⁰	D (.8412)	-.2325
14. Mining and Metallurgy	C⁰	D (.8248)	-.1674
15. Agriculture	C⁰	D (.8228)	-.1609
16. Energy and Hydrocarbons	C⁰	D (.8314)	.1929
17. Urbanization and Housing	C⁰	D (.8412)	.2325
18. Justice (Poder Judicial)	C	C (1.0000)	7.4509
19. Fiscal Tribune Affairs	C	C (1.0000)	7.4509
20. Public Debt Affairs	C	C (1.0000)	7.4509
21. International Organization Affairs	C	C (1.0000)	7.4509

1. Code C, central government; D, decentralized government; o, indicates that the predicted group membership, expressed as a probability, is contrary to its actual group membership.

SOURCE: Computed by SPSS Discriminant Analysis Program.

On the basis of this analysis of the discriminant function, we can conclude that the decentralized sector can be successfully (94.0%) discriminated as a group on the basis of the absence of administrative outlay. The central sector is not, however, successfully defined as a group on the basis of the administrative outlay. Heavily weighting this variable

[12] See Appendix D for the expenditures of the misclassified central sector entities.

means that nearly one-half (47.6%) of the central sector entities "end up" in the decentralized sector. Ironically, *both* the departmental and the municipal governments are more unlike the decentralized sector than one-half of the central sector entities are, based on the discriminant information contained in the administrative, economic, and social variables.

Interpretation and Conclusion

This analysis has shown that the discriminant value of the information in 1977 contained in the administrative, economic, and social spending variables is more qualified than Wilkie's analysis suggests.

The administrative variable was found to contain the most discriminant information. The discriminant value of the variable, however, depends on the uniform noncommitment to administrative outlay in the decentralized sector, not on any uniform commitment to administrative programs in the central sector. Although the heavy weighting of the administrative variable creates low discriminant scores for virtually all of the decentralized entities, it also creates low scores for nearly one-half of the central sector entities which, like the decentralized entities, are committed to social (and to a lesser extent economic) programs in lieu of public administration programs.

The analysis reveals also that the social and economic variables contain little discriminant information. The commitment to social programs as a group characteristic is no stronger in the central sector than it is in the decentralized sector. This is because the majority of the public institutes emphasize social programs (see fig. 7). Similarly, emphasis on
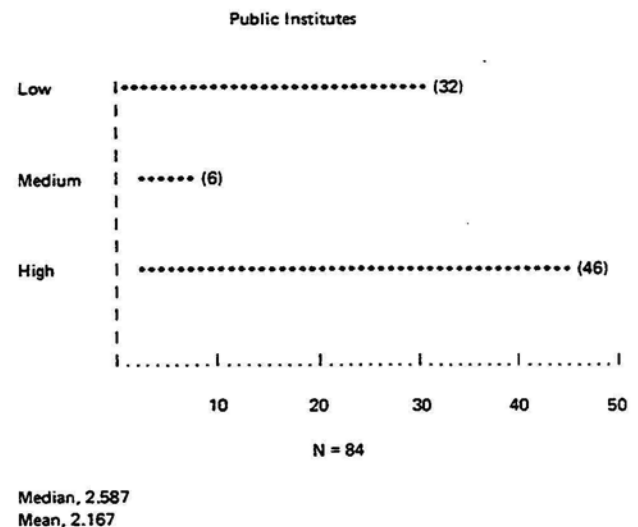
Public Institutes

Low |•••••••••••••••••••••••••• (32)
        |
        |
        |
Medium | •••••• (6)
        |
        |
        |
High | •••••••••••••••••••••••••••••••••••••• (46)
        |
        |
        |
        |.........I.........I.........I.........I.........I
           10   20   30   40   50

N = 84

Median, 2.587
Mean, 2.167

Figure 7. Frequency distributions of expenditures of public institutes on social programs (1977). Low, 0–30% of entity's total income; medium, 31–60%; high, 61–100%.

SOURCE: Computed from *PSB, 1977*.

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economic outlay does not characterize the decentralized sector more than the central sector. It applies mainly to the public enterprises and to a small number of public institutes. In fact, the cross tabulation in figure 8 shows that the decentralized sector is fundamentally split between those entities (primarily the public institutes) dedicated to social outlay rather than economic outlay and those entities (primarily the public enterprises) that emphasize economic over social outlay. The strong negative correlation between the social and economic emphasis causes these two variables to "cancel each other out" as characteristics of the behavior of the whole sector.

Social Outlay

	Low	Medium	High
Low	21	6	48
Medium	1	4	2
High	51	0	0

Economic Outlay

N = 133

Kendall's Tau B, - .62688
Gamma, - .86359

Figure 8. Cross tabulation of expenditures of decentralized entities on social and economic programs (1977). Low, 0–30% of entity's total income; medium, 31–60%; high, 61–100%.

SOURCE: Computed from *PSB, 1977.*

These findings and considerations suggest that the Wilkie theory that the central government is socioadministrative while the decentralized sector is economically oriented has to be qualified with respect to the Bolivian situation in 1977. This does not mean, however, that his theory is not relevant to the future shape of central government/decentralized sector relations. The importance of the approach is that the role divergence premise focuses attention on the possibility of politicized tension in the central/decentralized relationship. Although role divergence as such is not a significant part of the development of these relationships in Bolivia in the 1970s, the possibility of future political tension between the two sectors has not been foreclosed. In fact, the area where role divergence most ostensibly broke down in

the 1970s—the increased "sharing" of the social role between central and decentralized groups (public institutes)—may contain the seeds of tensions between the central and decentralized sectors, defined in terms of "role competition."

Under a succession of military governments since 1964, Bolivia has been working its way selectively out of the "populist" MNR pattern.[13] An aspect of the Paz-inspired MNR pattern was to emphasize central government social outlay while delegating economic outlay to the decentralized entities and US AID and holding to a "steady-state" in public administration. This was partly political; "social" expenditures of the central government were responses to populist demands and served as a means of political organization. As such, the central government could not afford to delegate social outlay to the decentralized sector and it was not Paz's intention to do so. However, the military government of Hugo Banzer, in power in the 1970s, was antipopulist and determined to break the link between government social outlay and populist politics. To accomplish this objective, the Banzer government deliberately established government management of social spending in the decentralized sector where the atmosphere is technocratic and not subject to political pressures.

But Bolivia in the 1980s will be shifting toward an eventual civilian regime. Unlike antipopulist military governments, civilian governments have to rely on political constituencies and must use the social role of the central government as a tool of political organization and as a means of accommodating leftist pressures. Paz understood this: in a populist-based political system the government's economic expenditures could be decentralized, but the social expenditures of government could not. As future civilian governments attempt to manipulate the government's social expenditures for political purposes, they will inevitably come into conflict with the apolitical stake in this role created in the 1970s for the decentralized entities. Consequently, each group will attempt to develop the social role of government for diametrically opposite purposes: the central entities will try to politicize it and the decentralized entities will try to depoliticize it. The central government will emphasize visible social capital programs that can be coordinated with populist support; the decentralized entities will orient their social outlay to subsidize the formation of an apolitical public employee cadre[14] which can be expected to serve as a counterweight to the populist cadre of the central government. In this context, the central government will see the

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[13] Ministerio de Planificación y Coordinación, *Estrategia Socio Económico del Desarrollo Nacional,* 2 vols. (La Paz, 1970), especially the introduction by José Ortiz Mercado (Minister of Planning) and pp. 31-43. These volumes are very useful for their analytic and developmental formulations and sophisticated application of dependency theory to the Bolivian case.

[14] In the decentralized sector as a whole, employee benefits appear to be greater than they are for central government employees. Decentralized employees are likely to be more career oriented. This suggests the possibility that budgetary expenditures for employee benefits might contain useful discriminant information.

decentralized entities as an obstacle to its political organization efforts. Therefore, either future civilian governments will have to be less populist or the potential for decentralized challenges to their political authority would seem to be very real from the Wilkie perspective. This government tension will not, however, be attributable to the decentralized entities having "stolen" the economic role of the central government (as Wilkie predicted in 1971), but rather to the decentralized invasion of the social arena of governmental expenditure. This does suggest, however, the continuing validity of Wilkie's "adversarial" perspective on central/decentralized relations, not only in Bolivia but in the other Latin American countries that will be working their way out of military government into civilian systems based on central government politics in the 1980s.

APPENDIX A
SAMPLING OF PROGRAMS INCLUDED IN
SOCIAL AND ECONOMIC RUBRICS[1]

Economic

Agricultural Sector
    Administration of credit
    Agro-industry; sugar refineries
    Animal sanitation
    Livestock
    Forestation
    Centers for agricultural development; experimental stations
    Technical assistance
    Chaco development
    Tropical agricultural research
    Agricultural technology[2]
    Agricultural Bank operations

Mining
    Planning
    Prospecting
    Exploitation
    Metallurgy
    Mining Bank operations

Energy and Hydrocarbons
    Electric power
    Mineral fuels

Industry, Commerce, Tourism
    Import-Export Policy; trade
    Norms for tourism industry
    Investment feasibility studies
    Industrial development

Manufactures
    Cement, wood, ceramics factories
    Hotels
    Artisanry
    Insurance
    Banking industry (unless specialized by sector)

Transport and Communications
    River and lake navigation
    Road networking
    Penetration roads
    Maps
    Airports
    Weather
    Telecommunications
    Railroads and rolling stock

Social

Housing, Urbanization, and Hygiene
    Housing Bank (Banco de Vivienda)
    Urban development
    City water supply and flood control
    Colonization
    Rural electrification
    City markets
    Rural buildings
    Cooperatives
    Credit to low-income groups
    Community development
    Social housing construction
    Worker housing

Education and Culture
    Television and newspapers
    Sports fields and recreation
    Polytechnic institutes
    Scientific research
    Schools
    Vocational training
    Artistic patrimony

Social Welfare and Public Health
    Social development of the labor force

[1] Some public entities do program budgeting for their investment outlay but not for their administrative (*funcionamiento*) outlay. In these cases the amount of investment programmed for a given sector, expressed as a percentage of total investment programmed, was multiplied by the total *funcionamiento* figure. This formula permitted the approximate computation, therefore, of how much *funcionamiento* was programmed into individual sectors.

[2] The programmed expenditures of specialized banks were classified into their particular sector of application. Thus the Mining Bank's expenditures were classified into the mining sector while the Agricultural Bank's credit operations were classified into the agriculture sector. Nonspecialized banks' (e.g., the Central Bank) expenditures, on the other hand, were classified into the industry and commerce sector.

Preventive medicine
Potable water
Hospitals
Food distribution
Health brigades
Administration of social welfare
Social security capitalization

Pharmaceuticals and medical clinics
Milk[3]

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[3] The question arises whether programmed expenditures on the production and commercialization of milk should be classified as industry and commerce (economic) or as public health (social). These expenditures have been divided equally between these two categories.

APPENDIX B
ENTITIES IN THE BOLIVIAN PUBLIC SECTOR

Central Government
Presidency
    1. Presidency
    2. National Board for Social Action
    3. National Maritime Council
Ministries
    4. Ministry of Foreign Relations
    5. Ministry of Interior
    6. Ministry of Defense
    7. Ministry of Planning and Coordination
    8. Ministry of Finance
    9. Ministry of Education and Culture
    10. Ministry of Transportation and Communications
    11. Ministry of Industry, Commerce, and Tourism
    12. Ministry of Labor
    13. Ministry of Social Welfare and Public Health
    14. Ministry of Mining and Metallurgy
    15. Ministry of Agriculture
    16. Ministry of Energy and Hydrocarbons
    17. Ministry of Urbanization and Housing
    18. Ministry of Justice (Poder Judicial)
    19. Fiscal Tribune Affairs
    20. Public Debt Affairs
    21. International Organization Affairs

Decentralized Sector
Development Corporation
    22. Chuquisaca (Sucre)
    23. La Paz
    24. Cochabamba
    25. Potosí
    26. Oruro
    27. Santa Cruz
    28. Tarija
    29. Beni
    30. Northeast
    31. Bolivian-Brazilian Corporation
Public Institutes
    32. State Comptroller
    33. National Social Welfare Council
    34. Food for Development
    35. National Sports Institute
    36. Bolivian Olympic Committee
    37. Committee on Provincial Sports Works
    38. National Civic Action

39. Service of Maps (Servicio Geodésico de Mapas)
40. Army Engineers Command
41. Naval Service (Servicio de Hidrografía Naval)
42. National Institute of Statistics
43. Superior Institute of Public Administration
44. National Institute of Pre-Investment
45. La Paz Airport Customs
46. Agricultural Customs of La Paz
47. Agricultural Customs of Cochabama
48. Public Credit and Savings Fund
49. National Academy of Sciences
50. National Council of Education
51. Superior Council of Teaching
52. Institute for Banking Training
53. Bolivian Institute of Culture
54. Administration of Airports
55. National Service of Meteorology and Hydrology
56. National Institute of Telecommunications
57. Bolivian Committee for Wool Development
58. National Institute for Investments
59. National Tourism Enterprise
60. Bolivian Institute for Small Industry
61. Bolivian Institute of Labor Formation
62. National Institute for Social Labor Research
63. National Institute of Cooperatives
64. Bolivian Institute of Social Security
65. National Fund of Social Security
66. Petroleum Fund of Social Security
67. Railroad Fund of Social Security
68. Drivers Fund of Social Security
69. Social Security of the National Roads Service
70. Social Security of the Bolivian Development Corporation
71. Social Security of the University of San Andrés (La Paz)
72. Complementary Social Security Fund of Fiscal Magistrate
73. Corporation of Military Social Security
74. Complementary Social Security Fund of National Police Social Security
75. Complementary Social Security Fund of Communications
76. Complementary Fund of Public Administration
77. Complementary Municipal Fund of La Paz
78. Complementary Social Security Fund of YPFB (State Oil Corporation) Workers

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79. Complementary Social Security Fund of Customs
80. Complementary Fund of the National Social Security Registers
81. Complementary Social Security Fund of Commercial Workers
82. Complementary Social Security Fund of Railway Workers
83. Complementary Social Security Fund of Factory Workers
84. Complementary Social Security Fund of Metallurgy Workers
85. Complementary Social Security Fund of Mining
86. Complementary Social Security Fund of Mining Professionals
87. National Lottery of Social Benefits and Health
88. Geology Service of Bolivia
89. Bolivian Atomic Energy Commission
90. Institute for Mineral and Metallurgy Research
91. National Agrarian Reform Council
92. National Community Development Service
93. National Colonization Institute
94. Bolivian Coffee Committee
95. Management Corporation for the Abapo-Izazo Project
96. Center for Forestry Development
97. Rural Development Project (Ingavi)
98. Center for Tropical Agriculture Research
99. National Service for Control of Rabies
100. Bolivian Institute for Agrarian Technology
101. National Institute for Rural Electrification
102. National Housing Council
103. National Council for Mining Housing
104. National Council for Petroleum Worker Housing
105. National Council for Commercial, Factory, and Graphics Workers Housing
106. National Council for Magistrates Housing
107. Municipal Portable Water Service for La Paz
108. National Council for Education Buildings
109. Potable Water Corporation
110. Municipal Potable Water Service (SAMAPA)
111. Local Aqueduct and Piping Service for Oruro
112. Autonomous Administration for Sanitary Works (Potosí)
113. Municipal Potable Water Service for Cochabamba
114. Local Enterprise for Potable Water and Piping (Sucre)
115. Potable Water and Piping Service (Santa Cruz)

Public Enterprises

116. Armed Forces Development Corporation
117. National Computer Center
118. Central Bank of Bolivia
119. State Bank
120. National Superintendency of Insurance
121. National Enterprise of Telecommunications
122. National Railways Enterprise
123. La Paz-Guaqui Railway

124. Todos Santos Complex
125. Program of Reyes Services
126. Suiza Technical Corporation
127. Industrial Plant of "Pil" Milk (Cochabamba)
128. Guabira Sugar Refinery
129. Bermejo Sugar Refinery
130. Metallic Industries
131. National Enterprise of Castaña
132. Industrial Plant of "Pil" Milk (La Paz)
133. Program for Milk Increase (Cochabamba)
134. Cacao and Sugar Industrialization
135. Bolivian Cement Company
136. National Tile Factory
137. Industrial Tea Plant
138. Great Chaco Complex
139. General Superintendency of Works
140. Bolivian Development Corporation
141. National Rice Enterprise
142. Bolivian Mining Corporation (COMIBOL)
143. National Foundry Enterprise
144. Mining Bank of Bolivia
145. Steel Enterprise of Bolivia
146. Agricultural Bank of Bolivia
147. State Oil Corporation (YPFB)
148. National Electricity Enterprise

Corporations

149. Lloyd Airline of Bolivia
150. Municipal Telephone Service of Cochabamba
151. National Cement Factory
152. CBF Laminated Rubber Plant
153. National Factory of Matches
154. Housing Bank

Deconcentrated Administration
Departmental Government

155. Chuquisaca Prefecture (Sucre)
156. La Paz Prefecture
157. Cochabamba Prefecture
158. Potosí Prefecture
159. Oruro Prefecture
160. Santa Cruz Prefecture
161. Tarija Prefecture
162. Beni Prefecture
163. Pardo Prefecture

Local Government
Municipal Governments

164. Alcaldía of Sucre
165. Alcaldía of La Paz
166. Alcaldía of Cochabamba
167. Alcaldía of Potosí
168. Alcaldía of Oruro
169. Alcaldía of Santa Cruz
170. Alcaldía of Tarija
171. Alcaldía of Trinidad
172. Alcaldía of Cobija

APPENDIX C
SCORES OF DECENTRALIZED ENTITIES ON DISCRIMINANT FUNCTION
(1977)

Entity	Actual Group Code[1]	Code and Highest Probability Group	Discriminant Score
Development Corporations			
22. Chuquisaca (Sucre)	D	D (.8338)	-.2024
23. La Paz	D	D (.8318)	-.1952
24. Cochabamba	D	D (.8360)	-.2112
25. Potosí	D	D (.8373)	-.2116
26. Oruro	D	D (.8377)	-.2183
27. Santa Cruz	D	D (.8325)	-.1972
28. Tarija	D	D (.8232)	-.1617
29. Beni	D	D (.8504)	-.2713
30. Northeast	D	D (.8371)	-.2158
31. Bolivian-Brazilian Corporation	D	D (.8312)	-.1924
Public Institutes			
32. State Comptroller	D°	C (1.0000)	7.4509
33. National Social Welfare Council	D	D (.8412)	-.2325
34. Food for Development	D	D (.8412)	-.2325
35. National Sports Institute	D	D (.8382)	-.2203
36. Bolivian Olympic Committee	D	D (.8412)	-.2325
37. Committee on Provincial Sports Works	D	D (.8412)	-.2325
38. National Civic Action	D	D (.8412)	-.2325
39. Service of Maps	D	D (.8312)	-.1924
40. Army Engineers Command	D	D (.8312)	-.1924
41. Naval Service	D	D (.8312)	-.1924
42. National Institute of Statistics	D	D (.8412)	-.2325
43. Superior Institute of Public Administration	D°	C (1.0000)	7.4509
44. National Institute of Pre-Investment	D	D (.8312)	-.1924
45. La Paz Airport Customs	D°	C (1.0000)	7.2140
46. Agricultural Customs of La Paz	D°	C (.9325)	2.1243
47. Agricultural Customs of Cochabamba	D°	C (.7415)	1.2616
48. Public Credit and Savings Fund	D	D (.8412)	-.2325
49. National Academy of Sciences	D	D (.8412)	-.2325
50. National Council of Education	D	D (.8400)	-.2273
51. Superior Council of Teaching	D	D (.8412)	-.2325
52. Institute for Banking Training	D	D (.8412)	-.2325
53. Bolivian Institute of Culture	D	D (.8412)	-.2325
54. Administration of Airports	D	D (.8312)	-.1924
55. National Service of Meteorology and Hydrology	D	D (.8312)	-.1924
56. National Institute of Telecommunications	D	D (.8312)	-.1924
57. Bolivian Committee for Wool Development	D	D (.8312)	-.1924
58. National Institute for Investments	D	D (.8312)	-.1924
59. National Tourism Enterprise	D	D (.8312)	-.1924
60. Bolivian Institute for Small Industry	D	D (.8312)	-.1924
61. Bolivian Institute of Labor Formation	D	D (.8312)	-.1924
62. National Institute for Social Labor Research	D	D (.8277)	-.1786
63. National Institute of Cooperatives	D	D (.8412)	-.2325
64. Bolivian Institute of Social Security	D	D (.8412)	-.2325
65. National Fund of Social Security	D	D (.8410)	-.2317
66. Petroleum Fund of Social Security	D	D (.8334)	-.2010
67. Railroad Fund of Social Security	D	D (.8386)	-.2218
68. Drivers Fund of Social Security	D	D (.8336)	-.2018
69. Social Security of the National Roads Service	D	D (.8411)	-.2319
70. Social Security of the Bolivian Development Corporation	D	D (.8351)	-.2079
71. Social Security of the University of San André (La Paz)	D	D (.8380)	-.2194
72. Complementary Social Security Fund of Fiscal Magistrate	D	D (.8340)	-.2032
73. Corporation of Military Social Security	D	D (.8336)	-.2018
74. Complementary Fund of National Police Social Security	D	D (.8321)	-.1956
75. Complementary Social Security Fund of Communications	D	D (.8358)	-.2104
76. Complementary Social Security Fund of Public Administration	D	D (.8324)	-.1971
77. Complementary Municipal Social Security Fund of La Paz	D	D (.8389)	-.2229
78. Complementary Social Security Fund of YPFB (State Oil Corporation) Workers	D	D (.8322)	-.1961
79. Complementary Social Security Fund of Customs	D	D (.8292)	-.1846
80. Complementary Fund of the National Social Security Register	D	D (.8395)	-.2250
81. Complementary Social Security Fund of Commercial Workers	D	D (.8344)	-.2048
82. Complementary Social Security Fund of Railway Workers	D	D (.8397)	-.2264
83. Complementary Social Security Fund of Factory Workers	D	D (.8213)	-.1543
84. Complementary Social Security Fund of Metallurgy Workers	D	D (.8359)	-.2111
85. Complementary Social Security Fund of Mining	D	D (.8394)	-.2252
86. Complementary Social Security Fund of Mining Professionals	D	D (.8357)	-.2100
87. National Lottery of Social Benefits and Health	D	D (.8390)	-.2234
88. Geology Service of Bolivia	D	D (.8298)	-.1868
89. Bolivian Atomic Energy Commission	D	D (.8312)	-.1924
90. Institute for Mineral and Metallurgy Research	D	D (.8312)	-.1924

1. Code: C, central government; D, decentralized government; o, misclassified cases.

APPENDIX C (Continued)
SCORES OF DECENTRALIZED ENTITIES ON DISCRIMINANT FUNCTION
(1977)

Entity	Actual Group Code [1]	Code and Highest Producibility Group	Discriminant Score
91. National Agrarian Reform Council	D°	C (1.0000)	7.4509
92. National Community Development Service	D	D (.8323)	-.1968
93. National Colonization Institute	D	D (.8412)	-.2325
94. Bolivian Coffee Institute	D	D (.8312)	-.1924
95. Management Corporation for the Abapo-Izazo Project	D	D (.8312)	-.1924
96. Center for Forestry Development	D	D (.8312)	-.1924
97. Rural Development Project (Ingavi)	D	D (.8412)	-.2325
98. Center for Tropical Agricultural Research	D	D (.8316)	-.1939
99. National Service for Control of Rabies	D	D (.8207)	-.1523
100. Bolivian Institute for Agrarian Technology	D	D (.8312)	-.1924
101. National Institute for Rural Electrification	D	D (.8413)	-.2326
102. National Housing Council	D	D (.8412)	-.2325
103. National Council for Mining Housing	D	D (.8225)	-.1591
104. National Council for Petroleum Worker Housing	D	D (.8412)	-.2325
105. National Council for Commercial, Factory, and Graphics Workers Housing	D	D (.8412)	-.2325
106. National Council for Magistrates Housing	D	D (.8412)	-.2325
107. Municipal Potable Water Service for La Paz	D	D (.8412)	-.2325
108. National Council for Education Buildings	D	D (.8411)	-.2320
109. Potable Water Corporation	D	D (.8412)	-.2325
110. Municipal Potable Water Service (SAMAPA)	D	D (.8412)	-.2325
111. Local Aqueduct and Piping Service for Oruro	D	D (.8412)	-.2325
112. Autonomous Administration for Sanitary Works (Potosi)	D	D (.8412)	-.2325
113. Municipal Potable Water Service for Cochabamba	D	D (.8412)	-.2325
114. Local Enterprise for Potable Water and Piping (Sucre)	D	D (.8412)	-.2325
115. Potable Water and Piping Service (Santa Cruz)	D	D (.8412)	-.2325

Public Enterprises

Entity	Actual Group Code	Code and Highest Producibility Group	Discriminant Score
116. Armed Forces Development Corporation	D	D (.8282)	-.1807
117. National Computer Center	D°	C (1.0000)	7.4426
118. Central Bank of Bolivia	D	D (.8298)	-.1868
119. State Bank	D	D (.8312)	-.1924
120. National Superintendency of Insurance	D°	C (1.0000)	7.4509
121. National Enterprise of Telecommunications	D	D (.8278)	-.1791
122. National Railways Enterprise	D	D (.8309)	-.1912
123. La Paz-Guaqui Railway	D	D (.8307)	-.1905
124. Todos Santos Complex	D	D (.8312)	-.1923
125. Program of Reyes Services	D	D (.8312)	-.1924
126. Suiza Technical Corporation	D	D (.8311)	-.1918
127. Industrial Plant of "Pil" Milk (Cochabamba)	D	D (.8336)	-.2017
128. Guabira Sugar Refinery	D	D (.8312)	-.1912
129. Bermejo Sugar Refinery	D	D (.8311)	-.1920
130. Metallic Industries	D	D (.8312)	-.1922
131. National Enterprise of Castaña	D	D (.8328)	-.1987
132. Industrial Plant of "Pil" Milk (La Paz)	D	D (.8354)	-.2087
133. Program for Milk Increase (Cochabamba)	D	D (.8363)	-.2124
134. Cacao and Sugar Industrialization	D	D (.8312)	-.1923
135. Bolivian Cement Company	D	D (.8312)	-.1924
136. National Tile Factory	D	D (.8312)	-.1924
137. Industrial Tea Plant	D	D (.8327)	-.1982
138. Great Chaco Complex	D	D (.8312)	-.1924
139. General Superintendency of Works	D	D (.8311)	-.1920
140. Bolivian Development Corporation	D	D (.8312)	-.1924
141. National Rice Enterprise	D	D (.8318)	-.1946
142. Bolivian Mining Corporation (COMIBOL)	D	D (.8302)	-.1885
143. National Foundry Enterprise	D	D (.8300)	-.1877
144. Mining Bank of Bolivia	D	D (.8304)	-.1893
145. Steel Enterprise of La Paz	D	D (.8312)	-.1924
146. Agricultural Bank of Bolivia	D	D (.9631)	-1.1082
147. State Oil Corporation (YPFB)	D	D (.8286)	-.1822
148. National Electricity Enterprise	D	D (.8312)	-.1924

Mixed Corporations

Entity	Actual Group Code	Code and Highest Producibility Group	Discriminant Score
149. Lloyd Airline of Bolivia	D	D (.8312)	-.1924
150. Municipal Telephone Service of Cochabamba	D	D (.8312)	-.1922
151. National Cement Factory	D	D (.8312)	-.1924
152. CBF Laminated Rubber Plant	D	D (.8312)	-.1924
153. National Factory of Matches	D	D (.8302)	-.1885
154. Housing Bank	D	D (.8412)	-.2325

1. Code: C, central government; D, decentralized government; o, misclassified cases.

APPENDIX D
EXPENDITURES OF MISCLASSIFIED CENTRAL SECTOR ENTITIES
(1977)

	Public Entity	T Pesos	
		Economic	Social
2.	National Board for Social Action		216,585,900
9.	Ministry of Education and Culture		2,168,463,000
10.	Ministry of Transportation and Communication	162,628,800	
11.	Ministry of Industry, Commerce, and Tourism	42,456,700	
12.	Ministry of Labor		25,549,600
13.	Ministry of Social Welfare and Public Health		903,173,000
14.	Ministry of Mining and Metallurgy	46,845,300	
15.	Ministry of Agriculture[1]	84,384,000	
16.	Ministry of Energy and Hydrocarbons	37,843,200	
17.	Ministry of Urbanization and Housing		149,887,500

1. Although the programs budgeted by this ministry are nominally concerned with the social progress of the rural (campesino) population, the nature of the programs, i.e., agricultural development, seemed to argue for their classification into the economic category. Wilkie, however, classified this ministry's programs as social.