

Committee II
Theoretical Empiricism: A General
Rationale for Scientific Model-Building

Second Draft --
for Conference Distribution Only

**PITFALLS IN SCIENTIFIC MODELING:
UNEMPLOYMENT, THE UNEMPLOYED, AND THE NAZI VOTE 1930-1933**

by

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1. Introductory Remarks

According to a 20 year old statement by H. Wold (1964) each science may be regarded as a collection of models. Scientific models by the same author are defined as the "systematic coordination of theoretical and empirical elements of knowledge into a joint construct" (Wold 1964: 4). The theoretical part of a model consists of hypothetical propositions, its empirical part of observational statements which are interpreted by means of the model. Furthermore, in his definition Wold exempts not only highly formalized but also verbally stated models whose function can be either predictive or retrodictive, i.e. oriented towards the future or the past.

In essence, scientific model building proceeds by a series of closely interrelated decisions which are part of a greater frame of reference where the problems to be solved by the model as well as certain prescientific notions about the area under scrutiny, about criteria of relevance *etc. and* are specified. Those decisions are directed towards the data used, the levels of measurement, the operationalization of theoretical concepts, statistical methods of analysis and their model implications etc.

At each decision point pitfalls of scientific modelling may occur (and, more often than not, remain undetected) such as overgeneralization of findings, model misspecification, aggregation bias or other fallacies of the wrong level etc. Cumulative research is only conceivable if such pitfalls are detected and, in a continual process of methodological criticism and replicatory efforts, eventually are ruled out.

In the following I will attempt to unravel the various causes of some strongly contradictory findings on the effects exerted by mass unemployment on the rise of National Socialism during the last years of the Weimar Republic. The data set used as well as the analytic and computational workdone for the purpose of this paper are the result of a collaborative effort by the author and his research associates which has been financed by the Volkswagen foundation during the last three years.

2. The Problem and its implications

There is widespread agreement among historians that mass unemployment was one of the major causes of the breakdown of the Weimar Republic and the rise of National Socialism. And indeed there is a striking parallel between the rise and fall of the unemployment rate and the up and down of the National Socialist vote (Figures 1 and 2).

It is not clear, however, whether the unemployed or the employed or both became radicalized in the series of four

Reichstag and two Presidential elections between 1930 and 1933. The theories advanced which postulate a causal relationship between the increase and duration of mass unemployment on the one hand and the radicalization of the German electorate on the other often lack adequate specification in this respect, a fact which makes them all but irrefutable as we will see.

┌ The first major empirical analysis using more or less adequate data and statistical techniques was published in 1981 by two well-known Swiss econometricians, Frey and Weck. As a result of their analysis they propose a positive relationship between unemployment and the Nazi vote while deliberately leaving open the question who was responsible for this correlation, the employed or the unemployed (see Figure 3).

Without the spectacular rise of mass unemployment between 1930 and 1932 the National Socialist share of the vote in the Reichstag election of July, 1932 according to Frey and Weck (1981: 23) would have amounted to only 22 instead of 37 percent (see Figure 4).

┌ This finding is clearly at variance with the results of a series of similar studies conducted by myself and my collaborators. Using substantially the same, i.e. similarly specified multiple regression equations as Frey and Weck we discovered a consistently negative relationship between unemployment and the vote for Hitler. This holds true not

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only for the statistical association between percentage levels at each election but also for the increase of the National Socialist vote in dependence of the (level or change) of the unemployment rate (Figures 5 and 6).

Furthermore, to rule out possible model effects we analyzed our data by means of two different, quite elaborate PLS models with some 70 manifest and up to 23 latent variables. The findings discerned by these LVPLS models confirm and further differentiate our earlier results: Unemployment displayed a negative influence on the Nazi vote (see Figures 7 and 8).

3. Explaining the discrepancies by differences in model building and model specification

These contradictory results may be attributed to three separate causes: (a) differences in regional aggregation (the analysis by Frey and Weck is based on the 13 Labor Exchange Districts of the Reich; our own analyses, in contrast, are working with the 1100 to 1200 counties and townships of the Weimar Republic); (b) differences in the operationalization of the unemployment variable (the indicators used by Frey and Weck are calculated as quotas, i.e. unemployed over gainfully employed; if there are more unemployed than employed in a district the quota takes a value greater than 1. Our analyses are based on the percentage of unemployed which, in turn, is calculated as the

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share of the unemployed on the basis of all employed and unemployed); (c) temporal aggregation: In order to increase the available number of observations Frey and Weck pooled their 4 longitudinal and 13 cross-sectional observation points into one, combined data set. Our own analyses rely on separate cross-sectional and longitudinal estimations.

In an extended replication of the Frey-Weck analysis we tried to find out step by step which effects account for the contradictory results mentioned above. Before discussing these results it might be advisable to describe the regional units used and to point out some peculiarities of the available data.

As a result of German history, the map of the Reich was characterized by a patchwork of kingdoms, dukedoms, counties, free cities and all sorts of enclaves and exclaves. This pattern which survived the First World War was gradually restructured by administrative reforms in the 1920s. At that time some 70.000 communities were grouped into some 1.200 counties which in turn were grouped into 72 major administrative districts (Regierungsbezirke) which in turn belonged to 18 states (Länder). To allow for longitudinal comparability, in our data set the counties have been slightly aggregated into 865 county units which remain nearly stable over the period 1925-1933. The election outcomes and the 1925 and 1933 census data are published in Statistik des Deutschen Reiches on the level of counties

The administration of labor and unemployment was performed by 352 Labor Exchange Agencies which were grouped into 13 State Labor Exchange Districts (Landesarbeitsamtsbezirke). Detailed unemployment statistics were collected and published in Germany on the level of the 352 Labor Exchange Agencies only from December 1931, when unemployment was close to its summit and showed little temporal variation. Earlier figures are available on the level of the thirteen State Labor Exchanges.

Thus, two ways to construct a joint data set on employment and election data can be considered. First, all data are aggregated on the level of the 13 State Labor Exchanges. This way was taken by Frey and Weck. Second, all data are disaggregated on the level of the counties. This is the approach used in our research project on the NSDAP electorate. Since the 13 State Labor Exchanges do not perfectly fit the 35 Weimar election districts there were some aggregation problems in constructing the Frey-Weck data set. Frey and Weck did not discover these problems. Since the effects were not too serious, however, there is no need for further discussion of this point (note, however, that in the Frey-Weck data set more than 1 million voters are regionally misclassified).

In the following I will show that the discrepancies between our findings and the Frey-Weck analysis has mainly to be attributed to regional aggregation. There is some additional influence of temporal aggregation as well which will be discussed in the last chapter

4. Results of our replication

In their statistically sophisticated and carefully argued investigation Frey and Weck (1981) introduce besides unemployment as additional predictors of the NSDAP vote the percentage of Catholics (at that time and even today by far the best predictor for election outcome in Germany), percentage of agricultural workers, percentage of blue-collar workers, and electoral turnout.

Observational units are, as pointed out, the 13 State Labor Exchange Districts at the four Reichstag elections 1930-1933. The data are arranged in a pooled cross-section/time-series data set with $N=52 (=4*13)$ observational "units". It is doubtful, at least, if Frey and Weck were well advised to use classical inferential testing since their observational "units" are not independent from each other).

Figure presents in row 1 the regression coefficients as reported by Frey and Weck, in row 2 our replication with the Frey/Weck data set (in our reconstruction), and in row 3 the same as in row 2 with covariances computed by using the numbers of eligible Voters in 1930 as weights for the units in order to account for differences in size of the regional units). In all three equations the regression coefficient of unemployment is positive (0.6) which indicates that unemployment displayed a positive influence on the rise of the Nazi party.

Still in the same figure Table 2b reports four pure cross-sectional analyses, one for each election. With only 13

observations for each unit the results should be expected not to be sufficiently reliable and stable. All four regression coefficients for unemployment, however, are again positive, varying in size from 0.14 to 0.71, thus confirming the result of the pooled cross-sectional/longitudinal analysis.

Still in the same Figure Tables 2e and 2f repeat the same analyses for $N = 4 \times 865$ and $N = 865$ county units. Now somewhat modified variables have to be used. The confessional and occupational data are taken from the 1933 census, and the unemployment figures are disaggregated from the 352 Labor Exchange Agencies. The 1930 election data are matched with the 1931 (December) unemployment data which are the indicators closest in time to the appropriate data.

The coefficients of the four separate cross-sectional regressions (Table 2f) differ in several respects from the previous results: (a) The squared multiple correlation, previously between 0.7 and 0.9, now typically *range* between 0.3 and 0.7. (b) The influence of the blue-collar variable, previously around zero, is now constantly negative which means that the NSDAP fared below average in blue-collar districts. (c) Most important for our problem here is the fact that the coefficients for the unemployment variable now switch from positive to negative, indicating that the NSDAP was less successful in counties with high unemployment figures.

In order to prove that this is not only an effect of different indicators, Tables 2c and 2d present the same analyses as before, but now the 865 county units are aggregated into the 13 State Labor Exchange Districts. Again, the influence of unemployment on the NSDAP result is positive, as reported by Frey and Weck.

The change from positive to negative coefficients when the regional level changes can also be shown in a longitudinal path model (Figure) where the lagged variables are introduced as predictors. The influence of unemployment on the Nazi share of the vote is positive when we use 13 regions and negative or close to zero when we base our analysis on the 865 county units.

It should be clear by now that the results reported by Frey and Weck (1981) strongly depend on the regional level chosen by them. On a county level their findings cannot be replicated. Quite to the contrary there can be no doubt that in counties with a below average percentage of unemployed the NSDAP received a higher share of the vote than in counties with an above average unemployment rate. This is not only true for the bivariate relationship between unemployment and the Hitler vote but also for a variety of multivariate models where we control for "disturbing factors" such as religion, urbanization, turnout etc. These findings, however, do not imply that no unemployed (or Catholics, blue-collar workers etc.) had voted for Hitler in 1932 or 1933. Quite the contrary is true, as far as we know.

Unfortunately, it is not possible to judge from the available data with the same *certainty* how many voters who were unemployed, Catholics or whatsoever, really did vote in favor of or against Hitler. The findings of an extended series of ecological regression analyses as developed by Bernstein (1932) and Goodman (1953, 1959), however, all point into the same direction: The unemployed voted in disproportionately low numbers for the Hitler movement. This is especially true for unemployed blue-collar workers while unemployed white-collar workers (who were outnumbered by their blue-collar colleagues by 4 to 1), on the other hand, seem to have voted above average for the Nazi party. These results imply that against the conviction of many historians and against the tacit implications of the Frey and Weck findings the unemployed did not direct their hopes towards the NSDAP.

5. Summary and Discussion

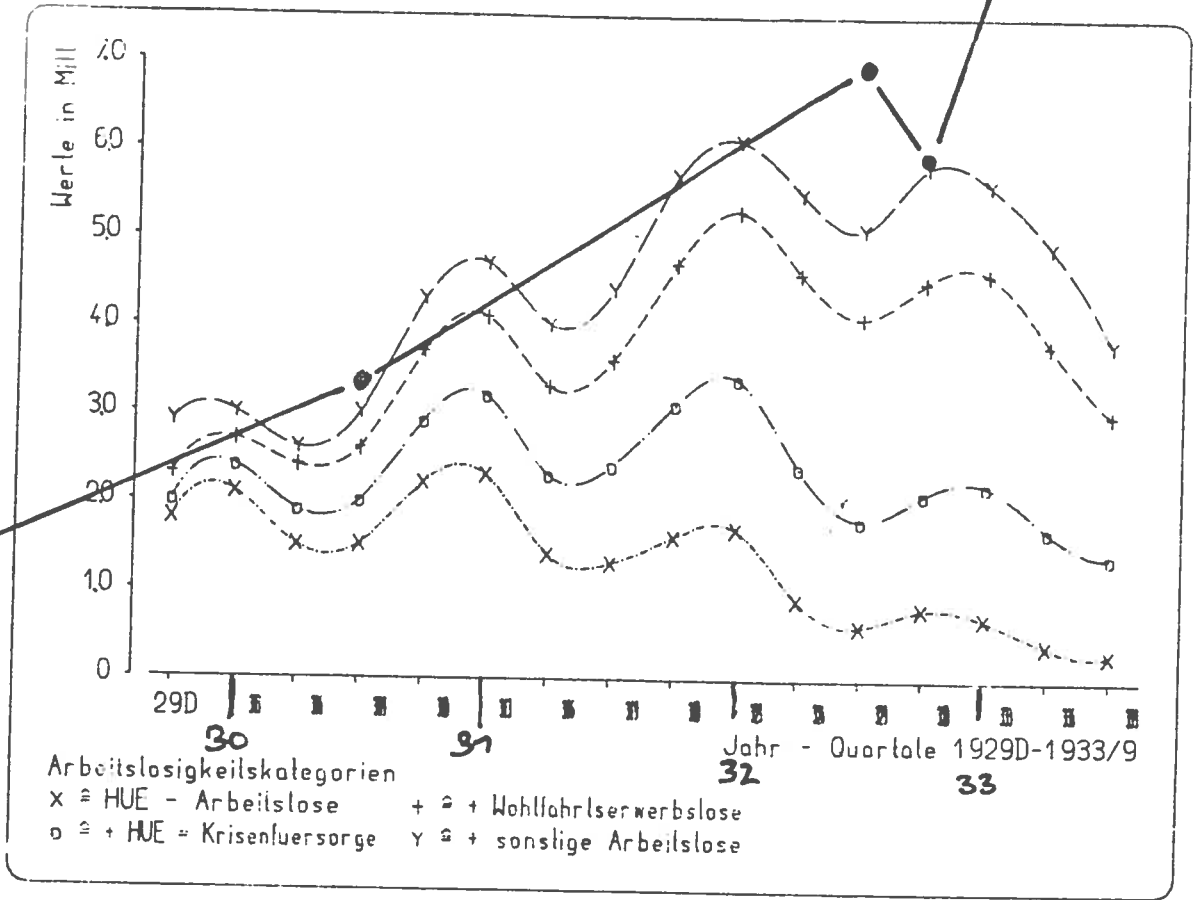
The answers to the question whether unemployment gave rise to the electoral successes of the Nazis range from a correlation near unity (as shown in Figure 1) to a regression coefficient of -0.30 (Table 2e in Figure). Since the Frey and Weck findings are based on an extremely high level of aggregation and since they do mix longitudinal and cross-sectional effects in their pooled analysis as is shown elsewhere the validity of their results has to be seriously questioned. They seem to be mainly an effect of regional aggregation bias.

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This is not to say that there was no influence of unemployment on the Nazi vote. Quite the contrary is true as can be shown by Figure where negative cross-sectional correlations form a positive longitudinal correlation between unemployment and the NSDAP vote on the Reich level. This influence, however, must have been an indirect one with strongest effects in those counties where the unemployment rates were low. These were mainly counties with a farming or small-town population, i.e. regions with a (at least in the protestant case) conservative voting tradition. In those counties the electorate became radicalized under the influence of the deepening economic crisis according to the prevailing local norms (which, in turn, favored the "right" alternative). An analogous mechanism ended in a radicalization of the electorate towards the political left in those counties where unemployment was high, i.e. in the classical industrial areas of the Weimar Republic such as the urban centers of the Rhein and Ruhr area, parts of Saxony, the densely populated parts of Berlin or Hamburg etc.

It is paradoxical that National Socialism could profit from mass unemployment mainly in those regions where unemployment was lowest. This paradox could not be detected by the analytic model used by Frey and Weck.

Abb. 52



Arbeitslosigkeit - absolut

Abb. 51

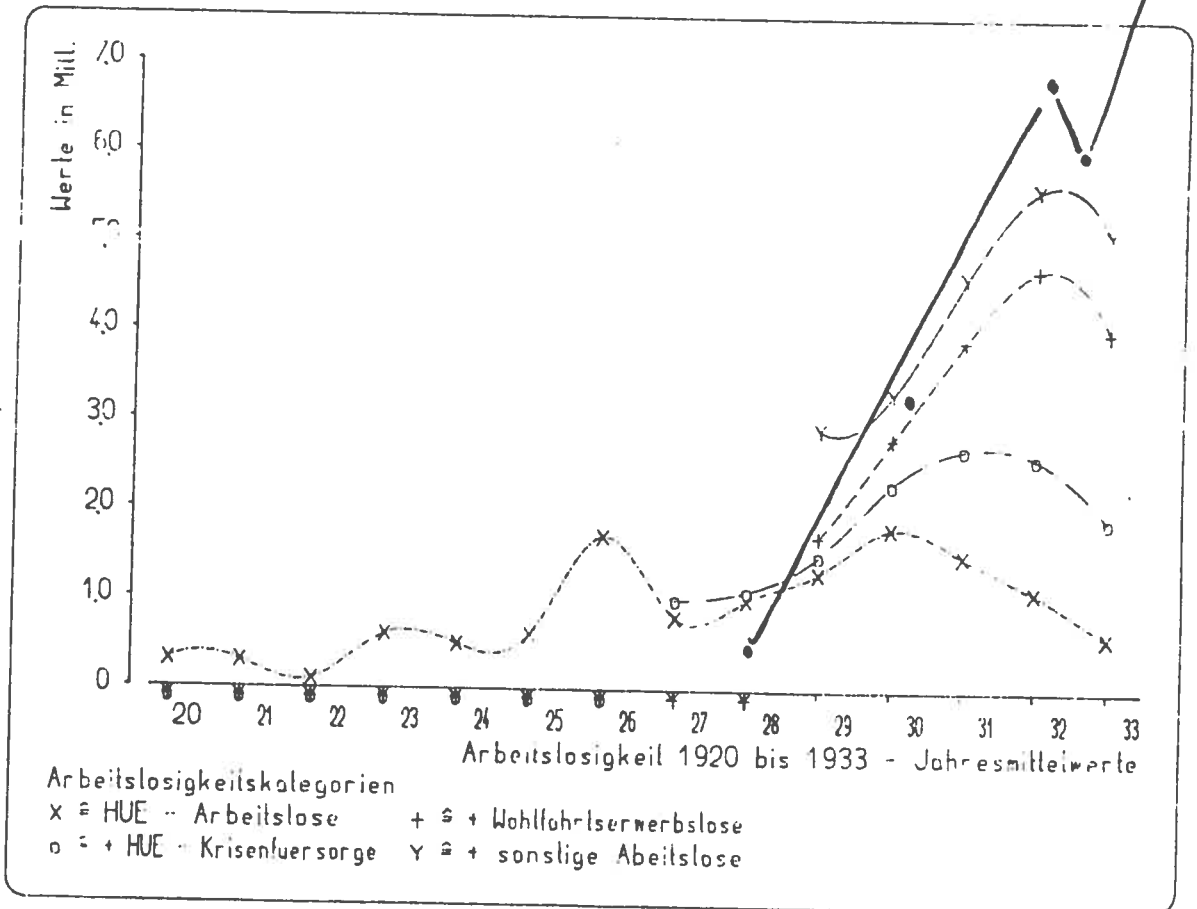


Figure 3 and 4

Tabelle 5: Stimmenanteil der NSDAP an den Reichstagswahlen 1930–1933. Unterschiedliche Spezifikationen (Längsschnitt-Querschnitt-Schätzungen)

| Gl. | Spezifikation | Absolutglied | Arbeitslosenquote % | Erklärende Variablen | | | Teststatistiken | | |
|------|--|--------------|---------------------------|--------------------------|-----------------------------|------------------------------|----------------------------|-------------|-------|
| | | | | Wahlbeteiligung % | Anteil d. Katholiken % | Anteil d. landw. Beschäft. % | Anteil der Arbeiter | \bar{R}^2 | F_5 |
| (8) | ohne Katholikenanteil | -58,0 | 0,52* (8,3) [0,75] | 0,73* (3,1) [0,28] | - | 0,55* (6,1) [0,63] | -0,12 (-0,9) [-0,09] | 78,9 | 2,1 |
| (9) | ohne Wahlbezirke Ostpreußen | -22,5 | 0,57* (13,4) [0,84] | 0,40* (2,2) [0,14] | -0,14* (-5,8) [-0,32] | 0,45* (5,0) [0,47] | -0,18 (-1,4) [-0,14] | 90,0 | 3,8 |
| (10) | ohne Ostpreußen (Sept. 1930, Juli 1932) und Pommern (Sept. 1930) | -22,9 | 0,56* (14,3) [0,78] | 0,35* (2,3) [0,13] | -0,16* (-8,0) [-0,36] | 0,56* (9,0) [0,60] | -0,12 (-1,2) [-0,08] | 92,6 | 3,3 |

| | Sept. 1930 | Juli 1932 | Nov. 1932 | März 1933 |
|--|------------|-----------|-----------|-----------|
| Stimmenanteil der totalitären Parteien (NSDAP, DNVP, KPD) { tatsächlich | 38,4% | 57,5% | 58,5% | 64,2% |
| hypothetisch (ohne Verschärfung der Wirtschaftskrise nach 1930) | 38,4% | 37% | 40% | 36% |

Fig. 5a

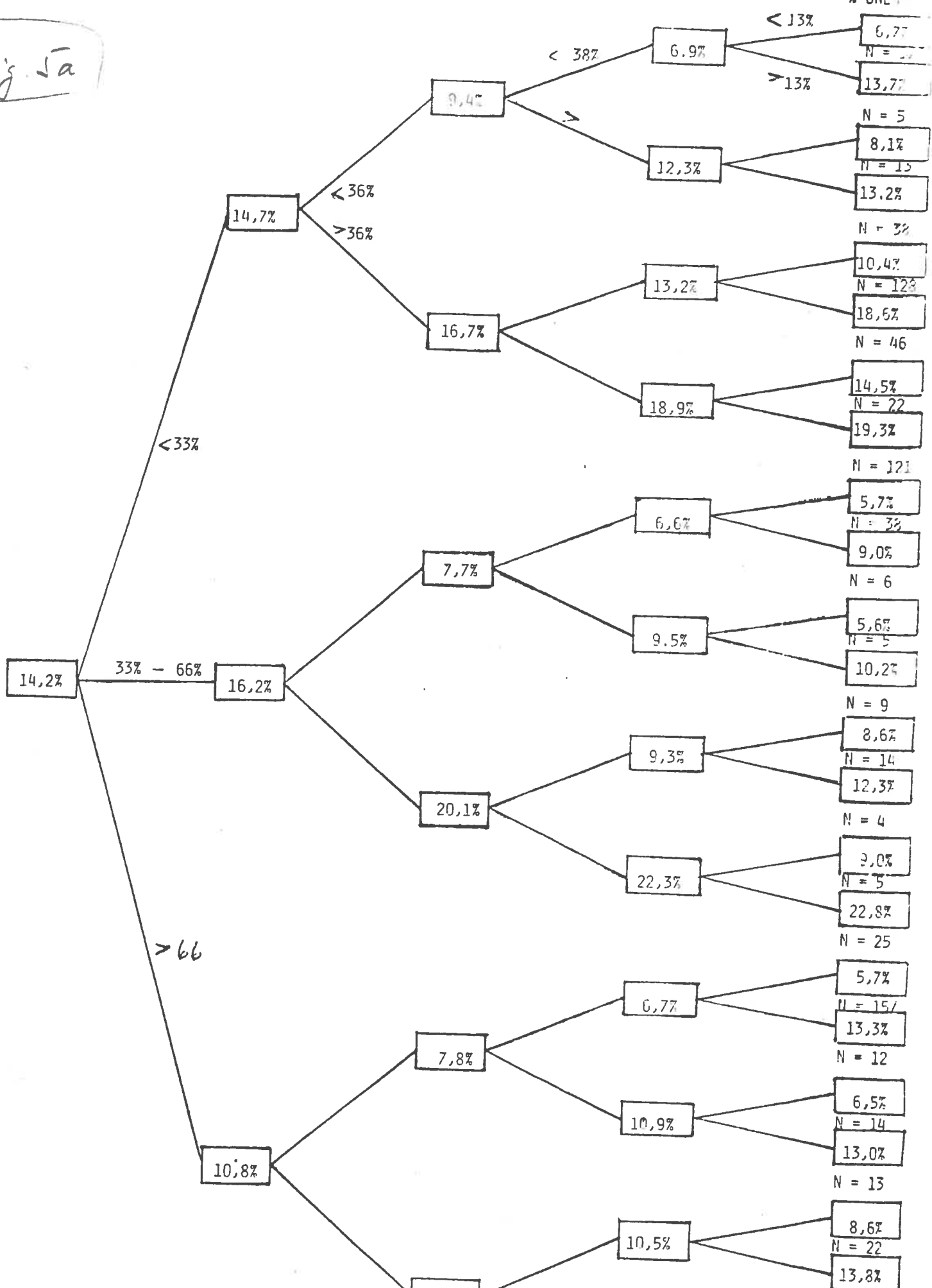
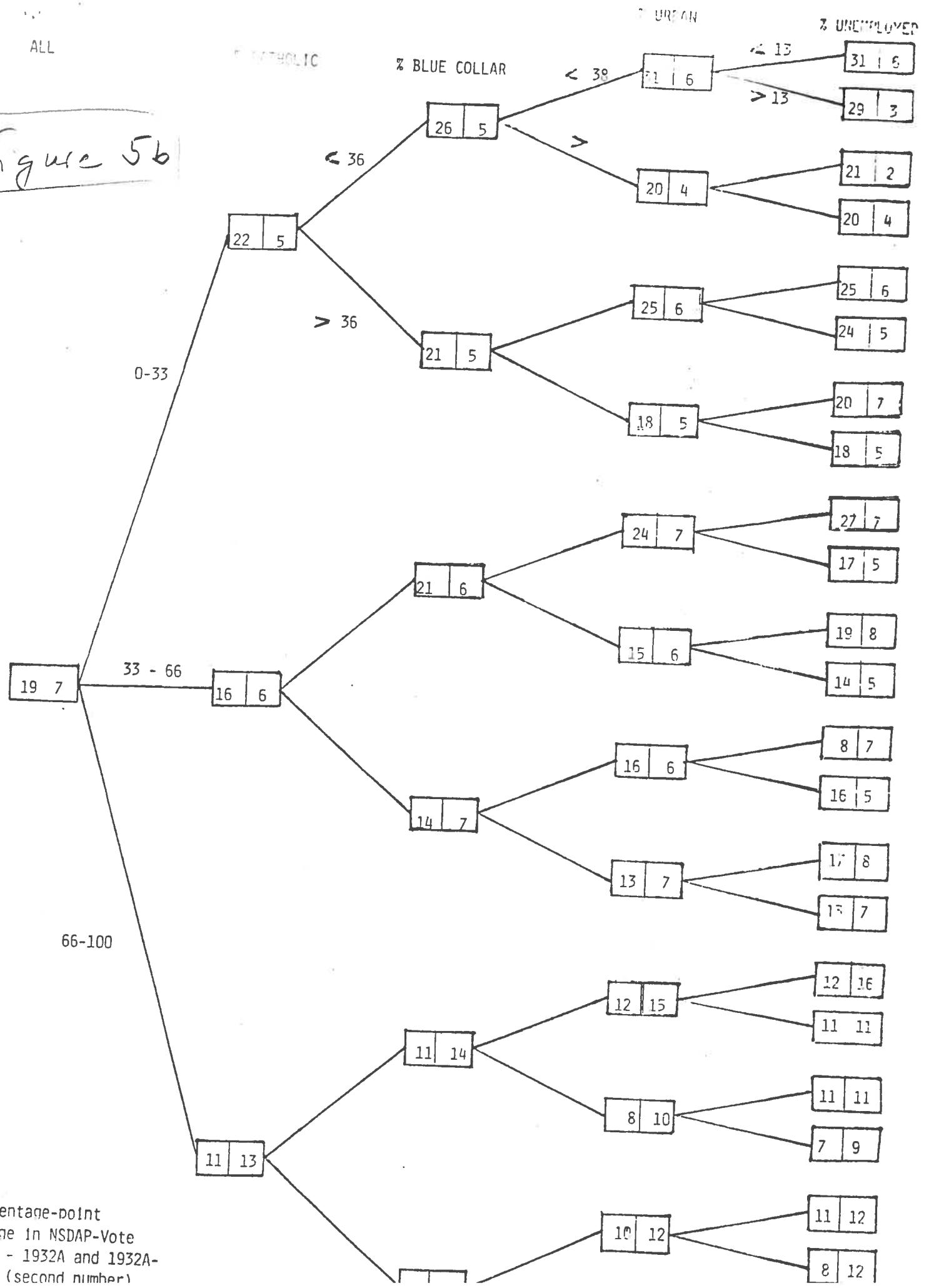


Figure 5b



Percentage-point
Change in NSDAP-Vote
1930 - 1932A and 1932A-
1933 (second number)

% Catholic

% BLUE COLLAR

% URBAN

% UNEMPLOYED

Figure 5c

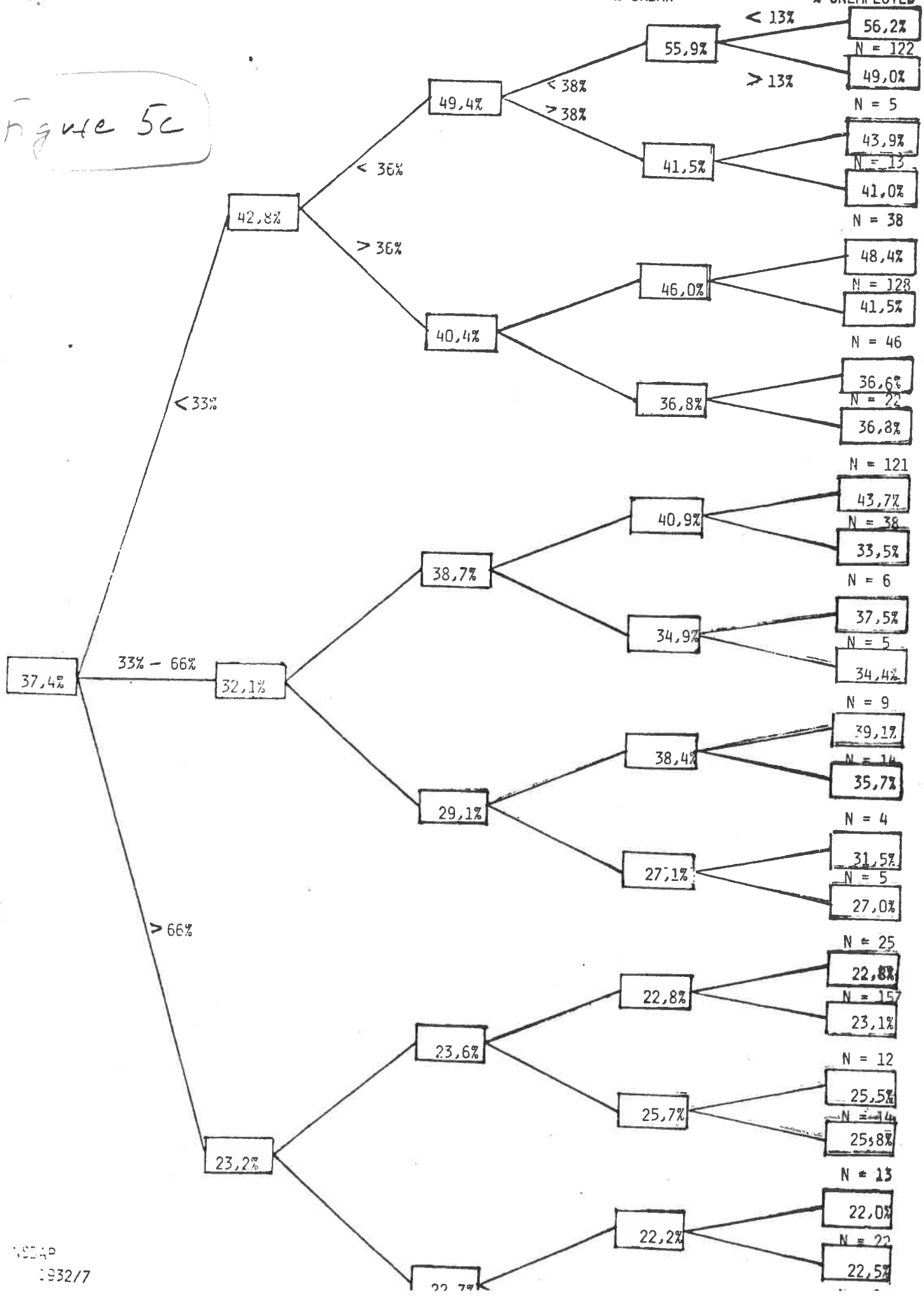


Tabelle 3: Regressionsanalyse der Kontrastgruppenvariablen*

| | 1932 A | | Reichtstagswahlen 1932 B | | 1933 | |
|---|----------------|----------------|-----------------------------|----------------|----------------|-----------------|
| | NSDAP | KPD | NSDAP | KPD | NSDAP | KPD |
| Konstante | 50.0 | -6.65 | 43.4 | -4.85 | 59.5 | -5.17 |
| Urbanisierungs- grad | -0.04 (-14) | -0.01 (-05) | -0.05 (-20) | -0.01 (-04) | -0.05 (-19) | -0.004 (-02) |
| Katholiken- anteil | -0.25 (-78) | 0.03 (01) | -0.22 (-73) | 0.08 (-04) | -0.19 (-65) | 0.17 (-09) |
| Arbeiter- anteil | -0.10 (-09) | 0.24 (34) | -0.11 (-11) | 0.23 (32) | -0.12 (-12) | 0.19 (28) |
| Erwerbslosen- anteil | -0.31 (-21) | 0.61 (65) | -0.18 (-13) | 0.63 (66) | -0.45 (-34) | 0.60 (68) |
| Erklärte Varianz R ² | 63.6 % | 68.8 % | 56.5 % | 70.4 % | 60.1 % | 70.9 % |
| R ² -Zuwachs durch Var. Erwerbslos. | 1.4 % | 13.6 % | 0.6 % | 13.9 % | 3.6 % | 14.4 % |

* Hierarchische Regressionsanalyse mit Erwerbslosigkeit als letzter in die Gleichung eingeführte Variable. Kreise jeweils mit ihrer Einwohnerzahl 1933 gewichtet. Beta-Koeffizienten in Klammern.

Figure 6

Tabelle 7: Der Zusammenhang von Dauererwerbslosigkeit und NSDAP-Wahlerfolgen in dynamischer Perspektive

| | Konstante | B | Beta | R ² |
|----------------------------|-----------|-------|-------|----------------|
| Zielvariable NSDAP 1932 A | 11.42 | | | |
| NSDAP 1930 | | 1.49 | 0.80 | 0.62 |
| Wohlfahrtserwerbslose 1930 | | -1.92 | -0.19 | 0.65 |
| Zielvariable NSDAP 1933 | 17.64 | | | |
| NSDAP 1932 A | | 0.78 | 0.88 | 0.86 |
| Wohlfahrtserwerbslose 1932 | | -0.57 | -0.24 | 0.91 |

AN EXPLANATORY MODEL
OF THE NS-VOTE 1932/33

Using Latent Variables Path
Analysis with PLS estimation.
[Numbers in brackets = indirect
effects, no's without brackets =
direct effects].

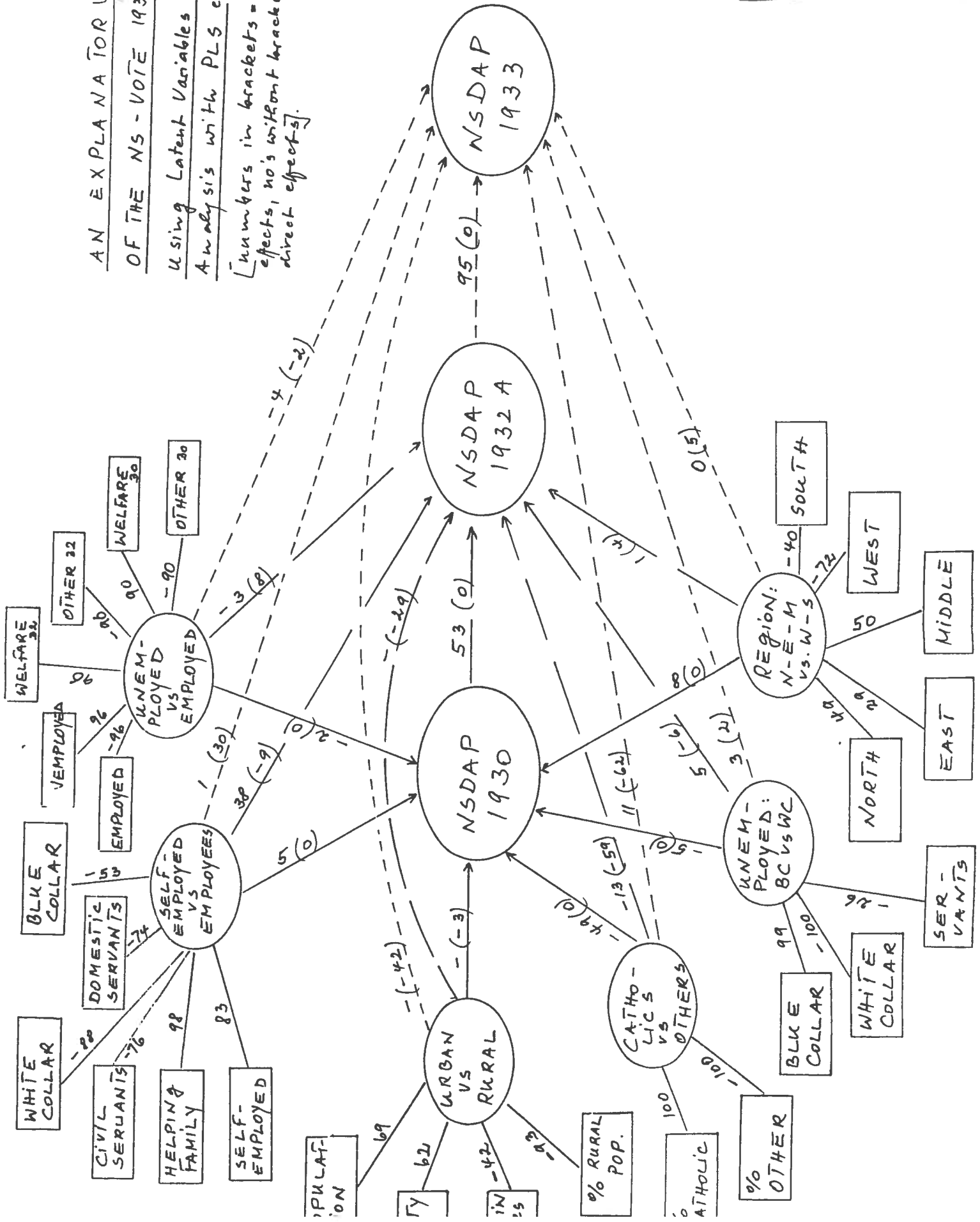


Figure 1

Fig. 8

| | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 13 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 2 | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|
| Katholikenanteil | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 100 | | | | | | | | | | | | | | | | | | | | | |
| Landwirtschaft vs Gewerbe | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 12 | 100 | | | | | | | | | | | | | | | | | | | | |
| 3 | 10 | 56 | 100 | | | | | | | | | | | | | | | | | | | |
| 4 | 8 | 88 | 58 | 100 | | | | | | | | | | | | | | | | | | |
| 5 | 6 | 86 | 64 | 93 | 100 | | | | | | | | | | | | | | | | | |
| 6 | -5 | 72 | 60 | 84 | 89 | 100 | | | | | | | | | | | | | | | | |
| 7 | 16 | 89 | 54 | 93 | 92 | 81 | 100 | | | | | | | | | | | | | | | |
| 8 | 9 | 82 | 49 | 86 | 83 | 75 | 93 | 100 | | | | | | | | | | | | | | |
| Landwirtschaftliche Struktur, Vermoegen, Schulden | | | | | | | | | | | | | | | | | | | | | | |
| 9 | -13 | 29 | 22 | 39 | 42 | 45 | 34 | 29 | 100 | | | | | | | | | | | | | |
| 10 | 56 | 31 | 17 | 23 | 14 | -2 | 28 | 27 | -32 | 100 | | | | | | | | | | | | |
| 11 | -10 | 23 | 36 | 23 | 36 | 41 | 23 | 18 | 22 | -16 | 100 | | | | | | | | | | | |
| 12 | -33 | 2 | 13 | 18 | 29 | 37 | 14 | 12 | 42 | -37 | 35 | 100 | | | | | | | | | | |
| Gewerbliche Struktur, Vermoegen, Schulden | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 6 | 76 | 41 | 80 | 72 | 59 | 77 | 71 | 26 | 23 | 9 | 2 | 100 | | | | | | | | | |
| 14 | -12 | -70 | -54 | -67 | -69 | -55 | -68 | -62 | -25 | -35 | -49 | -24 | -59 | 100 | | | | | | | | |
| 15 | -12 | -45 | -32 | -32 | -37 | -26 | -33 | -30 | 0 | -30 | -22 | 4 | -29 | 45 | 100 | | | | | | | |
| 16 | -9 | -10 | -10 | -3 | -3 | -1 | -2 | -1 | 2 | -12 | -10 | 10 | -5 | 9 | 100 | | | | | | | |
| Einkommen und Einkommensverbesserung 1928 bis 1932 | | | | | | | | | | | | | | | | | | | | | | |
| 17 | -20 | -90 | -58 | -88 | -86 | -73 | -91 | -84 | -33 | -40 | -28 | -15 | -76 | 80 | 45 | 10 | 100 | | | | | |
| 18 | 1 | -17 | -18 | -8 | -8 | -6 | 4 | 10 | 13 | -11 | -9 | 9 | 3 | 8 | 25 | 17 | 100 | | | | | |
| Arbeitslosigkeit 1931, 1932, 1933 | | | | | | | | | | | | | | | | | | | | | | |
| 19 | -22 | -72 | -43 | -74 | -69 | -60 | -80 | -82 | -15 | -40 | -9 | 0 | -57 | 52 | 29 | 3 | 77 | -17 | 100 | | | |
| 20 | -19 | -75 | -43 | -77 | -73 | -64 | -85 | -85 | -25 | -38 | -13 | -9 | -67 | 59 | 28 | 3 | 83 | -26 | 92 | 100 | | |
| 21 | -17 | -67 | -41 | -74 | -68 | -60 | -81 | -83 | -26 | -32 | -6 | -13 | -65 | 52 | 21 | 3 | 77 | -26 | 84 | 91 | 100 | |
| NSDAP-Stimmanteile, Zuwachs und Konstanz | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 29 | 54 | 29 | 58 | 55 | 49 | 64 | 67 | 18 | 32 | 2 | 7 | 46 | -38 | -21 | -3 | -58 | 7 | -60 | -62 | -64 | 100 |
| 23 | -65 | 25 | 12 | 28 | 30 | 34 | 27 | 31 | 27 | -21 | 24 | 37 | 25 | -30 | -5 | 1 | -28 | -1 | -12 | -21 | -19 | 100 |
| Regressionskoeffizienten fuer NSDAP-Stimmanteile, Zuwachs und Konstanz | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 0 | 0 | 0 | -20 | -2 | 13 | 36 | 36 | 5 | 22 | -7 | 7 | -3 | 10 | -3 | -2 | 8 | -2 | -4 | 16 | -30 | 100 |
| 23 | -74 | 0 | 0 | -25 | -17 | 6 | 22 | 23 | 7 | 11 | 1 | 6 | -3 | -12 | 8 | 0 | -31 | -8 | 31 | -29 | 8 | 100 |

| | | | | | | |
|---------------------------|----------|------|--|--|--|-----------|
| iv01 | P33KATH | 324 | Katholiken | | | /C33POP |
| LANDWIRTSCHAFT VS GEWERBE | | | | | | |
| iv02 | P25LAND | 459 | Einwohner in Orten unter 5000 Einwohner | | | /C33POP |
| iv03 | P28LWFL | 612 | Flächenanteil der Landwirtschaft | | | /C33FLACH |
| | P31LWFL | 636 | 99 l.w. Betriebsfläche | | | /C33FLACH |
| iv04 | P33BL020 | 161 | Landw. Anteil an Betrieben | | | |
| | P33BL050 | 17 | l.w. Betriebe bis 20 ha | | | /B33BET |
| | P33BL100 | 4 | l.w. Betriebe bis 50 ha | | | /B33BET |
| | P33BL999 | 2 | l.w. Betriebe bis 100 ha | | | /B33BET |
| | P33BINDU | 207 | l.w. Betriebe ueb 100 ha | | | /B33BET |
| | P33BHAND | 270 | g.w. Betriebe, industriell | | | /B33BET |
| | P33BKOMJ | 82 | g.w. Betriebe, handwerklich | | | /B33BET |
| | P33BHNDL | 252 | g.w. Betriebe, kommunale Versorgung | | | /B33BET |
| | | | g.w. Betriebe, Handel u. Dienstleistung | | | /B33BET |
| iv05 | P28LVRMG | 331 | Landw. Anteil am Einheitswert | | | |
| | P28LSCHU | 181 | Lw-Anteil am Rohvermögen 1928 | | | |
| | P28LWERT | 406 | Lw-Anteil an Schulden 1928 | | | |
| | P31LWERT | 420 | Lw-Anteil am Einheitswert 1928 | | | |
| | | | Lw-Anteil am Einheitswert 1931 | | | |
| iv06 | P28RVPOP | 632 | Landw. Rohvermögen pro Kopf | | | |
| | P28LWEPD | 524 | l.w. Rohvermögen 1928 | | | /C33POP |
| | P31LWEPD | 495 | l.w. Einheitswert 1928 | | | /C33POP |
| | | | l.w. Einheitswert 1931 | | | /C33POP |
| iv07 | P25ELAND | 260 | Landw. Anteil an Erwerbstaetigen | | | |
| | P25EWERK | 376 | 95 Erwerbstaetige, Landwirtschaft | | | /C25ERWTT |
| | P25EDIEN | 256 | -85 Erwerbstaetige, Industrie | | | /C25ERWTT |
| | | | -71 Erwerbstaetige, Dienstleistung | | | /C25ERWTT |
| iv08 | P33SELB | 247 | Selbstaendige | | | |
| | P33BEAM | 33 | Selbstaendige + Mithelfende | | | /N333WB |
| | P33ANGS | 69 | Beamte | | | /N333WB |
| | P33ARBEI | 229 | Angestellte | | | /N333WB |
| | P33HSANG | 23 | Arbeiter | | | /N333WB |
| | P33ELOAG | 19 | Hausangestellte | | | /N333WB |
| | P33ELOAR | 106 | erwerbslose Angestellte | | | /N333WB |
| | P33BRL0S | 130 | erwerbslose Arbeiter | | | /N333WB |
| | P33HAUSF | 141 | Beruflose (Rentner) | | | /N333WB |
| | | | Hausfrauen | | | /N333WB |
| LANDWIRTSCHAFT | | | | | | |
| iv09 | P33LW020 | 887 | Landw. Betriebsstruktur grosse Betriebe | | | |
| | P33LW050 | 83 | -54 Anzahl l.w. Betriebe < 20 ha | | | /B33LBET |
| | P33LW100 | 18 | 49 Anzahl l.w. Betriebe >= 20 ha u. < 50 ha | | | /B33LBET |
| | P33LWFLC | 282 | 32 Anzahl l.w. Betriebe >= 50 ha u. < 100 ha | | | /B33LBET |
| | | | 80 Fläche der l.w. Betriebe ueb 100 ha | | | /C33FLACH |
| iv10 | P25LWSLB | 324 | Anteil selbstaendiger Landwirte | | | |
| | P25LWMTH | 268 | l.w. Selbstaendige 1925 | | | /C25ERWLW |
| | P25LWARB | 387 | l.w. Mithelfende 1925 | | | /C25ERWLW |
| | QLWP33 | 1.2 | -83 l.w. Arbeiter + Angestellte | | | /C25ERWLW |
| | P25LWQBE | 8.2 | -22 l.w. Arbeitskraefte 1933 | | | /B33LBET |
| | | | -2 l.w. Beschaeftigte 1925 | | | /E28LWBE |
| iv11 | P28LWRVB | 15.8 | Vermögen pro Betrieb | | | |
| | P28LWEBT | 10.9 | 7 Rohvermögen 1928 | | | /E28LWBE |
| | | | 59 Einheitswert 1928 | | | /E28LWBE |
| iv12 | P31LWEDB | 0 | Landw. Schulden, Vermögensgewinn | | | |
| | P28LWSR | 158 | 19 l.w. Gewinn an Einheitswert von 1928 bis 31 | | | |
| | P28LWBB | 388 | 74 l.w. Schulden 28 / Rohvermögen 28 | | | |
| | | | -6 Anzahl verschuldeter l.w. Betriebe | | | /E28LWBE |
| GEWERBE | | | | | | |
| iv13 | P33GINDU | 241 | Gewerbliche Betriebe | | | |
| | P33GHAND | 353 | -62 g.w. Betriebe, industriell | | | /E28GBET |
| | P33GKOMJ | 99 | 99 g.w. Betriebe, handwerklich | | | /E28GBET |
| | P33GHNDL | 302 | -23 g.w. Betriebe, kommunale Versorgung | | | /E28GBET |
| | | | -37 g.w. Betriebe, Handel u. Dienstleistung | | | /E28GBET |
| iv14 | P28GWEBT | 34.7 | G.w. Einheitswerte pro Betrieb | | | |
| | P31GWEBT | 49.9 | 99 g.w. Einheitswerte 1928 | | | /E28GBET |
| | | | 94 g.w. Einheitswerte 1931 | | | /E31GBET |
| iv15 | iv15 | 546 | Gewerbliche Schulden / Rohvermögen 1928 | | | |
| iv16 | iv16 | 0 | Veränderung der gew. Verschuldung bis 1931 | | | |
| EINKOMMEN | | | | | | |
| iv17 | iv17 | 1725 | Einkommen 1928 | | | |
| iv18 | iv18 | 0 | Veränderung des Einkommens bis 32 | | | /C33ERWTT |

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|----------|-----|-----|---------------------------------|-----------|
| Iv07 | | | Landw. Anteil an Erwerbstätigen | |
| P25ELAND | 260 | 98 | Erwerbstätige, Landwirtschaft | /C25ERWTT |
| P25EWERK | 376 | -85 | Erwerbstätige, Industrie | /C25ERWTT |
| P25EDIEB | 256 | -71 | Erwerbstätige, Dienstleistung | /C25ERWTT |

| | | | | |
|----------|-----|-----|-----------------------------|---------|
| Iv08 | | | Selbstaendige | |
| P33SELB | 247 | 88 | Selbstaendige + Mithelfende | /N333WB |
| P33BEAM | 33 | -34 | Beamte | /N333WB |
| P33ANGS | 69 | -73 | Angestellte | /N333WB |
| P33ARBE1 | 229 | 25 | Arbeiter | /N333WB |
| P33HSANG | 23 | -33 | Hausangestellte | /N333WB |
| P33ELOAG | 19 | -73 | erwerbslose Angestellte | /N333WB |
| P33ELOAR | 106 | -84 | erwerbslose Arbeiter | /N333WB |
| P33BPLOS | 130 | -16 | Beruflose (Rentner) | /N333WB |
| P33HAUSF | 141 | -79 | Hausfrauen | /N333WB |

LANDWIRTSCHAFT

| | | | | |
|----------|-----|-----|--|-----------|
| Iv09 | | | Landw. Betriebsstruktur: grosse Betriebe | |
| P33LW020 | 887 | -54 | Anzahl lw Betriebe < 20 ha | /B33LBET |
| P33LW050 | 83 | 49 | Anzahl lw Betriebe >= 20 ha u. < 50 ha | /B33LBET |
| P33LW100 | 18 | 32 | Anzahl lw Betriebe >= 50 ha u. < 100 ha | /B33LBET |
| P33LWFLC | 282 | 80 | Flaeche der lw Betriebe ueb. 100 ha | /C33FLACH |

| | | | | |
|----------|-----|-----|---------------------------------|-----------|
| Iv10 | | | Anteil selbstaendiger Landwirte | |
| P25LWSLB | 324 | 97 | lw Selbstaeendige 1925 | /C25ERWLW |
| P25LWMTH | 288 | 63 | lw Mithelfende 1925 | /C25ERWLW |
| P25LWARB | 387 | -83 | lw Arbeiter + Angestellte | /C25ERWLW |
| QLWP33 | 1.2 | -22 | lw Arbeitskraefte 1933 | /B33LWBET |
| P25LWQBE | 8.2 | -2 | lw Beschaeftigte 1925 | /E28LWBET |

| | | | | |
|----------|------|----|------------------------|-----------|
| Iv11 | | | Vermoege n pro Betrieb | |
| P28LWRVB | 15.8 | 7 | Rohvermoege n 1928 | /E28LWBET |
| P28LWEBT | 10.9 | 69 | Einheitswert 1928 | /E28LWBET |

| | | | | |
|----------|-----|----|---|-----------|
| Iv12 | | | Landw. Schulden, Vermoege nsgewinn | |
| P31LWEOB | 0 | 19 | lw Gewinn an Einheitswert von 1928 bis 31 | |
| P28LWSR | 158 | 74 | lw Schulden 28 / Rohvermoege n 28 | |
| P28LWBB | 388 | -6 | Anzahl verschuldeteter lw Betriebe | /E28LWBET |

GEWERBE

| | | | | |
|----------|-----|-----|---------------------------------------|----------|
| Iv13 | | | Gewerbliche Betriebe | |
| P33GINDU | 241 | -62 | gw Betriebe, industriell | /E28GBET |
| P33GHAND | 353 | 99 | gw Betriebe, handwerklich | /E28GBET |
| P33GKOMJ | 99 | -23 | gw Betriebe, kommunale Versorgung | /E28GBET |
| P33GHNDL | 302 | -37 | gw Betriebe, Handel u. Dienstleistung | /E28GBET |

| | | | | |
|----------|------|----|------------------------------|----------|
| Iv14 | | | Gw Einheitswerte pro Betrieb | |
| P28GWEBT | 34.7 | 99 | gw Einheitswerte 1928 | /E28GBET |
| P31GWEBT | 49.9 | 94 | gw Einheitswerte 1931 | /E31GBET |

| | | | | |
|------|-----|--|---|--|
| Iv15 | 546 | | Gewerbliche Schulden / Rohvermoege n 1928 | |
| Iv16 | 0 | | Veraenderung der gew. Verschuldung bis 1931 | |

EINKOMMEN

| | | | | |
|------|------|--|------------------------------------|-----------|
| Iv17 | 1725 | | Einkommen 1928 | /C33ERWTT |
| Iv18 | 0 | | Veraenderung des Einkommens bis 32 | |

ARBEITSLOSIGKEIT

| | | | | |
|----------|-----|----|----------------------------------|---------|
| Iv19 | | | Arbeitslosigkeit 1931-Dezember | |
| P31DALEP | 130 | 96 | Arbeitslose am 31.12.31 | /N309WB |
| P31DWO | 11 | 87 | Wohlfahrtsarwerbslose am 30.6.30 | /N309WB |

| | | | | |
|----------|-----|-----|----------------------------------|-----------|
| Iv20 | | | Arbeitslosigkeit 1932-Juli | |
| P327ALEP | 121 | 96 | Arbeitslose am 30.7.32 | /N327WB |
| P327HUEA | 183 | -38 | Hauptunterst empf. am 30.6.32 | /N327ALOS |
| P327HUEK | 303 | -45 | Krisenfuersorgeempf. am 30.6.32 | /N327ALOS |
| P323WO | 61 | 99 | Wohlfahrtsarwerbslose am 30.9.32 | /N327WB |

| | | | | |
|----------|-----|-----|---------------------------------|-----------|
| Iv21 | | | Arbeitslosigkeit 1933-April | |
| P334ALEP | 93 | 93 | Arbeitslose am 30.4.33 | /N333WB |
| P334HUEA | 199 | -88 | Hauptunterst empf. am 31.3.33 | /N334ALOS |
| P334HUEK | 380 | -77 | Krisenfuersorgeempf. am 31.3.33 | /N334ALOS |

NSDAP

| | | | | |
|----------|-----|-----|---------------------------|--|
| Iv22 | | | Zuwachs der NSDAP-Anteile | |
| P309NSDA | 148 | -27 | Reichstagswahl 1930-9 | |
| P327NSDA | 310 | 6 | Reichstagswahl 1932-7 | |
| P32NNSDA | 265 | 5 | Reichstagswahl 1932-N | |
| P333NSDA | 388 | 31 | Reichstagswahl 1933-3 | |

| | | | | |
|----------|-----|----|----------------------------|--|
| Iv23 | | | Konstanz der NSDAP-Anteile | |
| P309NSDA | 148 | 84 | Reichstagswahl 1930-9 | |
| P327NSDA | 310 | 99 | Reichstagswahl 1932-7 | |
| P32NNSDA | 265 | 98 | Reichstagswahl 1932-N | |
| P333NSDA | 388 | 95 | Reichstagswahl 1933-3 | |

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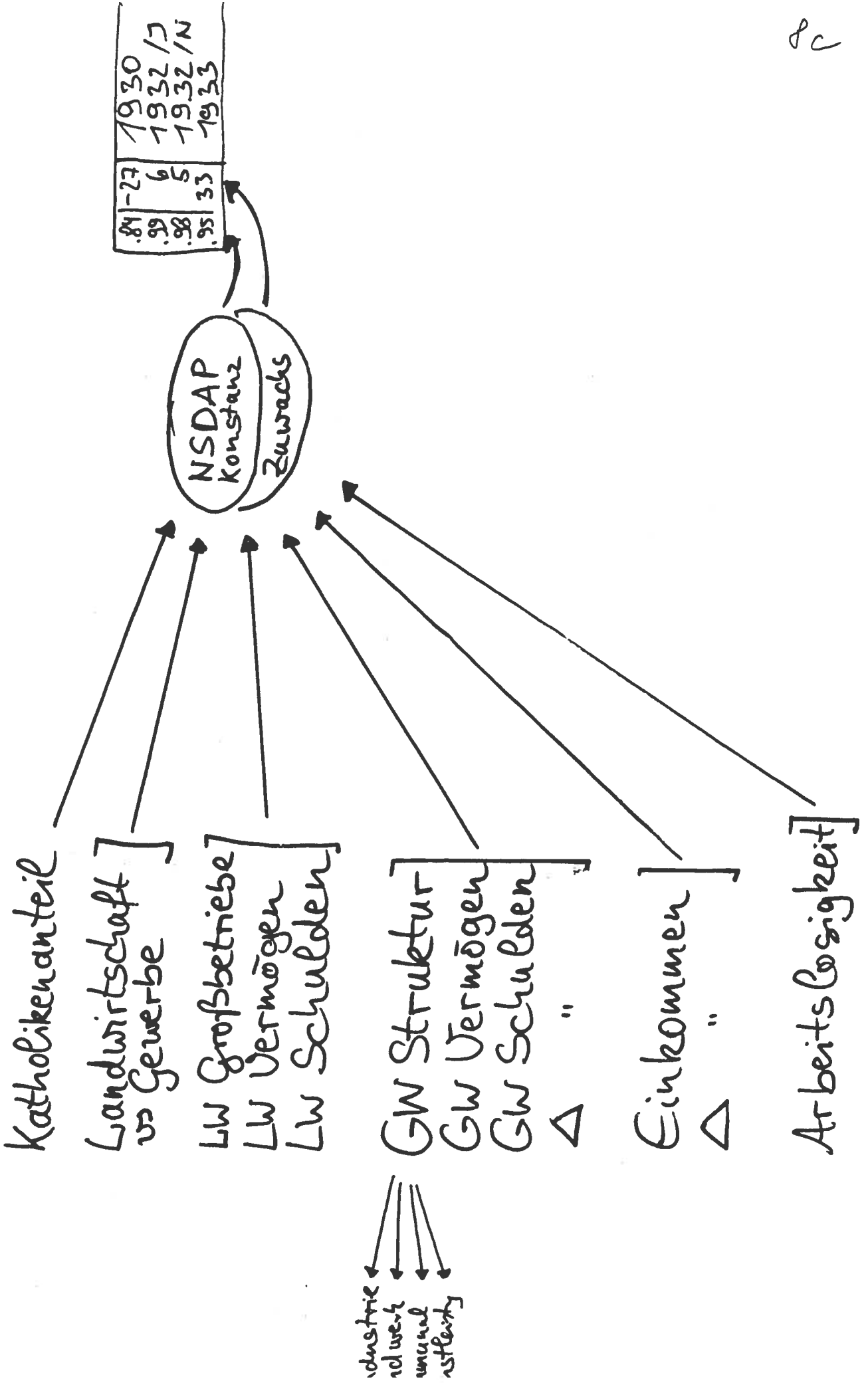


Table 2 Regression for cross-sectional and longitudinal samples
Dependent is % votes for National Socialists

| Sample | Predictor | | | | | Constant | R ² |
|---|-----------|------|--------|------|---------|----------|----------------|
| | Cath | Agri | Unempl | Work | Turnout | | |
| (a) Frey & Weck data: Pooled cross-sectional and longitudinal data | | | | | | | |
| N=4*13, reported F&W | -16 | 58 | 59 | -3 | 35 | -29 | 89 |
| N=4*13, replicated | -16 | 58 | 60 | -3 | 30 | -25 | 89 |
| N=4*13, weight=#vot30 | -15 | 55 | 57 | -9 | 36 | -26 | 91 |
| (b) Pure cross-sectional data: weight = voters '30 | | | | | | | |
| N=13, 1930 | -7 | 15 | 14 | -7 | 22 | -6 | 67 |
| N=13, 1932 July | -24 | 67 | 52 | 0 | 3 | -1 | 96 |
| N=13, 1932 Nov | -21 | 73 | 71 | 2 | -8 | -45 | 91 |
| N=13, 1933 | -14 | 48 | 28 | 2 | -22 | 38 | 93 |
| (c) Aggregated from county level: Pooled cross-section and longitudinal | | | | | | | |
| N=4*13, unweighted | -12 | 58 | 10 | -42 | 164 | -102 | 49 |
| N=4*13, weight=#vot30 | -12 | 46 | 5 | -44 | 161 | -94 | 49 |
| (d) Aggregated from county level: Pure cross-sectional data | | | | | | | |
| N=13, 1930 | -8 | 49 | 47 | -39 | 41 | -22 | 80 |
| N=13, 1932 July | -22 | 64 | 31 | -30 | 47 | -8 | 88 |
| N=13, 1932 Nov | -17 | 56 | 29 | -30 | 35 | -3 | 82 |
| N=13, 1933 | -16 | 70 | 31 | -17 | -5 | 34 | 83 |
| (e) County level data: Pooled cross-sectional and longitudinal data | | | | | | | |
| N=4*865, unweighted | -23 | 6 | -30 | -28 | 88 | -17 | 43 |
| N=4*865, weighted | -18 | 14 | -16 | -26 | 88 | -25 | 39 |
| (f) County level data: Pure cross-sectional data, weight=#voters | | | | | | | |
| N=865, 1930 | -12 | 3 | -1 | -9 | -12 | 34 | 28 |
| N=865, 1932 July | -28 | 15 | -15 | -21 | 29 | 29 | 65 |
| N=865, 1932 Nov | -23 | 15 | -15 | -17 | 24 | 27 | 59 |
| N=865, 1933 | -21 | 23 | -13 | -16 | -5 | 59 | 59 |

All table entries multiplied by 100. Explanations see Table 1

Figure 1c

Table 1 The variables and data

Frey & Weck: N=13 State Labor Exchange districts

voters Eligible voters 1930
 Cath Catholics / religiously affiliated in total
 Agri in agriculture employed / Labor force
 Unempl Unemployed reported at Labor Exchange
 / employed members of health insurances (without disabled)
 : 1930 July, 1932 July, 1932 Oct, 1933 Jan
 Work Blue collar workers / Labor force
 Turnout Turnout / eligible voters
 : 1930 Sept, 1932 July, 1932 Nov, 1933 March
 N Observational units are N=13 Landesarbeitsamtsbezirke
 (State Labor exchange districts)
 Source: Statistisches Jahrbuch des Deutschen Reiches 1931 - 1933

County level data, N=865

voters Eligible voters at each election
 Cath Catholics 1933 / Population 1933
 Agri In agriculture employed + working family members 1933
 / Labor force 1933
 Unempl Unemployed as registered at Labor Exchange
 / Labor force 1933
 Work Blue collar workers 1933 / Labor force 1933
 Turnout Turnout / eligible voters
 N Observational units for elections and census data are
 "Stadt- und Landkreise" (counties), originally N=1200,
 aggregated on N=825 longitudinally stable counties.
 Observational units for seasonal unemployment figures are
 N=365 Labor Exchange districts, disaggregated into N=865
 counties.
 Sources: Statistik des Deutschen Reiches

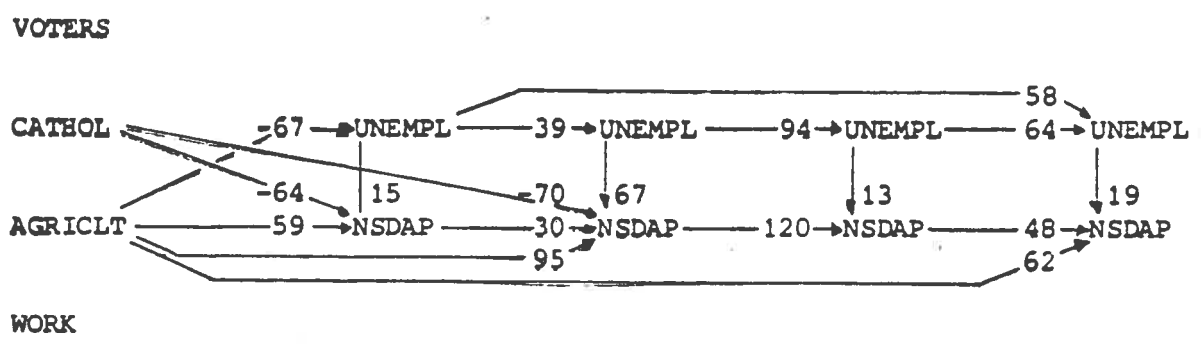
Distribution of unemployment figures

| Frey & Weck | Mean | | | R | County level data | | |
|-------------|------|-----|-----------|----------|-------------------|-----|-----------|
| | Mean | R | | | Mean | R | |
| 1930 July | 14% | 100 | | 1931 Dec | 17% | 100 | |
| 1932 July | 42% | 85 | 100 | 1932 Jul | 15% | 97 | 100 |
| 1932 Oct | 40% | 83 | 98 100 | 1932 Oct | 14% | 96 | 99 100 |
| 1933 Jan | 52% | 87 | 89 85 100 | 1933 Jan | 18% | 98 | 98 98 100 |

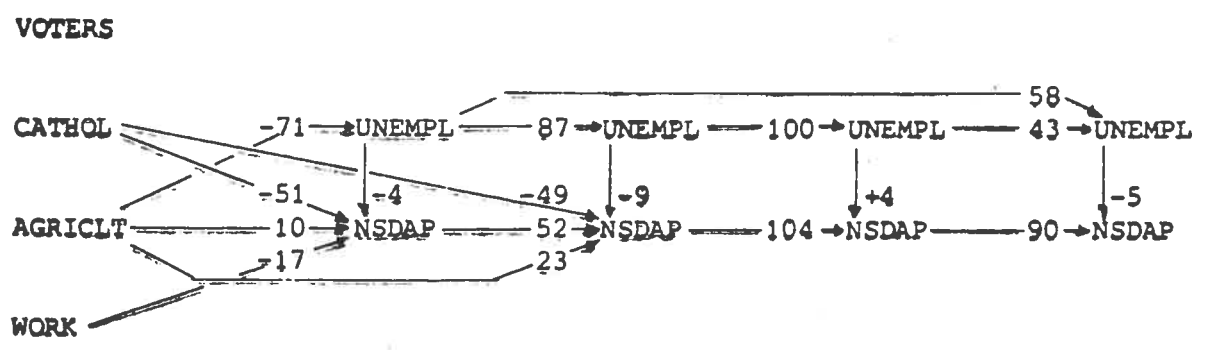
Figure 2 Longitudinal path model

| | 1930 | 1932 July | 1932 Nov | 1933 |
|--|------|-----------|----------|------|
|--|------|-----------|----------|------|

(a) N=13



(b) N=865

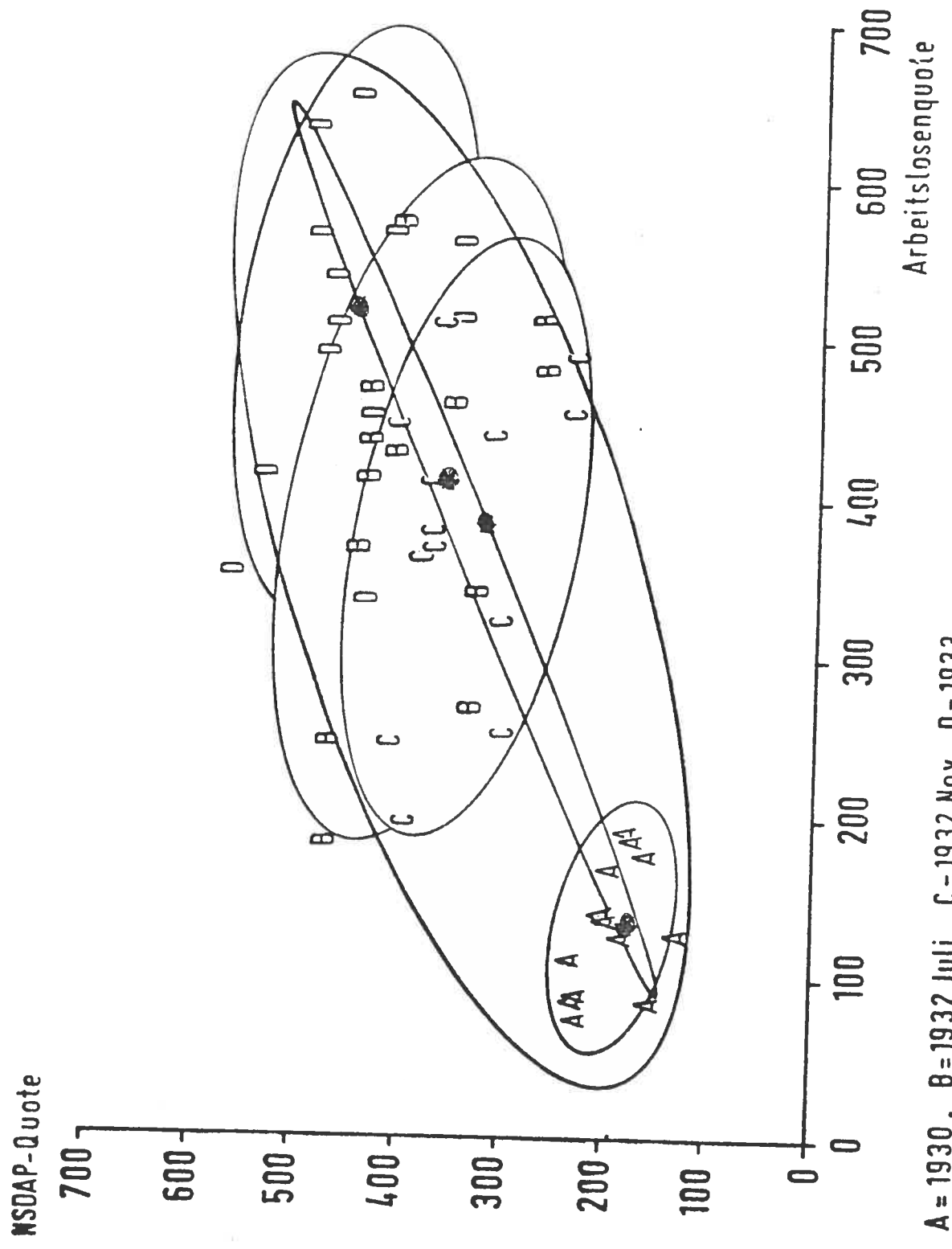


Tafel 5

Regressionen für Querschnitt- und Längsschnitt-Daten, Zielvariable ist Wahlergebnis der NSDAP (in Prozent).

| Daten | Korrelation | | | Regression, Prädiktor: | | | | | | R ² |
|--|--|------|-----|------------------------|-----|-----|-----|-----|------|----------------|
| | Alos mit: | | | Kat | Lnd | Arb | Als | Wbt | c | |
| | Land | Arbt | NS | | | | | | | |
| I. Kombiniertes Querschnitt-Längsschnitt | | | | | | | | | | |
| #1 | N=4*13 Frey & Weck - Regionen; LAA-Daten nach Frey & Weck | | | | | | | | | |
| #10 | F&W berichten | | | | | | | | | |
| #11 | .. | .. | .. | -16 | 58 | -3 | 59 | 35 | -29 | 89 |
| #12 | -43 | 35 | 63 | -16 | 58 | -3 | 60 | 30 | -25 | 89 |
| #13 | -43 | 35 | 63 | -16 | 58 | -6 | 60 | 31 | -25 | 89 |
| #14 | -43 | 31 | 63 | -17 | 52 | -22 | 60 | 35 | -20 | 90 |
| #14 | -40 | 32 | 68 | -16 | 53 | -21 | 57 | 40 | -23 | 91 |
| #2 | N=4*13 Frey & Weck - Regionen; LAA-Daten aggregiert aus Kreisdaten | | | | | | | | | |
| #21 | Arbeitslose KAAB | | | | | | | | | |
| #22 | -87 | 72 | -6 | -12 | 11 | -22 | -57 | 185 | -101 | 50 |
| #22 | -92 | 64 | -15 | -11 | 19 | -36 | 1 | 159 | -96 | 49 |
| #3 | N=4*13 korrigierte Regionen; LAA-Daten aggregiert aus Kreisdaten | | | | | | | | | |
| #31 | Arbeitslose KAAB | | | | | | | | | |
| #32 | -86 | 75 | -9 | -11 | 14 | -8 | -66 | 186 | -105 | 51 |
| #32 | -91 | 68 | -18 | -11 | 49 | -36 | 1 | 159 | -96 | 49 |
| #4 | N=4*865 Kreise | | | | | | | | | |
| #41 | Arbeitslose KAAB | | | | | | | | | |
| #42 | -81 | 47 | -18 | -18 | 14 | -26 | -16 | 88 | -25 | 39 |
| #42 | -82 | 48 | -25 | -18 | 12 | -25 | -17 | 85 | -22 | 39 |
| II. Reiner Querschnitt | | | | | | | | | | |
| #1 | N=13 Frey & Weck - Regionen; LAA-Daten nach Frey & Weck | | | | | | | | | |
| #15 | 1930 | | | | | | | | | |
| #16 | -73 | 54 | -30 | -7 | 17 | -13 | 19 | 39 | -13 | 66 |
| #17 | -89 | 73 | -26 | -24 | 60 | -17 | 48 | 24 | -6 | 95 |
| #18 | -91 | 69 | -30 | -21 | 69 | -12 | 70 | 1 | -3 | 92 |
| #18 | -69 | 69 | -15 | -15 | 47 | -9 | 31 | -25 | 45 | 94 |
| #2 | N=13 Frey & Weck - Regionen, LAA-Daten aggregiert aus Kreisdaten | | | | | | | | | |
| #25 | 1930 | | | | | | | | | |
| #26 | -84 | 79 | -10 | -8 | 38 | -49 | 50 | 25 | -3 | 79 |
| #27 | -91 | 73 | -17 | -24 | 104 | -56 | 101 | -12 | 27 | 92 |
| #28 | -92 | 68 | -22 | -18 | 78 | -41 | 68 | 8 | 13 | 84 |
| #29 | -86 | 75 | -30 | -15 | 77 | -32 | 53 | -24 | 49 | 87 |
| #29 | -92 | 64 | -49 | -16 | 70 | -16 | 31 | -4 | 33 | 83 |
| #3 | N=13 korrigierte Regionen; LAA-Daten aggregiert aus Kreisdaten | | | | | | | | | |
| #35 | 1930 | | | | | | | | | |
| #36 | -84 | 82 | -14 | -7 | 40 | -41 | 47 | 24 | -4 | 80 |
| #37 | -91 | 78 | -17 | -24 | 102 | -54 | 97 | -10 | 26 | 91 |
| #38 | -92 | 73 | -23 | -18 | 79 | -37 | 66 | 7 | 12 | 84 |
| #39 | -85 | 79 | -31 | -15 | 80 | -26 | 52 | -27 | 49 | 88 |
| #39 | -92 | 69 | -50 | -16 | 71 | -8 | 26 | -7 | 33 | 84 |
| #4 | N=865 Kreise | | | | | | | | | |
| #45 | 1930 | | | | | | | | | |
| #46 | -81 | 49 | -6 | -12 | 3 | -9 | -1 | -12 | 34 | 28 |
| #47 | -82 | 49 | -25 | -28 | 15 | -21 | -16 | 30 | 28 | 65 |
| #48 | -82 | 46 | -28 | -23 | 15 | -17 | -16 | 25 | 27 | 59 |
| #49 | -82 | 47 | -42 | -21 | 23 | -16 | -14 | -4 | 58 | 59 |
| #49 | -82 | 48 | -50 | -20 | 19 | -13 | -20 | -6 | 61 | 60 |

Abb. 53



A = 1930, B = 1932 Juli, C = 1932 Nov, D = 1933