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Planning for self-employment at the beginning of a market economy: Evidence from individual data of East German workers

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Planning for Self-Employment at the Beginning of a Market Economy. Evidence from Individual Data of East German Workers

by

Michael Lechner and Friedhelm Pfeiffer**

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Deutsches Institut für Wirtschaftsforschung

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Berlin, Februar 1992

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Planning for Self-Employment at the Beginning of a Market Economy. Evidence from Individual Data of East German Workers

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ABSTRACT

We investigate the plans of individual workers concerning future self-employment in the former German Democratic Republic (East Germany) shortly before the economic, monetary and social union in June/July 1990. In order to model these plans, we take detailed account of individual heterogeneity, the economic and social environment of the individual, and the situation of the firm in which the person is employed. Our data base is the Socio-Economic Panel (SOEP) East. We find that the desire to become an entrepreneur is basically determined by individual and household characteristics, including income and asset indicators, and not as much by the current job situation of the individual. The work experience attained in the socialist economy seems to be irrelevant for the decision to become self-employed in a market economy. Furthermore, we find evidence of barriers to entry which may come from capital market constraints and institutional restrictions.

Due to the ordinal nature of the answers, we used the ordinal logit model for estimation. The corresponding stochastic assumptions are tested extensively using pseudo-Lagrange multiplier tests against omitted variables, non-linearity, asymmetry of distribution, and heteroscedasticity.

We also present an estimation of the determinants of the probability of being self-employed in Summer 1990, where we find, due to institutional restrictions in the former GDR, only a few individual characteristics to be important.

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1. Introduction

After the introduction of the West German economic system in former East Germany on July 1, 1990, the economic transformation process resulted in high bankruptcy- and unemployment-rates in the former GDR. One hope for the creation of new jobs lies in the growth of the small-firm sector, which has been widely neglected and was even systematically suppressed in the former centrally planned economy. Larger plants were usually preferred to smaller ones because: "(1) the belief that economies of scale are found in larger firms, and (2) a small number of firms are more conducive to central planning and party control." (Roman, 1990, p 194). Another reason is that the self-employed are seen as capitalists who profit at the expense of the workers. In former East Germany, self-employment was only allowed in the service and the trade sector, and the self-employed could not hire more than ten workers. Their income was heavily taxed, see Balling (1990).

In this paper we present a cross-sectional analysis of the plans of east German workers to become self-employed within two years after June 1990. Although plans are usually modelled in a dynamic context, the unique situation of east Germans not having practical experience in a market economy allows a static modelling and an empirical analysis based on a single cross-section. Individual-based approaches on the formation of plans are sparse in the economic literature. Low et al. (1990), for example, use the static framework to model plans with respect to output and employment realizations of firms (Ivaldi, 1990, gives a review of available methods and work in this field), but the plans of individuals have not been analysed with representative data.

Our work is pertinent to economic policy considerations, since market entry in the small business sector might create employment opportunities during and after the transition process. It is important to know who decides to become self-employed and for what reasons. The introduction of the market economy confronts east Germans with a new set of choices: besides the option of migration to the West, they can become self-employed instead of remaining an employee. At the same time the probability of being layed-off is a realistic and individually recognized possibility, see Akerlof et al. (1991) and Lechner et al. (1991).

In a market economy, creating new firms requires people willing to take a risk. The situation in east Germany can be characterised by two conflicting factors. On the one hand new profit opportunities exist at the very beginning of a market economy so that entrepreneurship is a realistic option. On the other hand, the socialist ideology under which east Germans lived for 40 years denounced capitalism and private entrepreneurship. Thus, the psychological and sociological prerequisites for dynamic entrepreneurship might not be prevalent (see also the discussion of obstacles to development from Hirschman, 1965).

In the econometric section of our paper we apply specification tests designed for the ordered logit model, which have been developed in Lechner et al. (1991). Testing these models is necessary since the estimates are sensitive to a violation of the underlying stochastic assumptions.

The following section discusses potential factors which determine the decision to become self-employed. Section 3 describes the east German survey of the SOEP, from which we derive our database. Our sample and the explanatory variables are also described here. In Section 4, we present the econometric model and the methods of estimation and inference for the ordered logit model. Section 5 examines the estimation and test results. Here we also present data on self-employment in the former GDR and an additional estimation of the probability of being self-employed. In Section 6 we draw our conclusions. Detailed descriptions of the data and selected test results are provided in the appendix.

2. Factors Influencing the Decision to Become Self-Employed

The last decade has seen a lot of work, both empirical and theoretical, from economists as well as sociologists and psychologists on the determinants of self-employment relative

to wage-work, see e.g. Brock and Evans (1986) and Wärneryd (1988).[2] Although the question of planned self-employment has not been directly analysed before, it is related to the factors determining self-employment. The difference to previous work on self-employment in market economies has to be kept in mind: east German worker's plans did not result from extensive experience in a market economy. In June, 1990, prices and wages were not free and therefore contained no information on the scarcity of goods and labour. Unemployment did not yet exist.

A priori any factors in a person's life can be a potential determinant for wanting to become self-employed. The main factors can be discussed in termini of the standard microeconomic textbook concepts - preferences, endowment with human and financial capital, production possibilities, market situation on input and output markets and institutional restrictions. These ideas, which have been elaborated in the literature, see e.g. Casson (1982), will help us find meaningful information in the empirical work.

Preferences are formed by family background, relationships to other persons, the public mood, religious affiliation and other socio-economic factors. As Weber (1975) pointed out, the two religions that are most compatible with the ethics of capitalism are the Jewish and the Protestant faith. The degree of risk aversion, which has been analysed theoretically in the self-employment context by Kihlstrom and Laffont (1979) should also be considered. Furthermore, the desire to be independent together with high motivations characterise individual preferences suited for self-employment.

The initial endowment of both human and financial capital is most important for east German workers at the beginning of the market economy. Discovering new profit possibilities in situations with new technical possibilities and in an expected dynamic and

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2 For recent empirical work, see Evans and Leighton (1989) for the USA, Magnac and Robin (1990) for France, Wit and van Winden (1990) for the Netherlands and Blanchflower and Oswald (1991) for Australia. This recent interest stems from two empirical observations which deserves scientific explanation: First, more employment has been created in the small business sector than in the large business sector. Second, the self-employment rate, which has declined in Germany in the last 100 years, has begun to rise again in the eighties. The details for West Germany are in Börsch-Supan and Pfeiffer (1991).

uncertain environment is not an easy task. Leadership and decision making are influenced by human capital and experience (for a formal model build on management skills see Lucas, 1978). Sinn (1991) argue that east Germans face massive capital market constraints being a result of the particular implementation of the German unification. With such constraints, potential entrepreneurs may refrain from self-employment.[3]

The set of production possibilities have been significantly enhanced through unification with the West German economy, which itself is integrated in the world market. The decision to become self-employed is related to the situation on both the input, and output markets. Besides the above mentioned capital market imperfections, this category includes e.g. the regional availability of input factors, which may be monopolized or fixed through long term contracts making it difficult for a newcomer to enter the market. Absence of office spaces, a prerequisite for starting a business, can be an effective hindrance at least in the short run.

With the unification contract ("Einigungsvertrag"), the west German regulations have been introduced in east Germany. Special institutions are designed to promote new firm formation, see Kurz et al. (1990). Furthermore, the West German "Craft Regulation Act" (Handwerksordnung) constitutes an effective barrier to entry. The act allows only those with a degree as master of a trade to become self-employed in 126 occupations (e.g. baker or butcher, so called "Positivliste", for details see Mirbach, 1989). A further possibility is, that a person with such a qualification must be employed in a business engaged in these activities. Interestingly, in former East Germany a very similar construct was used (Bundesministerium für Innerdeutsche Beziehungen, 1985).

In former East Germany, there were people who would have liked to become self-employed, but who were forbidden from doing so. Furthermore, one has to acknowledge the high degree of uncertainty about the political and economic development in the near future. It is generally not an easy task to estimate the future competitive situation of the relevant

3 For empirical evidence for the USA, see Evans and Jovanovich (1989).

markets, but clearly a potential entrepreneur needs to make such judgements when deciding for self-employment. For the above reasons, we cannot use a tightly specified microeconomic model for analysing the decision of an east German worker, who is suddenly confronted with the introduction of a market economy, to become self-employed. To model all the realistic choices open to him is not possible. What we present in the next sections can be best thought of as a reduced form of such an microeconomic model, where we will empirically determine the factors which are relevant from the subjective viewpoint of the individual.

3. The Data

3.1. The Construction of Our Samples

The east German survey is the first wave of the Socio-Economic Panel (SOEP) for this part of Germany and is described in Schupp and Wagner (1990).[4] 2179 households with 4453 members aged 16 and older were successfully interviewed. All working members of the household are asked the following question: "What are your future job expectations?" And, in a more detailed form, "How probable do you think it is that you will become self-employed within the next two years ?" The response categories are 'definitely', 'probably', 'probably not', and 'definitely not', or the question is left unanswered. 8.3% of the workers in our sample plan to definitely or probably become self-employed (see Table 1).

We chose all workers and apprentices with German citizenship between the ages of 20 and 65.[5] We disregard foreigners because they are quantitatively unimportant. In addition,

4 For the West German SOEP, see Projektgruppe Panel (1990).

5 Of course it is possible for those outside the current labour force to become self-employed, but only workers are asked the above cited question in the SOEP.

Table 1 Planned and Actual Self-Employment in former GDR in 1990

	definitely	probably	probably not	definitely not	total
plan for self-employment	48	156	361	1904	2469
	yes		no		total
actually self-employed	82		3026		3108

Source: SOEP-East 1990

we disregard the data on those that are already self-employed for obvious reason.[6] Only 2.6% in our sample answered that they are self-employed.

For the empirical analysis of planned self-employment, we eliminate all persons who did not answer all relevant questions. Through this selection process, we retain 2469 observations (in the following called Sample A) from the 3332 available after the selection process described above. The same selection rule, with the exception of adding the self-employed, but with a reduced variable set leaves us with 3108 (in the following called Sample B) of the 3424 observations available for the empirical analysis of the self-employed. Due to the small number of self-employed in the SOEP-East 1990, we disregard sectoral and other information where we found a lot of missing values. Furthermore, while some variables are strictly exogenous for the study of planned self-employment, they are endogenous for the analysis of being self-employed against being an employee.

The survey was accomplished in six weeks. With the east German transition, a field time of six weeks (between end of May and the beginning of July) was still enough time for

6 A formulation of the question making sense for these persons could only be whether they want to remain self-employed. But this is not asked in the SOEP-East.

workers to alter plans because of the fast changes and the flood of new information and impressions. Since the interview date is recorded, the field date can be accounted for in our study.

3.2. The Explanatory Variables

The SOEP data reflect sociological and economic fields of interest that are well suited for our study. While there is a lot of information about the personal characteristics and situation of the individuals, which deliver some information about preferences and initial endowments, it is hard to find objective information about the market situation which the individual might face. We know something about the sectors of the firms where the person is currently working; we know the situation inside the firm and roughly how many employees are in the firm.

For the ease of representation, we divide the potential factors into three groups G_1, G_2 and G_3, representing individual characteristics, the income and asset situation and variables describing the current working place and career perspectives of the individual. For the sake of brevity, we describe in detail only the variables which pass all the statistiscal tests and were included in our final model (see Table 2 for a description of the variables). A full description of all variables is contained with explanations and descriptive statistics in Appendix A.

Since preferences and human capital variables should not be ignored, we include information on sex, age (together with age polynomials to allow non-linear age effects), health, religious affiliation, and education. The school and professional degrees are not identical to the West German equivalents although they are similar. A worker in East Germany could get the degree 'master of a trade' (MASTER) through experience and proven quality work, while in West Germany an exam has to be taken.

Table 2 Data Description: Sample A and Sample B

G_1 **Individual Characteristics**

FEMALE	= 1, if female
PROTESTANT	= 1, if member of the protestant church
ILLNESS	= 1, if the persons feels unhealthy
AGE	age
AGE2	age squared
AGE3	age cubic
GRADE10	= 1, if high school degree (grade 10)
ABITUR	= 1, if university entrance qualification (reference group: no degree and grade 8)
NODEGREE	= 1, if no professional degree
OTHER	= 1, if other professional degree
MASTER	= 1, if master in a trade
ENGINEER	= 1, if engineering or technical college degree
UNIVERSITY	= 1, if university degree
HEALTHUNI	= 1, if university degree and belonging to the health sector (reference group: apprenticeship or a degree in a skill)
SELFHH	= 1, if another self-employed person lives in the household
CONFUSED	= 1, if confused by the circumstances (only Sample A)
NEWJOBE	= 1, if the individual can easily find a new job
CITY	= 1, if the community has more than 100000 inhabitants

G_2 **Income and Asset Indicators of Household or Person** (only Sample A)

OWNER	= 1, if owner of present quarter
INCOME90	income in May 1990 in East German marks
SAVING500	= 1, if income from savings or other assets is higher than 500 East German marks
LANDLORD	= 1, if owner of other real estate

G_3 Situation of the Employee in the Firm and Situation of the Firm

LAYEDOFF	= 1, if the worker will be layed-off, but still working
TENURE	number of years, the employee has worked in the current firm
PRIVATE	= 1, if the firm has recently been privatized
EMPL019	= 1, if firm with 0 to 19 employees
EMPL20199	= 1, if firm with 20 to 200 employees
	(reference group: firms with more than 200 employees)
PRIV019	= 1, if recently privatized firm with 0 to 19 employees
PRIV20199	= 1, if recently privatized firm with 20 to 200 employees
AGRICULT	= 1, if agriculture, fishing
HEAVYIND	= 1, if heavy industries
UTILITIES	= 1, if energy, water
CONSTRUCT	= 1, if construction
TRADE	= 1, if trade
TRANSPORT	= 1, if transportation
SERVICE	= 1, if services
EDUCATION	= 1, if education (part of SERVICE)
HEALTH	= 1, if medical care (part of SERVICE)
CIVSERV	= 1, if public services
	(reference group: light industries)
PUBLIC	= 1, if the firm belongs to the public sector as seen by the individual

To be more realistic we controlled for institutional entry barriers in the health sector, where a university degree is necessary to set up as a self-employed physician. The workers with a university degree in the health sector (HEALTHUNI = HEALTH * UNIVERSITY) are likely to be physicians.

Preferences are formed in the primary social group, the family. SELFHH equals one if another member of the household is already self-employed. Intensive contacts with a self-employed family member can reduce the cost of obtaining information. The dummy variable CONFUSED controls for observable optimism or pessimism; CONFUSED equals 1, if the individual has great difficulties in adapting to the new circumstances. Entrepreneurs are often people who like to be independent. In the SOEP, people are asked how they value independence and we used the answers to construct INDEPEND.

An often discussed question is whether becoming self-employed is a consequence of unemployment or expected unemployment,[7] that is whether it is a reaction to bad prospects on the labour market. This push-effect has to be compared with a pull-effect. A person with good prospects on the labour market may believe he has comparative advantages as a self-employed worker. NEWJOBE equals one, if the individual is convinced that she can easily find a new job if necessary.

Indicators of the worker's income and asset position are important from an economic point of view. The question is whether entrepreneurship is handicapped by capital market constraints or the lack of office space. The last month's income before taxes (INCOME90) reflects human capital build up in the former GDR as well as current wealth.[8] SAVING500 equals one, when income from assets and savings in the household of the individual have been higher than 500 East Marks in the last year. This bound was chosen because i) the information is not available on a continuous scale and ii) we want to capture the rich households in the former GDR. Ownership of a house was not as unusual as one might think for a socialist country. OWNER equals one if the current living quarters is owned by a member of the household and LANDLORD equals one if the household owns other flats or real estate.[9]

The last group of variables G_3 characterizes the individual career position in the current working place and the sectoral and structural attributes of the firm. TENURE renders the number of years the individual has worked at the present firm and indicates the individual's degree of experience, reliability, firm-specific knowledge, and seniority. With wide-spread job reductions, those having worked longer in the current firm might believe they have safer jobs. At the time of the SOEP survey, firms had already announced lay-offs. LAYEDOFF equals 1, if the individual has been stricken by the lay-offs. This information

7 See for example Bögenhold and Staber (1990) and Evans and Leighton (1990).

8 Money savings in East Germany were changed to West Marks at an average rate of 1.8, Sinn (1991).

9 It is possible that the current living quarter is not owned by the household yet that the household owns other real estate.

has to be combined with NEWJOBE in the interpretation of the results. Some firms has already been privatised (PRIVATE), and this might contain relevant information for a worker, because he could recognize the important steps of the privatising procedure.

The same is true for firm size (EMPL019, EMPL20199). In a small-firm, the division of labour is not as strict as in a large firm so that workers can learn more about the various processes from production to sales. To make the story more realistic, we let the firm size interact with PRIVATE (PRIV019, PRIV20199). Privatisation, so the hypothesis, contains more information for the worker of the small-firm than for the worker of the large firm.

The other variables are sectoral dummies comparable to the one-digit level of the official German statistic with the exception of the service sector. We additionally constructed two subsets of SERVICE, namely the health sector (HEALTH) and the education sector (EDUCATION). The health sector was nearly totally socialist in the former GDR. Identifying the public sector is partly arbitrary in a socialist system since 80% of all employees worked in collectively owned firms. Therefore we add PUBLIC, which depends on whether the individual considers himself part of the state apparatus.

4. The Econometric Model

While the binary logit needs no further comments, we discuss shortly the ordered logit model. The individual's plans for self-employment are only observed categorically. Since it is possible to order the categories the ordinal logit model can be used in the empirical analysis. We assume that the basic latent model has the following linear form:

$$y_i^* = V_i\theta + u_i \qquad i = 1, \ldots, N, \tag{4.1}$$

where y_i^* represents the latent, endogenous variable, V_i the $N \times K$ dimensional vector of exogenous variables without a constant, and u_i the error term, which is assumed to be independently logistically distributed. However, we can only observe y_i as:

$$(4.2) \qquad y_i = \begin{cases} 1 & \text{iff} \quad c_0 < y_i^* \leq c_1 \\ 2 & \text{iff} \quad c_1 < y_i^* \leq c_2 \\ 3 & \text{iff} \quad c_2 < y_i^* \leq c_3 \\ 4 & \text{iff} \quad c_3 < y_i^* \leq c_4. \end{cases}$$

$c = (c_0, \ldots, c_4)'$ is a vector of unobserved bounds identical for all observations. Because of the ordinal structure of the model, not all parameters (c, θ, σ) can be identified. The following normalization is chosen: $c_0 = -\infty, c_4 = +\infty, \sigma^2 = \frac{\pi^2}{3}$, and the coefficient of the constant equals zero. This is identical to setting another bound to zero and estimating the constant, as is usually done with binary logit models. Because of the global concavity of the log-likelihood function, Maximum Likelihood estimation is easy to perform and discussed e.g. by Maddala (1983).

Specification tests become a necessity since these types of models require strong stochastic assumptions, e. g., on the distribution of u_i and linearity, without which the parameter estimations usually turn inconsistent. Therefore, we apply quasi-Lagrange-Multiplier tests, which have been proposed for the ordinal logit in Lechner et al. (1991). In order to test for the functional form or against omitted explaining variables, higher polynomials and logarithms of positive continuous regressors as well as the potential omitted variables (if observed) are included in V. We test the null hypothesis whether the additional coefficients are individually or jointly equal to zero.

For the test against heteroscedasticity we specify an alternative where the variance depends on an exponential function of observables and coefficients. To test the distributional assumption the Burr(II) distribution is an attractive alternative, since it nests the logistic distribution and allows a deviation from symmetry in both directions. To obtain a more multidirectional test, we also perform joint tests of the hypothesis of homoscedasticity and the logistic distribution.

The estimation proceeds in two steps. First, theoretically relevant but empirically insignificant regressors are detected by estimating and testing against omitted variables. To arrive at an efficient estimation, we then exclude all regressors that have a low significance (p-value larger than 20%). This final model is again tested against functional form, omitted variables, heteroscedasticity and the distributional assumption.

5. Self-Employment and Planned Self-Employment before Unification

5.1. Self-Employment in the GDR

In this section we provide descriptive statistics of the labour force and industry structure in the former GDR with respect to self-employment. Table 3 shows the irrelevance of the private sector shortly before the fall of the wall on September 1989. 2.2% (or 184,600) of the totally employed were self-employed. This group employed 274,500 workers. This is low compared to West Germany, where the self-employment rate in 1989 was about 8.9%. A West German self-employed person has, on average, two additional paid employees.[10] Nearly 30% of the West German labour force are therefore working in firms governed by those self-employed, including the self-employed. This number shows the hope for job creation and the expected dynamic in the small-firm sector for the east German economy.

The third row in Table 4 shows the development of the self-employment rates (including unpaid family workers) in East Germany since 1955. Especially the jump from 20.5% in 1955 to 3.4% in 1970 is peculiar. It reflects the various waves of expropriation between these times. The last expropriation wave was in 1972, (Handbuch für innerdeutsche Beziehungen, 1985) and since then the self-employment rate stabilized at around 2.2%. The self-employed were allowed to hire only up to 10 employees and were mainly active in the trade and craft sector ("Handwerk"). They were controlled regularly by a local member of the socialist party.

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10 Calculated roughly from the West German Arbeitstättenzählung 1987.

Table 3: Employment with Respect to the Form of Ownership and the Position within the Firm for the GDR in Sept. 1989 (x 1000)

Firm	hourly and salary employees	members of co-operatives	self-employed (incl. unpaid family members)
state owned	6828.8 (79.9%)	---	---
co-operative	438.2 (5.1%)	821.2 (9.6%)	---
private	274.5 (3.2%)	---	184.6 (2.2%)

Source: Statistisches Jahrbuch der DDR 1990; DIW Wochenbericht 12/91; own calculations (Remarks: without trainees and information about selected government institutions, political parties, and social organisations; total employment: 8547.3; total employment on average in 1989 according DIW Wochenbericht 12/91: 9640).

Table 4: Development of Self-Employment in the GDR (x 1000)

	1955	1970	1980	1985	1989
Total employment	7722.5	7769.3	8225.2	8539.0	8547.3
Self-employed	1579.2	268.2	180.8	176.8	184.6
Self-employment rate	20.5%	3.4%	2.2%	2.1%	2.2%

Source: Statistisches Jahrbuch der DDR 1990 (Remarks: see Table 3).

Table 5 shows the recent rise in the quarterly self-employment rates shortly before and after unification in 1990. When interpreting the rate, which has risen from 2.2% to 5.2% at the end of 1990, one has to keep in mind that total employment has declined rapidly during the same time. This is due to lay-offs and possibly to migration.

Table 5: Development of Self-Employment in East Germany in 1990 (x 1000)

Quarter	I	II	III	IV
total employment	9366	9045	8569	7962
Self-employed	207	289	362	418
Self-employment rate	2.2%	3.2%	4.2%	5.2%

Source: DIW Wochenbericht 12 and 24/91; own calculations.

Table 6 compares the size of the small-firm sector in east and west Germany before unification.[11] Taken from the unweighted raw counts of the SOEP-West 1989 and the SOEP-East 1990, the data show that the small-firm sector (with less than 20 employees) in west Germany is twice as large as in east Germany. Interestingly, there are relatively more employees in east Germany in the middle category (20 to 199 and 200 to 1999 employees), whereas the employment rate in the large firm group (more than 2000 employees) is identical in both parts of Germany. The last row shows the relative importance of the self-employed who are working without any paid employees. In west Gerrmany, this group is more than three times as large as in east Germany.

In our Sample B, derived from the SOEP-East 1990, we observed 82 persons (from 3108, that is about 2.6%) who claimed to be self-employed. Only about 20% of these people became self-employed after the fall of the wall. We present a logit estimation of the probability of being self-employed, which should describe this group in the east German economy before unification. Due to the small number, we can present only a few factors influencing the probability of being self-employed; the rest of the variables (see Appendix A) were insignificant. We applied the standard diagnostic tests as described in Lechner (1991) for the logit model, and these tests did not reject our specification.[12]

11 See also Bannasch (1990).

12 Results are available on request.

Table 6: A Comparison of the Industry Size Structure in East and West Germany

Employees	East Germany (1990)	West Germany (1989)
less than 20	11.54%	23.78%
20 - 199	28.01%	25.44%
200 - 1999	35.4%	23.03%
more than 2000	24.09%	24.43%
does not apply, self-employed without employees	0.95%	3.32%

Source: SOEP - West, 1989; SOEP - East, 1990; unweighted raw counts.

Table 7 contains the estimates, asymptotic t-statistics, the p-value in %, and the mean of the variable in Sample B. Females have a lower probability of being self-employed. The coefficient of PROTESTANT is significantly positive, so that the analysis of Weber (1975) still seems to have merit. The highest degree of schooling has no measurable effects.

Relative to the reference category apprenticeship, those with a master in a trade (MASTER) and those with a diploma from a technical university (ENGINEER) have a significantly higher probability of being self-employed, which is not surprising given the institutional arrangements. The greatest impact, however stems from SELFHH, which may be is driven by endogeneity. If not, this is hints at learning effects in the household resulting from low information costs and traditional behaviour.

These results have to be viewed with care. The self-employed were a minority in East Germany because the official ideology was set against self-employment. The factors, which were historically relevant for becoming self-employed in this environment, are not observed in the SOEP.

Table 7: Probability of Self-Employment in East Germany: Logit Estimation

Variable	Coefficient	t-statistic	p-value in %	mean
FEMALE	-1.28	-4.20	0.00	0.48
PROTESTANT	0.74	2.98	0.29	0.26
AGE	0.01	0.57	57.16	39.36
GRADE10	0.10	0.31	75.94	0.52
ABITUR	-1.17	-1.59	11.24	0.14
NODEGREE	-0.43	-0.41	68.49	0.04
OTHER	-0.24	-0.22	82.57	0.03
MASTER	2.03	6.43	0.00	0.07
ENGINEER	1.02	2.75	0.61	0.17
UNIVERSITY	1.34	1.78	7.46	0.09
SELFHH	3.00	9.44	0.00	0.03
INDEPEND	0.37	1.45	14.67	0.31
JULY	-0.26	-0.25	80.00	0.02

82 Self-employed (without unpaid family workers) (1), 3026 Employees (0),
d. o. f.: 3094, -log Likelihood: 296, likelihood ratio test (all coefficients except the constant are zero): χ^2: 165.96, d.o.f: 13

5.2. Planning for Self-Employment: Results

In the following, a negative coefficient indicates that the variable has a positive effect on the plan of becoming self-employed. In the context of estimated coefficients, the coefficients for the bounds hint at the strength of the impact of one variable. Table 8 presents the estimation results of the final model, t-values and the levels of significance. Given the sample size and the configuration of the variables, we regard a significance level of less than 1% as well-determined while the values between 1% and 10% are only weakly determined.

Our general result is that the worker's plan for becoming self-employed in the next two years is determined mainly by individual characteristics and the endowment of financial and other assets, including access to information. It has nothing to do with the current position in the firm and the characteristics of the firm, with two exceptions discussed later. The firms under central planning were governed by political aims and had only a limited autonomy. The same was true for the individual worker. Except for political reasons, it was impossible to lose one's job. There was no 'neutral' mechanism determining success as in the case of a functioning market economy. The integration into the world economy will destroy most of the existing technologies and organization structures of the east German firms. The job position in the firm and firm specific human capital are maybe worthless.

In the first group of variables we found two negative and well determined impacts on planned self-employment: FEMALE and the age-polynomial (AGE, AGE2, AGE3). Although the coefficient of AGE2 is negative, the age effect is monotonically increasing. The older a person is, the longer he has worked in the socialist economy, the less he plans on becoming self-employed. The same is true for TENURE. A person having worked for a long time at the same firm is no longer willing or flexible enough to risk self-employment. These two effects show, that the age-structure of the east German labour force matters in the transformation process. Only young workers and those not having worked long at one place might eventually become self-employed.

The positive influence of being a Protestant (PROTESTANT) and of subjective illness (ILLNESS) are only weakly determined. The first confirms the Weberian statement from the last section. The latter is surprising given that self-employment is generally more demanding and therefore only a realistic alternative for healthy people. Since only 5% of the east Germans feel ill, this result has to be taken with care.

The impact of higher educational degrees (GRADE10, ABITUR) is well determined. One explanation lies in the difficulties of coping with the changes in the legal and economic system transformations. For example, the Unification Contract ("Einigungsvertrag") is a

long text, with more than 1000 pages, written in the language of lawyers and bureaucrats. Although it was publicly available at the time of the interview, it is surely not an easy task to understand its consequences for economic life. The same is true for the various possibilities of receiving subsidies for establishing new firm.[13]

The professional degrees are not important, apart from the master degree (MASTER), which confirms that the "Craft Regulation Act" already serves as an institutional entry barrier in the crafts sector. Those with no master degree are not allowed to become self-employed in this sector. Therefore, this regulation may hinder the growth of the small business sector, at least in the short run, since it is not possible to increase the number of workers with master degrees quickly. The old debate about the welfare effects of this entry barrier in Germany, see Habermann (1990), gains a new actuality. Our results furthermore provide some hint that the institutional entry barrier in the health sector are also important. The workers who are likely to be physicians (HEALTHUNI) have a higher tendency for becoming self-employed, since they fulfil the legal requirements for setting up a general practice. This result, however, has to be interpreted with care, since there are only 16 observations with HEALTHUNI equals 1.

The workers who feel confused by the circumstances tend to become self-employed more often than others, but the effect is only weakly determined. This variable is discussed more intensively in section 6.4 below.

The threat of unemployment is probably not a major force for planning self-employment in June 1990. Both the workers who believe that it will be easy to get a new job if necessary (NEWJOBE) and those already layed-off (LAYEDOFF) have, c. p. a higher expectation for becoming self-employed in the next two years. The mean of LAYEDOFF, however, is only 5% and the coefficient is only weakly determined.

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13 It is an interesting question, whether these effects remain the same in the future. In empirical research of the determinants of West German self-employment among men, education is unimportant, see Börsch-Supan and Pfeiffer (1991).

Table 8: Planning for Self-Employment: Ordered Logit Estimation

Variable	Coefficient	t-statistic	p-value in %	mean
G_1 **Individual Characteristics**				
FEMALE	0.562	4.38	0.001	0.49
PROTESTANT	-0.270	-2.23	2.597	0.25
ILLNESS	-0.472	-2.00	4.513	0.05
AGE	0.561	2.81	0.492	39.11
AGE2	-0.017	-3.10	0.211	1650.49
AGE3	0.0002	3.40	0.069	74286.06
GRADE10	-0.670	-4.26	0.002	0.52
ABITUR	-0.923	-3.93	0.009	0.15
NODEGREE	0.594	1.32	18.395	0.04
OTHER	-0.498	-1.89	5.860	0.03
MASTER	-0.990	-4.79	0.0002	0.06
ENGINEER	-0.259	-1.57	11.637	0.17
UNIVERSITY	-0.304	-1.19	23.504	0.10
HEALTHUNI	-1.511	-3.08	0.209	0.006
SELFHH	-0.786	-2.62	0.879	0.02
CONFUSED	-0.286	-1.81	7.000	0.12
NEWJOBE	-0.433	-3.26	0.114	0.17
CITY	-0.180	-1.39	16.424	0.27
G_2 **Income and Asset Indicators of Household or Person**				
OWNER	-0.590	-4.74	0.0002	0.31
INCOME90	-0.0003	-2.09	3.677	1240.41
SAVING500	0.156	1.38	23.209	0.20
LANDLORD	-0.156	-0.99	32.178	0.11

G_3 **Situation of the Employee in the Firm and Situation of the Firm**

TENURE	0.029	3.70	0.021	12.641
LAYEDOFF	-0.487	-2.31	2.118	0.048
PRIVATE	-0.233	-1.63	10.367	0.356
EMPL019	-0.292	-1.37	17.021	0.097
EMPL20199	0.075	0.49	62.304	0.288
PRIV019	-0.717	-1.98	4.794	0.022
PRIV20199	-0.498	-2.07	3.871	0.082
AGRICULT	-0.051	-0.25	80.518	0.132
HEAVYIND	0.548	2.93	0.341	0.186
UTILITIES	0.310	0.80	42.128	0.023
CONSTRUCT	0.296	1.27	20.373	0.071
TRANSPORT	-0.075	-0.27	78.722	0.087
SERVICE	-0.015	-0.06	95.303	0.204
TRADE	-0.367	-1.74	8.123	0.087
CIVSERV	-0.009	0.03	97.654	0.068
PUBLIC	0.344	1.62	10.449	0.345
1. bound	1.126	(2.36)		
2. bound	2.738	(2.36)		
3. bound	4.092	(2.36)		

Observations: 2469, d.o.f.: 2431, -log likelihood: 1603.96,

correct predictions: 76.14%, likelihood ratio test $(\theta = 0, c \neq 0): \chi^2 = 409.73$, d.o.f.: 38

The positive effect of SELFHH can be interpreted in the same way as in the last section, with the difference that in the present analysis endogeneity is no problem. With another self-employed person in the household, the individual can easily learn about potential chances and risks as well as the legal and institutional aspects pertaining to self-employment. Besides the information aspect this influence might result from traditional behaviour.

In the second group of variables we find a positive, although only weakly determined, impact of the personal income from the last month (INCOME90), but no measurable effect of high income from savings in the household where the individual lives (SAVING500). The savings may stem from older members of the household who do not want

to become self-employed. Furthermore, we find a well determined positive effect for OWNER. Workers living in a rented quarter have less motivation for becoming self-employed. This can be caused by two effects, which we cannot isolate; either there are imperfect capital markets, or there are imperfect or nonexistent markets for office space. Those who own a house can obtain loans more easily, or they can use various rooms as office space. This result is confirmed by the irrelevance of owning other real estate (LANDLORD), which could be, for example, a cottage in the country side that is not appropriate for office space.

The sectoral affiliation of the firm where the worker is currently employed is nearly unimportant for the decision of self-employment. Only workers in the heavy industries have a lower motivation for self-employment. The heavy metal industries are characterized by a high capital intensity, where self-employment is generally low due to high entry costs.

The firm size as well as the fact that the firm has recently been privatized are irrelevant. Interestingly, the interaction of these two factors (PRIV019, PRIV20199) have a positive effect on planned self-employment, although the coefficient is only weakly determined. This can be best understood in the context of informational costs. An employee thinking about self-employment recognizes the legal and economic aspects of privatisation more intensively when employed in a small-firm than in a large firm. Therefore, the coefficient of PRIV019 is even larger than that of PRIV20199. The policy of the "Treuhand" to privatize small-firms first will therefore have, other things being equal, positive secondary effects on the development of the small-firm sector.

5.3. Plans and Realisations: Preliminary Results

The second wave of the SOEP-East was conducted in April 1991. Although workers were asked about their plans in the next two years in 1990, one can take a preliminary look at

the realisations for 1991, which is done in Table 9.[14] 38.2% of the workers who planned in 1990 "definitely" to become self-employed were already self-employed in 1991. This was true for only 9.7% of those who "probably" expected to become self-employed.

Table 9: Plans and Realisation until 1991 in %

Plan \ Realisation	Self-employed 1991	Unemployed 1991
definitely	38.2	10.9
probably	9.7	8.7
probably not	1.8	8.7
definitely not	0.4	9.4

Source: SOEP-East 1990, 1991

There is no relationship between the self-employment plan and realised unemployment.[15] Since Table 4 clearly shows the positive relationship between plans and realisations (after the first year of the two year interval), our results on the socio-economic factors influencing planned market entry have to be taken seriously. An interesting issue in this context is whether the "Unification Contract" has provided optimal signals for private entrepreneurship up to now. Sinn (1991, p. 4) concluded in May 1991, nearly one year after unification, that east Germany "is rather still in the middle of its rent seeking fight. Entrepreneurial efforts are largely absorbed by participating in zero sum games. Fighting the legal battle for property rights is currently much more profitable than supervising and designing the necessary reorganisation of the east German economy."

14 At the time of writing, the SOEP-East 1991 was not yet distributed to the users. We want to thank Gert Wagner from the Deutsche Institut für Wirtschaftsforschung, DIW, Berlin for making this table possible.

15 The rest is the group where nothing has changed.

5.4. Specification Tests for the Ordered Logit Model

The LM-Multiplier tests of the functional form show that there are no more non-linearities. Furthermore, we tested other possible influences on plans, but they turned out to be insignificant in the presented model. Especially, we tested the marital status, regional information, whether a person works full- or part-time, the date of interview, the actual position of the worker in the firm and other information which were all statistically insignificant. All variables tested are reported in Appendix A.

The choice of the variables which potentially influence the variance is important for testing against heteroscedasticity in order to obtain maximum power. We include all relevant variables, whether they enter the final estimation or not, individually and in corresponding groups, and test the null hypothesis that the variance does not vary. The test of the distributional assumption of the Logit revealed no problem. The joint tests against the distributional specification and heteroscedasticity give similarly results as the test against heteroscedasticity alone. Appendix B contains selected test results.

The variable CONFUSED is a potential source of heteroscedasticity, which casts some doubt on the estimates. On a priori grounds we would expect these workers (12%) to have a higher variance, or to have a different coefficient vector (e.g. a different expectation formation process) caused by their confusion about the drastic political and economical transformations. Note that binary choice models cannot identify these two different possibilities separately. One strategy for future research is to disregard the observations of this group in the empirical analysis.

7. Conclusions

This work is a first approach to analyzing planned market entry with individual data. During forty years of central planning in the former GDR, self-employment was systematically suppressed for ideological reasons. The introduction of the West German market system after unification will have, and already has, dramatic consequences for the east German

economy as a whole and especially for its labour market. It is widely believed that a growing small-firm sector is necessary to create new jobs and revive the east German economy. In order to achieve that aim it is necessary that there are people willing to take the risks in forming new firms.

Relatively little is known about the structure of the east German labour force and their willingness as well as their ability to cope with the risks inherent in self-employment. We therefore investigate the individual worker's plans to start a firm at the beginning of the market economy.

Our results show that market entry on a small scale is probably hindered by institutional, economical, psychological, and sociological factors. The plan for self-employment is popular only among young people. However, these young people probably have few financial assets. Since those who own houses and have higher current income tend to plan on becoming self-employed, capital markets constraints or missing office space may hinder others. The "Craft Regulation Act" allows market entry only with a master degree and this maybe is too restrictive, at least in the short run. Social relationships are important, since the informational costs of becoming self-employed, under a new law, are very high.

After having described the starting point of a historically (and economically) unique process, due to German unification, future research will show how realistic the east German worker's plans turned out to be and whether the small-firm sector will become as important as in West Germany. Furthermore, it will show how expectations and plans are altered in the light of experiences within the market economy. The determinants of success in the small-firm sector can be studied and set in relation to individual characteristics, plans and institutional arrangements.

Appendix A General Data Description: Sample A and Sample B

Symbol	Description	Sample A Mean	Sample B Mean[16]
G_1 **Individual Characteristics**			
FEMALE	female	0.485	0.478
AGE	age	39.111 (10.996)	39.363 (11.110)
AGE2	age squared	4225.0 (893.86)	4284.5 (901.2)
AGE3	age cubic	274625.1 (58072.1)	283536.4 (59031.9)
age groups			
YOUNG_30	age: younger than 30	0.260	0.257
OLD_45	age: older than 45	0.333	0.346
marital status			
MARRIED	married	0.780	0.782
SINGLE	single (never married)	0.139	0.132
DIV_WID	divorced or widowed	0.081	0.086
religion			
CHURCH	member of a church	0.295	0.312
CATHOLIC	catholic (subset of CHURCH)	0.050	0.052
PROTESTANT	protestant (subset of CHURCH)	0.245	0.260
working status			
FULLTIME	full-time work	0.874	o. A[17]
PARTTIME	part-time work	0.123	o. A
TRAINING	training in the firm	0.002	o. A
ILLNESS	illness	0.054	0.052
PHONE	telephone in household available	0.233	0.242

16 Standard derivation for non dummy variables in parenthesis

17 only in Sample A

SELFHH	another self-employed person in the household	0.022	0.033
School Degree			
ABITUR	university entrance qualification	0.151	0.143
GRADE10	high school degree (grade 10)	0.524	0.523
Professional Degree			
NODEGREE	no degree	0.043	0.043
OTHER	other degree	0.030	0.030
MASTER	master in a trade	0.061	0.067
ENGINEER	engineering or tech. college deg.	0.173	0.165
UNIVERSITY	University degree	0.098	0.094
HEALTHUNI	University degree and belonging to the health sector	0.006	o. A
INDEPEND	person puts strong emphasis on independence	0.299	0.309
CONFUSED	confused by the circumstances	0.122	o. A
prospects of having to find a new job			
NEWJOBE	easy	0.172	o. A
NEWJOBD	difficult	0.168	o. A
size of community			
TOWN	less than 2000 inhabitants	0.257	0.263
CITY	more than 100000 inhabitants	0.271	0.270
JULY	date of interview: after 7/1/1990	0.023	0.023
TIME	days before or after July 1	14.489 (7.630)	14.287 (7.630)
German Federal States (Bundesländer)			
MECKLVP	Mecklenburg-Vorpommern	0.116	0.122
BRANDENB	Brandenburg	0.162	0.160
SACHSAN	Sachsen-Anhalt	0.184	0.182
THUERING	Thueringen	0.173	0.167
SACHSEN	Sachsen	0.294	0.300
BERLIN	Berlin-East	0.072	0.069

G_2 Income and Asset Indicators of Household or Person

housing			
OWNER	owner of present quarter	0.307	o. A
RENTER	renter of present quarter	0.693	o. A

LANDLORD	owner of other real estate	0.105	o. A
REALASSET	real assets in a firm	0.017	o. A
INCOME89	income in Nov 1989	1086.079 (509.50)	o. A
INCOME90	income in May 1990	1240.408 (488.12)	o. A

income from assets or savings

SAVING499	up to 500 East German marks	0.791	o. A
SAVING500	more than 500 East German marks	0.202	o. A

G_3 **Situation of the Employee in the Firm and Situation of the Firm**

actual position held in the firm

SKILLED	skilled worker	0.553	o. A
FOREMAN	master of a trade/ foremen	0.047	o. A
MANAGER	middle to high management	0.204	o. A
LAY-OFFS	lay-offs taken place or planned	0.469	o. A
LAYEDOFF	worker already layed off	0.049	o. A
TEMP	temporary work contract	0.043	o. A
OVERTIME	overtime last month in hours	6.463 (12.834)	o. A
TENURE	number of years the employer has worked in the current firm	12.642 (10.207)	o. A

number of employees in the firm

EMPL019	from 0 to 19	0.097	o. A
EMPL20199	from 20 to 199	0.288	o. A
EMPL200	from 200 to 1999	0.365	o. A
EMPL2000	more than 2000	0.250	o. A
PRIVATE	recently privatized firm	0.356	o. A

interaction of PRIVATE and number of employees in the firm

PRIV019	from 0 to 19	0.022	o. A
PRIV20199	from 20 to 199	0.082	o. A
PRIV200	from 200 to 1999	0.156	o. A
PRIV2000	more than 2000	0.096	o. A

sector dummies

AGRICULT	agriculture, fishing	0.132	o. A
CONSTRUCT	construction	0.071	o. A
UTILITIES	energy, water	0.023	o. A
HEAVYIND	heavy industries	0.186	o. A
TRADE	trade	0.087	o. A
TRANSPORT	transportation	0.087	o. A
SERVICE	services	0.204	o. A
EDUCATION	education (part of SERVICE)	0.103	o. A
HEALTH	medical care (part of SERVICE)	0.071	o. A
CIVSERV	public services	0.068	o. A
PUBLIC	job in the public sector as seen by the individual	0.345	o. A

Appendix B Selected Specification Tests[18]

Variable	χ^2	D.o.f.	p-value in %
a) Omitted Variables			
BRANDENB	3.57	1	5.877
b) Heteroscedasticity			
NODEGREE	2.97	1	8.48
CIVSERV	3.58	1	5.83
CONFUSED	6.57	1	1.04
BRANDENB	3.01	1	8.27
c) Distribution	0.25	1	61.87
d) Distribution and Heteroscedasticity			
CONFUSED	7.17	2	2.77

18 Only variables with probability below 10% are listed.

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