The KfW/ZEW Start-up Panel – Design and Research Potential

Helmut Fryges, Sandra Gottschalk

Centre for European Economic Research (ZEW), Mannheim

Karsten Kohn

KfW Bankengruppe and IZA Bonn

Outline

1. Motivation to form a start-up panel for Germany

2. Survey design
   - Co-operating partners
   - Parent population
   - Stratification
   - Interviews
   - Questionnaires

3. Research potential
   - Results from the first survey 2008
   - Long-term prospects

4. Data access for external researchers

Motivation I

There is no data set in Germany that observes start-ups continuously over a number of years. Extant data sets exhibit several shortcomings.

- **Global Entrepreneurship Monitor (GEM) / KfW Start-up Monitor**

  - population surveys
  - tends to identify the share of entrepreneurs within the population
  - identifications of motives and obstacles during the formation process (successful and non-successful entrepreneurs)
  - individuals are not tracked over several years
  - only a relatively small number of entrepreneurs

Motivation II

- **Establishment Panel of the German Federal Employment agency (IAB Betriebspanel)**
  - only establishments with at least one employee who is subject to social insurance contributions
  - date of firm formation is approximated by the time the establishment employs its first employee subject to social insurance contributions

- **Mannheim Enterprise Panel (MUP) of the ZEW**
  - based on the database of Creditreform, Germany's largest credit rating agency
  - lack of information on important firm-specific variables (human capital, innovation, financial structure)

Survey design: co-operating partners

- Centre for European Economic Research (ZEW)
- KfW Bankengruppe, economics department
- Verband der Vereine Creditreform e.V., economics department

Survey design: parent population

- Database of Creditreform; data are collected by Creditreform's 130 offices all over Germany
- Legally independent firm as the database's statistical unit
- Only firms that actively participate in business life (e.g., employing workers, renting a business room)
- Full-time entrepreneurs (no "part-time" entrepreneurs)

Survey design: stratification

- Random sample stratified by (i) year of firm formation (ii) sector (iii) whether or not a firm has been promoted by the KfW bank
- Each year, firms that are founded in the three years prior to the year of the survey
- The panel covers almost all industrial sectors. The sample is stratified by 10 sectors.
- Half of the firm in the sample shall belong to high-technology industries.
- In each stratification cell a maximum of 50% has been financially supported by the KfW bank

Table 1: Composition of high technology industries

	Sector	NACE Rev. 1
1	cutting-edge technology manufacturing	23.30, 24.20, 24.41, 24.61, 29.11, 29.60, 30.02, 31.62, 32.10, 32.20, 33.20, 33.30, 35.30
2	high-technology manufacturing	22.33, 24.11, 24.12-4, 24.17, 24.30, 24.42, 24.62-4, 24.66, 29.12-4, 29.31-2, 29.40, 29.52-6, 30.01, 31.10, 31.40, 31.50, 32.30, 33.10, 33.40, 34.10, 34.30, 35.20
3	technology-intensive services	64.2, 72 (without 72.2), 73.1, 74.2, 74.3
4	software supply and consultancy	72.2

Cutting-edge manufacturing technology: manufacturing industries with average R&D expenditure > 8.5% of total sales. High-technology manufacturing: manufacturing industries with average R&D expenditure 3.5 – 8.5% of total sales. Source: Grupp and Legler (2000), own classification.

Table 2: Composition of non-high-tech industries

5	non-high-tech manufacturing	15 – 37 (without sectors 1 + 2)
6	skill-intensive services (non-technical consulting services)	73.2, 74.11-4, 74.4
7	other business-oriented services	71.1, 71.2, 71.3, 74.5 – 74.8 (without 74.84.7), 90, 64.1, 61, 62, 60.3, 63.1, 63.2, 63.4
8	consumer-oriented services	55, 70, 71.4, 92, 93, 80.4, 65-67, 60.1, 60.2, 63.3
9	construction	45
10	wholesale and retail trade (without trade agents)	50 – 52 (without 51.1)

Source: own classification.

Survey design: interviews

- The target size of each year's net sample totals to an average of 6,000 firms per year.
- The surveys are carried out using computer-aided telephone interviews (CATI).
- Average length of an interview: 25 minutes
- The interviews are currently conducted by the Zentrum für Evaluation und Methoden (ZEM) of the University of Bonn.
- In 2008, 5,508 interviews were realised (response rate 26%).
- Firms that participated in the survey in the past will be contacted in future waves of the panel until they are eight years of age or younger.

Table 3: Composition of Net Sample 2008

Year of Start-Up	2005	2006	2007	total
cutting-edge technology manufacturing	71	77	55	203
high-technology manufacturing	138	177	120	435
technology-intensive services	398	438	472	1,308
software	283	303	221	807
non-high-tech manufacturing	170	177	155	502
skill-intensive services	86	99	87	272
other business-oriented services	93	96	92	281
consumer-oriented services	173	187	176	536
construction	184	188	168	540
wholesale and retail trade	202	225	197	624
total	1,798	1,967	1,743	5,508

Number of firms in sector-by-year cells.

Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

Table 4: Response Code of Gross Sample

	Number of Firms	Share in Percent
completed interview	5,510 [a]	25.52
incomplete interview	1,216	5.63
open interview appointment	651	3.02
interview denied	6,239	28.90
firm other than indicated	1,434	6.64
firm no longer exists	884	4.10
no independent start-up	509	2.36
start-up year other than 2005/2006/2007	5,144	23.83
total	21,587	100.00

[a] Due to two duplicates in the data set, the final number of interviews as reported in Table 2 amounts to 5,508 firms.

Survey design: questionnaires

- Each year, there are two versions of the questionnaire:
  (i) baseline questionnaire that focuses on structural information at time of start-up
  (ii) follow-up questionnaire that focuses on changes over time

- There is a significant overlap between the two questionnaires.

- Topics that are surveyed each year are:
  - human capital of the team of founders/managers
  - composition of employees
  - innovation and R&D activities
  - sales and profits
  - financing structure

- Along with standard questions, additional main focus themes are addressed each year.

Research potential: labour demand

- The questionnaire collects data on
  - the employment structure of firms (full-time employees subject to social insurance distributions, marginally employed workers, freelancers)
  - skill structure of employees (occupations that require a university degree, vocational training, no vocational training)

- The data set includes data on within-year fluctuation of employment (how many employees entered the firm, how many left the firm?).

- Relevant research questions:
  - Determinants of employment growth
  - Determinants and impact of employment fluctuation
  - How do young firms acquire highly-skilled employees?

Table 5: Composition of Employment at Time of Start-up

	Share of firms employing ...	Total employment created
Founders	100.0	37.7
full-time employees subject to social insurance contributions	20.8	17.7
part-time employees subject to social insurance contributions	9.8	5.9
marginally employed workers (Mini-Jobs)	18.1	18.5
family members of founders	14.0	5.9
apprentices	3.3	1.3
freelancers	8.3	10.1
interns	3.1	1.6
temporary employees (Leiharbeitskräfte)	1.0	1.3
Total		100.0

Shares in percent.

Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

Research potential: innovation activities

- Each year firms are asked on
  - expenditures on R&D, number of R&D employees
  - introduction of product and process innovations in the previous year
  - introduction of products new to the market
  - degree of innovativeness of the newly introduced products

- Main focus of last year's survey: market entry strategies (comparative advantage in product quality, price, technology etc.)

- Relevant research questions:
  - Which entrepreneurs opt for which strategy?
  - Do different strategies lead to different firm performance in the short run (establishment in the market) and/or in the long run (firm growth)?
  - How do young and small firms finance expensive R&D activities?

Table 6: Products new to the Market

	world market	Germany	region	no
cutting-edge technology manufacturing	16	12	3	69
high-technology manufacturing	11	13	8	68
technology-intensive services	6	10	7	77
software	9	12	7	72
non-high-tech manufacturing	6	8	10	76
skill-intensive services	2	12	10	76
other business-oriented services	4	6	12	78
consumer-oriented services	-	5	10	85
construction	1	2	5	92
wholesale and retail trade	5	5	8	82
total	3	6	9	82

Shares in percent of start-ups.

Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

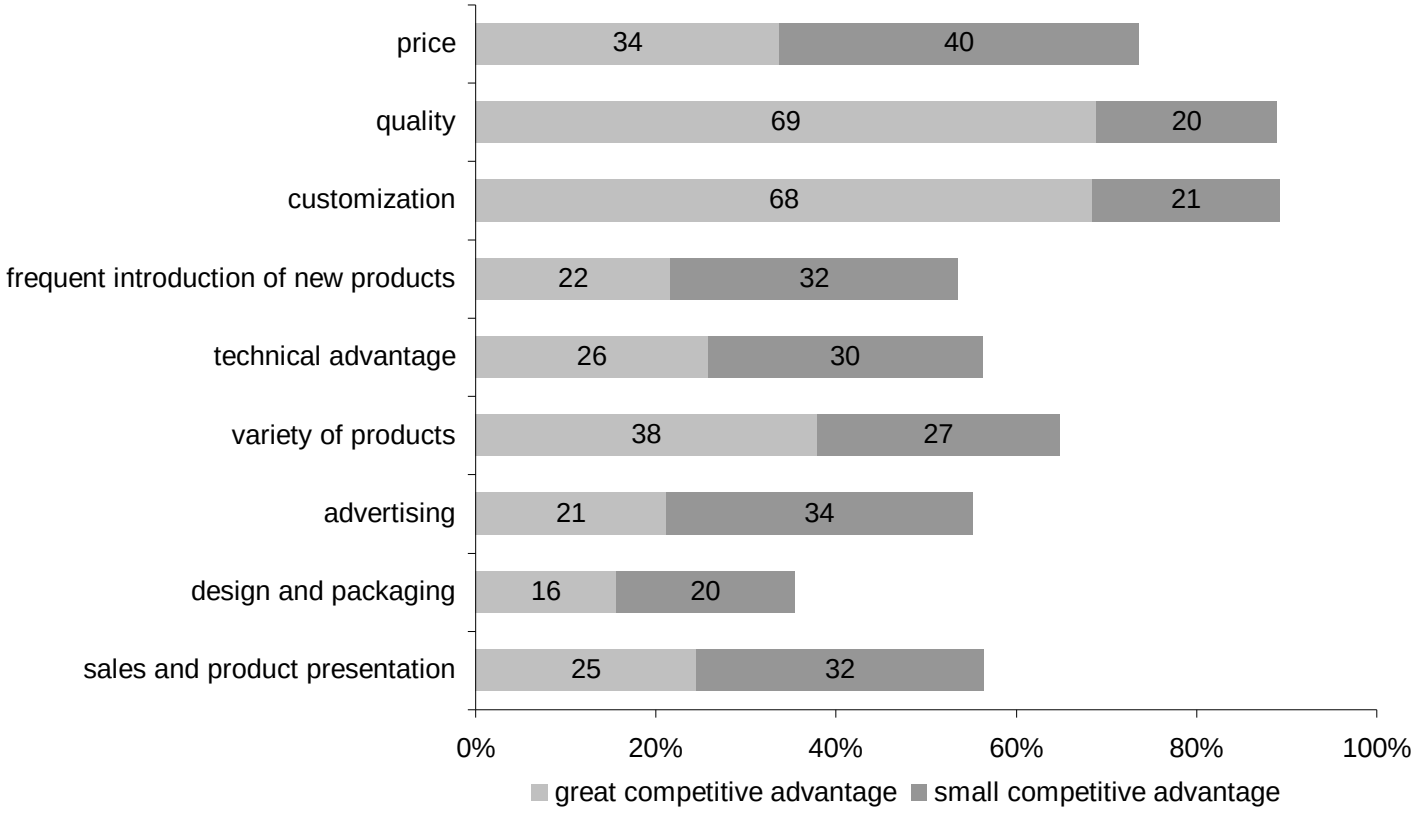
Table 7: Research and Development Activities

	continuous	occasional	no
cutting-edge technology manufacturing	33	17	50
high-technology manufacturing	23	19	58
technology-intensive services	16	15	69
software	30	16	54
non-high-tech manufacturing	13	15	72
skill-intensive services	16	9	75
other business-oriented services	6	10	84
consumer-oriented services	10	8	82
construction	2	5	93
wholesale and retail trade	7	7	86
total	9	9	82

Shares in percent of start-ups.

Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

Figure 1: Comparative Advantages over Main Competitors



Shares in percent of start-ups.

Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

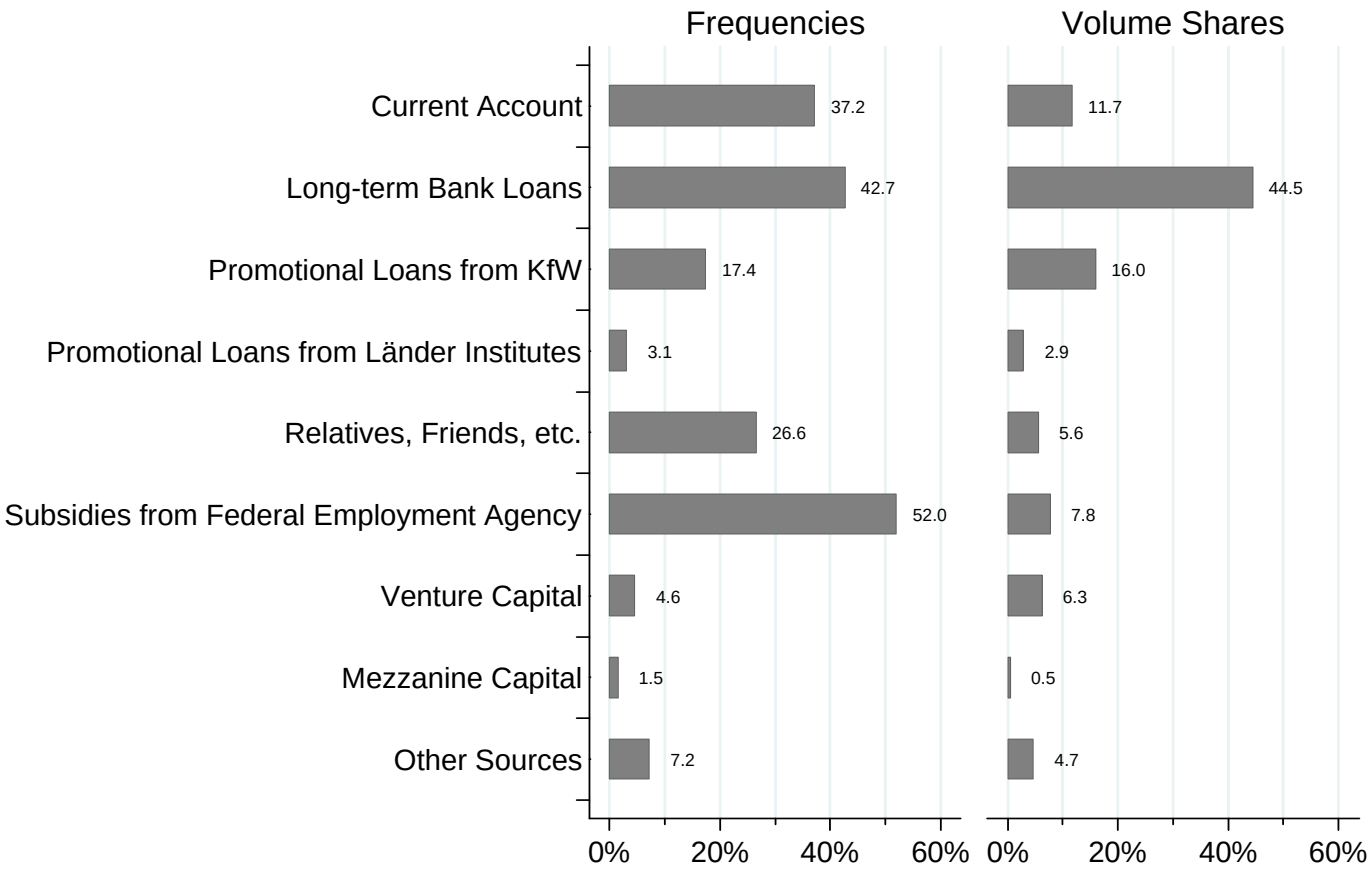
Research potential: financing structure

- To determine firms' financing structure, we collect data on
  - tangible assets for the set-up of the new business
  - use of three types of financial resources: revenues from sales, founders' own funds, capital from external provides
  - use of different sources of external financing: bank loans, subsidies, venture capital, business angels

- In addition, the questionnaire addresses problems and obstacles in getting access to different sources of external financing.

- Relevant research questions:
  - determinants of financing strategies
  - impact of financing strategies on firm development
  - change of a firm's financing strategy over time (e.g., whether or not business angel financing is replaced by venture capital financing)

Figure 2: Frequency and Volume of External Financing Sources



Left column: use of different financing sources during start-up year (shares in percent of start-ups, multiple answers); frequencies conditional on the use of external financing. Right column: volume shares in percent of external financing. Start-ups in 2007. Source: KfW/ZEW Start-up Panel, first wave 2008 (Gottschalk et al. 2008).

Research potential: firm survival

- Creditreform will directly investigate all firms that do no longer respond to the telephone survey in order to determine the survival status of all firms in the panel data set.
- This will allow us to distinguish between firm death and other events that prohibit a contact (take over, relocation).
- This will enable researchers to take account of a survival bias when carrying out econometric analyses with data of existing firms.
- It will be possible to track firms in the years before market exit and to identify determinants of firm mortality by means of survival analysis.

Data access

- The utilisation of the data is restricted for scientific purposes only.
- Creditreform and KfW are not allowed to use the data for credit ratings or credit negotiations.
- Anonymised scientific-use files will be provided for external scientists.
- The data will be allowed to be used for purely non-commercial basic research only. Teaching purposes will also be excluded.
- Scientific-use-files will be generated for each cross-section of the survey separately with a delay of three years.

Thank you for your attention!