



The Effects of Student Aid - Evidence from Germany

DRAFT - Master's Thesis
in Economics (Science Track)

by

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Abstract

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DISCLAIMER: AI (ChatGPT & DeepL) was used in the following ways: (1) to identify grammatical and typographical errors (ex-post; chapter wise, AI identifies weaknesses & I manually correct), and (2) to suggest synonyms for in my view not-fitting words or phrases (while writing; only sentence fragments chosen by myself).

Acknowledgement

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Contents

List of Tables	iv
List of Figures	iv
1 Introduction	1
2 Theoretical Framework	2
2.1 BAfoeG in Germany	2
2.2 The Student's Decisions	2
3 Data and Descriptive Statistics	3
4 Empirical Framework	5
4.1 Costs	6
4.2 Effects	6
5 Results	8
5.1 Costs	8
5.2 Effects	8
6 Discussion and Limitations	9
7 Summary and Concluding Remarks	10
References	v
A Further Figures	v

List of Tables

1	Summary Statistics Students (2002-2019)	3
2	Share of BAfoeG Recipients per Year - Actual vs. Simulated	vii
3	Summary Statistics Non-Students (2002-2019)	viii

List of Figures

1 Introduction

RQ1: *What are the costs associated with BAfoeG, and how do are the effects on the decisions to start studies, complete studies, and supplying labor during the studies? (What factors influence the likelihood of taking up or not taking up BAfoeG? see Kalinowski Herber (2016) paper with comparable SOEP approach)*

RQ2: *How does this differ between certain (marginalized) subgroups; First-Gen, certain income classes ...*

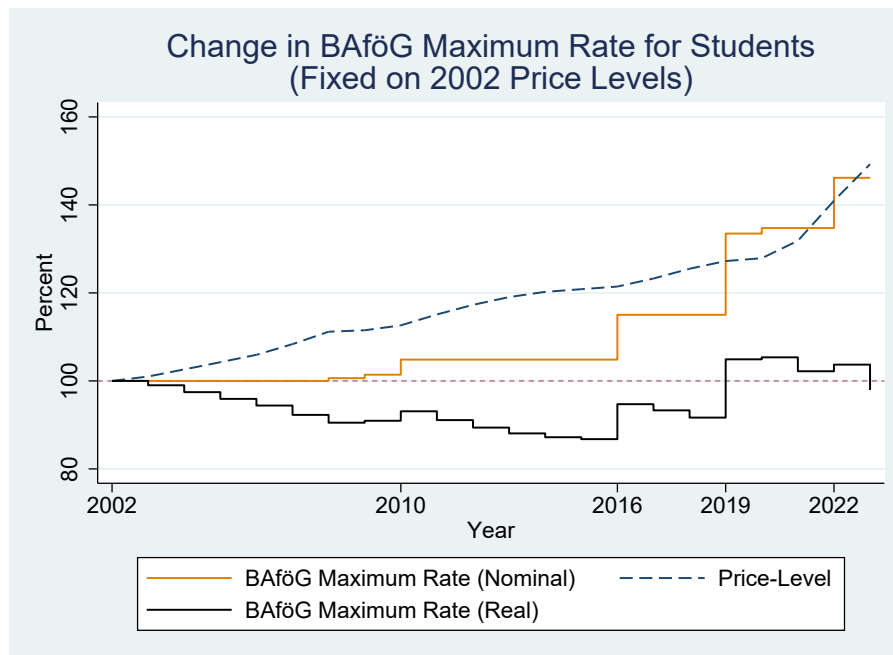
Relevant Literature:

- Welfare State Intro: Several Paper from Torben
- Study Grants: Several Paper from Elena
- SOEP/Germany Specific Pre-Literature:

2 Theoretical Framework

2.1 BAfoeG in Germany

- **Means-Based Testing:** Explaining the "Calculation Algorithm".
- **Algorithm Overview:** Brief explanation highlighting the essential parameters.
([Create Table of Parameters in Appendix](#))
- **Parameter Modifications & Policy Reforms:** Real vs. nominal changes.



Change also holds for other parameters

2.2 The Student's Decisions

1. Decision to enter the state: Study vs. Work
2. Decision to leave state: (i) Ability to finish program &

3 Data and Descriptive Statistics

- SOEP \Rightarrow
- Data Cleaning
 - Starting with 2002, because prior too many "filler students". Year $y \in [2002, 2019] \Rightarrow$ pre Covid.
 - Imputations (e.g. Heckman correction for missing wages in specific waves) \Rightarrow Optimal Behavior e.g. "Steuerklassen"
 - Discussion: Left- & Right-censored students & Students without Parents in Sample (*provide summary in appendix that no difference between two groups*)
 - Tax Estimation

Table 1: Summary Statistics Students (2002-2019)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>Individual Characteristics:</i>					
Age	12589	23.5436	3.2963	17	35
Male	12589	.4799	.4996	0	1
HH with Parents	12589	.4273	.4947	0	1
Migration Background	12589	.2273	.4191	0	1
First Gen	12589	.3395	.4736	0	1
<i>Academic:</i>					
University	12589	.7283	.4448	0	1
Polytechnic	12589	.2332	.4229	0	1
Work Academy	12589	.0274	.1633	0	1
Year in University	12589	3.3196	2.3323	1	16
<i>Income:</i>					
Inc. Student (€, Gross, Mth.)	12589	506.285	690.0756	0	3000
Labor Supply	12589	.4902	.4999	0	1
Labor Supply (Weekly Hours)	6171	20.3635	12.6687	1	40
Inc. Father (€, Gross, Mth.)	12589	4068.4187	5151.7772	0	92317.5
Inc. Mother (€, Gross, Mth.)	12589	1785.1596	2277.5304	0	72000
<i>BAfoeG:</i>					
Student Grants (SOEP)	12589	.2361	.4247	0	1
Student Grants (€, Mth.)	2151	430.0014	236.917	10	3000
BAfoeG (simulated)	12589	.3246	.4682	0	1
BAfoeG (€, Mth.)	4086	360.05	206.1949	10.3133	2599
Eligible for BAfoeG	12589	.8988	.3016	0	1

Note: This includes every individual who studied for at least one semester in the respective year. Consequently, individuals appearing in j study years influence the mean with a weighting of j/n . Student Grants include state funding (BAfoeG) as well as other forms of stipends. BAfoeG amounts are calculated under the assumption of optimal behavior and always assume an application is made if the amount is greater than zero. Therefore, these figures may be higher than the actual amounts received.

- BAfoeG Simulated vs. Actual
 - [See for Share actual vs. simulated details per year](#)
 - Discussion where difference might stem from (totally in line with ”official estimates” (from Fraunhofer FIT in official BAF Statistik [**include proper citation in BibTex**]))
 - Discussion Approach
- Differences other papers, e.g. Kalinovski Herber 2016 or
 - Many just took Student Grant variable = BAFoeG, which is not correct
 - HH with parents too high (SOEP specific reporting & Living place vs. official place of residency aka specific variables vs. hid)

4 Empirical Framework

The Game-Plan:

1. Plain Cost Estimation

- (a) Estimate the costs of BAfoeG per Year \Rightarrow suppose an Income-Tax-Change to finance this costs \Rightarrow take ε from the Literature \Rightarrow End up with Monetary + Labor Supply Costs

2. Effects Real BAfoeG Variation

- (a) Decision to start study (first. post. sec. degree)
 - General
 - Only Students which qualify for BAfoeG (Probit/OLS - LPM)
 - Share First Generation Students
 - FH & Technical
- (b) Decision to end study in planned time ¹
- (c) Decision to provide labor while studying (Reference to positive effects Mattana & Joensen) - both extensive & intensive margin
- (d) Take up & Non-Take-UP
 - Income Groups who drop out due to real wage inadjustment

3. Controls:

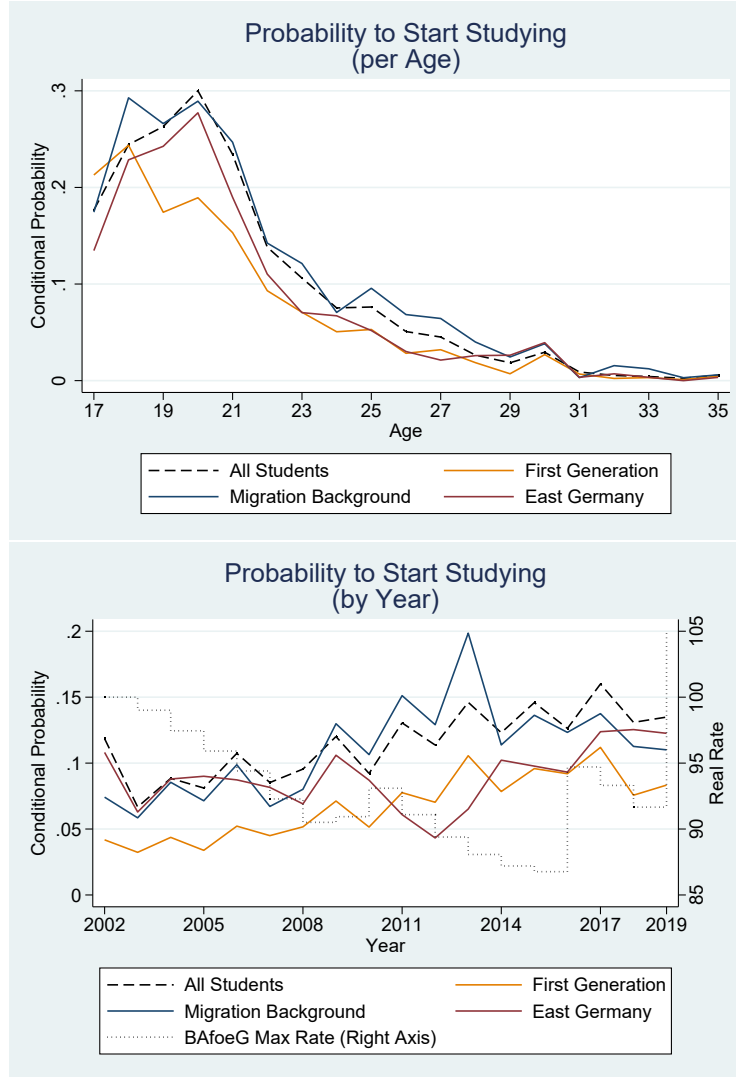
- Average Wage (Inflation Variation might not fully reflecting Real Wage Variance)
- Financial Crisis 2008 (2018) similar argument as above (+ US argument of choosing edu in crisis; might not hold for risk averse Germany with inversely observed effects).
- Grant & Loan Share (can be calc. using sim BAF), see argument Elena Mattana & Juana Joensen: *"find that if study aid consists mostly of grants, a reduction in loans and increase in grants reduces graduation rates. However, once loans are larger than grants, further changes have little impact on dropout and graduation rates. This means that once aid is mostly provided as loans, the government can decide who bears the college cost without affecting human capital accumulation"*
- Hochschultyp (internal FIT Argument that differences in BAF Behavior, Takeup between Uni type)
- Brutto t-1 (t-1, since t flawed for students who chose to study; proxy for outside option)

¹Still open, if panel structure allows to validly access this.

4.1 Costs

4.2 Effects

(a) Ω = all i with age ≤ 35 , qualifying highschool degree, no student, no degree + respective first year students (*Rightarrow* obv. result unbalanced panel - **Does this yield any unwanted bias?**)



General Pooled Regression - (Naïve Pre Reg) \Rightarrow Using Real BAfoeG Max Rate as Treatment (No Effect expected)

$$PR_{it}(\text{Begin} \mid \text{Eligible}) = \beta_0 + \beta_1 \times \text{BAfoeG Max Rate}_t + W'\zeta + \varepsilon_{it} \quad (1)$$

$W'\zeta$ = Matrix Controls

Problem: General time trend of increasing student numbers \Rightarrow LPM + FE (**Add Appendix Table where we see non-difference between Probit & LPM**)

$$PR_{it}(\text{Begin} \mid \text{Eligible}) = \beta_0 + \beta_1 \times \text{BAfoeG Max Rate}_t + W'\zeta + u_i + \mu_t + \varepsilon_{it} \quad (2)$$

u_i = i FE

μ_t = As the treatment varies with each syear, capturing a year-FE would not make that much sence. Rather I include "a linear time trend" (syear in stata instead of i.syear)

Problem: Not everyone receives treatment.² With Simulated individual specific Data \Rightarrow allows to (i) determine who would have received BAfoeG & (ii) use mechanical BAfoeG variation (simulated) unconditional on working decision:

(i) Simulated Treatment $\Rightarrow s = 1; s = 0 \Rightarrow$ BAfoeG Max Rate = 0

$$PR_{ist}(\text{Begin} \mid \text{Eligible}) = \beta_0 + \beta_1 \times \text{BAfoeG Max Rate}_{st} + W'\zeta + u_i + \mu_t + \varepsilon_{ist} \quad (3)$$

(ii) Mechanical BAfoeG Variation (w/o own Income Restriction)

$$PR_{ist}(\text{Begin} \mid \text{Eligible}) = \beta_0 + \beta_1 \times \text{Sim. BAfoeG}_{ist} + W'\zeta + u_i + \mu_t + \varepsilon_{ist} \quad (4)$$

Following regressions with similar setup. Also possible to use the variation in grant rate (vs loan).

²Actually, one could argue that current missperception of BAfoeG in the public the treated are only those, who think they receive BAfoeG. \Rightarrow Limitations.

5 Results

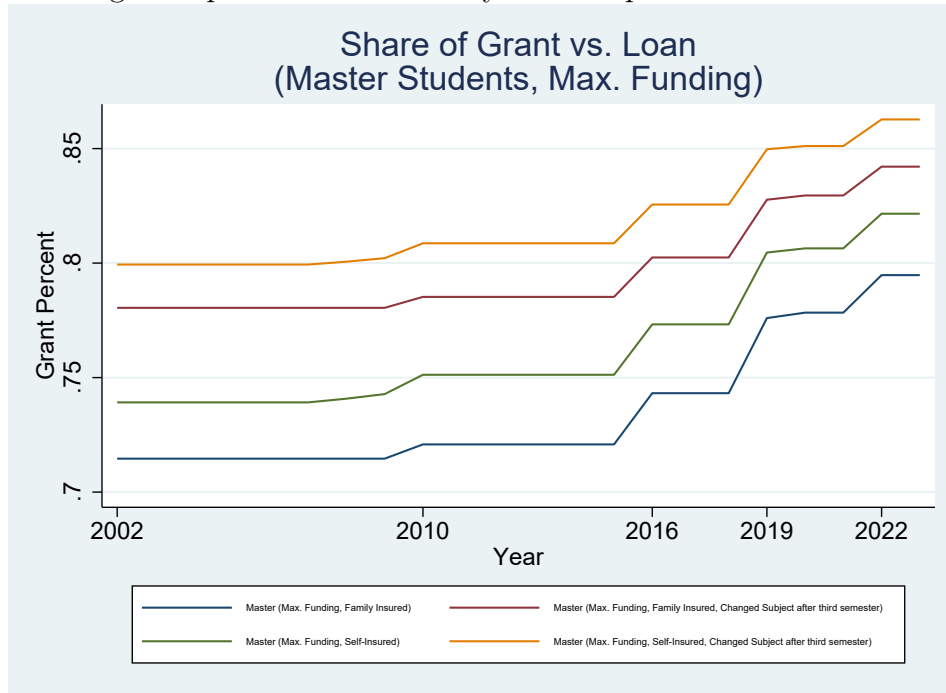
5.1 Costs

5.2 Effects

6 Discussion and Limitations

Collection of Limitations

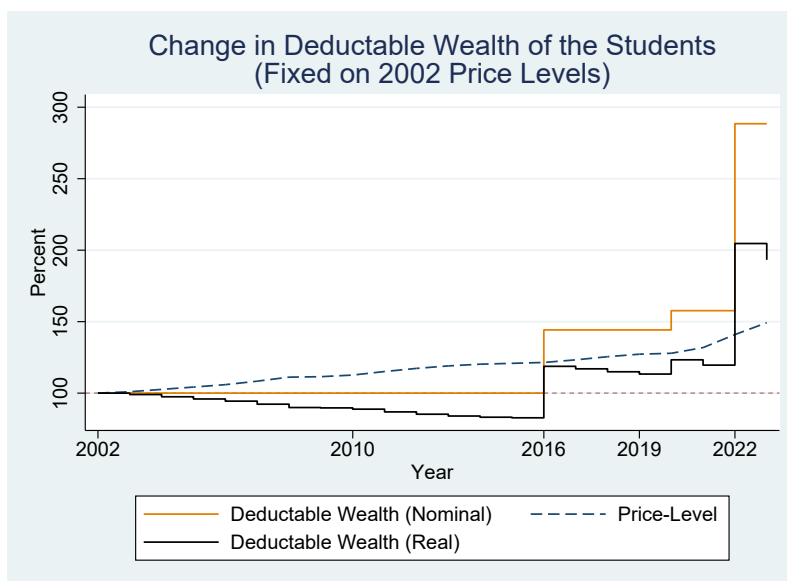
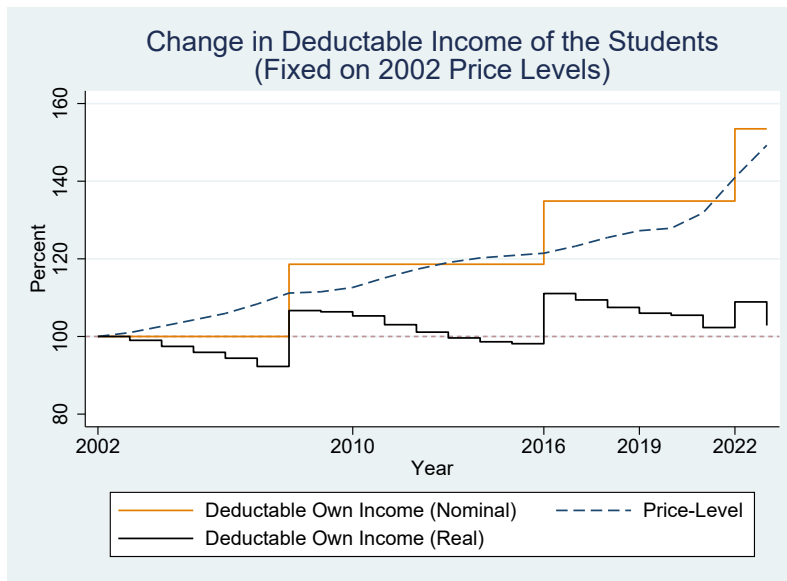
- The forgotten parameter: The "Pay-Back-Cap"



- Benefit Side cannot measure: (i) Skill (ii) Buraucrty costs & (iii) Effects of Uncertainty/Certainty on students
- Search & Matching in this thesis excluded.
- Causal Diagram to highlight the imposed orthogonality assumptions.

7 Summary and Concluding Remarks

A Further Figures



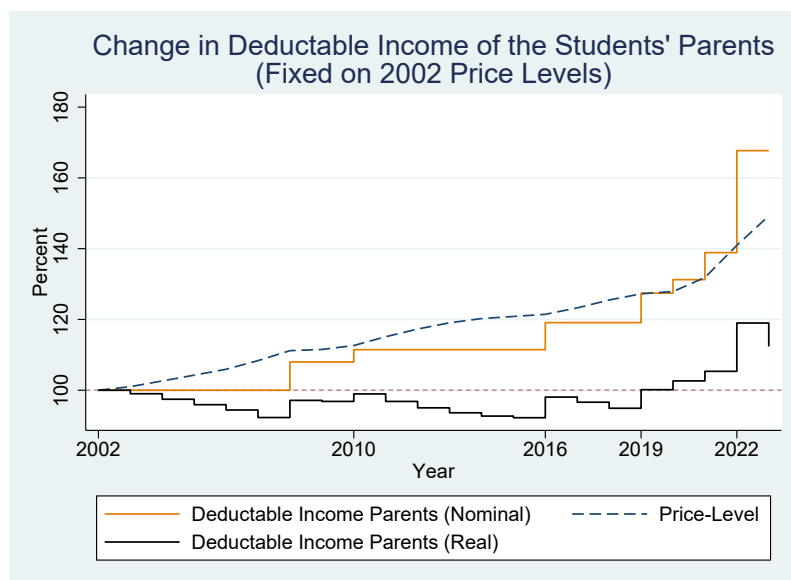


Table 2: Share of BAfoeG Recipients per Year - Actual vs. Simulated

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>Received Student Grants (actual)</i>	12589	.2361	.4247	0	1
- 2002	589	.2309	.4218	0	1
- 2003	601	.2696	.4441	0	1
- 2004	660	.2591	.4385	0	1
- 2005	633	.2243	.4175	0	1
- 2006	641	.234	.4237	0	1
- 2007	614	.2117	.4089	0	1
- 2008	607	.2273	.4195	0	1
- 2009	599	.2321	.4225	0	1
- 2010	615	.2325	.4228	0	1
- 2011	644	.264	.4411	0	1
- 2012	637	.2873	.4529	0	1
- 2013	772	.2798	.4492	0	1
- 2014	764	.2421	.4287	0	1
- 2015	812	.2389	.4267	0	1
- 2016	794	.2418	.4285	0	1
- 2017	886	.2167	.4122	0	1
- 2018	890	.191	.3933	0	1
- 2019	831	.1913	.3936	0	1
<i>BAfoeG (simulated)</i>	12589	.3246	.4682	0	1
- 2002	589	.3379	.4734	0	1
- 2003	601	.3627	.4812	0	1
- 2004	660	.2894	.4538	0	1
- 2005	633	.2717	.4452	0	1
- 2006	641	.259	.4384	0	1
- 2007	614	.2557	.4366	0	1
- 2008	607	.2685	.4436	0	1
- 2009	599	.2838	.4512	0	1
- 2010	615	.3138	.4644	0	1
- 2011	644	.3323	.4714	0	1
- 2012	637	.3375	.4732	0	1
- 2013	772	.386	.4871	0	1
- 2014	764	.3416	.4746	0	1
- 2015	812	.3424	.4748	0	1
- 2016	794	.3791	.4855	0	1
- 2017	886	.351	.4776	0	1
- 2018	890	.3371	.473	0	1
- 2019	831	.3357	.4725	0	1

Note: Student Grants include state funding (BAfoeG) as well as other forms of stipends. BAfoeG amounts are calculated under the assumption of optimal behavior and always assume an application is made if the amount is greater than zero. Therefore, these figures may be higher than the actual amounts received.

Table 3: Summary Statistics Non-Students (2002-2019)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>Individual Characteristics:</i>					
Age	25350	25.7273	5.0901	17	35
Male	25350	.5163	.4997	0	1
Migration Background	25350	.2709	.4444	0	1
First Gen	25350	.6968	.4597	0	1
<i>Income:</i>					
Inc. Student (€, Gross, Mth.)	25350	1304.9394	1291.6710	0	49000
Labor Supply	25350	.7987	.4010	0	1
Labor Supply (Weekly Hours)	25350	27.4225	17.4336	0	80
Inc. Father (€, Gross, Mth.)	25350	2132.5798	3163.2108	0	104000
Inc. Mother (€, Gross, Mth.)	25350	1047.1010	1341.3494	0	25000

Note: A person is considered a non-student if they are under 35 years old, have earned the right to study, but are not studying in the respective year and have not finished any post-secondary degree.