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Soft power and Germany's exports - First evidence from transaction data

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Abstract

A recent literature reports evidence showing that the rate of approval of the job performance of the leadership of a home country among the people of a foreign country is important for the exports from the home country to this country. These exports are larger, *ceteris paribus*, if this rate of approval is higher among the importers. This is known as the soft power effect. These results are based on a standard gravity model that is estimated with aggregate data for trade between the countries. While this approach takes care of differences in the characteristics of the destination countries of exports differences in the characteristics of the exporting firms and differences in the characteristics of the traded goods are ignored. Using transaction data for German exports of goods this paper shows that the soft power effect exists when differences in the destination countries and differences in the exporting firms and differences in the traded goods are controlled for.

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Soft Power and Germany's Exports First Evidence from Transaction Data

1. Motivation

In a recently published paper Andrew Rose (2019) reports that the rate of approval of the job performance of the leadership of the United States among the people of a foreign country is important for the exports from the US to this country. These exports are larger, *ceteris paribus*, if this rate of approval is higher among the importers. Rose labels this the *soft power effect* (see also Rose 2016). For US exports, he finds that this effect is both statistically and economically significant – a one percent increase in leadership approval raises exports by around two-thirds of a percent (Rose 2019, p. 1573). Wang (2019) reports similar results for Germany. He finds that a one percent increase in approval for the German chancellor in a country outside of the European Union increases exports from the whole EU by three quarters of a percent and by slightly more than two-thirds of a percent for the EU excluding Germany. Note that Rose (2019, p. 1576) points out that there is no theoretical model that shows this soft power effect - the intuitive idea behind it is “that the import decisions of consumers and businesses may be affected by the popularity of the this exporters’ leadership”.

Results by Rose (2019) and Wang (2019) are based on a standard gravity model that is estimated with aggregate data for trade between the countries. This holds also for the study by Didier (2019) who uses data from the World Bank’s Exporter Dynamics Database and proxies from BBC-GlobalScan and Pew surveys to look at soft power in exports. He finds evidence for significant effects on exports, essentially for developing countries at the aggregate level of trade. Similarly, Bao et al. (2019) investigate the effect of bilateral attitudes on international trade with cross-country data. By adding attitude as an explanatory variable to the traditional gravity model on international trade they find that a more positive attitude of the reporting country toward a responding country increases imports of the former country from the latter, whereas a more negative attitude reduces bilateral trade.

While this approach takes care of differences in the characteristics of the destination countries of exports (like distance to the exporting country, a common language or a common border in the exporting and the importing country, or common membership in a regional trade agreement) differences in the characteristics of the exporting firms and differences in the characteristics of the traded goods are ignored. These differences might be important when it comes to the influence of the rate of approval of the job performance of the leadership of the exporting country among the people in the importing country on the exports from this country. As said, Rose (2019, p. 1576) points out that the intuitive idea behind the soft power effect is “that the import decisions of consumers and businesses may be affected by the popularity of the exporters’ leadership”. The sensitivity of buyers of an imported good with regard to the popularity of the exporting country’s leadership can be expected to vary over the goods and the firms that produce these goods. To illustrate, think of exports of Porsches that are identified by many people all over the world as luxury cars from Germany on the one hand and of a standardized chemical product manufactured by a German firm that is known to experts in the field only on the other hand. If for whatever reason the public opinion in a country turns against the German government one would expect that the effect on the export of these two goods from Germany to this country might be different.

This paper aims to contribute to the literature by showing for the first time the presence of soft power in exports when differences in the destination countries *and* differences in the exporting firms *and* differences in the traded goods are controlled for. To

this end transaction data for German¹ exports of goods are used to estimate empirical models for the influence of the rate of approval of the German government in a country on German exports to this country, controlling for firm-product-country fixed effects.

The rest of the paper is organized as follows. Section 2 describes the data used and reports descriptive statistics. Section 3 reports results from the econometric investigation. Section 4 concludes.

2. Data

Data to measure soft power are taken from the Gallup World Poll (used in Rose (2019) and made available by the author on his web site as detailed in his paper). Gallup asks about a thousand survey participants in each of over a hundred countries each year “Do you approve or disapprove of the job performance of the leadership of Country X” where Country X is, among others, Germany. Annual percentages of approval and disapproval are reported. Rose (2019) creates a net approval figure by subtracting disapproval from approval, measured as a fraction (so that 100% approval/disapproval corresponds to 1.0/-1.0).²

To illustrate the Gallup data, Table I reports approval/disapproval rates of Germany’s leadership in three important trade partner countries over the years 2009 to 2014 (the years used in the empirical investigation in this paper). Note that some figures are missing in some years – this holds true for other countries and other years, too. Note further that the rates differ both between the countries and within a country over time.

Information on Germany’s international trade in goods is available from the statistic on foreign trade (*Außenhandelsstatistik*). The raw data that are used to build the statistic on foreign trade are transaction level data, i.e. they relate to one transaction of a German firm with a firm located outside Germany at a time. Published data from this statistic report exports or imports aggregated at the level of goods traded and by country of destination or origin.

For the years from 2009 onwards the German Federal Statistical Office prepared data based on the raw data from the statistic on foreign trade that can be accessed by researchers inside the research data center of the Office (see Wagner 2020 for details). In these data exports are recorded as one transaction between a firm in Germany and a firm in a foreign country, e.g. the export of X kilogram of good A with a value of Y Euro from Germany to China. Therefore, the data used in this study are year-firm-product-value-destination data. Products here are distinguished according to the detailed Harmonized System at 6-digit level (HS6).

The Federal Statistical Office prepared this type of data for the reporting year 2009 for the first time; the most recent data available at the time of writing this paper are for 2014.

Computations are based on data for 27,548,829 export transactions by 197,906 firms for 5,365 different products traded with 197 different destination countries in 12,427,165 firm-product-country combinations. Descriptive statistics for the sample used are reported in Table II.

Note that the rates of approval and disapproval vary widely in the sample and that both the exports and the all three rates do vary not only between the transactions but also within the transactions over time (see Cameron and Trivedi 2010, p. 244f.).

¹ The focus on Germany is due to the fact that, on the one hand, Germany is one of the leading actors on the world market for goods and , on the other hand, transaction data on exports and imports are confidential and only data for Germany can be used in this study based on a contract with the statistical office.

² For a discussion of the concept of soft power and its measurement see Rose (2019, p. 1575f.)

3. Econometric investigation

To test for an influence of the rate of approval of the job performance of the leadership of Germany among the people in the importing country on Germany's exports to this country a number of empirical models are estimated with the transaction data described in section 2 above. The dependent variable in all these models is the value of German exports in a transaction. This approach differs from the standard gravity models used in the literature on soft power in exports (discussed in the introductory section 1) where the total bilateral trade between two countries is investigated (see Anderson 1979, Anderson and van Wincoop 2003, and Head and Mayer 2004, among others, for a discussion of these gravity models).

All models include as independent variables one of the three rates of approval or disapproval (described in section 2) plus a set of dummy variables for the years from 2009 to 2014 and a constant. In total there are nine different empirical models, six of them (Model 1 – 6) include the export value in logs, three models (Model 7 – 9) include export value in levels. The models differ by the fixed-effects included. Model 1, 3 and 5 include country fixed-effects that control for time-invariant country characteristics (that are included in the standard gravity models used in Rose (2019) and Wang (2019) that are discussed in section 1). The other models include firm-product-country fixed effects that control for differences in the destination countries *and for* differences in the exporting firms *and for* differences in the traded goods.

Formally, the empirical models are specified as follows:

- (1) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \log(\text{app}) + t + c$
- (2) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \log(\text{app}) + t + \text{fpc}$
- (3) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \log(\text{dis}) + t + c$
- (4) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \log(\text{dis}) + t + \text{fpc}$
- (5) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \text{net} + t + c$
- (6) $\text{Log}(\text{export}) = \beta_0 + \beta_1 \cdot \text{net} + t + \text{fpc}$
- (7) $\text{export} = \beta_0 + \beta_1 \cdot \text{app} + t + \text{fpc}$
- (8) $\text{export} = \beta_0 + \beta_1 \cdot \text{dis} + t + \text{fpc}$
- (9) $\text{export} = \beta_0 + \beta_1 \cdot \text{net} + t + \text{fpc}$

where export is measured at the transaction level and refers to the value of exports of one firm in one year of one HS6-good to one destination country, app is the approval rate of the German government by people in the destination country in this year, dis is the respective disapproval rate and net is the respective net approval rate, t are year fixed effects, c are destination country fixed effects, and fpc are firm-product-country fixed effects.

Results for Model 1 – 6 are included in Table III. It turns out that the estimated regression coefficient of the “Gallup-rate” is never statistically significantly different from zero at the five-percent error level in the models with country fixed effects (i.e., Model 1, 3 and 5). The picture is different when firm-product-country fixed effects are included. From Model 4 we see that an increase in the disapproval rate lowers exports and an increase in the net approval rate increases exports within a firm-product-country combination. Both regression coefficients are statistically highly significant. Controlling for firm and product fixed effects besides country fixed effects matters. Note that, contrary to this, Model 2 does not point to a positive link between the rate of approval of the German leadership and Germany's exports.

As a robustness check models with firm-product-country fixed effects were estimated with exports and all rates measured in levels (instead of logs) in Models 7 – 9. Results reported in Table IV show that the conclusions do not depend on the functional form chosen for the empirical models.

4. Concluding remarks

A recent literature finds that the rate of approval of the job performance of the leadership of a home country among the people of a foreign country is important for the exports from the home country to this country. Exports are larger, *ceteris paribus*, if this rate of approval is higher among the importers. This is called the *soft power effect*.³ These results are based on a standard gravity model that is estimated with aggregate data for trade between the countries. While this approach takes care of differences in the characteristics of the destination countries of exports differences in the characteristics of the exporting firms and differences in the characteristics of the traded goods are ignored. Using transaction data for German exports of goods this paper shows that the soft power effect exists when differences in the exporting firms and differences in the traded goods are controlled for, too.

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³ For a broad and comprehensive discussion of the measurement of country image and its effects on the cultural, economic and political competitiveness of nations in a globalized world see Buhmann (2016).

Table I: Approval / disapproval of Germany's leadership (percentage) in selected countries, 2009 – 2014

Country	USA		France		Netherlands	
	Approval	Disapproval	Approval	Disapproval	Approval	Disapproval
Year						
2009	43	20	46	42	-	-
2010	46	26	58	15	70	13
2011	48	22	59	15	72	9
2012	-	-	49	19	78	11
2013	47	21	47	21	74	12
2014	45	25	58	25	77	13

Source: Rose (2019) based on Gallup World Poll data

Table II: Descriptive statistics for sample used

	Mean	Standard deviation			p1	p10	p99
		Overall	Between	Within			
Exports (in 10 Mio €)	0.11738	6.517	3.944	2.182	2.00e-6	0.001365	1.5463
Rate of approval (percent)	45.44	15.637	15.499	5.211	12	47	77
Rate of disapproval (percent)	21.54	12.735	12.156	5.616	5	20	66
Rate of net approval	0.24	0.239	0.235	0.084	-0.54	0.3	0.64
Number of export transactions	27,548,829						
Number of exporting firms	197,906						
Number of exported HS-6 products	5,365						
Number of destination countries	197						
Number of firm-product-country combinations	12,427,165						

Note: For a definition of variables see text. p1, p50 and p99 are the 1st, 50th and 99th percentile of the distribution – minimum and maximum values are confidential because they (may) refer to a single firm.

Table III: Results from empirical models

Dependent variable: log(exports)

Model		1	2	3	4	5	6
Log(approval rate)	β	-0.0136	-0.00165				
	P	0.067	0.844				
Log(disapproval rate)	β			0.00766	-0.11398		
	P			0.222	0.000		
Net approval rate	β					-0.0078	0.1480
	P					0.527	0.000
Year fixed effects		yes	yes	yes	yes	yes	yes
Country fixed effects		yes	no	yes	no	yes	no
Firm-product-country fixed effects		no	yes	no	yes	no	yes
R ²		0.018	0.789	0.018	0.884	0.0181	0.789

Note: β is the estimated regression coefficient from an OLS regression, p is the prob-value. All models include a constant. Standard errors are clustered at the level of the exporting firm. For numbers of observations, firms, products, countries and firm-product-country combinations see Table 2.

Table IV: Results from robustness checks

Dependent variable: exports

Model		7	8	9
Approval rate	β	-0.000252		
	P	0.898		
Disapproval rate	β		-0.000989	
	P		0.001	
Net approval rate	β			0.03505
	P			0.001
Year fixed effects		yes	yes	yes
Firm-product-country fixed effects		yes	yes	yes
R ²		0.796	0.796	0.796

Note: β is the estimated regression coefficient from an OLS regression, p is the prob-value. All models include a constant. Standard errors are clustered at the level of the exporting firm. For numbers of observations, firms, products, countries and firm-product-country combinations see Table 2.