Gabriel M. Ahlfeldt, Wolfgang Maennig and Tobias Osterheider

Industrial structure and preferences for a common currency: the case of the EURO referendum in Sweden

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Industrial structure and preferences for a common currency
The case of the EURO referendum in Sweden

Abstract: Attitudes for a common currency differ from nation to nation, or from region to region. We analyze regionally differing voting results of a referendum held in Sweden in lieu of joining the European Monetary Union. We put a special focus on the role of the industrial mix – being a potential factor influencing heterogeneous transmission – and find a significant, but subordinated, impact on voting behavior.

JEL codes: E52, P16, R12

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Gabriel Ahlfeldt
The London School of Economics and Political Science (LSE)
Centre for Economic Policy Research (CEPR)
Houghton Street
WC2A 2AE London / United Kingdom
g.ahlfeldt@lse.ac.uk
Tel.: +44 (0)20 7852 3785

Wolfgang Maennig
Department of Economics
University of Hamburg
Von Melle Park 5
20146 Hamburg / Germany
wolfgang.maennig@wiso.uni-hamburg.de
Tel: +49 (0)40 42838 4622

Tobias Osterheider
Statoil ASA
Department of Corporate Mergers and Acquisitions
2 Kingdom Street
London W2 6BD / United Kingdom
TOBOS@statoil.com
Tel.: +44 7826 911249[1]

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I. Introduction

Differing attitudes across nations on the desirability of currency unions may depend on national economic conditions. Nations with a large share of export-intensive industries may benefit from reduced transaction costs, lower risk associated with transnational investment, and lowered exchange rate volatility. Nations with a larger concentration of small firms, which are potentially more dependent on conventional bank loans, may benefit from smoothened monetary variations (Gertler and Gilchrist, 1993). The national industry's sensitivity to monetary shocks and the integration of its industry with other regions of the currency union may play a role. For example, fixed investment and construction are sensitive to changes in interest rates (Bernanke and Gertler, 1995) while services tend to be relatively independent of large amounts of foreign capital. A difference between some sectors such as e.g., construction and other interest-sensitive sectors, however, lies in the lower degree of integration with foreign economies. Since the effects of interest sensitivity and integration may run counter to each other for some sectors, clear-cut expectations do not exist for all sectors, making the impact of the respective sectors an empirical issue.

We approach the influence of the industrial mix on the regionally diverse attitudes to joining a monetary union by investigating the 2003 public referenda where Swedish voters were asked whether their countries should join the EMU: 55.9% of the voters opted for the no-alternative, and the turnout was 82.6%.

We integrate our test of the importance of the industrial structure into a general analysis which provides evidence of a range of other socio-economic, demographic and political as well as spatial variables. Our analysis adds to the debate on the economic efficiency of currency unions. It also contributes to the literature analyzing public referenda and processes

of direct democracy (e.g., Ahlfeldt and Maennig, 2015) and to the literature of the heterogeneous effects of homogeneous monetary policies that analyzes on the basis of VAR models (Carlino and DeFina, 1998).

II. Empirical strategy and data

We follow the public choice literature, employ aggregated data, and as a first step investigate the voting outcome by using OLS regressions (Coates and Humphreys, 2006)

$$pcv_i = \alpha + \sum_n \beta_n s_{ni} + \sum_m \gamma_m x_{mi} + \omega_i \quad (1)$$

where pcv_i is the percentage share of "no" votes of the municipality i, s_n is the relevance of sector n at the voter's place of work, and x_m are attributes that influence idiosyncratic preferences and other regional particularities. The regional importance of a sector is captured by its proportion at total employment. α, β_n and γ_m are parameters, and ω is an error term.

The set of variables x_m includes the dummy variable *urban* that defines areas with more than 150 residents per km^2 in order to test for the effects of urbanization, and the regional *rate of unemployment*. It also includes the *average age* of the population as currencies may be experience goods and the Swedish currency may be associated with a relative stability. We include the proportions of votes of the Green Party, the Centre Party, and the Left Party opposing the EMU in the preceding 2002 Riksdag elections (*no-parties*) as a control for political preferences.

We include a dummy *border* denoting regions bordering another EU country or the Baltic Sea to control for any disproportional benefits of border regions from European integration. As an indicator of remoteness we consider the distance to the headquarters of the ECB in Frankfurt, Germany (*distECB*). In order to control for within-country centrality, a market potential in the Harris (1954) tradition is employed that for each municipality is the aggregate of the GDP in all Swedish regions weigted by the distance. We use a standard internal

distance measure to account for a region's self-potential (Redding and Venables, 2004) and set the negative exponential decay parameter to 0.012 following a grid search that targets the standard information criteria.

In order to control for cross commuting we use the proportion of distance-weighted employment within a sector at distance-weighted total employment with a negative exponential discount parameter of 0.1, in line with Ahlfeldt (2011) and the empirical observation that only a small fraction of people commute at distances larger than 50km (Öhman and Lindgren, 2003).

Data were obtained from the Statistika centralbyrån of Sweden. Sweden is divided into 21 'Län' or counties which are subdivided into 290 municipalities.

The share of "no-votes" varies between 24%–87%. Figure 1 depicts a north-south heterogeneity and a reduction in the share of "no-votes" along the eastern border areas.

III. Results

To correct for heteroscedasticity, variables are weighted by the inverse of the square root of the variance of the error term ε_i. The empirical results corresponding to specification (1) are presented in Table 2, column (1). We report unstandardized coefficients (first row), the standardized ("beta-") coefficients (italics, second row), and the standard errors (in parentheses, third row). Beta-coefficients suggest that the fraction of supporters of No-EMU-parties has the largest impact on the share "no-votes." A 1% increase of the fraction of supporters of No-EMU-parties increases no-votes against the EURO by more than 0.7%. Given the difference in "No Party supporters" between the least supportive region and the most supportive region of more than 26 percentage point (Table 1) this estimate implies large quantitative effects on the voting outcome. Market potential has a negative impact on the share of no-votes and is of second-largest influence, leading to an 11.3% voting variation

between the regions with the smallest and the largest market potential. The share of "no-votes" increased by about 0.7 percentage points for every 100km increase in distance from the ECB, supporting the impression from Figure 1.

A strong regional construction sector has a positive but subordinated impact on the share of "no-votes": The no-vote variation between the region with the largest and the lowest construction sector shares is at some 4.3%. Similarly, the interest-sensitive sector wholesale and retailing (G50–52) has a significant negative impact, but the effect is even more limited (3.9%). The only exception to this limited relevance of sectoral structure consists of the "other services" sector, implying a variation between the regions of some 9.8%.

In column 2, shares of employment refer to distance-weighted employment, including neighboring municipalities. The relevant coefficients remain qualitatively unchanged, significant, and of roughly the same magnitude. Based on the Akaike information criterion (AIC), we keep the unweighted model as a benchmark.

LM tests of models (1) and (2) indicate spatial dependency. We thus estimate an error correction model using a maximum likelihood estimator with a contiguity weights matrix which, however, does not change the qualitative implications. Generally, the pattern of results remains almost unchanged throughout models (1) to (4) with the exception of market potential, which loses statistical significance in (3). The magnitude of the coefficient point estimates is similar in the OLS and SAR models. If spatially weighted employment variables are used (4), the lambda coefficient even becomes insignificant. Problems of spatial dependency are of relatively little concern.

The results proved to be robust if

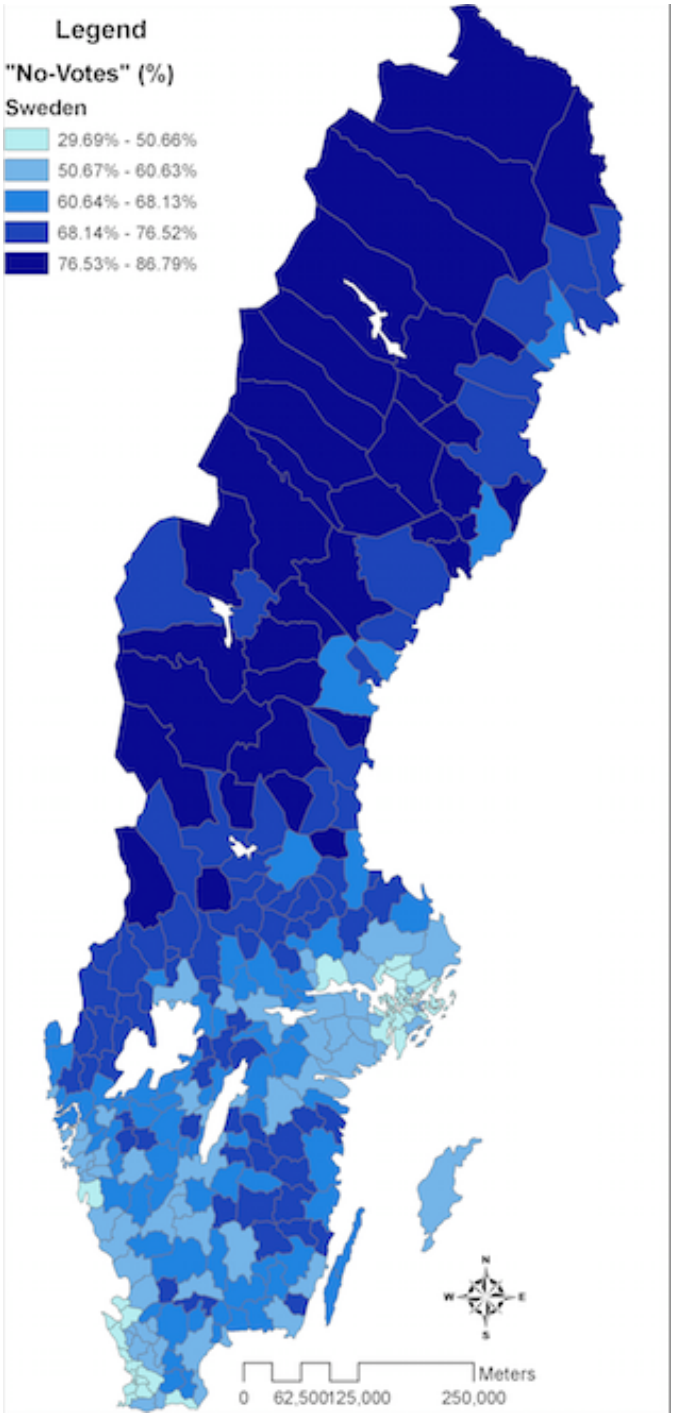
- the impact of the manufacturing of consumer durables and capital goods and interest-insensitive services is investigated at sub-sector level, or
- the specifications were re-estimated employing a binary choice model or,

- the minimum distance to the three major gateway cities of Stockholm (ferry terminal, airport), Gothenburg (ferry terminal), and Malmoe (Oeresund-bridge) is used as an alternative to the market potential measure.

IV. Conclusion

Our results provide new evidence on the heterogeneous effects of a common monetary policy and analyze the notion that the industrial mix is an important driving force behind the regionally heterogeneous transmission. We show that voters in regions with interest-sensitive industries did not expect to gain from joining the currency, although the influence of the industrial structure is of subordinated importance.

Figure 1. Spatial distribution of "no-votes" against the EURO in Sweden, 2003[a]



[a] Own illustration. Figure is stylized to save space.

Table 1. Descriptive statistics

Variable	Mean	Median	Standard Deviation	Minimum Value*	Maximum Value**
Market potential (10 Mio SEK)	270.62	267.36	168.67	11.76	757.47
Average age (years)	41.38	41.57	2.22	35.77	46.33
Unemployment rate (%)	5.59	5.28	2.00	2.04	14.62
NO-Parties (%)	16.79	16.65	4.56	6.24	32.50
Construction (%)	11.73	11.30	4.53	1.31	28.07
Manufactures (%)	13.44	9.47	12.14	0.00	64.06
Services G50-52 (%)	23.87	23.41	7.12	2.90	48.81
Services I60-62 (%)	10.52	9.16	7.22	0.00	46.48
Other services (%)	25.82	24.92	12.29	3.16	75.98

* truncated at 5%
** truncated at 95%

Table 2. Determinants of the share of no-votes in Swedish referendum on EMU-membership, 2003[a]

	(1) OLS	(2) OLS	(3) SAR	(4) SAR
Distance to ECB [km]	0.007**	0.007**	0.009**	0.007**
	0.204	*0.204*	*0.252*	*0.204*
	(0.001)	(0.001)	(0.003)	-0.001
Market Potential [1 Mio SEK]	-1.78e-05**	-1.44e-05**	-8.41e-06	-1.44e-05***
	-0.270	*-0.218*	*-0.127*	*-0.218*
	(2.87e-06)	(3.19e-06)	(8.22e-06)	(3.12e-06)
Border [dummy]	-4.304**	-4.373**	-3.119**	-4.372**
	-0.171	*-0.174*	*-0.124*	*-0.174*
	(0.697)	(0.731)	(0.911)	(0.750)
Urban [dummy]	-5.021**	-3.888**	-5.678**	-3.888**
	-0.146	*-0.113*	*-0.165*	*-0.113*
	(1.369)	(1.453)	(1.721)	(1.424)
Average age [years]	0.853**	0.544**	1.073**	0.544*
	0.172	*0.11*	*0.217*	*0.11*
	(0.169)	(0.206)	(0.116)	(0.219)
Unemployment rate [%]	-0.023	0.001	0.187	0.001
	-0.004	*0.000*	*0.034*	*0.000*
	(0.183)	(0.187)	(0.177)	(0.181)
No-Parties [%]	0.733**	0.773**	0.638**	0.773**
	0.303	*0.320*	*0.264*	*0.320*
	(0.095)	(0.097)	(0.092)	(0.095)
Construction [%]	0.162**	0.266*	0.143*	0.266*
	0.067	*0,009*	*0.059*	*0.009*
	(0.061)	(0.117)	(0.062)	(0.114)

Manufact. Durables [%]	0.014	-0.025	0.030	-0.025
	0.015	*-0.030*	*0.033*	*-0.030*
	(0.023)	(0.038)	(0.023)	(0.038)
Services G50-52 [%]	-0.085*	0.064	0.030	0.064
	-0.055	*0.024*	*0.019*	*0.024*
	(0.046)	(0.061)	(0.044)	(0.063)
Services I60-62 [%]	-0.054	0.074	-0.010	0.074
	-0.030	*0.022*	*-0.006*	*0.022*
	(0.057)	(0.112)	(0.053)	(0.111)
Other services [%]	-0.134**	-0.223**	-0.112**	-0.223**
	-0.192	*-0.221*	*-0.160*	*-0.221*
	(0.029)	(0.055)	(0.027)	(0.053)
Constant	14.855*	29.627**	0.003	29.609**
	1.349	*2.691*	*0.000*	*2.690*
	(7.442)	(8.894)	(0.422)	(10.238)
Lambda			0.134***	2.77e-05
			(0.032)	(0.006)
Sector employment	Unweighted	Weighted	Unweighted	Weighted
Observations	288	288	288	288
(Pseudo) R-squared	0.856	0.845	0.843	0.845
Mean VIF	1.81	2.13	1.81	2.13
AIC	1666.119	1687.002	1642.190	1691.002

[a] Figures in first lines are unstandardized estimates, numbers in second lines and in italics beta-coefficients. The standard errors (in parentheses) are robust to heteroscedasticity in (1) and (2) and are corrected for spatial dependency in (3) and (4). The sector variables represent the share of sector employment at total employment within municipalities in (1) and (3) and the same for spatially weighted employment as in equation (10) in (2) and (4).* / ** / *** denote significance at the 10, 5 and 1% level.

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