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Migration, Local Fiscal Variables and Local Economic Conditions

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MIGRATION, LOCAL FISCAL VARIABLES AND LOCAL ECONOMIC CONDITIONS

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MIGRATIONS, LOCAL FISCAL VARIABLES AND LOCAL ECONOMIC CONDITIONS

Abstract

The paper examines the effects of local fiscal variables and local economic conditions on exit decisions of Norwegian households. The study takes advantage of a unique survey data set in which respondents evaluate a range of local amenities and report whether they intend to relocate. We find that municipal services are important to exit decisions. Norwegian municipalities can increase the population share of young, educated households by improving living conditions for children and the quality of schools and cultural services. The estimated effects of personal unemployment, local unemployment and local wages on migration plans become weaker when amenity variables are included, indicating that capitalization of amenities cannot explain weak effects of local economic conditions on migration in Europe.

Keywords: Migration, local fiscal variables, local economic conditions.

JEL Classification: R23.

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1. Introduction

The basic assumption underlying the Tiebout model (Tiebout, 1956) is that citizens 'vote with their feet' if they become sufficiently dissatisfied with the supply of local government services. Mobility helps to reveal the preferences of residents, but may cause an inefficient level and mix of local services if local authorities ignore externalities when competing for firms and tax payers. Wilson (1999) and Wellisch (2000) provide recent surveys of the potential benefits and costs of Tiebout mobility.

Whether interregional mobility has a practical effect on local fiscal choice, depends on the impact of local policy variables on exit and entry decisions of households and firms. Whereas several North-American studies have examined the importance of local fiscal variables for location decisions, few studies have utilized European data.

This study examines the impact of local government services and fees on out-migration decisions in Norway. The analysis is based on a unique survey data set in which about 60.000 respondents evaluate a variety of local amenities, including local services, and report whether they plan to move from the resident municipality. While many studies of Tiebout mobility lack good proxy variables for service levels, our data set allows a direct test of the impact of potential migrants' evaluation of local services on the exit decision.

Another purpose of the study is to examine whether the estimated impact of local economic conditions on migration intentions becomes biased when local amenities are omitted from the analysis. European empirical studies of interregional migration flows tend to find that migration is relatively unresponsive to local economic

conditions (Eichengreen, 1993; Decressin and Fatás, 1995). One possible explanation suggested by, among others, Pissarides and Wadsworth (1989) and Antolin and Bover (1997), is that local amenities are capitalized into local unemployment and wages so that these variables also capture effects of omitted amenities. Our data set allows a test of this hypothesis.

The paper proceeds as follows. The next section presents a brief review of relevant literature which also serves to motivate this paper's approach. A brief description of the Norwegian local sector is included in section 3. Section 4 presents the data set. Results are reported in section 5. Section 6 presents several robustness checks, and section 7 contains concluding remarks.

2. Literature review and motivation of the paper

Studies which attempt to evalute whether location decisions of households are affected by local government services and taxes can be divided into two categories. One set of studies include local fiscal variables in regressions explaining migration flows or individual location choices; the other set of studies examine the extent to which local government services and taxes are capitalized into house prices and wages. Virtually all existing studies within both categories employ data from North-America.

Several studies find that location decisions are affected by the quality of schools. Day (1992) provides evidence that spending on education dampens out-migration from Canadian provinces, Herzog and Schlottmann (1986) and Fox, Herzog and Schlottman (1989) find a negative impact of spending per pupil on out-migration

from US metropolitan areas, and Nechyba and Strauss (1998) find that spending per pupil play a major part in explaining destination choices of movers in the US. Consistent with these results, several studies present evidence that school quality is reflected in housing values (Haurin and Brasington 1996; Black 1999).

The results for other local services are not as clear-cut. For instance, Gyourko and Tracy (1991) find evidence of capitalization of health services into wages and house prices in the US, whereas Porell (1982) find no effect of health services on migration flows between US geographical areas. Studies of the relation between mobility and public safety, fire protection and local taxes also have produced mixed results.

One possible reason why the empirical literature on Tiebout mobility provides few unambiguous conclusions is that data limitations often force researchers to use proxies for local government services for which the relation to service levels is uncertain. As pointed out by Charney (1993), many proxy variables may very well be *negatively* related to service levels: few police officers may indicate a safe area, low spending on fire control may reflect that buildings satisfy fire safety standards, and low health spending may indicate that the population is relatively healthy. We can be confident that our study does not suffer from this problem since the survey data set provides direct information about the quality of local government services as perceived by the decision makers, i.e. the persons who decide whether to relocate.

Few studies of Tiebout mobility utilize European data. Nelson and Wyzan (1989) have examined migration flows between a subset of Swedish municipalities and find weak effects of local fiscal variables. John, Downding and Biggs (1995) reach the opposite conclusion based on a survey of movers between London boroughs.

Both studies use rather small samples. Several European studies of household mobility utilize large micro data sets, including Hughes and McCormick (1981, 1985, 1994), Dijk et al (1989), Pissarides and Wadsworth (1989), Antolin and Bover (1997), Axelsson and Westerlund (1998) and Ahn et al (1999). However, none of these studies include controls for local government services and taxes or other amenities. This may explain why these studies generally find weak effects of local economic conditions on mobility.[1] Since households prefer areas with favourable living conditions and firms prefer areas with favourable producer conditions, the spatial variation of rents, wages and unemployment will reflect the underlying distribution of site-specific amenities (Roback, 1982; Blanchflower and Oswald, 1994). If capitalization of amenities has practical importance for local labour markets, the estimated sensitivity of migration to local labour market slack will be biased unless variation in amenities has been properly controlled for.

Weak or no effects of local economic conditions on migration may thus be consistent with high geographic mobility if amenities have been omitted from the analysis. The data set employed in this study allows a test of whether weak estimated responses of migration to local economic conditions are due to omission of amenities. Migration equations are estimated both with and without the respondents' evaluation of local amenities as regressors, and the estimated effects of personal unemployment, local unemployment and local wages of the two equations are compared.

[1] Some studies even find that local unemployment has a *negative* impact on out-migration (Dijk et al, 1989; Hughes and McCormick, 1994; Antolin and Bover, 1997).

3. The local sector in Norway

As in the other Nordic countries, local government in Norway plays an important role in providing public services. About two-third of all government employees work in the local sector of which the majority are employed by 435 municipalities. The main services provided by the municipalities are: day care, primary education, cultural services, primary health care, care for the elderly and infrastructure. The largest sectors are primary education and care for the elderly which together account for more than 50% of municipal spending. Publicly provided private services directed towards specific subgroups of the population thus comprise a substantial part of the municipal budget. There has been public concern that municipalities are shifting spending away from care for the elderly towards day care and primary education in order to attract young households.

The main revenue sources of the municipalities are central government grants, local income taxes and fees. Whereas income tax rates are determined by the state and do not vary between municipalities, the municipalities have considerable discretion to determine fees, of which the main component is infrastructure fees. As infrastructure fees paid by an household do not depend on household income, a high level of municipal spending and therefore of municipal fees may repel poor households. The main policy issue is consequently whether Norwegian municipalities are able to control the population shares of different demographic groups by choosing the appropriate spending mix and/or the appropriate spending level. The paper provides evidence on this issue.

4. Data description

4.1 Survey data set

Since 1993, the Norwegian Gallup Institute (NGI) has conducted annual surveys in which respondents evaluate a range of local amenities and indicate whether they plan to move from the municipality. For some questions, the wording was changed in 1995; this study therefore uses the four surveys conducted in 1995-98.

Each year 25-50.000 persons are contacted, and about 50% return the questionnaire. The 1995-98 surveys comprise 71.191 respondents of which 60.186 provided complete information about migration plans and personal characteristics and resided in municipalities for which data about economic variables are available. NGI does not store information about respondents who did not return the questionnaire. However, since I allow the impact of local amenities and local economic conditions on migration plans to vary across population subgroups, selection bias is not likely to be important.

The question about migration is:

Has the household specific plans to exit the municipality during the next two years?

The questionnaire provides three response alternatives: 'Yes', 'No' and 'Do not know'. 3307 persons (5.49%) responded 'Yes' and 4478 (7.44%) responded 'Do not know'. The responses conform well with aggregate migration flows in Norway. During 1995-98, the average annual rate of out-migration from municipalities was 4.71%.

We have no information about whether migration plans were actually executed. A

recent study of the process of residential mobility by Kan (1999) concludes that almost half of the households who plan to move are interrupted by unanticipated events. However, to my knowledge, there exists no evidence suggesting that the *determinants* of migration plans differ from the determinants of actual movements.

The survey provides information about nearly all personal characteristics which previous micro data studies have identified as important determinants of migration, house tenure being the main exception. Experimentation with alternative specifications suggested that the effects of family members and length of residence are captured by dummy variables (see Table 1).

With the exception of infrastructure, the questionnaire includes questions about the main services provided by Norwegian municipalities.[2] There are also questions about some other local amenities: the climate, recreation and shopping opportunities, personal safety and higher education services. Respondents are asked to rank local amenities on a discretionary scale from one to six. The questionnaire explains that one corresponds to 'very dissatisfied' and six to 'very satisfied'. Table 1 presents summary statistics for the explanatory variables and the wording of the amenity questions.

[2] The questionnaire includes separate questions about upper and lower primary schools. The questions give very similar results; the paper presents results based on the latter question. The question about primary health care refers to primary physician services as consultations by office-based general practitioners represent the most important part of primary health care. There is no question about the quality of child care, but the responses to the question about general living conditions for children are positively correlated with the number of day care slots per child in preschool age.

Table 1. Variable description

Personal characteristics

Variable	Description	Mean
Age	Age of respondent	46.0
Male	Dummy = 1 if respondent is male	0.502
High school	Dummy = 1 if respondent has completed high school but not college	0.459
College	Dummy = 1 if respondent has a college degree	0.312
Married	Dummy = 1 if respondent is married	0.710
Family	Dummy = 1 if familiy members $\geq$ 4	0.331
Unemployed	Dummy = 1 if respondent is unemployed	0.028
Out of workforce	Dummy = 1 if respondent is not in the labour force	0.302
Mover	Dummy = 1 if respondent moved to the municipality during the last five years.	0.085

Reported satisfaction

Variable	Question: How satisfied are you with:	Mean (St.dev)	Respondents
Municipal services:			
Children	Living conditions for children	4.49 (1.11)	54.148
Primary education	Primary schools	4.34 (1.12)	36.974
Culture	The supply of cultural services in the municipality	3.98 (1.20)	53.843
Primary health care	The supply of primary physician services in the municipality	3.87 (1.42)	56.946
Care for the elderly	The supply of care for the elderly in the municipality	3.57 (1.38)	50.468
Other amenities:			
Climate	The weather and the climatic conditions	4.28 (1.29)	57.714
Recreation	The opportunities for outdoor recreation in the municipality and the surroundings	5.52 (0.84)	58.647
Shopping	The variety of shops and goods	4.49 (1.39)	57.891

Safety	Safety in your living area	5.29 (1.01)	54.310
Higher Education	The supply of educatioin services beyond primary education	3.94 (1.63)	55.306

Municipal revenues

Variable	Description	Mean (St.dev)	Data points
Municipal fee	Annual municipal fees paid by owner of a standardized appartment (in 10^3)	0.578 (0.168)	1305

Area economic variables

Variable	Description	Mean (St.dev)	Data points
Unemployment	County unemployment rate	0.043 (0.014)	76
Wage rate	County manufacturing wage rate (in 10^3 NOK)	0.147 (0.015)	76
House price	County price per m^2 of standardized appartment (in 10^4 NOK)	0.790 (0.180)	76

Note: Sample size = 60.186

The response rate to the amenity questions varies between 97.6% (recreation) and 61.4% (primary education). People are most satisfied with safety and recreation opportunities and least satisfied with public services, particularly primary health care and care for the elderly.

4.2 Municipal fees

The NGI survey data set is matched with variables registered at the municipal and county level. Annual information is available about the main fee component, fees paid by house owners for basic infrastructure services. The variable is annual

infrastructure fees paid by the owner of a standardized appartment.[3]

[3] The 1995 survey was matched with 1996 data as information about infrastructure fees for 1995 is not available.

4.3 Area economic variables

Three area economic variables are considered: unemployment, nominal wages and price of housing. Regional price indices for Norway are not available, and other potential determinants of migration, such as vacancies and labour force participation, were insignificant in all regressions. The area economic variables are computed for two alternative geographical units, the municipality and the county.[4] Results for area economic variables registered at the county level are presented as preliminary analyses indicated that local labour markets generally comprise several municipalities.

Our unemployment variable is the number of unemployed registered at local labour market offices scaled by the labour force. Annual regional data on wages are available for manufacturing industries only. Our wage variable is the average hourly manufacturing wage rate. The house price variable is computed from Statistics Norway's data base of transactions of owner-occupied houses. Annual hedonic regressions were estimated explaining the per m^2 price as a function of housing attributes (the number of rooms and bathrooms, etc.) and a full set of county dummy variables. The estimated county fixed effects are taken to represent the housing prices of the respective counties in that year. As is evident from Table 1, among the area economic variables there is most variation in unemployment and least variation in wages.

[4] There are 435 municipalities and 19 counties. Average population size in 1998 was, respectively, 10.150 and 232.500.

5. Results

5.1 Empirical specification

Empirical analyses of individual migration are typically conducted within the human capital framework. Potential migrants are assumed to move if expected net economic returns exceed the subjective costs of movement. Area economic variables and personal characteristics are employed as proxy variables for economic returns and subjective costs. This paper extends the standard framework by including local amenities among the determinants of net returns to migration.

The empirical human capital model of migration is familiar and is not developed here (see, e.g. Hughes and McCormick 1994 and Antonin and Bover 1997). I estimate a probit model where the dependent variable, Exit, is coded one if the respondent answers the question about migration plans by 'Yes' and zero otherwise.

In order not to loose observations due to missing responses to the amentity questions, the amentity variables are interacted with dummies equal to zero if the variable is missing, denoted response dummies. The ten interaction terms and the ten response dummies are included as regressors. The coefficient of an interaction term can be interpreted as the estimated effect of reported satisfaction with that amenity on migration plans of respondents who choose to rank the amentity. The basic empirical specification is:

$$Exit_{jit} = \begin{cases} 1 & \text{if } Exit^*_{jit} \geq 0, \\ 0 & \text{if } Exit^*_{jit} < 0, \end{cases}$$

$$Exit^*_{jit} = \alpha_{0t} + \mathbf{Person}_{jit}\boldsymbol{\alpha}_1 + \Sigma_k(\alpha_{2k}Satisfaction_{kjit}D_{kjit} + \alpha_{3k}D_{kjit}) + \alpha_4 Municipal\ fee_{it} + \alpha_5 Unemployment_{it} + \alpha_6 Wage\ rate_{it} + \alpha_7 House\ price_{it} + \varepsilon_{jit},$$

where $Exit_{jit}$ is reported migration plans by respondent j in municipality i and year t, $Exit^*_{jit}$ is the corresponding latent variable, $\mathbf{Person}_{jit}$ is a vector of personal characteristics, $Satisfaction_{kjit}$ is reported satisfaction with amenity k, and D_{kjit} is a response dummy which is unity if respondent j in municipality i and year t answered the question about amenity k. The year effects, α_{0t}, are included to capture the effects of general economic conditions on household mobility.

If unobservable factors are correlated among respondents from the same geographical unit, estimated standard errors may be biased (Moulton 1990). In the following, I use a robust estimator of variance which allows for municipal random effects:

$$\varepsilon_{jit} = \varepsilon_i + \xi_{jit},$$

where ε_i and ξ_{jit} are assumed to be normally, identically and independently distributed.

5.2 Regression results

Table 2 presents two probit regressions, one with and one without the amenity variables. For brevity, coefficients of year dummies and response dummies are not reported.

Table 2. Determinants of migration intentions (Probit regressions)

	Coef	t-value	Coef	t-value
Age 15-24	1.031	18.669	1.142	22.513
Age 25-29	0.883	13.793	0.971	16.800
Age 30-34	0.724	12.472	0.801	15.409
Age 35-49	0.564	10.447	0.609	12.401
Age 50-54	0.475	8.328	0.496	9.491
Age 55-66	0.348	6.396	0.347	6.805
Male	0.007	0.351	0.033	1.656
High school	0.197	6.085	0.184	5.884
College	0.475	12.654	0.465	11.944
Married	-0.219	-5.880	-0.232	-6.115
Family	-0.139	-5.500	-0.164	-7.267
Unemployed	0.218	4.397	0.248	4.966
Out of workforce	0.170	6.636	0.170	6.502
Mover	0.478	11.677	0.546	14.615
Children	-0.046	-2.728		
Primary education	-0.035	-2.871		
Culture	-0.060	-5.396		
Primary health care	0.003	0.384		
Care for the elderly	0.026	2.581		
Climate	-0.066	-5.555		
Recreation	-0.043	-4.291		
Shopping	-0.054	-6.615		
Safety	-0.036	-3.154		
Higher education	-0.033	-4.666		
Municipal fee	0.130	1.431	0.171	1.608
Unemployment	7.043	3.457	7.628	3.262
Wage rate	-2.069	-1.872	-3.942	-3.309
House price	0.385	3.169	0.343	2.444
Log L	-10911		-11244	
Log L at zero	-12809			

Notes: t-values adjusted for municipal random effects.
Year dummies and response dummies included.
Sample size = 60.186.

With the exception of the dummy for gender, the coefficients of all personal characteristics are statistically significant at the 1% level and have the expected sign. Other things equal, being young, single, unemployed and a previous mover with a college degree increases the probability of migration.

Eight out of ten amentity variables have the expected negative sign and are statistically significant. The exceptions are primary health care and care for the elderly. These variable have a positive impact on out-migration and the effect of care for the elderly is significant at the 5% level. One possible interpretation is that young people are reluctant to move from their parents if municipal care for the elderly is not of sufficient quality.[5] The results reported in Table 2 suggest that municipalities are able to slow down out-migration flows by improving living conditions for children and the quality of primary education and cultural services at the expense of primary health care and care for the elderly.

The estimated effects of municipal fees and area economic variables are also as expected. The coefficients of fees, unemployment and house prices are not much affected by omission of amenity variables; municipal fees are insigificant in both regressions, and unemployment and house prices are significant in both regressions. Controlling for amenities seems to be most important for the estimated effect of wages. With amenity variables, the coefficient has the expected negative sign but is statistically insignificant. Without amenity variables, the absolute value of the coefficient is nearly doubled and the coefficient becomes highly significant.
The results reported in Table 2 suggest that omitted amenities cannot explain why

[5] An alternative interpretation is that (minus) the variable captures the effects of omitted municipal services.

many studies find weak effects of unemployment and wage differentials on migration. In fact, the opposite is the case: the estimated effects of personal unemployment, local unemployment and, in particular, local wages, become weaker when controls for amenities are included. Thus, if anything, analyses without amenity variables tend to *overstate* the importance of local labour markets for migration.

The effects of amenities, fees and area economic variables on migration plans may depend on personal characteristics. The probit regression reported in Table 3 includes interaction terms with a dummy for college degree and a dummy for whether the respondent is 50 years or older; only interaction terms that are significant at the 10% level are included.[6] For brevity, coefficients of personal characteristics are not reported.

[6] The main results are robust with respect to variation in the threshold value of the age dummy. Interaction terms with other personal characteristics than age and education level were generally not significant.

Table 3. Inclusion of interaction terms with dummies for age and education level

	Coef	t-value
Children	-0.060	-3.653
Children * Age≥50	0.057	2.501
Primary education	-0.034	-2.796
Culture	-0.040	-3.059
Culture * College	-0.048	-3.212
Primary health care	0.003	0.346
Care for the elderly	0.036	3.360
Care for the elderly * Age≥50	-0.042	-2.343
Climate	-0.066	-5.913
Recreation	-0.042	-4.223
Shopping	-0.054	-6.611
Safety	-0.035	-3.129
Higher education	-0.033	-4.728
Municipal fee	0.213	1.901
Municipal fee * College	-0.228	-1.916
Unemployment	8.594	4.131
Unemployment * Age≥50	-6.552	-3.964
Wage rate	-1.975	-1.815
House price	0.384	3.132
Log L	-10886	

Notes: t-values adjusted for municipal random effects.
Personal characteristics, year dummies and response dummies included. Sample size = 60.186.

All interaction terms have the expected sign. A negative and significant effect of living conditions for children and a positive and significant effect of care for the elderly on migration plans are found only for people below 50. The effect of cultural services is strongest for respondents with a college degree. Municipal fees matter only for those without a college degree, and local unemployment is most important to people below 50.

To examine the practical importance of the various explanatory variables, out-

migration probabilities based on the probit equation reported in Table 3 have been computed for four demographic groups, divided according to age and education level.

Table 4. Estimated migration probabilities (percentage)

	Age=30 College=1	Age=30 College=0	Age=60 College=1	Age=60 College=0
All variables at mean	6.41	3.65	3.00	1.57
One variable one st.dev. above mean				
Children	5.62	3.15	2.97	1.55
Prim. Education	5.95	3.36	2.75	1.42
Culture	5.18	3.28	2.34	1.39
Prim. Health care	6.46	3.69	3.02	1.58
Care for the eld.	7.07	4.07	2.94	1.53
Climate	5.41	3.02	2.46	1.26
Recreation	6.16	3.50	2.86	1.49
Shopping	5.53	3.10	2.52	1.30
Safety	6.10	3.46	2.83	1.47
Higher education	5.75	3.24	2.64	1.37
Municipal fee	6.44	3.38	3.01	1.43
Unemployment (below mean)	5.03	2.79	2.81	1.46
Wage rate	6.05	3.42	2.80	1.45
House price (below mean)	5.59	3.13	2.56	1.32
Joint effect of six municipal variables[a]	3.68	2.48	2.13	1.38

Notes: The probabilities are computed for a married employed male who has completed high school, lives in family with less than four members and has lived in the municipality for more than five years. [a]Joint effect of a one st.dev. increase in Children, Primary education, Culture and Municipal fee, and a one st.dev. decrease in Primary health care and Care for the elderly.

The first row of Table 4 reports migration probabilities for the benchmark case where

amenity variables, fees and area economic variables are at their mean values. The next rows show the effects of increasing one regressor by one standard deviation (local unemployment and house prices are *decreased* by one standard deviation). Among the amenitity variables, living conditions for children, cultural services, the climate and shopping opportunities have the strongest effects on exit decisions. Among the area economic variables, local unemployment seems to matter most.

The quantitative effects of municipal services are clearly of practical importance. The last row shows the joint effect of raising reported satisfaction with living conditions for children, primary education and cultural services by one standard deviation, increasing municipal fees by one standard deviation and reducing reported satisfaction with primary health care and care for the elderly by one standard deviation.[7] The effect on people aged 30 with a college degree is quite strong: the out-migration probability is reduced by 2.73 percentage points, or 44%. The effect is smaller for the other demographic groups, in particular for people aged 60 without a college degree. The results thus indicate that municipalities are indeed able to affect the size and composition of their population.

6. Sensitivity analysis

This section presents some robustness tests. I first drop 'Don't know' respondents from the sample rather than pooling them with respondents who report that they do not plan to exit the resident municipality. The main results do not change: the coefficients and t-statistics of amenity variables, municipal fees and area economic

[7] To assess whether such a policy change is compatible with the municipal budget constraint, we need to examine the relation between municipal spending and reported satisfaction with municipal services.

variables are not much affected.

The second robustness check is to include yearly changes in fees and area economic variables as regressors. If mobility costs are low, we would expect location decisions to depend on changes in local fiscal and economic conditions. Again, the main results appear robust. The estimated effects of the additional regressors are generally small and insignificant. The only exception is change in local unemployment which has a positive and borderline significant impact on migration plans. However, inclusion of change in local unemployment hardly affects the estimated effects of other explanatory variables.

I next consider a potential source of reverse causality known as cognitive dissonance in the psychology literature.[8] Persons like to view themselves as having made correct decisions. One possible explanation of the negative coefficients of amenity variables in the migration equation is that respondents who have decided to move from the municipality attempt to legitimize their decision by forming negative judgements of local amenities. If this is the case, the amenity variables are endogenous and should be instrumented.

The two stage conditional maximum likelihood estimator suggested by Rivers and Vuong (1988) produces consistent coefficient estimates in limited dependent variables models when explanatory variables are endogenous. In the first stage, a set of regressions are estimated explaining reported satisfaction as a function of exogenous variables. At least one of these variables must be excluded from the migration regression. The variable I use for this purpose, is average satisfaction

[8] Akerlof and Dickens (1982) pioneered economic applications of cognitive dissonance theory.

reported by *other respondents* in the same municipality. Personal characteristics are also included as explanatory variables in the first stage regressions. In the second stage, the residuals of the first stage regressions are included in the migration regression together with the amenity variables.

The results indicate that reverse causality is not important. Most first stage residuals are insignificant in the second stage regression. Only three residuals, those of primary education, care for the elderly and shopping opportunities, are significant at the 10% level. Table 5 presents migration regressions with these three residuals as regressors; for brevity, coefficients of residuals are not reported.

Table 5. Instrumental variable estimates

	Coef	t-value	Coef	t-value
Children	-0.050	-3.033	-0.059	-3.816
Children * Age≥50			0.037	1.731
Primary education	-0.151	-2.435	-0.154	-2.517
Culture	-0.060	-5.466	-0.040	-3.044
Culture * College			-0.049	-3.285
Primary health care	0.003	0.422	0.003	0.383
Care for the elderly	0.076	2.706	0.071	2.555
Climate	-0.067	-6.231	-0.067	-6.199
Recreation	-0.045	-4.595	-0.044	-4.524
Shopping	-0.092	-4.550	-0.092	-4.612
Safety	-0.038	-3.422	-0.038	-3.404
Higher education	-0.024	-3.214	-0.025	-3.285
Municipal fee	0.167	1.851	0.247	2.246
Municipal fee * College			-0.226	-1.902
Unemployment	7.001	3.543	8.507	4.193
Unemployment * Age≥50			-6.430	-3.931
Wage rate	-1.116	-0.937	-1.008	-0.857
House price	0.347	2.757	0.345	2.709
Log L	-10900		-10878	

Notes: t-values adjusted for municipal random effects.
Personal characteristics, year dummies, response dummies and first stage residuals included. Sample size = 60.186.

Comparison with Tables 2 and 3 shows that the main conclusions are not affected. Contrary to what could be expected, the estimated effects of reported satisfaction with primary education, care for the elderly and shopping opportunities on migration plans actually become stronger. The interaction term between reported satisfaction with care for the elderly and the age dummy becomes insignificant, but simulations suggest that the effect on migration plans remains stronger for people below 50. The coefficients of the other amenity variables are hardly affected.

The final robustness check is to consider alternative specifications of the amenity variables. When the level of reported satisfaction is included as regressor, it is implicitly assumed that the response categories are equally spaced in the sense that an increase in reported satisfaction from 1 to 2 has the same impact on migration plans as an increase from 2 to 3, etc. An alternative approach, which may be more robust to variation in the subjective distance between response categories, is to create dummy variables turned on if reported satisfaction exceeds a given threshold. Table 6 presents migration regressions with dummy variables which are unity if reported satisfaction exceeds mean satisfaction; other thresholds produce very similar results.

Table 6. Results with alternative amenity variables

	Coef	t-value	Coef	t-value
Children	-0,068	-3,329	-0.099	-4.260
Children * Age≥50			0.120	2.316
Primary education	-0.093	-3.051	-0.092	-3.067
Culture	-0.166	-7.628	-0.127	-4.518
Culture * College			-0.101	-2.725
Primary health care	-0.044	2.030		
Primary health care * Age≥50			-0.088	-2.029
Care for the elderly	0.061	2.452	0.066	2.481
Care for the elderly * Age≥50			-0.047	-0.942
Climate	-0.124	-5.196	-0.125	-5.176
Recreation	-0.095	-4.557	-0.093	-4.499
Shopping	-0.126	-6.083	-0.128	-6.202
Safety	-0.009	-0.384	-0.009	-0.391
Higher education	-0.130	-5.631	-0.134	-5.764
Municipal fee	0.151	1.693	0.218	2.003
Municipal fee * College			-0.188	-1.565
Unemployment	7.971	3.811	9.570	4.489
Unemployment * Age≥50			-6.897	-4.223
Wage rate	-2.184	-2.000	-2.101	-1.944
House price	0.415	3.214	0.403	3.047
Log L	-10991		-10969	

Notes: t-values adjusted for municipal random effects.
Personal characteristics, year dummies and response dummies included. Sample size = 60.186.

The main results do not change: with the exception of primary health care, the coefficients of all amenity variables, including interaction terms, have the same sign as in Tables 2-3, and most coefficients remain statistically significant. The coefficients of area economic variables are hardly affected. The negative estimated effect of reported satisfaction with primary health care on migration plans of people aged 50 and above confirms our earlier conclusion that improvement of health care services will cause an increase in the population share of elderly households.

7. Conclusion

The main results of the paper can be summarized as follows. First, municipal fees and services matter for migration decisions. The estimated effects are quantitatively important and differ between demographic groups. Norwegian municipalities can increase the population share of young, educated households by improving living conditions for children and the quality of schools and cultural services, reducing the quality of primary health care and care for elderly and raising municipal fees. Second, capitalization of amenities cannot explain weak effects of local economic conditions on migration. The estimated effects of personal unemployment, local unemployment and local wages on migration plans become weaker, not stronger, when amenitity variables are included. These conclusions survive a number of robustness tests.

References

Ahn, N., S. de la Rica, and A. Ugidos (1999), Willingness to Move and Unemployment Duration in Spain, *Economica* 66, 335-357.

Akerlof, G., and W. Dickens (1982), The Economic Consequences of Cognitive Dissonance, *American Economic Review* 72, 307-319.

Antonin, P., and O. Bover (1997), Regional Migration in Spain: The Effect of Personal Characteristics and of Unemployment, Wage and House Price Differentials using Pooled Cross-sections, *Oxford Bulletin of Economics and Statistics* 59, 215-235.

Axelsson, R., and O. Westerlund (1998), A Panel Study of Migration, Self-selection and Household Real Income, *Journal of Population Economics* 11, 113-126.

Black, S. (1999), Do Better Schools Matter? Parental Valuation of Elementary Education, *Quarterly Journal of Economics* 114, 577-599.

Blanchflower, D., and A. Oswald (1994), *The Wage Curve*, MIT Press, Cambridge/Mass.

Charney, A. (1993), Migration and the Public Sector: A Survey, *Regional Studies* 27, 313-326.

Day, K., (1992), Interprovincial Migration and Local Public Goods, *Canadian Journal of Economics* 25, 123-144.

Decressin, J., and A. Fátas (1995), Regional Labor Market Dynamics in Europe, *European Economic Review* 39, 1627-1655.

Dijk, J., H. Folmer, H. Herzog, and A. Schlottmann (1989), Labor Market Institutions and the Efficiency of Interregional Migration: A Cross-Nation Comparison, in: J. Dijk, H. Folmer, H. Herzog and A. Schlottmann (eds.), Migration and Labor Market Adjustment, Kluwer Academic Publishers, Dordrecht, 61-83.

Eichengreen, B. (1993), Labor Markets and European Monetary Unification, in: P. Masson and M. Taylor (eds.), Policy Issues in the Operation of Currency Unions, Cambridge University Press, Cambridge, 130-162.

Fox, W., H. Herzog, and A. Schlottmann (1989), Metropolitan Fiscal Structure and Migration, *Journal of Regional Science* 29, 523-536.

Gyourko, J., and J. Tracy (1991), The Structure of Local Public Finance and the Quality of Life, *Journal of Political Economy* 99, 774-806.

Haurin, D., and D. Brasington (1996), School Quality and Real House Prices: Inter- and Intrametropolitan Effects, *Journal of Housing Economics* 5, 351-368.

Herzog, H., and A. Schlottmann (1986), State and Local Tax Deductibility and Metropolitan Migration, *National Tax Journal* 39, 189-200.

Hughes, G. and B. McCormick B (1981), Do Council Housing Policies Reduce Migration between Regions? *Economic Journal* 91, 919-939.

Hughes, G. and B. McCormick (1985), Migration Intentions in the UK, *Economic Journal* Conference papers supplement, 113-123.

Hughes, G. and B. McCormick (1994), Did Migration in the 1980s Narrow the North-South Divide? *Economica* 61, 509-527.

John, P., K. Dowding, and S. Biggs (1995), Residential Mobility in London: A Micro-level Test of the Behavioural Assumptions of the Tiebout Model, *British Journal of Political Science* 25, 379-397.

Kan, K. (1999), Expected and Unexpected Residential Mobility, *Journal of Urban Economics* 45, 72-96.

Moulton, B. (1990), An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units, *Review of Economics and Statistics* 72, 334-338.

Nechyba, T., and R. Strauss (1998), Community Choice and Local Public Services: A Discrete Choice Approach, *Regional Science and Urban Economics* 28, 51-73.

Nelson, M. and M. Wyzan (1989), Public Policy, Local Labor Demand, and Migration in Sweden, 1979-84, *Journal of Regional Science* 29, 247-264.

Pissarides, C., and J. Wadsworth (1989), Unemployment and the Inter-Regional Mobility of Labour, *Economic Journal* 99, 739-755.

Porell, F. (1982), Intermetropolitan Migration and Quality of Life, *Journal of Regional Science* 22, 137-158.

Rivers, D., and Q. Vuong (1988), Limited Information Estimators and Exogeneity Tests for Simultaneous Probit Models, *Journal of Econometrics* 39, 347-366.

Roback, J. (1982), Wages, Rents, and Quality of Life, *Journal of Political Economy* 90, 1257-1278.

Wellisch, D. (2000), *Theory of Public Finance in a Federa State*, Cambridge University Press, Cambridge.

Wilson, J. (1999), Theories of Tax Competition, *National Tax Journal* 52, 269-304.