Title:
How important is consumer city?
A comparison of expenditure patterns of urban and rural consumers

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Abstract:
A recent literature in urban economics has stressed the importance of urban amenities for consumers. If cities are important to consumers, one would expect differences between the spending patterns of urban and rural consumers. One reason for expecting different consumer patterns is that the greater density of consumers may facilitate a higher number of product varieties in urban regions. For instance, the presence of a large number of restaurants with diverse kitchens is expected to induce urban residents to spend more on restaurants than rural consumers. A second possibility is that there are relative price differences between rural and urban regions for given products. Higher land prices in (large) cities have an upwards effects on prices in urban regions. On the other hand, economies of scale and more intense competition in dense cities may have a decreasing effect on prices. A third possibility for different spending patterns between rural and urban consumers is related to a selection effect. Consumers in cities might have different preferences or incomes than consumers in rural regions. Third, it may be the case that urban consumers are different from rural consumers because of differences in income and preferences.

In this paper we investigate spending patterns of consumers in urban and rural regions issue on the basis of a set of expenditure surveys on Dutch consumers referring to the period 1978–2004. We estimate Engel curves for broad categories of products as well as for individual products. The budget shares are explained by several household characteristics and by the degree of urbanization of the municipality the consumers lives in. We use an instrumental variable regression, where total spending is instrumented by income. We consistently find that the budget shares of urban consumers are different from those of rural consumers. The impact is usually more substantial for regions with a higher degree of urbanization and largest for the four largest cities. For example, consumers in urban regions spend a higher share on restaurants and on music and stage performances. These results are consistent with the hypothesis that urban regions have more varieties. These results are found after controlling for income, education and demographic variables which means that some of the most obvious selection effects are excluded. To investigate the significance of selection on unobserved characteristics, we intend to exploit the fact that some of the households in our data have participated in the survey in multiple years.

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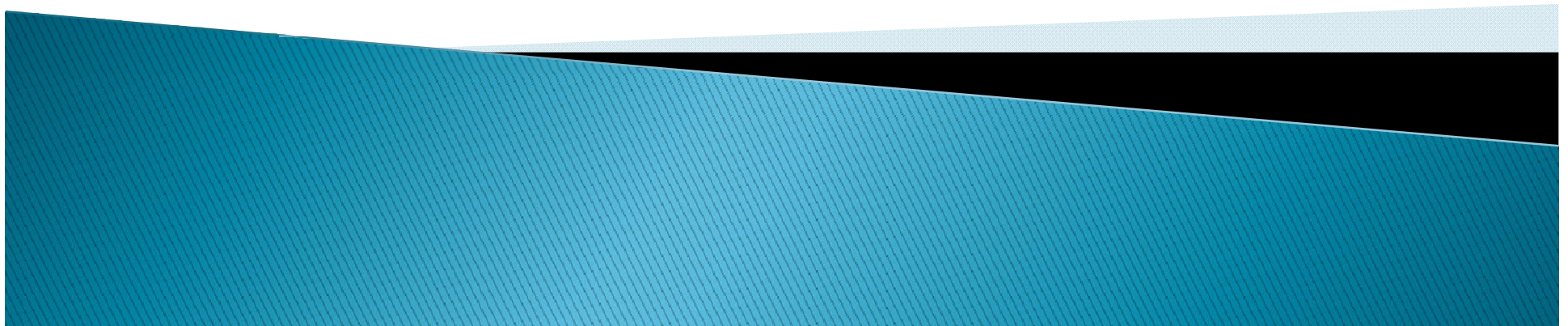
Consumer city

▶ Urban economics has emphasized the role of cities as employment centers …

▶ … but a recent literature calls attention for consumption aspects of cities.

- Brueckner, Thisse and Zenou: urban amenities determine location of income groups
- Glaeser, Kolko Saiz: cities are attractive to live in because of consumer amenities
  - Higher density is crucial
- Handbury and Weinstein: more product varieties available in cities
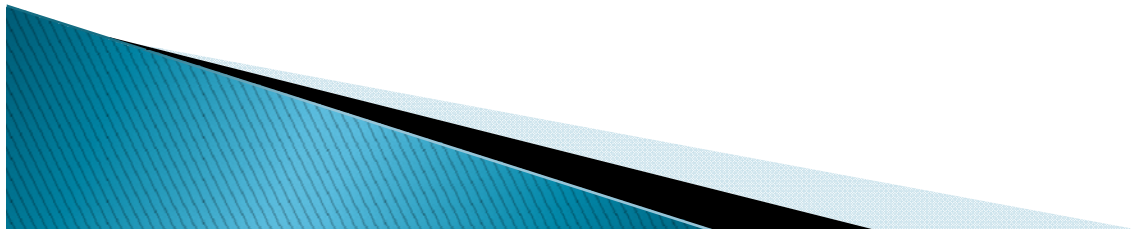
Consumer behaviour

- If (large) cities differ from other areas in consumer amenities, consumer behaviour should be expected to depend on the residential location
- There is some evidence that confirms this
  ◦ E.g. 'Stad en Land': market areas of urban amenities is small relative to labour market areas
- Here we look at expenditure patterns
  ◦ A series of cross-sectional expenditure surveys
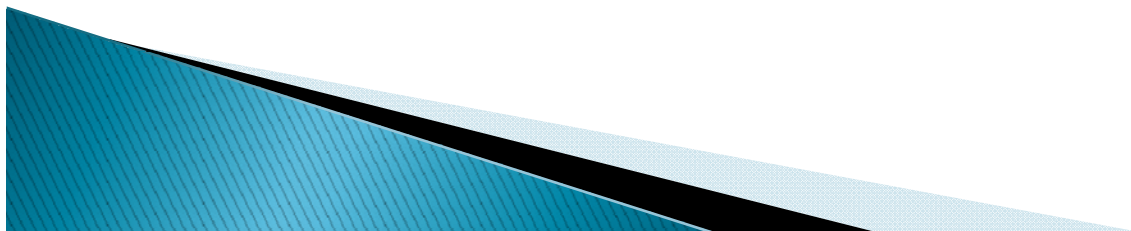
Theory (1)

▸ The standard model of consumer behaviour assumes maximization of a utility function

$$u = u(q;z)$$

◦ u=utility, q=quantities, z=characteristics

▸ Subject to a budget constraint

$$pq = c$$

◦ p=prices, c=budget (not income)
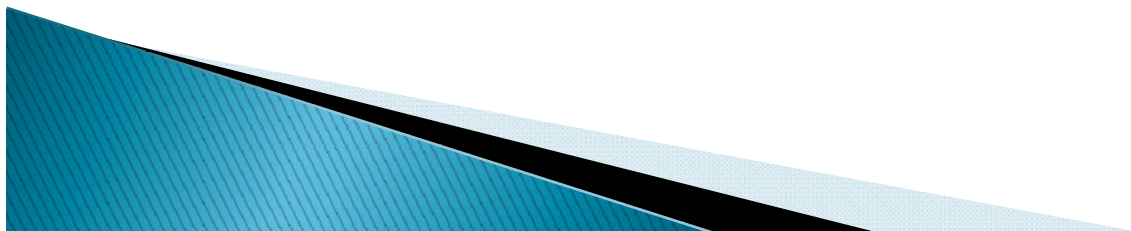
Theory (2)

- We generalize this model
  - The q's are groups of commodities
  - Some may not be available in all locations
  - And the prices of available commodities may differ over locations
- This results in a reinterpretation:
  - The q's are quantity indices
  - The p's are price indices
  - Their product is still total expenditure
- Differences in availability and prices can be absorbed in the standard setting

Data

- Expenditure surveys of Dutch households for the period 1978–2000,2003–4
- Collected to determine the consumer price index
- Detailed information about expenditure on a large number of categories
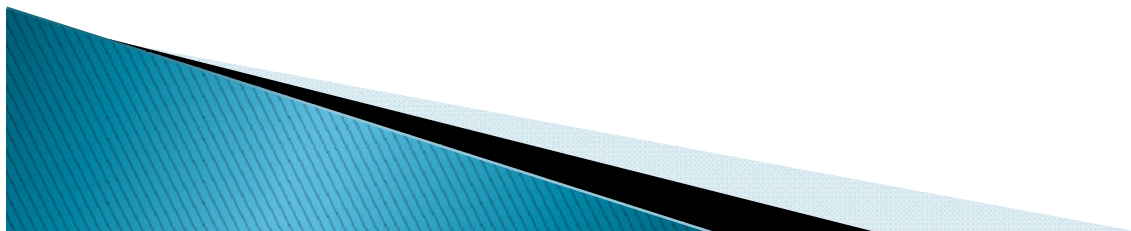
5 main categories

Table 1: Average budget shares (in percent) for main product groups

	Mean	Standard deviation	Code
Food	**19.42**	**7.37**	**11**
Bread, pastry and flour products	**2.61**	**1.54**	**110**
Potatoes, vegetables and fruit	**2.67**	**1.57**	**111**
Beverages and products containing sugar	**3.70**	**2.55**	**113**
Oils and fats	**0.30**	**0.32**	**115**
Meat, meat products and fish	**3.83**	**2.67**	**116**
Dairy products	**2.57**	**1.50**	**118**
Other food products	**3.74**	**3.99**	**119**
Outdoor food consumption	**3.15**	**3.93**	**1193**
Household effects	**34.53**	**11.47**	**22**
Clothing and footwear	**7.11**	**4.77**	**33**
Hygiene and medical care	**10.90**	**6.47**	**44**
Education, recreation and transport	**26.29**	**14.67**	**55**
Other expenses	**1.74**	**2.72**	**66**

Detailed information about household characteristics

Table 2: Average household characteristics

Based on 55,801 households.

	Mean
Single and male	0.076
Single and female	0.115
Couple	0.809
Highly educated head of household	0.246
No children below 17	0.589
One child below 17	0.132
Two children below 17	0.199
Three children below 17	0.063
Four children below 17	0.012
Five or more children below 17	0.005
Age head of household below 25	0.038
Age head of household 25–29	0.109
Age head of household 30–34	0.144
Age head of household 35–39	0.139
Age head of household 40–44	0.113
Age head of household 45–49	0.088
Age head of household 50–54	0.073
Age head of household 55–59	0.067
Age head of household 60–64	0.071
Age head of household 65–69	0.069
Age head of household 70–74	0.048
Age head of household 75 or older	0.041

Residential municipality is known

Table 3: Classification of urbanization for municipalities

	Municipalities	Household observations	Average # observations per municipality
Rural	146	10,381	71
A little urbanized	83	6,195	75
Somewhat urbanized	60	5,230	87
Strongly urbanized	93	19,964	215
Very strongly urbanized	19	14,031	738
of which contain one of the four largest cities	4	7,795	1,949
Total	405	55,801	138

Housing

Table 4: IV estimation results for budget shares Engel curves for rent and maintenance
Total spending instrumented by net income. Standard errors are shown in parentheses.
Statistical significance levels are indicated by *** (1%), ** (5%) and * (10%).

	Dependent: budget share (in percent)		
	Rent and maintenance	Rent (renters)	Imputed rent (owner-occupied)
ln(total spending)	– 64.31***	– 29.83***	– 46.50***
	(18.09)	(3.12)	(3.53)
(ln(total spending))^2	2.98***	1.01***	1.81***
	(0.89)	(0.16)	(0.17)
Single man	1.74***	0.56***	1.83***
	(0.28)	(0.15)	(0.19)
Single woman	3.25***	1.68***	1.91***
	(0.28)	(0.13)	(0.17)
Highly educated	0.27***	0.75***	1.10***
	(0.10)	(0.11)	(0.08)
Strongly urbanized	– 0.70***	0.20**	– 0.002
	(0.08)	(0.10)	(0.08)
Very strongly urbanized	– 1.70***	– 0.79***	– 0.88***
	(0.12)	(0.13)	(0.13)
One of the four largest cities	– 1.53***	– 1.28***	0.74***
	(0.13)	(0.14)	(0.18)
Constant (couple, no children, age below 25)	357.02***	211.66***	304.11***
	(91.52)	(15.48)	(18.24)
Dummies for # of children	5	5	5
Dummies for age groups	11	11	11
Year dummies	24	24	24
Observations	54,079	23,215	27,953
R^2	0.29	0.50	0.33

Main categories

Table 5: IV estimation results for budget shares Engel curves of main product groups
Total spending instrumented by net income. Standard errors are shown in parentheses.
Statistical significance levels are indicated by *** (1%), ** (5%) and * (10%).

	Food	Clothing and footwear	Hygiene and medical care	Education, recreation and transport
ln(total spending)	– 39.76***	– 5.70	56.87***	58.28***
	(9.32)	(6.08)	(7.21)	(13.72)
$(ln(\text{total spending}))^2$	1.58***	0.39	– 2.84***	– 2.54***
	(0.47)	(0.31)	(0.36)	(0.69)
Single man	– 4.42***	– 2.38***	0.31*	9.07***
	(0.24)	(0.16)	(0.19)	(0.36)
Single woman	– 8.22***	2.38***	2.41***	3.24***
	(0.24)	(0.16)	(0.19)	(0.35)
Highly educated	– 0.74***	– 0.58***	– 0.56***	1.95***
	(0.10)	(0.06)	(0.08)	(0.14)
Strongly urbanized	0.15*	0.01	0.46***	0.46***
	(0.08)	(0.05)	(0.06)	(0.12)
Very strongly urbanized	0.29**	– 0.29***	0.38***	1.27***
	(0.12)	(0.08)	(0.09)	(0.18)
One of the four largest cities	0.93***	– 0.17*	0.29**	– 0.18
	(0.14)	(0.09)	(0.11)	(0.21)
Constant (couple, no children, age below 25)	263.89***	28.39	– 270.58***	– 291.57***
	(46.06)	(30.06)	(35.66)	(67.80)
Dummies for # of children	5	5	5	5
Dummies for age groups	11	11	11	11
Year dummies	24	24	24	24
Observations	54,079	54,079	54,079	54,079
R^2		0.06	0.36	0.27

Food

	Strongly urbanized	Very strongly urbanized	One of the four largest cities	Average budget share excluding rent and maintenance (%)
Food	0.15^*	0.29^{**}	0.93^{***}	25.20
Bread, pastry and flour products	-0.16^{***}	-0.21^{***}	-0.03	3.39
Potatoes, vegetables and fruit	0.27^{***}	0.41^{***}	0.19^{***}	3.46
Beverages and products containing sugar	0.03	0.14^{***}	0.07	4.80
Oils and fats	-0.03^{***}	-0.15^{***}	0.00	0.39
Meat, meat products and fish	-0.01	-0.19^{***}	0.22^{***}	4.97
Dairy products	-0.13^{***}	-0.08^{***}	-0.03	3.34
Other food products	0.18^{***}	0.27^{***}	0.50^{***}	4.85
Outdoor food consumption	0.19^{***}	0.29^{***}	0.51^{***}	4.09

Education, recreation and transport

Table 7: IV estimation results of urbanization variables
Total spending instrumented by net income. Coefficients for control variables not shown.
Statistical significance levels are indicated by *** (1%), ** (5%) and * (10%).

	Strongly urbanized	Very strongly urbanized	One of the four largest cities	Average budget share excluding rent and maintenance (%)
Education, recreation and transport	0.46***	1.27***	– 0.18	34.12
Education	0.24***	0.63***	0.12	4.46
Sport, games and holidays	1.10***	1.38***	0.60***	7.34
Sport and games	0.05	0.03	0.05	1.12
Holidays	1.05***	1.35***	0.31***	6.23
Other recreation	0.16***	0.52***	0.08	5.32
Music, singing and theatre	0.04***	0.07***	0.03	0.34
Smoking	0.12***	0.24***	0.05	1.49
Transport and communication	– 1.17***	– 1.50***	– 0.79***	15.49
Public transport	0.23***	0.49***	0.54***	1.21
Cars	– 0.68***	– 0.81***	– 0.83***	5.19

Is it the city or selection?

- We have controlled for a large number of household characteristics
- Still, there may be selection on unobservables
  - To address this concern, we undertook a panel data analysis
  - Although the possibilities to do so are rather limited
    - We need residential moves between urbanization categories
    - If budget shares remain unchanged after the move this indicates a selection effect
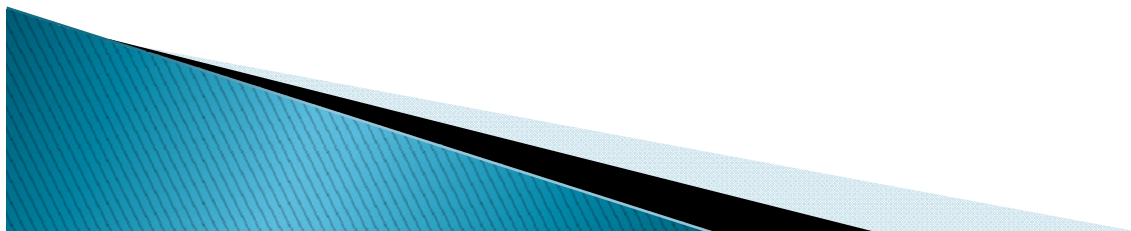
Table 8: Fixed effects estimation results

Coefficients are obtained in separate estimations. Coefficients for control variables not shown.
Standard errors are shown in parentheses. Statistical significance levels are indicated
by *** (1%), ** (5%) and * (10%).

	Very strongly urbanized	One of the four largest cities	Average budget share excluding rent and maintenance (%)
	3.97**	4.51*	
Food	(1.86)	(2.42)	25.20
	1.16*	0.33	
Beverages and products containing sugar	(0.71)	(0.92)	4.80
	1.60*	3.49***	
Other food products	(0.91)	(1.18)	4.85
	1.78**	3.77***	
Outdoor food consumption	(0.89)	(1.16)	4.09
	0.54	− 0.81	
Clothing and footwear	(1.16)	(1.51)	9.23
	− 1.09	− 1.06	
Hygiene and medical care	(1.10)	(2.43)	14.14
	− 0.94*	− 1.05	
Domestic services and cleaning	(0.55)	(0.72)	2.65
	− 1.66	− 0.77	
Education, recreation and transport	(2.82)	(3.66)	34.12
	2.77***	3.46***	
Education	(0.91)	(1.18)	4.46
	− 4.55	− 6.81*	
Transport and communication	(2.80)	(3.63)	15.49
	0.49	− 0.55	
Public transport	(0.54)	(0.70)	1.21
	− 2.65	− 3.30	
Cars	(2.96)	(3.85)	5.19

Conclusion

- The urban environment makes a difference
  - For many categories there is a difference between urban and rural consumers
  - And often the intensity of urbanisation also matters
  - These results are robust to the inclusion of a large number of controls
  - A limited panel data analysis confirms that the effects are not completely due to sorting

- Are urban consumers better off?
  - It would be nice to have equivalence scales