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BUDAPEST WORKING PAPERS ON THE LABOUR MARKET

BWP. 2002/7

Residential Mobility, Migration and Economic Incentives – the Case of Hungary in 1990–1999

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This research was carried out with the support of the European Commission 5th Framework Program 'EU-enlargement: The impact of East-West migration on growth and enlargement'.

ISSN 1418–3331
ISBN 963 9321 66 4

Published by the Institute of Economics, Hungarian Academy of Sciences.
Budapest, 2002
With financial support from the Foundation for Job Creation

RESIDENTIAL MOBILITY, MIGRATION AND ECONOMIC INCENTIVES – THE CASE OF HUNGARY IN 1990–1999

by

ZSOMBOR CSERES-GERGELY

Abstract

Mobility in Hungary is a relatively infrequent phenomenon of which we have mostly aggregate-level information. I use settlement- and individual level data to show a more elaborate picture of the Hungarian population moving house across settlements and regions between 1990 and 1999. Along with giving an aggregate overview of mobility in the decade, characteristics of the mobile population is described. Using a simple economic model, I estimate the probabilities of moving house both from aggregate and individual data, and look at its response to economic incentives given by geographic differences in wages and unemployment.

The findings show two main results. Firstly, the flow of people does follow wage and unemployment differences as expected, although exact parameter estimates vary in different models. Secondly, the findings show considerable heterogeneity on the individual level that prompts caution in extending results from simple local models to large distance or cross-border migration. Clear signs of the dominant change in mobility, a strong suburban development, is apparent that goes right against local labour market benefits.

CSERES-GERGELY ZSOMBOR

MIGRÁCIÓ, MOBILITÁS ÉS A GAZDASÁGI ÖSZTÖNZŐK HATÁSA MAGYARORSZÁGON 1990 ÉS 1999 KÖZÖTT

Összefoglaló

Magyarországon a migráció összehasonlításban ritka esemény az emberek életében, melyről jobbára makroszintű információkkal rendelkezünk. Ebben az írásban település és egyéni szintű adatok segítségével írom le az 1990 és 1999 között települések és régiók között mozgó magyar népességet. Az évtizedben lezajlott mobilitás fő trendjeinek leírása után bemutatom a mobil népesség jellemzőit. Egy egyszerű közgazdasági modellre építve mind aggregált, mind egyéni adatok segítségével megbecsülöm a településváltással járó költözés valószínűségét befolyásoló tényezők hatását, különös tekintettel a gazdasági ösztönzőkre, melyeket a bérek és munkanélküliség közelít.

Az elemzésnek két fő eredménye van. Először is, a mobiltás iránya követi a gazdasági ösztönzőknek a bérek és munkanélküliség által megjelenített hatását, noha a vonatkozó együtthatók becslése nem mindig kellően pontos. Másodszor azonban az egyének szintjén igen nagy heterogenitás mutatkozik a mobilitási döntések motivációjában, ami óvatosságra int az eredmények extrapolációjában. Világosan jelentkezik a gazdasági ösztönzőknek látszólag ellentmondó szuburbanizáció hatása is, ami rámutat annak fontosságára, hogy a mobilitás különféle formáit elkülönítve és összefüggésében kezeljük.

CONTENTS

1 Introduction

In the 1990 the economy of Hungary was transformed from a post-socialist to a market economy. The GDP of the country fell sharply from its pre-transition level, and only gradually recovered thereafter. In parallel the structure of the economy changed dramatically. Previously favoured and developed industries collapsed on the one hand, foreign direct investment created previously nonexistent ones on the other. Both processes followed a distinctive geographical pattern, favouring mostly regions of the country that have already been developed or survived the transformation the best. Clustering of both destruction and construction of economic activity widened the already sizeable differences between regions of the country.

In what follows I examine the extent to which geographic mobility of people reacted to these differences. Given that there does not exist much economic literature on this topic concerning Hungary, here I establish the major facts and mechanics relating to the 1990s in a way that is comparable to the international literature. Stylised facts of aggregate mobility and the trends that characterise the 1990s are shown firstly. Secondly an empirical and theoretical motivation, based on individual decisions, is given to the empirical analysis. Next I estimate mobility probabilities at the aggregate level. To give an understanding of migrants' characteristics and to employ a richer estimation framework, I turn to micro-level survey data. After a description of the migrant population, I estimate outmigration probabilities for individuals.

The main results are the following:

1. Whereas mobility, defined as the change of address outside a settlement, is an infrequent event in international comparison, migration through borders of regions happens quite often. This feature was not possible to study in depth and needs further analysis (see point 4).

2. Stylised facts and both aggregate and individual regression models show that in the first and second half of the 1990s, there are two well defined regimes in the movement of people. The first is characterised by mainly mobility towards benefits that labour markets offer, while the second by movements towards suburban areas. Standard human capital models work as expected, better in the first half of the decade and for part of the population that did not follow the "move out and commute back" strategy. Although labour market driven mobility weakened over time, the resulting state seems to be dependent on the current distribution of economic possibilities and might change if new possibilities open up.

3. Notwithstanding the above peculiarities, the relevant population shows characteristics familiar from the literature of migration. People who move are predominantly young, who are either about to start or already have started a family. Level of education, especially college degree is have a strong impact on migration propensity. Decomposition of the population showed however, that it is important do differentiate permanent and temporary movers. Although members of the latter group might stay at the new place of living for a longer period, many of them is driven by motives, such as schooling, that are easy to confound with economic motives in a less broad sense.

4. Even with relatively stabilised residential patterns, the data demand of in depth analysis of mobility or migration is high. In the Hungarian case however, with a structural change proceeding, these demands are even higher. Moreover, the currently available data does not allow the evaluation of the effect of distance on the migration motive. These problems are expected to be rectified by the possible release of data from the 2000 Census (not yet available).

2 Macro-level processes of mobility in the 1990s

Hungary is characterised by regional differences that are not only considerable in magnitude, but are also fairly persistent (see Köllő (2002), for example). Figure 1 on page 4 shows the evolution of inequality in two key indicators, unemployment and average wage between NUTS 4 micro-regions, measured as the coefficient of variation. It is remarkable how similar trends they show. Before 1992 there are no great changes in labour market inequality, but beginning with 1995, it increases steadily both in terms of unemployment and wages only with a slight setback in 1998. Analysis of the changes in labour demand showed that it is not post-socialist slowdown, but economic upswing that shapes the developments of inequality.

In 1991, the GDP dropped by more than 10 percent over one year and continued to decline for another two. This contraction hit hard almost the whole of the economy as it marked the start of a comprehensive and painful restructuring process. Previous markets collapsed, the institutional environment changed and several tens of thousands of jobs were destroyed as a result. Beginning with 1994, GDP growth resumes to overcome the pre-transition level over the following five years. Even though the contraction in the first half of the decade affected different regions and groups of people differently ac-

cording to their association with unsuccessful business, growth was even more selective. Established firms could skim the cream, the young and well-trained individuals from the pool of workers. The earnings of these increased well beyond that of the less fortunate and through the sustained growth of businesses also demand for additional work-force was generated. It is therefore the structure of both the collapse and the following development that seems to explain the sustained geographic differences.

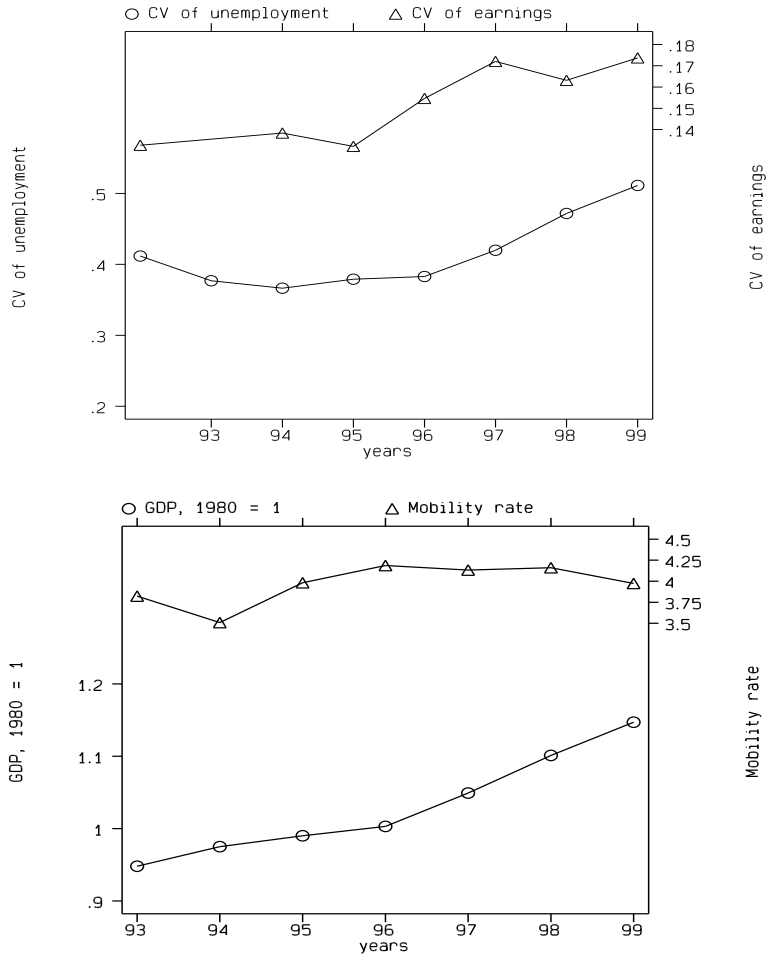
Economic theory predicts that there can not be uncompensated price differences between markets on the long run, as it will be arbitrated away. In case of the labour market, this is realised through the transportation of useful human and non-human assets, mobility of workers and firms. As we have already noted, the regional patterns in the establishment seem to have left room for workers to exploit the regional differences through migration. Nevertheless, the share of geographically mobile population does not track closely inequality indicators. The second panel of Figure 1 on the next page shows that it follows two pattern over the decade. Falling by one percentage point at the beginning of the period[1], it increases and stays at a higher levela after 1994. Maybe not a great change in magnitude, the first period brings a significant drop considering the level of departure. Looking at the other indicators, this behaviour is not at odds with previous experience.

As emphasised by Bentolila (1997), migration propensity typically falls with the weakening of the economy. Idiosyncratic shocks might open up gaps between rewards in different places, but the overall uncertainty increases the risk associated with migration as such. After 1995 however mobility rate stays at an approximately constant level of 4 percent, which does not fit the uncertainty explanation. The substantial increase in both inequality and economic performance suggests that overall migration propensity should have increased steadily, as the former had generated incentives while the latter reduced aggregate uncertainty hence a possibly important part of the costs of migration.

Before proceeding to the decomposition of aggregate processes, a clarification of terms is in order. Geographic mobility and migration is not the same phenomenon. While the former refers to any change of address, migration is understood as mobility crossing boundaries of large geographic units such as regions, countries or continents. In what follows, I will define migration this way and mobility as a change of address across settlements. Wherever it is possible, I point out differences between results using one or the other definition. Suiting most of the cases better, I will use the term “mobility”, as it always subsumes migration, where it is not true the other way around. Nev-

[1] As inequality indicators could not be computed, years before 1993 are omitted.

Figure 1: Evolution of regional labour market inequality indicators (coefficient of variation of unemployment and earnings across NUTS 4 micro-regions), overall GDP and the share of geographically mobile population over 1993-1999



ertheless it turns out that with the data available, focusing on one or the other will not change conclusions considerably in the case of Hungary, although it does matter in international comparison.

Böheim and Taylor (1999) quotes previous studies showing that the proportion of the population changing address in the UK was 7 and 11 percent in the 1960s and the 1970s. A more recent analysis by van der Gaag and van Wissen (2001) presents figures suggesting that the long-term rate of geographic mobility is around 13 percent in Sweden and 11 percent in the Netherlands, figures that are very similar to the UK case. Reaching at most the half or third of these numbers, Hungarian mobility rate shown in Table 1 on the following page appears to be quite moderate.

To look at migration rates, I use aggregate data from issues of the Hungarian Demographic Yearbook Hungarian Central Statistical Office (1998) to calculate migration rates at the level of counties and two definitions of larger regions.[2] The first provides me with 20 counties including the capital separately, the second and the third giving seven and eight units, respectively.[3] Using counties gives a units with approximately 500 thousand, while regions around 1.3 million inhabitants on average. The most significant difference between the two region definitions is that the official categorisation (corresponding to NUTS 2 regions) does not separate the capital from county Pest, its greatest neighbour, and uses a coarser division of the eastern part of the country that the alternative one.

The trend of the above indices are very similar to that of mobility, with peaks at the beginning of the period and after a decline until 1994, returning to the vicinity of their 1993 level. The absolute numbers are however lower than in the case of mobility, as expected. In 1990 a little more than 2.5 percent of the population crossed the boundaries of counties, a rate decreasing to about 2 percent by the end of the decade. A surprising fact is that employing the

[2] As many people change their address within a given geographic area, the larger this area, the lower is in general the probability of exit. Because of this, migration rates are quite sensitive to the number and size of chosen basic geographic unit.

[3] NUTS 2 regions are: Central Hungary (Budapest and Pest county), Central Transdanubia (Fejér, Komárom-Esztergom, Veszprém counties), Western Transdanubia (Győr-Moson-Sopron, Vas, Zala counties), Southern Transdanubia(Baranya, Somogy, Tolna counties), Northern Hungary(Borsod-Abaúj-Zemplén, Heves, Nógrád counties), Northern Great Plain (Hajdú-Bihar, Jász-Nagykun-Szolnok, Szabolcs-Szatmár-Bereg counties), Southern Great Plain (Bács-Kiskun, Békés, Csongrád counties). The "alternative" regions are: Budapest, Eastern Transdanubia (Pest, Komárom-Esztergom, Fejér, Veszprém counties), Western Transdanubia (Győr-Moson-Sopron, Vas, Zala counties), Southern Transdanubia (Baranya, Somogy, Tolna counties), Region Between the Danube and Tisza Rivers (Bács-Kiskun, Csongrád counties), Great Plain (Békés, Hajdú-Bihar, Jász-Nagykun-Szolnok counties), Heves and Nógrád Counties, Borsod and Szabolcs Counties.

Table 1: Migration and mobility rates in Hungary during the 1990s, selected years

	Migration			Mobility	
	County	Alt. Regions	NUTS 2	All	Permanent
1990	2.58	2.30	1.89	4.58	2.06
1992	2.12	1.88	1.50	3.92	1.98
1993	2.07	1.83	1.43	3.82	2.02
1996	2.19	1.94	1.44	4.19	2.05
1998	2.17	1.91	1.42	4.16	2.22
2000	2.09	1.84	1.36	4.05	

Source: Own calculations from the respective volumes of the Demographic Handbook of Hungary Hungarian Central Statistical Office (1998).

non-official regional categorisation (as opposed to using counties) decreases the migration rates only slightly, by 0.28 percentage point (12 percent). This either suggests an unlikely event of traffic clustered close to the border of regions, or the more plausible one that a large proportion of people changing home go far once they get started. Switching to the official regions yields another substantial drop, driving down the migration rate from 1.89 percent to 1.36 percent over a decade. As we shall see later, this change is largely due to the fact that this definition does not combine county Pest and the capital into a single region.

When comparing results from different indices, we have to note that more than half of the people finding a new home have crossed the boundaries of counties. In stark contrast to mobility rates, this number is surprisingly large also in international comparison. Citing again van der Gaag and van Wissen (2001), NUTS 2 migration rate[4] increased from 1.8 percent to 2.1 percent over the 1990s in Sweden and was around 2.5 percent in the Netherlands. Jackman and Savouri (1992) reports that the corresponding figure in the UK was around 4.2 percent at the beginning of the 90s. As opposed to mobility, the level of migration can be regarded comparable to and even high with European standards.

Moving to the regional level, a similar picture appears with the Hungarian

[4]The authors call this measure a "Crude Migration Rate" to contrast it to one that is standardised to filter out differences in the age structure. We unfortunately do not have sufficient data do perform standardisation.

figures contrasting to a 1.6 to 1.8 percent reported for the above countries. These show that in terms of migration, Hungary appears to be more similar to western Europe than to its peers. The relevant parts of Table 1 in Huber (2002), page 18 is reproduced here in Table 2 on the next page for convenience.[5] This shows that in contrast to other Central and Eastern European countries the Hungarian numbers are all very large, regardless of the classification we use.

2.1 Changes in the structure of mobility at the level of settlements

Behind the relatively stable aggregate time series, the pattern of mobility is not constant. As a first comparison, I repeat the exercise of Kertesi (1997) and relate net population gains as a fraction of population for the whole 1980s, to the periods 1990-1994, 1995-1999 and the whole 1990-1999. Correlations of these measures presented in Table 3 are moderate and positive in both cases. There is a declining trend however that confirms the findings of both Kertesi (1997) and Kupiszewski et al. (2001) indicating signs of a structural change in the pattern of mobility.

The weakening similarity in the mobility structure comprises differences on the level of regions and settlements. Looking at positions by net gain on a regional level reveals that the greatest change over time was the decrease in the Central Region's gain of population. The position of other regions has changed too, but shows no distinct pattern. As regional aggregation can hide many important details, I move right to the settlement level. The top panel of Table 4 on page 10 shows mobility *to*, the bottom *from* types of settlements as absolute numbers and as shares from a given year's total flow. Behind the changes of the mobility rate, the structure of the flows shows a continuous transformation.

Although the transition between them is fairly smooth, the endpoints identify two distinct regimes in mobility. In the beginning of the period, large towns gain the most population, the capital Budapest being the most outstanding. County-centres and villages in the upper population bracket are also gainers, but all other settlements lose population. This pattern suggest a dominating process of urbanisation, a legacy of the former development path of Hungary and indeed many European countries.

[5] Huber reports "...the percentage of population which changed region of residence in 1993 in the CEE and in selected EU member states." The definition of these figures is thus compatible with mine. Although settlement structure, population distribution and various other factors render comparison nontrivial, mean population sizes give an idea to which Hungarian categorisation the numbers are comparable.

Table 2: Migration rates in selected member and candidate countries of the European Union.

	Year	Average region population (thousand)	Gross Migration Rate
Netherlands	1993	1260.6	1.64
	1995	1308.9	1.62
Italy	1983	2828.8	0.64
	1995	2828.3	0.28
Spain	1983	2003.5	0.66
	1994	2059.0	0.52
Poland	1992	783.0	0.72
	1998	789.1	0.44
Slovenia	1996	165.9	0.14
	1998	165.2	0.15
Slovakia	1992		0.43
	1995		0.31
Czech Rep.			
Okresy (76)	1992	137.5	1.08
	1998	137.3	0.87
NUTS 2 (14)	1992	736.8	0.68
	1998	735.4	0.56
Kraje (8)	1992	1289.4	0.56
	1998	1286.9	0.47

Reproduction of parts of Table 1 in Huber (2002), page 18.

Table 3: Correlation of net mobility rates across time periods

	1980-1990	1990-1999	1990-1994	1995-1999
1980-1990	1.00			
1990-1999	0.48	1.00		
1990-1994	0.44	0.83	1.00	
1995-1999	0.34	0.81	0.34	1.00

Source: own calculations from the TSTAR database and a 1% sample of the 1980 and 1990 Censuses.

Without inter-settlement or inter-regional data, we can not say reliably more about the direction of mobility flows starting from a given type of settlement (see Appendix A.1 on page 40 on the data available for aggregate analysis). Nevertheless, we rely on parts of the thorough demographic study of aggregate mobility and migration in 1997 and 1987 by Kupiszewski et al. (2001) already mentioned above. The authors provide a description of many important details, including flows between different types of settlements within regions. Their analysis identifies the process of urbanisation and provides further supporting evidence for it. On the aggregate level, the analysis finds patterns of flows in 1987 and before that are similar to what the tables above show in the case of the early 1990s. This confirms that the urbanisation pattern we see on a year-to year basis is the end of a longer process.

By the second half of the decade the picture changes and ranks in terms of net mobility gains reverse. From being the greatest gainer, Budapest becomes the greatest loser among all settlements, having a greater negative balance by 2000 in absolute terms than its gain was in 1990. A steady decrease in both in- and outflow accompanies this change that decreases until 1994, but jumps back to its 1990 level thereafter and stays fairly stable. Although with the process shifted by around 1-2 years, county centres show similar behaviour. The remaining set of towns is divided, as the larger and smaller ones turn to gainers from losers, but the ones in the middle lose from their population almost throughout the decade. Some towns may gain considerably, but real winners are clearly the villages. The largest ones gain steadily, almost 10 thousand people a year but even the smallest could reverse their position and back up their population to more than the starting level.[6]

[6]This of course does not preclude an increasing heterogeneity *within* these categories. Indeed, there are quite a few small villages losing large proportions of the population through death and

Table 4: In- and outwards mobility by settlement types and population categories 1990-1999 (absolute numbers and shares in total flow, categories by settlement types and population brackets)

	1990	1992	1994	1996	1998	2000
Inwards mobility						
Budapest	81000	60441	43606	56256	53513	45390
	17	15	12	13	13	11
County	86240	76902	64420	72263	69956	61845
centres	18	19	18	17	17	15
Towns	58239	52299	48430	55396	53547	52120
20000–	12	13	13	13	13	13
Towns	44193	37679	35004	42103	40111	38569
10000–20000	9	9	10	10	10	10
Towns	26746	22841	20827	25543	24956	26023
–10000	6	6	6	6	6	6
Villages	25934	22941	23802	28727	29783	31269
5000–	5	6	7	7	7	8
Villages	64962	55630	53248	64369	65010	67102
2000–5000	14	14	15	15	15	17
Villages	45684	38520	36475	42986	43914	44742
1000–2000	10	10	10	10	10	11
Villages	41633	36855	33630	38454	39114	37919
–1000	9	9	9	9	9	9
Together	474631	404108	359442	426097	419904	404979
	100	100	100	100	100	100
Outwards mobility						
Budapest	69249	57139	52186	64236	64066	63766
	15	14	15	15	15	16
County	85586	72199	61340	77341	75211	72912
centres	18	18	17	18	18	18
Towns	60932	51098	44981	55267	53995	51441
20000–	13	13	13	13	13	13
Towns	45777	39836	35540	41375	40615	38048
10000–20000	10	10	10	10	10	9
Towns	27881	23384	21379	24471	24201	22790
–10000	6	6	6	6	6	6
Villages	25488	21745	19634	24262	23950	23417
5000–	5	5	5	6	6	6
Villages	65667	57751	52108	58557	58183	56744
2000-5000	14	14	14	14	14	14
Villages	47349	41079	36939	41352	41032	39844
1000–2000	10	10	10	10	10	10
Villages	46702	39905	35323	39166	38651	36017
–1000	10	10	10	9	9	9
Together	474631	404136	359430	426027	419904	404979
	100	100	100	100	100	100

Source: own calculations from the TSTAR database.

One of the most important changes between the two periods highlighted by Kupiszewski et al. (2001) is the source of the change in net gains of regions and settlement types. Whereas in 1987 the most popular "routes" were those from villages to towns and especially Budapest, this has reversed by 1997. During the 90s a new trend, counter-urbanisation took over. As a reason for this, the authors identify suburban development and agglomeration using flow data between settlements. Although flow to suburbs was already higher in the 1980s than to many central settlements, this process continued even further in the 90s and became finally dominant.

To complement the numeric description, we can turn to a visual display of the situation in both periods. The maps of Figure 4 on page 48 and Figure 5 on page 49 in Appendix B show the relative average gains in population for two representative periods in the beginning and the end of the period — between 1990-1992 and 1998-2000. In addition Figure 3 on page 47 shows an outline map to help identification of agglomeration centres, and Table 16 on page 44 lists the actual relative gains for settlements in these centres.

The map of Figure 4 on page 48 depicts the relative average gains from mobility in 1990-1993. Black and dark grey colouring represents those with an overall gain, while light gray or white indicates those who lose population through mobility. Looking at the doughnut-shaped dark areas, it is apparent that already this early period is characterised by a distinctive pattern. Centres of suburban development[7] are usually among gainers. Some of them are surrounded by a rim of settlements that gain even more than they do, some with a rim that gains less. Being unable to separate the actual pairs of flows behind the numbers, we can hypothesise two dominant mechanics on the aggregate data that can create such pattern.

In the era of urbanisation, it might be difficult for a migrant to reach the final target at once. This can make it necessary to include a stop before reaching it and settle in a temporary residence. It is possible from the outer rim to commute to the town, but costs of living are probably lower as agricultural activity is still possible and accommodation might be cheaper or available. Once established, the migrant might chose to move forward, which generates a population gain for the town itself.

Suburbanisation is a different process. While people moving into a town are seeking economic opportunities, those moving out might already enjoy that (see Mieszkowski and Mills (1993) for an introduction). These people use their wealth to move away from the centre to seek a more pleasant place

unbalanced mobility.

[7] This classification was created by the Hungarian Central Statistics Office.

of living, but commute back to work. Another type of migrant moving out of the town is that discouraged by the costs of urban living. Having possibly been a "two-stage" migrant, those unsuccessful are moving back to previous places of residence. This can be the place they originally came from or the first stage.

Being different, these two regimes might follow each other easily in time, possibly alternating. Suppose that the underlying factor that attracts migrants is business activity, that produces employment opportunities and favourable wages, but also disamenities, such as pollution, crowd and possibly in-migrants themselves. If people look for amenities but want to take advantage of economic opportunities, it is easy to imagine a situation where there is a constant flow of migrants into and from a city with quite different composition.

Despite of its qualitative similarity, the situation changes dramatically by the second half of the decade. As already seen in Table 4 on page 10, Figure 5 on page 49 shows that large towns' gain turns to a loss in some years with a rim around them that thrives even more than before. If we think of mobile people in terms of the two stories outlined above, it seems likely that the former balance has shifted considerably and the majority of prospective urban dwellers has been offset by those moving out to the suburbs.

There might be at least two reasons for this. It might be the case that the "escalator mechanism" of the city does not work any more (up to the previous efficiency) and there are possibly new ways of organisation and technologies that allow people to enjoy the benefits of a city without suffering from its disamenities. In the case of Hungary, the selectively favourable effect of the economic upswing (favouring the well-educated) and the massive relocation of manufacturing industries to the countryside provide example for the first set of forces. The second set includes the development of mobile communication, flexible working hours and the beginning of large residential developments around larger towns. Anecdotal evidence also suggests the possible importance of "postmodern" transformation of values emphasising natural living. This is however hard to tell apart from the effect of increased affluence.

3 Empirical and theoretical motivation

There exist a variety of theoretical models to explain driving forces behind migration (see Akkoyounlu and Vickerman (2002) for a brief survey). Differing in sophistication and additional considerations, they are all based on the same arbitrage argument, where an agent or a set of agents decide about relocating their human capital among more favourable conditions if these appear.

The most frequently used approach, often labelled as the "human capital approach" is built on a micro-level decision that relates actual utility to expected returns of the change, net of costs.[8] Besides the strictly labour-market related reasons, there can be other ones to move. People are randomly allocated to a birthplace and they simply might not like it. They might aim to move to a final destination and stay "in the middle" just for a while, but maybe for years. Demographic changes such as marriage, death or, childbirth can play an important part. Since not every opportunity is available locally, schooling can be an important factor in migration. And finally migration itself can "back-fire" and trigger yet another move if a previous one was unsuccessful.

Note that although I referred to migration here, the above motives can be true for relocation within any distance. Even if somebody does not go out of a town, moving house can be a substantial change requiring calculus in terms of costs and benefits similar to a longer range migration decision. These might be different both in magnitude and the way they exert their effect, but we have no reason to suppose that the underlying mechanics are different. However, changes in costs and benefits are probably discontinuous or at least highly nonlinear. Stepping out of one's well known cultural and physical surrounding can change everyday experience from "familiar" to "completely different" by crossing the boundary of a geographic unit.

We might also think about generalising the mechanics to the other direction, to migration that spans countries or continents. The fact that the literature on this issue does not bring about extra considerations on the individual decision is encouraging (see for example the comprehensive paper of Borjas (1994)), but direct extensions should be probably avoided. In simple models which are the only estimable ones on all but highly specialised datasets, we are already forced to sidestep the above mentioned nonlinearities or insert some kind of a distance measure as a proxy. It is thus very unlikely that a parsimonious empirical specification can be general enough to allow for such flexibility.

3.1 Individual attitudes towards mobility

Beside individual characteristic and a host of other information, the Regional Development Survey conducted by the market research company Szonda Ipsos elicited motives to move house (for further details see the Data Appendix A).

[8] The other branch, started by Jackman and Savouri (1992) adapts this idea to the use of recent technology and supposes that agents migrate only if they already have a job offer. Although this idea is appealing, using it requires data on job engagements that I do not have access to.

Unfortunately since the survey was not specially designed to study migration, the elicited reasons do not cover a complete set of possibilities. Nevertheless, they include some motivations that are plausible in the given socioeconomic setting.[9] The first three columns of Table 5 shows the proportion of respondents mentioning different reasons among those moved between 1986 and 1990, between 1991 and 1994 and after or in 1995.

Among the motives, poor labour market conditions in previous place of living is one of the most important reasons to move house. Similarly important reasons include regional amenities such as access to facilities and pleasant surrounding. High growth in mentioning "too expensive" and "paying utility bills" is notable, suggesting that beside working conditions and amenities, financial pressure associated with a place of residence is an important issue. There is a decreasing incidence of mentioning "man made" features of the surrounding and an increase in natural ones. Even the importance of transportation is falling. Comparing these factors with aggregate figures of mobility, these appear to be in line with sub- or counter-urbanisation, but the picture is far from being clear.

The only way here to isolate migrants from the pool of mobile people is to constraint the population to those who moved across counties. This operation however yields so little cell sizes that are impossible to evaluate. The remarkable exceptions were the role of labour market motivations and moving back close to family. Compared to the unrestricted ones, values for the former increase uniformly by around 6 percentage points, becoming the second, while the latter increases to 50 percent in almost all periods, being clearly the single most often mentioned reason (figures not shown in table). Unfortunately we do not know the labour market status of the migrant nor whether she or he was a temporary one. If so, the proportion of students is likely to be high among them.

Information is also available on the perceived success rates for each type of motivation, although these are so high with so little variance[10] that they hardly convey any information. Nevertheless we note that unsatisfactory working conditions, the prime reason to move, have been succesfully improved in about

[9] These exclude many basic ones like marriage, divorce, own studies. Later however we will see that these people are most likely to be ones who permanently settled in the new place and the most problematic non-elicited motive for mobility and migration, studies, is not of great importance among them.

[10] Quesions were similar to the motivation one, but asking "To what extent do you feel that your expectations were fulfilled in this respect?". Scores vary between 60 and 93 percent in the first – except for 22 for "too expensive" in 1986-1990 – and between 92 and 98 percent in the second block of questions.

Table 5: Reasons playing a role in mobility

	% saying "yes"			Factor loadings	
	70s	80s	90s	"aggressive"	"defensive"
Life too expensive	5	10	15	-0.09	0.54
Poor job opportunities	28	26	24	0.44	0.04
Problems with paying utility bills	9	13	18	-0.04	0.53
Condition of the building was poor	10	12	17	0.15	0.32
Safety in the neighbourhood was poor	3	6	7	0.06	0.45
People were too poor	3	5	4	0.22	0.32
Buying rented accom. helped in moving	3	6	8	-0.01	0.26
Bigger, better flat	35	35	33	0.23	0.36
Schooling facilities	25	24	17	0.78	-0.04
Medical care facilities	24	21	18	0.80	0.04
Shopping	26	23	20	0.85	0.02
Pleasant surrounding, less pollution	19	23	24	0.04	0.48
Cultural facilities	21	20	15	0.79	-0.01
Good transportation, not cut off	25	22	20	0.78	0.05
Back to relatives	37	36	36	-0.02	0.02

Source: Own calculations from the Regional Development Survey of Szonda Ipsos. Cell sizes are above 37, except for "Safety was poor" and "People were poor".

87 percent on average in every period. This is a high number in both absolute terms and also relative to others in the list.[11]

To explore the covariance pattern behind the motives, I performed a factor analysis. Two factors emerged with an eigenvalue larger than unity. The factor loadings after varimax rotation are given in columns 4 and 5 of Table 5.

[11] It might be tempting to draw the conclusion that migration is an extremely effective relief to labour market difficulties. It is this point however where we need to keep in mind that our sample contains probably the most successful migrants of all. See Appendix A.3 for details.

Table 6: Average factor scores by sending and receiving settlement types. (“aggressive”/**“defensive”)**

Sending	Receiving									
	Budapest		County centres		Towns		Villages		Together	
Budapest			-0.46	**0.48**	-0.52	**0.28**	-0.44	**0.65**	-0.47	**0.52**
County centres	0.25	**-0.34**	-0.38	**0.18**	-0.38	**0.13**	-0.49	**0.67**	-0.37	**0.37**
Towns	0.36	**-0.15**	0.36	**-0.23**	-0.26	**0.07**	-0.44	**0.17**	-0.12	**0.02**
Villages	0.66	**0.04**	0.92	**-0.11**	0.49	**-0.19**	-0.16	**-0.10**	0.27	**-0.11**
Together	0.47	**-0.10**	0.40	**-0.04**	0.08	**-0.03**	-0.32	**0.21**	-0.02	**0.08**

Source: Own calculations from the Regional Development Survey of Szonda Ipsos. Cell-sizes are above 50, except in the Budapest-county centre relations.

The two factors gather motives that are attached to two strategies, which I term “aggressive” and “defensive” respectively. The first characterises an upwardly mobile behaviour, seeking better working conditions and man-made amenities that the place of living can offer. The second one describes a potentially more defensive strategy. People here seem to flee from costs and financial pressures, taking advantage of selling previously rented then purchased accommodation. Man-made labour amenities are not exceptionally valued, natural ones much more. Labour market possibilities do not pose particular pressure either. These responses of course can fit two sub-populations. It is not only the less well off who plan to move out of a town, but also those successful, having possibly multiple cars within the family that make distances manageable. They might express attitudes that seem similar to that of less fortunate. The two types of strategies suggest a mainly urban and rural type of lifestyle. To check this intuition, Table 6 on the facing page gives averages of the two factor scores for those moved after 1989 by types of settlements. Rows indicate type for sending, columns for receiving settlements.

Table 7: Factor scores by year of relocation

	“aggressive”	**“defensive”**
90	0.12	**0.01**
91	-0.05	**0.11**
92	0.13	**-0.07**
93	-0.10	**0.10**
94	0.00	**0.08**
95	-0.13	**0.16**
96	-0.13	**0.20**
97	0.02	**0.19**

Source: Own calculations from the Regional Development Survey of Szonda Ipsos.

There is a clear picture emerging from the combinations of the two factors. Moving upwards in the settlement hierarchy almost always goes together with a greater “aggressive” motivation on average and the least “defensive” whereas moving downwards is characterised by the opposite pattern. As aggregate trend showed decreasing flow of workers from villages to towns but an increase in the other direction, we can conjecture that motivations change as well over time with the composition of movers. The actual figures are shown in Table 7 as the averages of both scores by the year of moving house. There

is no trend in the first, "aggressive" factor although it takes mostly negative values in the second half of the decade. The second "defensive" on the other hand shows an increase over time that starts from 1994 and is in line with what we found so far.

3.2 A simple theoretical model

The previous subsection showed that there are several reasons to migrate beside the improvement of labour market conditions. Many of these are non-economic, although if we consider a broader context, drawing a dividing line between is not always easy. Nevertheless, we have seen that labour market opportunities play an important role. In what follows I use a simple, widely used model to formalise this motivation.

Agents relocate to a new place of living if the total expected discounted benefits from the move are greater than the costs incurred. Benefits are most commonly understood as the gains from greater probability of finding a job or higher wages when the job is found. Costs include direct and indirect costs of moving, including transportation of possessed items, giving up and finding a property to live in and the loss of social network. Depending on whether they are amenities or disamenities, features of places of living might contribute to the benefit or the cost side. The decision is captured by the index function

$$m_{i,j,k} = \mathrm{I}\left(U(w_{i,k}, u_{i,k}, A_{i,k}, \epsilon_{i,k}), \mathrm{E}\left[U\left(\mathrm{E}[w_{j,k}], u_{j,k}, A_{j,k}, \epsilon_{i,k}\right)\right], C_{i,j,k}\right).$$

The variable $m_{i,j,k}$ takes the value 1 if person k moves from i to j. Living in i yields utility[12] $U(w_{i,k}, u_{i,k}, A_{i,k}, \epsilon_{i,k})$ while living in j gives expected utility $\mathrm{E}\left[U(\mathrm{E}[w_{j,k}], u_{j,k}, A_{j,k}, C_{i,j,k}, \epsilon_{i,k})\right]$, with $C_{i,j,k}$ being the cost of migration. The sources of utility are realised and expected wages ($w_{i,k}$ and $\mathrm{E}[w_{j,k}]$) and employment opportunities ($u_{i,k}$, $u_{i,k}$) in the current and terminal place, along with amenities that the area can offer ($A_{j,k}$, $A_{j,k}$). Individual heterogeneity enters through the stochastic terms, $\epsilon_{i,k}$ and $\epsilon_{j,k}$, whose expected contribution to the index is zero. Costs ($C_{i,j,k}$) include actual costs of moving house, but also losses coming from leaving a social network or prompting a spouse to move with possibly no personal reason or even a disutility resulting from moving.[13] This framework can be used to define estimating equations at the individual and aggregate level.

[12] This is actually a mixture of an indirect (wages are arguments) and a direct (amenities are arguments) utility function.

[13] This is the extent the simple model accommodate the fact that in many cases not individuals, but households move.

Assuming separability of utilities and the cost element, and denoting utilities in a concise way, the individual probability of moving from $\bar{i}$ to $\bar{j}$ is

$$\Pr\left[m_{\bar{i},\bar{j},k}=1|\bar{j}=\bar{j}^*\right]=\Pr\left[\mathrm{E}\left[U(\bar{j},k)\right]-C_{\bar{i},\bar{j},k}\geq U(\bar{i},k)|\bar{j}=\bar{j}^*\right],$$

where $\{\bar{j}=\bar{j}^*\}$ is equivalent to $\{\mathrm{E}\left[U(\bar{j},k)\right]\geq \mathrm{E}\left[U(j,k)\right]\forall j\in J\}$. Note that the mobility decision is conditional on residence in $\bar{i}$ and on the characteristics, therefore the choice of $\bar{j}$. The decision is therefore understood in two stages. In the first, the agent considers all possible new places of living and selects the best among them. In the second, a decision is made about moving to the selected place, $\bar{j}$, or not.

A possible empirical specification[14] is to suppose full linearity on the left-hand side and write

$$\begin{aligned}\Pr[m_{\bar{i},\bar{j},k}=1|\bar{j}=\bar{j}^*]=\Pr\big(&\alpha+\beta_1 w_{\bar{i},k}+\beta_2\,\mathrm{E}[w_{\bar{j},k}]+\gamma_1 u_{\bar{i},k}+\gamma_2\,\mathrm{E}[u_{\bar{j},k}]\\&+\delta_1 A_{\bar{i},k}+\delta_2\,\mathrm{E}[A_{\bar{j},k}]+\eta Z_k\geq\epsilon_{\bar{i},k}+\epsilon_{\bar{j},k}\big),\quad(1)\end{aligned}$$

with $\mathrm{E}(X\epsilon)=0$, where X denote the full matrix of regressors and ϵ the sum of the two disturbances.

Beside the labour market indicators a new term appears in equation (1), Z_k, the set of individual characteristics that influence the migration decision. These can be connected to the utility term, characterising preference heterogeneity that manifests in observables and represents costs elements, such as loss of social networks and familiar surrounding. Differences in labour market possibilities might arise because of temporary imbalances, but might by compensated by local (dis-) amenities, included in $\mathrm{E}[A_{\bar{j},k}]$. Since these are plentiful and picking the "right one" might be impossible, we would like to model them as some variety of fixed effects.

Our interest focuses on the β and γ parameters. If the model used is correct, β_2 and γ_1 are expected to be positive, while β_1 and γ_2 negative. If only differences matter, the β and γ pairs should not be different in expected value. Beside these expectations, we need to keep attention to the facts learned from the stylised facts characterising Hungary. Since counter-urbanisation is becoming increasingly important and agglomerations do not offer especially favourable labour market conditions, we are likely to lose the effect of incentives

[14] We could "derive" this result from a linear specification of utilities and building the estimating equation from that, as it is often done in the analysis of participation decision. Although does not make any practical difference, it is much less restrictive to impose linearity as an *approximation* to the index function than to suppose it as a feature of the utilities.

in the estimation phase through averaging individual-specific responses. Parameter estimates therefore might be dampened by effects working towards the opposite direction.

Often data is not available for individuals, but only on a more aggregated level as number of migrants from one settlement/region to the other. If one has data on the whole population, then aggregating the decision rule among all migrants moving from $\bar{i}$ to $\bar{j}$, the left-hand side yields the probability of a transition conditional on the data. A linear parameterisation of this aggregate relationship with the migration probability from $\bar{i}$ to j is

$$\Pr[m_{\bar{i},\bar{j},k} = 1] = \tilde{\alpha} + \tilde{\beta}_1 \,\mathrm{E}[w_{\bar{i}}] + \tilde{\beta}_2 \,\mathrm{E}[w_j] + \tilde{\gamma}_1 \,\mathrm{E}[u_{\bar{i}}] + \tilde{\gamma}_2 \,\mathrm{E}[u_j] + \tilde{\delta}_1 \,\mathrm{E}[A_{\bar{i}}] + \tilde{\delta}_2 \,\mathrm{E}[A_j] + \nu_{\bar{i},j},$$

with $\mathrm{E}(X\nu) = 0$, where X denote the full matrix of regressors and ν the vector of disturbances.

A variant of this formulation is probably the most widely used one for studying migration (see Fidrmuc and Huber (2002) for a Central European example). Note that this specification is different from the individual one in many respects. After aggregation only the expected values of a given settlement's characteristics enter the equation, both in the sending and in the receiving settlement. As we did not get the equation from direct aggregation of the individual rule, including expected individual characteristics is an option, although not shown here.

Although the structure of the equation is similar to the individual one, the parameters do not correspond to the same theoretical responses unless the individual equation is of a linear probability type too, and the specification is the same — a tilde on the respective parameters indicate this distinction. The notation $\bar{j}$ is replaced with j to reflect that on the settlement level it *is* meaningful to have nonzero probability towards many destinations. Although the individual equation is informative only about the probability of leaving a settlement, aggregation brought back the information on probabilities of a transition between a pairs of settlements, given the starting point $\bar{i}$.

In some other cases, information on between-settlement flows is not available, only on out- and inflow totals. With a further aggregation of the previous equation, adding up all js that receive people from i, we obtain the overall

probability of moving out from a given settlement as

$$\begin{aligned}\Pr[M_{\bar{i},j}=1] = \breve{\alpha} + \breve{\beta}_1 \,\mathrm{E}[w_{\bar{i}}] + \breve{\gamma}_1 \,\mathrm{E}[u_{\bar{i}}] + \breve{\delta}_1 \,\mathrm{E}[A_{\bar{i}}] \\ + \breve{\beta}_2 \,\mathrm{E}[w|\,\Pr(M_{\bar{i},j}=1)\neq 0] + \breve{\gamma}_2 \,\mathrm{E}[e|\,\Pr(M_{\bar{i},j}=1)\neq 0] \\ + \breve{\delta}_2 \,\mathrm{E}[A|\,\Pr(M_{\bar{i},j}=1)\neq 0] + \breve{\nu}_{\bar{i},j}. \quad (2)\end{aligned}$$

In this case, aggregation affected the characteristics of the receiving settlements as well, resulting only the inclusion of the expectation of their overall characteristics, conditional on the fact that they receive migrants from region i at all.

4 Evidence from aggregate data

I first estimate the conditional probability of outmigration from a given settlement conditional on the realised destinations. The dependent variable is this probability without scaling, ie. 0.04 means that 4 percent of the population has left the small region. The estimating equation ($2*$) is a variant of equation (2).

$$\Pr[M_{\bar{i},j}=1]_t = \breve{\alpha} + \breve{\beta}_1 \widehat{\mathrm{E}[w_{\bar{i}}]}_t + \breve{\gamma}_1 \widehat{\mathrm{E}[u_{\bar{i}}]}_t + D_l^1 + D_t^2 + D_l^1 D_t^2 + \breve{\nu}_{\bar{i},j}. \quad (2*)$$

Local unemployment rate[15] and average wage[16] enters the equation. Unemployment rate is not scaled, so 0.1 represents a 10 percent unemployment rate. Earnings are measured in thousand forints at 1992 prices.[17]

Noting that aggregate data suggests the important role of a settlement's status and geographic location, I include indicators for the settlement type, county, year and interaction for all of the pairs of these. Beside amenities

[15] As the Data Appendix A.4 on page 42 explains, I have two measures for unemployment rate, but the results are fairly robust to replacing one with the other. The one used to generate the presented results is based on the population in "active-age".

[16] One could argue that average wages are not the appropriate measure here, since the reflect the composition of workers. For a newly arrived employee, it might be more appropriate to use a wage measure that is cleaned from this effect. Using simple Mincer-type earnings equations with indicators for small regions, I have estimated the following models using the indicators instead of means of earnings. Since results did not change, I decided against this procedure.

[17] Ideally wages should be deflated by region-specific price-indices, which are not available in Hungary. Casual observation suggests however that with the appearance of large-scale retail outlets the between-region price variation of commodities might be relatively small compared to that *within* a region. Price data for services, especially housing, on the other hand are very sparse or nonexistent.

and common macroeconomic shocks, these indicators are supposed to represent four more factors. One is the average of relevant individual characteristics of the sending settlements ($\mathrm{E}[A_{\bar{i}}]$) and those of the receiving partners ($\mathrm{E}[A|\Pr(M_{\bar{i},j}=1)\neq 0]$ with wages $\mathrm{E}[w|\Pr(M_{\bar{i},j}=1)\neq 0]$ and employment possiblilities $\mathrm{E}[e|\Pr(M_{\bar{i},j}=1)\neq 0]$). The second is the changing structure of labour demand factors, such as the relocation of the manufacturing industries during the decade. The third is the important infrastructural development of settlements, especially villages. The fourth is changes in the housing market.[18]

A question that might intrigue some is the joint inclusion of unemployment and wages. The strength of the wage curve in Hungary is well-documented in Kertesi and Köllő (1998) and this might be worrying from an identification point of view. In the case of perfect correlation it is of course not possible to estimate the parameters and even in a weaker case, the estimated standard errors are "inflated". Nevertheless, including both is a theoretical necessity. If we include only one, unemployment rate for example treating it effectively as a sufficient statistics for labour market conditions, we would confound the two effects it carries. The estimate obtained this way would be biased downwards if earnings has the theoretically predicted effect. With including both, high unemployment measures purely the poor chances of getting a job, without its depressing effect on wages.

There were two factors influencing the choice of the unit of analysis. One of them is the characteristics of the underlying process, namely that the prevalent counter-urbanisation generates population flows within relatively short ranges. Since we do not know to which destination someone moving out of a settlement heads, choosing a unit of observation that is at least as big as the above range, we risk to register considerable outflow even if there is none. This suggest taking settlements as the unit of observation. The other factor is the availability of data. Although we have unemployment figures at that level, wage data on the level of settlements are nonexistent. For most of the micro-regions (NUTS 4 level) however, one can produce estimates of average wages with or without composition effects. This suggests choosing micro-regions over settlements. Based on the stylised facts of mobility, I believe choosing a larger unit introduces more substantial problems than a smaller one, therefore I choose settlements. With this, a measurement error in earnings is introduced that is expected to artificially drive the parameter on wages towards zero.

To check for this possibility, first I estimated a fixed-effects model. A

[18] Being theoretically observable, these last three factors should ideally included as regressors. Unfortunately in practice they are either not observed or not accessible.

Hausman specification test indicates that after including the extensive set of indicators, the randomness of the individual effects can not be rejected. For this reason, I revert to a random-effect model and keep it throughout the analysis.[19] This reduction increases efficiency and is also useful to motivate later specifications.

The first column of Table 8 gives estimates for the entire period between 1992 and 1999. The parameters have the expected sign, but that of earnings is significant only at the 10 percent level. The model explains a modest but significant variation of the data. One has to note however that after including all the binary indicators, the marginal contribution of the two central variables is limited.

Table 8: Aggregate estimates of mobility probabilities (outmovers as shares of population)

	1992-1999	1992-1995	1996-1999
Unemployment rate	0.0889^{**}	0.1115^{**}	0.1048^{**}
	(17.33)	(16.83)	(15.39)
Average earnings	-0.0001^{*}	-0.0002^{**}	0.0001
	(-1.79)	(-2.05)	(0.93)
"R^2"	0.14	0.18	0.11
N	$21,485$	$9,209$	$12,276$

Data: TSTAR database.
FGLS estimates of a random-effects model with 3070 groups. In all models indicators are included for every settlement type, county, year and the paired interaction of these effects with appropriate omissions.
Heteroskedasticity robust asymptotic "t" statistics are in parentheses to the right of parameters.

In the above estimates I have pooled all observations over the whole decade. However, aggregate data showed evidence for a change in the migration process which might result from a change in the role of the drivers themselves. To investigate this possibility, I re-estimated the model splitting the sample at 1995, the turning point in mobility rate. The results are shown in the second and third column of Table 8. Estimates for the first period are close to those obtained from the pooled sample with both key variables being significant, but the wage parameter in the second is small and insignificant and the effect of unemployment has decreased somewhat. Although the direct connection is not apparent, this change does not contradict to the aggregate mobility processes.

[19] The conclusions of the Hausman test hold also for later specifications.

Despite the statistical significance of the variables, their economic significance is mixed. A one percent increase in unemployment rate induces around 0.1% increase in outmigration probability, thus one percentage *point* gives a change of 0.001, a small, but meaningful amount, given the spread of the variables (see Table 15 on page 40 in Appendix B). Considering that unemployment rates vary between 2 and 25 percent in any single year, moving from the worst to the best place in this respect predicts 2.5 percentage point change in outmigration rate. Given a range of 5 percentage points, this is not much but plausible. The effect of earnings is somewhat weaker. A thousand Forint increase in the average earnings generates a 1 *pro mille* change. Crossing the range of average earnings from about 12 to 30 thousand Forints brings a change of 0.18 percent in outmigration probability.

5 Evidence from individual-level data

Aggregate data can dampen measurement error quite substantially and being drawn from administrative sources, it is comprehensive. Individual-level observations however allow us to look at the migration process closer and allow specifications that may be more plausible than those used at the aggregate level. As a further benefit, we can inspect and control the composition of the population at hand to understand and control estimates.

The individual analysis is based on the Regional Development Survey (RDS) of the market research company Szonda Ipsos and the 1996 Microcensus (MC) of the Hungarian Central Statistics Office. Both of these data sources allow us to investigate migration at the individual level but from different angles. Detailed information on the data sets is given in Data Appendix A.2 on page 41 and 41.

5.1 Geographic patterns of mobility

We have already seen in Section 2 that both the geographic patterns of mobility and their changes are quite characteristic. Using individual data to obtain the same information and its derivatives has a double use. Firstly we can ascertain that the behaviour of the population in the individual data is similar to the aggregate, so there are no large-scale sampling problems biasing the results. Secondly, its decomposability helps to understand temporal changes in the patterns of mobility and differences in the behaviour of typical groups of people.

First I use the RDS to look at flows between different types of settlements. Among all persons in the RDS who changed place of living, 2830 did so after 1986, 1994 after 1989 and 136 in 1997. These two recent changes are of greatest interest to us. Table 9 on the following page shows the transitions between types of settlements in three consecutive decades: 90s, 80s and 70s. Rows represent the type of previous, columns that of the current settlement. The tendencies are in line with what we see at the aggregate level and hallmarked by a reverse of rural to urban mobility. Whereas in the 70s and the 80s both the capital and county centres show a positive and villages a negative balance, this reverses by the 1990s. Despite the possible sample selection issues (see Appendix A.3 on page 41), the implied flows replicate the aggregate ones quite well.

It is notable that an almost constant one fifth of the relevant population move horizontally between villages, a phenomenon largely due to the formation of families. The small size of settlements itself makes it more probable that people work or go about some other business outside its boundaries. Seeking partners from a relatively large pool of persons requires this, matching couples more often from outside the settlement than in the case of a larger place such as a town.

Up to this point, people who change their address temporarily or permanently were treated together, since neither the settlement-level TSTAR nor the RDS makes it possible to tell them apart.[20] This however might lead to mixing two characteristically different population. An interesting piece of evidence on the possible differences between the composition of permanent and temporary is shown by aggregate data on the seasonality of temporary mobility (see page 328 in Hungarian Central Statistical Office (1998) for example). After long periods with equally distributed load, monthly mobility figures peak in September, when students take their places in dormitories if studying far from home. In the case of towns but the capital this increases the number of mobile persons up to five times of its usual level (at around 25 thousand people) and also in the case of villages the comparable factor reaches four. As a result, September alone represents more than one fifth of the total mobility flow.

In the MC, we can separate the two types of mobility. A total of 10,585 persons in our sample, amounting to 5.46 percent of the total population have changed the settlement of living from 1990 to 1996, of which 2536 people (1.3

[20] Although these definitions are based purely on official categories, they convey relevant information. Beside the legal obligation to report a place of living, certain benefits from municipalities are tied to being registered as a permanent resident in a place, such as certain medical services or living subsidies.

Table 9: Distribution of mobility flows by settlement types by time of last move (RDS, percent).

Previous residence	Residence in 1997				
	Budapest	County c.	Towns	Villages	Together
1970s					
Budapest	0	1	3	2	7
County centre	1	1	2	2	7
Towns	4	6	5	7	22
Villages	4	15	21	23	64
Together	9	24	32	35	100
1980s					
Budapest	0	1	3	3	7
County centre	2	2	3	6	14
Towns	4	6	6	10	26
Villages	3	11	18	21	53
Together	9	20	30	40	100
1990s					
Budapest	0	1	4	7	13
County centre	2	3	3	9	17
Town	4	5	5	10	24
Village	4	8	13	22	46
Together	9	17	25	48	100

Source: Own calculations from the Regional Development Survey of Szonda Ipsos. Percentages might not add up due to rounding.

percent) changed only temporary and 8,186 people (4.23 percent) permanent address too. Given that these figures are cumulated in the MC over six years through an unknown process, it is hard to judge the representativeness of the data (for details on the data see Appendix A.2 on page 41). The nature of the selection however suggests that the proportion of temporary relocations among all is below the population number of 50 percent.

Although with different actual numbers, flows between types of settlements show similar patterns as experienced in the RDS. There is a well-defined "path" to small towns and villages, producing an overall loss of Budapest and county centres. Just as the negative position of large places, one-fifth of the flow between villages appears too.

Temporary flows on the other hand show a very different picture in every respect. In their case Budapest and county centres have a *positive* balance,

Table 10: Distribution of mobility flows by settlement types by nature of move (MC, percents).

Previous residence	Residence in 1996				
	Budapest	County c.	Towns	Villages	Together
Permanent					
Budapest	1	1	5	6	12
County centres	2	3	4	10	19
Towns	3	5	6	11	25
Villages	4	9	11	20	44
Together	9	18	25	47	100
Temporary					
Budapest		3	7	8	19
County centres	5	4	4	6	19
Towns	8	9	5	6	28
Villages	8	10	8	8	34
Together	21	26	24	28	100

Source: Own calculations from the 1996 Microcensus. Percentages might not add up due to rounding.

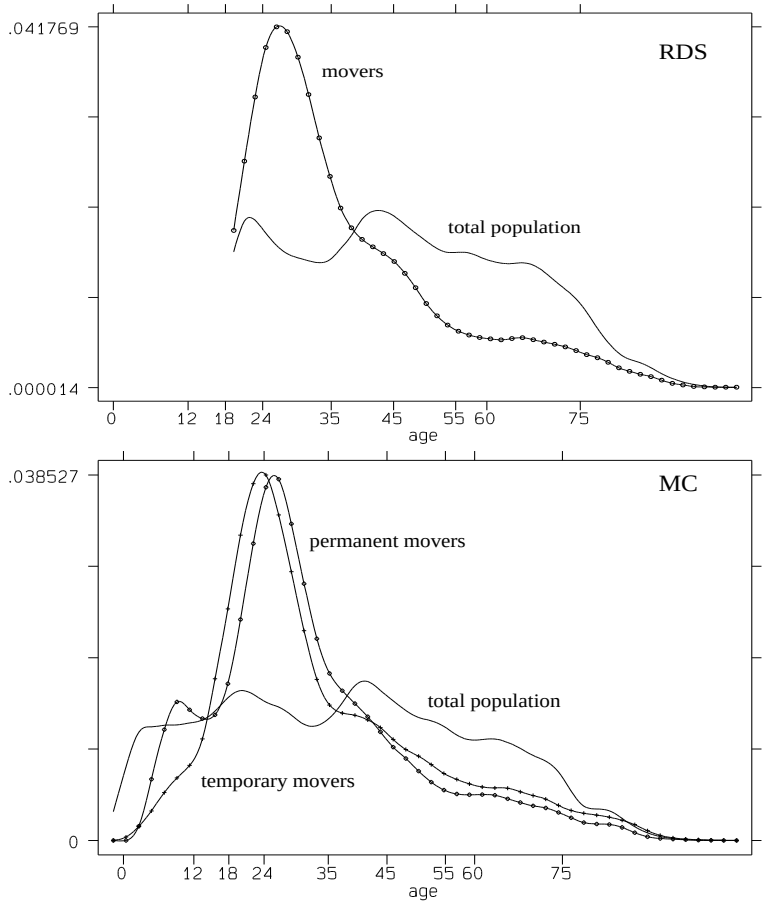
where small towns and villages have a net loss of population through this channel. Rather than following the distribution of permanent ones, temporarily mobile people head towards different settlement types with equal probability. Finally, the characteristic horizontal movement between villages is absent in this case.

5.2 Individual characteristics

Aggregate trends, spatial distribution, individual motivations and the different behaviour of temporary and permanent migrants outline a structure that is characterised by considerable heterogeneity. Without aiming to model this, it is important to understand its nature so that erroneous inference can be avoided. To strengthen our intuition about peculiar individual motivations, such as schooling, marriage or suburban relocation, I turn now to the descriptive analysis of individual characteristics.

Ideally, we would like to use exogenous characteristics or preferences to analyse mobility behaviour but as the data available is retrospective, these are rare. In fact the only ones are age, gender, and – after constraining age and supposing no schooling after that – education. In addition, I include status

Figure 2: Age distributions of mobile and non-mobile people (label refers to closest curve)



Source: RDS and the MC. Kernel density estimates smoothed over with cubic splines.

within the family as it sheds light on motivations that are above the individual level. Both the RDS and the MC are used for this purpose.

Whatever is the reason for mobility, it is certainly an undertaking that

Table 11: Schooling of the mobile population (percents)

	MC			RDS	
	non-mobile	permanent	temporary	non-mobile	mobile
Less than	2	2	1	3	2
Primary	23	22	13	22	22
Vocational	35	31	22	34	33
Secondary	31	28	43	32	28
Higher	9	16	21	10	15
Together	100	100	100	100	100

Source: Own calculation from the RDS and the MC.

brings a great deal of uncertainty. As moving house is a free decision, the relevant population is probably fit or feels fit enough for this undertaking. Figure 2 on the preceding page depicts density estimates of ages for people who did and who did not change their address. The top panel shows calculations obtained from the RDS, the bottom one that from the MC, separating temporary and permanent movers. The first fact is that the distributions for the non-mobile are very close and so are that of the mobile from the RDS and the permanent movers from the MC. Contrasting the non-mobile population, the mode for the mobile is unique at around 28 years, tails descending rapidly towards both directions. The MC reveals a hump at younger ages, hinting at mobility of relatively young families with small children. Temporary movers are again different as their mode is at a lower, 24 years of age level and exclude very young children.

We can compare the schooling of mobile and non-mobile in the 18-40 age bracket where the majority of mobile people are to be found. Table 11 reveals that data from both the MC and the RDS agree on that although still a relative minority, the proportion of graduates from higher education is about 50 percent higher among the mobile than among the non-mobile.[21] Temporary movers are different in this respect, too, since the proportion of graduates of higher and even to a greater extent from secondary education is remarkably high. Together with the seasonality of temporary movers, this corroborates the hypothesis about temporary movers being largely students or those very recently graduated.

The distribution of current labour market status in Table 12 reinforces pre-

[21] This difference remains even if we take only those into account older than 24.

Table 12: Economic activity of the mobile population (percents)

	MC			RDS	
	non-mob.	perm.	temp.	non-mob.	mob.
			men		
Working	68	76	70	67	76
Unemployed	13	13	9	14	14
Maternity leave	0	0	0	0	1
Pensioner	3	2	1	3	2
Full-time student	6	3	15	10	5
Other	9	6	5	5	3
Together	100	100	100	100	100
			women		
Working	54	43	50	52	40
Unemployed	8	6	5	10	10
Maternity leave	18	34	15	20	39
Pensioner	3	2	2	2	3
Full-time student	6	3	19	10	4
Other	11	11	9	7	5
Together	100	100	100	100	100

Source: Own calculation from the RDS and the MC.

vious findings. As gender roles can easily lead to increased specialisation, I describe men and women separately. Young men who move permanently appear to be more active (a 10% point advantage) than others and less likely to be full-time students. Those moving temporarily on the other hand are less likely to be unemployed but much more to be full-time students than those not moving at all: as opposed to 6 percent in the reference group, 15 percent of them falls into this category.

Women are considerably likely to stay at home with children than to work if changing home permanently. We might suppose thus that in many cases mobility is endogenous to fertility, either through stricter budget constraints or the desire to seek a more pleasant surrounding, a bigger home to raise children. The case of temporary movers shows that the great proportion of students is not gender-specific.

The "family building" and study hypotheses are strengthened if we look at the family status of movers. While the great majority, 70% of permanent movers is married, the same figure for temporary ones is only 34%. Among the latter however we find twice as many people cohabiting (20% versus 10%) and five times more singles (25% percent versus 5%).

5.3 Estimating individual mobility probabilities

To complement and check aggregate findings, I estimate mobility probabilities at the individual level. I use the MC for this purpose as, although giving a host of individual-specific information, the RDS does not provide us with the identity of the sending settlement and would allow only coarse categories to be created. After some experiments and also for the sake of comparability, I decided that in spite of the already described measurement-error issue in wages, the chosen geographic unit of analysis is again chosen to be settlements. The sample size is originally 183,589 with 10,127 people changing address.[22] To focus on the economically most active population, the sample was first restricted to those between 18 and 60 years of age in 1996, giving a total of 111,205 and there are 7,445 mobile persons in total, of which 5,699 are permanent and 1835 are temporary movers.

The actual specification I use is based on equation (1)

$$\Pr[m_{\bar{i},\bar{j},k}=1] = \Pr\left(\alpha + \beta_1 \,\mathrm{E}[w_{\bar{i},k}] + \beta_2 \,\mathrm{E}[w_{\bar{j},k}] + \gamma_1 \,\mathrm{E}[u_{\bar{i},k}] + \gamma_2 \,\mathrm{E}[u_{\bar{j},k}] + \eta Z_k + \bar{D}_i + \bar{D}_j + \geq \epsilon_{\bar{i},k} + \epsilon_{\bar{j},k}\right). \quad (1*)$$

The outcome variable is an indicator that takes the value 1 if the place of living coincided in 1990 and 1996 and zero otherwise. On the right-hand side, three sets of regressors are included. One refers to settlements, and is an estimate in the case of wages only, otherwise data come from administrative records. Variables for both receiving and sending regions are included — marked with *1990* and *1996*, respectively — to avoid artificially constraining parameters. We have seen that using average wage of the sending region was appropriate in the aggregate framework, but is no longer so in the individual case. That I nevertheless use it is a constraint of available data, not a theoretical consideration.[23]

[22] Those not born in 1990 yet are excluded from the sample all together.

[23] We have therefore two measurement errors in wages. The first comes from approximating settlement-level wages with wages of micro-regions and the second from approximating individual wages with expected wages.

The second set of regressors are individual characteristics. Based on descriptive results, these are indicators of age and schooling. Knowing the exact time of the move and personal characteristics *at that time* would allow for a richer specification. Ex-post demographic characteristics however are likely to be endogenous and are thus excluded.[24] Finally the third set of variables are indicators for counties and types of settlements crossed and also as main effects. These are included to control for amenities and other fixed effects, just as in the case of the aggregate model. As we do not observe the exact times of moving house, indicators for time-effects are missing.[25]

The estimates for this and further specifications are shown in Table 13 on the facing page. For clarity and easier comparison to previous results, the table does not show the probit parameters, but impacts of a unit change in variables on mobility propensity. The underlying parameters for all models are provided in a similar fashion in Table 17 of Appendix B on page 43.

Results for people in the potentially active age band are shown in the upper half of table 17 on page 45, the first column referring to all of them. The estimated sensitivities of the mobility decision has the signs we expect. Increasing unemployment in the sending and decreasing in the receiving region encourages mobility. The magnitudes in the parameter pairs are very different, but we can reject their equality at all conventional significance level. Although estimates for earnings take the expected sign as well, the parameter on the sending region is not significant and its point estimate is much smaller compared to that of the receiving one, indicating the presence of the measurement error. The effect of schooling and age is the same that we have seen in Table 11 on page 29 and in Figure 2 on page 28. People with college degree are much more likely to move than others, with the propensity decreasing monotonically towards less education. Advances in age decreases mobility propensity increasingly.

Having seen the differences between temporary and permanent movers, I re-estimated the equation for both subsets. In the case of permanent movers, the qualitative results are similar to the overall ones, although the actual estimates are lower. The major difference is that those with secondary education and in the second age-bracket are not significantly different from those in the

[24] This and the problem of unobserved heterogeneity can be treated if individual panel data is available, such as in Böheim and Taylor (1999).

[25] Also note that although we have data on both the sending and the receiving region, the estimation still refers to the second stage of the decision process. Estimating the probability of mobility, it is not possible to include variables that vary only trivially among movers and non-movers. A prime example of this is the distance between the sending and receiving region, a popular and important variable in gravity models.

Table 13: Estimates of impacts on individual mobility probability without restrictions

	All		Permanent		Temporary	
			$18 \leq age \leq 60$			
Unemp. rate *1990*	0.2466^{**}	(3.18)	0.1374^{*}	(2.14)	0.0728	(2.46)
Unemp. rate *1996*	-0.3208^{**}	(-3.96)	-0.1753^{**}	(-2.64)	-0.1262	(-3.54)
Avrg. earnings *1990*	-0.0017	(-1.13)	-0.0014	(-0.73)	-0.0003	(-0.56)
Avrg. earnings *1996*	0.0057^{**}	(3.78)	0.0044^{**}	(3.23)	0.0007	(1.17)
Compl. pri. school	0.0068	(1.45)	0.0022	(0.61)	0.0061	(2.18)
Vocat. sec. school	0.0071	(1.48)	0.0026	(0.73)	0.0077	(2.64)
Secondary school	0.0250^{**}	(4.99)	0.0094^{*}	(2.42)	0.0183	(5.53)
College	0.0781^{**}	(11.89)	0.0464^{**}	(8.94)	0.0372	(7.72)
Age: 25-39	-0.0067^{**}	(-3.53)	0.0012	(0.74)	-0.0061	(-8.19)
Age: 40-60	-0.0680^{**}	(-32.35)	-0.0480^{**}	(-26.21)	-0.0148	(-17.05)
Pseudo R^2	0.08		0.08		0.13	
			$30 \leq age \leq 60$			
Unemp. rate *1990*	0.2277^{**}	(2.57)	0.1528^{**}	(2.12)	0.0607^{*}	(1.93)
Unemp. rate *1996*	-0.2756^{**}	(-3.05)	-0.1713^{**}	(-2.32)	-0.0959^{**}	(-2.87)
Avrg. earnings *1990*	0.0006	(0.39)	0.0003	(0.46)	-0.0001	(-0.17)
Avrg. earnings *1996*	0.0025	(1.54)	0.0022	(1.42)	0.0003	(0.44)
Compl. pri. school	-0.0015	(-0.42)	-0.0037	(-1.21)	0.0043^{*}	(2.04)
Vocat. sec. school	0.0015	(0.38)	-0.0023	(-0.71)	0.0080^{**}	(3.13)
Secondary school	0.0103^{**}	(2.51)	0.0037	(1.17)	0.0103^{**}	(4.05)
College	0.0355^{**}	(6.99)	0.0193^{**}	(4.85)	0.0217^{**}	(6.11)
Age: 40-60	-0.0396^{**}	(0.94)	-0.0278^{**}	(6.41)	-0.0029^{**}	(-4.21)
Pseudo R^2	0.08		0.08		0.11	

Data: 1996 Microcensus. Heteroskedasticity robust asymptotic "t" statistics in parentheses. $**$ indicates significant difference from zero at least 1%, $*$ at least at 5% level, while no stars indicate other, higher levels. The impact of the variables are evaluated at the their mean. In the case of binary indicators, the impact corresponds to a discrete change, not to the derivative proper. The hypothesis that the regressors jointly have explanatory power is rejected in all cases at all significance levels.

baseline group. In the case of temporary movers, the role of employment possibilities are even less important, but wages both on the sending and receiving end have turned insignificant. Every level of schooling monotonically increases the probability of mobility and still university degree has the greatest effect.

As in the case of aggregate, it is worth looking at the economic significance of the estimates. Although the estimates in Table 13 on the page before do not show the average effect of the regressors, but their effect at the *average* of the variables, they are comparable to the aggregate results. They offer a similar qualitative conclusions, and the magnitude of the estimates are not very different. The largest estimates in Table 8 is one third of the largest estimate here and is similar to the smallest, obtained for temporary movers.

Jumping from the luckiest settlement to the most disadvantaged, our indicators predict much greater changes than before. A 20 percentage point increase of unemployment rate brings about a 5 percentage point change in mobility probabilities which is equal to about the range of aggregate mobility rates. Almost the same applies to earnings. A less extreme change of ten thousand Forints in the expected earnings at the receiving settlement causes a change in mobility rate of about 6 percentage points. The real differences are of course much smaller than these values and what matters is the difference between the sending and receiving regions. Nevertheless, these parameters can plausibly generate the heterogeneity observed in the data.

Given that the schooling system mostly follows the hierarchical structure of settlements, the higher education one wants to take, the greater are the chances that a change of the place of living is necessary. Not taking this explicitly into account, we might confuse schooling with a mobility decision and conclude mistakenly that those entering or in higher education are more likely to move house. To control for this effect, I restricted the sample further. Taking people aged at least 24 *in 1990* probably excludes almost everyone who moved in connection with studies. After tightening the age limits, the sample size is 77,532 with 2657 permanent and 755 temporary movers. The results for this sample are shown in the lower part of Table 13. Although there are numeric differences, the signs and magnitudes of most estimates remain constant and the qualitative results are unchanged.[26]

Up to this point I gathered evidences supporting the idea that differences

[26] I experimented with a restricted sample to estimate the above equations for migrants only, crossing the boundaries of counties. Unfortunately after including only those who moved across regions, the sample size did not allow the identification of parameters with any acceptable precision.

Table 14: Estimates of impacts on individual mobility probabilities (full sample with restrictions place of work)

	No back-commuting		Back-commuting	
Unemp. rate *1990*	0.2410^{**}	(3.30)	-0.1563^{**}	(-3.01)
Unemp. rate *1996*	-0.2845^{**}	(-3.66)	0.1282^{**}	(2.65)
Avrg. earnings *1990*	0.0001	(0.10)	-0.0003	(-0.50)
Avrg. earnings *1996*	0.0030^{*}	(2.02)	0.0004	(0.77)
Compl. pri. school	0.0028	(0.65)	0.0108^{**}	(3.31)
Vocat. sec. school	0.0005	(0.12)	0.0152^{**}	(3.76)
Secondary school	0.0160^{**}	(3.50)	0.0172^{**}	(4.12)
College	0.0637^{**}	(10.58)	0.0378^{**}	(4.82)
Age: 25-39	-0.0089^{**}	(-5.06)	0.0014^{**}	(3.15)
Age: 40-60	-0.0653^{**}	(-32.75)	-0.0009^{*}	(-2.15)
Pseudo R^2	0.09		0.49	

Data: 1996 Microcensus. Heteroskedasticity robust asymptotic "t" statistics in parentheses. $**$ indicates significant difference from zero at least 1%, $*$ at least at 5% level, while no stars indicate other, higher levels. The impact of the variables are evaluated at the their mean. In the case of binary indicators, the impact corresponds to a discrete change, not to the derivative proper. The hypothesis that the regressors jointly have explanatory power is rejected in all cases at all significance levels.

in labour market opportunities do influence the decision about mobility. Although the individual-level data do not extend beyond 1997, we have seen that suburbanisation was a strong phenomenon already before that time. In some cases suburbs can be economically developed, but as they are mostly residential areas with only minimal local business, this usually is not the case.

If a substantial proportion of people moving to suburbs rely on their previous place of living and suburbs offer labour market opportunities inferior to that of centres, labour market possibilities alone are expected to have a perverse effect. Since we know the place of living as well as that of work (if any) for every individual, we can identify people who commute back to their previous place of living. Table 14 gives estimates firstly for movers without this subgroup leaving 9,318, and secondly for them alone, with only 809 "mobile" persons.

Results from the split sample is in line with our previous findings about the effect of suburbanisation. While it is not possible to precisely identify responses to earnings differences, parameter estimates on unemployment rates

are relatively precise and interesting. Those for people working in a place *different* from their previous residence, unemployment shows effects quite similar to that in the case of the pooled estimates. Those for the other group however starkly contrast this result. The parameter of unemployment rate for both regions are significant, and have a "wrong" sign. Earnings in the sending region stays insignificant, and that in the receiving region not only loses significance, but is almost indifferent from zero.

6 Conclusions

In this paper I looked at mobility and migration in Hungary between 1990 and 1999 at several levels. Using aggregate as well as individual data, the structure and large-scale trend of mobility was described, the relevant population characterised and a simple behavioural model estimated to show and evaluate the effects of economic incentives.

Mobility in Hungary is among the least frequent in Europe, both compared to the EU or other Central and East European countries. In terms of migration (long-range mobility) however the country is more comparable to the European experience. A puzzling fact at first sight is that although labour market inequalities increased after the start of real economic growth in 1995, the trend of mobility followed them only through a brief period, flattening down by the end of the decade. Aggregate analysis on the other hand established that the 1990s witnessed a structural change in mobility. The former pattern of urbanisation was gradually replaced by that of suburbanisation, people moving mainly from big towns to smaller ones and villages. This phenomenon explains why the aggregate data seem to contradict conventional wisdom.

To look at economic incentives, I estimated an aggregated version of a gravity model modified to be used with only data on outward mobility rates for individual regions. Results indicate that before 1995, both unemployment and wage differentials have the expected and significant effect, while after 1995, this is true only for unemployment. Although the economic significance of both effect is small, they together are able to explain some of the heterogeneity found in the data.

Detailed data on individual characteristics allowed to look at the composition of mobile population closely. Personal attitudes showed that although economic incentives are an important factor in mobility migration, there are many other to consider. Using factor analysis, I showed that an increasingly dominant reason to move is seeking pleasant surrounding. This corroborates the already established results of the importance on suburbanisation and other,

non-economic factors.

Aggregate behaviour was shown to be different in the case of temporary and permanent movers. Temporary movers, about half of the overall mobile population, contain a possibly large proportion of students, whose movement seems to follow economic incentives. This is however seem to be the result of the close connection between the hierarchical structure of the schooling system and the incidence of higher wages and lower unemployment. While the pool of temporarily mobile people contains a large proportion of mostly young, single or cohabiting people without a child or in full time studies, permanent movers are different. They are older (but not old or middle-aged), raise children in many cases, live in families where men are working and women take care of children in an above-average proportion.

Individual data also allows to re-visit the role of economic incentive in mobility, taking both characteristics of the sending and the receiving settlement into consideration. Results show similar qualitative properties as the aggregate case, underlining the important part that labour market opportunities play. Opposed to the aggregate findings, these effects prove to be stronger and — along with individual characteristics — capable to generate the observed heterogeneity. The difference between the two estimates can be explained by the effect of aggregation. The results are robust to a number of scrutinies. They also show that although there is a large number of movers whose behaviour can be captured by the underlying simple model, this is not true for the suburban dwellers whose importance is increasing.

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A Data Appendix

The data at my disposal consists of settlement level and individual information. The two main data sources are the settlement-level TSTAR and the individual-level Microcensus. These are complemented by wage data from the Wage Survey and unemployment data from the registers of the National Labour Centre.

A.1 TSTAR

TSTAR[27], a comprehensive database contains administrative information on more than 3,100 Hungarian settlements. Data is available on a variety of topics including demographics and the number of persons moving into and out from the settlement, regardless whether it is a temporary or a permanent change. One shortcoming of these data is that, due to the constantly changing definitions of concepts and scope of data-gathering at governmental offices, time-series that span a whole decade are not possible in the case of most variables.

The TSTAR is not a panel database of the settlements. To fix their status, settlements spun off from another one or created by a split are put back together and treated in the form as they existed in 1990. This reduces their number to 3,070. Using this database, a panel is created with selected variables.

Table 15: Summary statistics for variables used in aggregate estimation, settlements over 1992-2000

	obs.	mean	std. deviation	min.	max.
Mobility outflow rate	1350	4.2	0.8	2.3	7.9
Unemployment rate	1200	12.7	4.6	2.9	30.2
Earnings[a]	1050	18.8	3.6	11.6	36.2

[a]Thousand Forints, 1992 prices. Real variation only across micro-regions.

[27]TSTAR is a Hungarian acronym for "Településsoros Statisztikai Adatbázis Rendszer", Settlement-level Statistical Database System, created at the Institute of Economic, Hungarian Academy of Science with the Hungarian Central Statistics Office from different sources.

A.2 Microcensus

The "Microcensus" (MC) is a large representative sample of the population that provides extensive information on around 200 thousand individuals, their homes and households. Answering this survey is mandatory, so there is virtually no bias from nonresponse (but due to discrepancies between the population registry and reality, the sample is weighted). In the MC, we know the identity of the settlement where people lived in 1990 and 1996, but we do not know what happened in the meantime and have no information on past characteristics of the respondents.

Omitting children who were not yet born in 1990, the sample size is 183,589 with 10,127 movers. Constraining age to the 18-60 years of age band, we are left with 111,205 observations, of which 7,445 are movers. 5,699 of them are permanent and 1835 are temporary movers. Taking only people over 30 years of age into consideration, we have 77,532 observations, with 2657 permanent and 755 temporary movers. Looking at the effect of back-commuting to previous place of living, I excluded those who do (809) and those who do not (9,318) commute back. Thus excluded were eliminated from the sample altogether.

Mobility here is defined as living in different settlements in 1990 and 1996. This means that repeated movers and those moving only once during the period are both counted only once, but movers returning to a previous address never. Masking repeated and temporary moves will bias the fraction of movers and possibly weaken signs of the relations we are interested in. Nevertheless if the moves are time-consistent and every choice dominates a previous one, the signs of the relations should not be affected.

A.3 Regional Development Survey

The "Regional Development Survey" (RDS) of the Szonda Ipsos market research company elicited questions on individuals' living circumstances and reasons for moving house. The sample size is 26,800 with 1200 observation from every county except from Budapest, where 4,000 interviews took place. Because of the disproportionate sampling and possibility of nonresponse, the data is weighted.

Movers here are defined as those not having born in the present settlement of residence. Out of the 26,736 respondents of the RDS, only a little more than half of the sample (57%) was born at the current place of living and about 1 percent moved in from abroad. The subsample without these people and the 200 moving house within Budapest will be designated as "movers"

(also excluding those without a date of relocation), a total of 11,344.

In the RDS, we do not know the identity of the sending settlement, just its type and to every type its rough relation to the current place of living ("far", "close"), which makes it unsuitable to estimate individual mobility propensities. The benefit here is that the year of moving house the last time is known, so it is possible to trace the change of motivations over time and relate those to aggregate observations. Also here we have a departure from the definition of mobility used in the aggregate data. Here we record moving in every year, but only the last one for everybody. This means that a yearly snapshot will include all movers conditional on staying at the new residence and the most frequent mover somebody is, the latter he or she is recorded.

A.4 Auxiliary data sources

I impute wage and unemployment data from auxiliary data sources. For the former, I use the available waves of the Wage Survey, comprising years 1992, 1994, 1995, 1996, 1997, 1998 and 1999. This is a sample of around 150 thousand workers from firms with more than 11 employees, providing high quality payroll wage data. The number of observations makes it feasible to estimate the mean wage for the 150 small regions, but not for smaller units.

Unemployment figures refer to the number of registered unemployed, coming from records of the National Labour Centre ("OMK") and are valid on the settlement level. Lacking real time-series on the number of active persons, we use two feasible measures, the number of active persons in 1990 (known from the Census) and the number of persons in active age (18-59 years old men and 18-54 years old women) registered in the TSTAR database. Estimation using both measures revealed that the choice between them does not have any important influence on the results.

B Complementary tables and maps

Table 16: Relative mobility gains of agglomeration centres

County	Settlement	Relative gain	
		1990-1992	1998-2000
Budapest	Budapest	0.37%	−1.19%
Baranya	Pécs	0.41%	−0.63%
Bács-Kiskun	Kecskemét	0.66%	0.35%
Békés	Békéscsaba	0.26%	−0.27%
Békés	Békés	−0.16%	−0.45%
Békés	Csabaszabadi	0.26%	−0.27%
Békés	Gyula	0.61%	0.32%
Borsod-Abaúj-Zemplén	Kazincbarcika	−1.27%	−1.70%
Borsod-Abaúj-Zemplén	Miskolc	−0.79%	−0.94%
Csongrád	Szeged	0.67%	−0.77%
Fejér	Székesfehérvár	0.03%	−0.48%
Győr-Moson-Sopron	Sopron	0.64%	0.27%
Győr-Moson-Sopron	Győr	0.24%	−0.01%
Hajdú-Bihar	Debrecen	0.57%	−0.83%
Heves	Eger	0.71%	−1.20%
Komárom-Esztergom	Komárom	0.31%	0.64%
Komárom-Esztergom	Tata	−0.72%	−0.04%
Komárom-Esztergom	Tatabánya	−0.27%	−0.01%
Komárom-Esztergom	Lábatlan	−0.68%	−0.28%
Komárom-Esztergom	Nyergesújfalu	−0.38%	−0.42%
Komárom-Esztergom	Dorog	0.54%	0.44%
Komárom-Esztergom	Esztergom	0.07%	0.48%
Komárom-Esztergom	Oroszlány	−0.20%	0.01%
Nógrád	Salgótarján	−0.51%	−0.88%
Pest	Gyál	1.44%	2.36%
Pest	Gyömrő	0.63%	3.12%
Pest	Pécel	0.91%	3.51%
Pest	Gödöllő	0.88%	0.93%
Pest	Kistarcsa	0.48%	1.30%
Pest	Fót	1.59%	2.54%
Pest	Dunakeszi	1.38%	1.08%
Pest	Vác	−0.06%	−0.21%
Pest	Szigetszentmiklós	0.49%	4.03%

Table 16: Relative mobility gains of agglomeration centres

County	Settlement	Relative gain	
		1990-1992	1998-2000
Pest	Százhalombatta	-0.83%	1.28%
Pest	Érd	0.95%	3.47%
Pest	Budaörs	1.65%	1.71%
Pest	Budakeszi	0.38%	1.90%
Pest	Piliscsaba	1.40%	3.27%
Pest	Pilisvörösvár	0.75%	2.17%
Pest	Szentendre	1.77%	2.59%
Pest	Pilisjászfalu	1.40%	3.27%
Pest	Kerepes	0.48%	1.30%
Pest	Dunaharaszti	0.55%	2.01%
Somogy	Balatonfenyves	0.44%	0.95%
Somogy	Fonyód	0.44%	0.95%
Somogy	Balatonboglár	0.51%	1.34%
Somogy	Balatonlelle	0.51%	1.34%
Somogy	Balatonföldvár	0.63%	0.02%
Somogy	Siófok	0.15%	0.35%
Somogy	Kaposvár	-0.26%	-0.20%
Szabolcs-Szatmár-Bereg	Nyíregyháza	-0.01%	-0.35%
Jász-Nagykun-Szolnok	Szolnok	0.56%	-1.25%
Jász-Nagykun-Szolnok	Törökszentmiklós	-0.35%	-0.50%
Jász-Nagykun-Szolnok	Martfű	0.36%	-1.17%
Tolna	Szekszárd	0.17%	-0.58%
Vas	Kőszeg	0.36%	-0.58%
Vas	Szombathely	0.00%	-0.74%
Veszprém	Balatonalmádi	0.88%	1.02%
Veszprém	Veszprém	0.28%	-1.92%
Veszprém	Várpalota	-0.51%	0.18%
Veszprém	Ajka	-0.59%	-1.00%
Veszprém	Balatonfüred	0.72%	0.17%
Zala	Zalaegerszeg	0.24%	-0.78%
Zala	Keszthely	0.12%	-0.87%
Zala	Nagykanizsa	-0.45%	-0.56%

Table 17: Probit parameter estimates in a model of individual mobility probabilities

	All		Permanent		Temporary	
			$17 \leq age \leq 60$			0
Unemp. rate *1990*	2.13^{**}	(3.18)	1.51^{*}	(2.14)	2.45^{**}	(2.46)
Unemp. rate *1996*	-2.78^{**}	(-3.96)	-1.92^{**}	(-2.64)	-4.25^{**}	(-3.54)
Avrg. earnings *1990*	-0.01	(-1.13)	-0.01	(-0.73)	-0.01	(-0.56)
Avrg. earnings *1996*	0.05^{**}	(3.78)	0.05^{**}	(3.23)	0.02	(1.17)
Compl. pri. school	0.06	(1.45)	0.02	(0.61)	0.19^{**}	(2.18)
Vocat. sec. school	0.06	(1.48)	0.03	(0.73)	0.23^{**}	(2.64)
Secondary school	0.20^{**}	(4.99)	0.10^{*}	(2.42)	0.47^{**}	(5.53)
Higher	0.50^{**}	(11.89)	0.40^{**}	(8.94)	0.68^{**}	(7.72)
Age: 25-39	-0.06^{**}	(-3.53)	0.01	(0.74)	-0.22^{**}	(-8.19)
Age: 40-60	-0.60^{**}	(-32.35)	-0.53^{**}	(-26.21)	-0.50^{**}	(-17.05)
Pseudo R^2	0.08		0.08		0.14	
			$30 \leq age \leq 60$, no students			
Unemp. rate *1990*	2.73^{**}	(2.57)	2.32^{**}	(2.12)	2.97^{*}	(1.93)
Unemp. rate *1996*	-3.31^{**}	(-3.05)	-2.60^{**}	(-2.32)	-4.70^{**}	(-2.87)
Avrg. earnings *1990*	0.00	(0.39)	0.01	(0.46)	-0.00	(-0.17)
Avrg. earnings *1996*	0.03	(1.54)	0.03	(1.42)	0.01	(0.44)
Compl. pri. school	-0.02	(-0.42)	-0.06	(-1.21)	0.19^{*}	(2.04)
Vocat. sec. school	0.02	(0.38)	-0.03	(-0.71)	0.31^{**}	(3.13)
Secondary school	0.12^{**}	(2.51)	0.06	(1.17)	0.39^{**}	(4.05)
Higher	0.34^{**}	(6.99)	0.25^{**}	(4.85)	0.60^{**}	(6.11)
Age: 40-60	0.41^{**}	(0.94)	-0.46^{**}	(6.41)	-0.13^{**}	(-4.21)
Pseudo R^2	0.08		0.08		0.11	

Data: 1996 Microcensus. Heteroskedasticity robust asymptotic "t" statistics in parentheses. $**$ indicates significant difference from zero at least 1%, $*$ at least at 5% level, while no stars indicate other, higher levels. The hypothesis that the regressors jointly have explanatory power is rejected in all cases at all significance levels.

Table 18: Probit parameter estimates in a model of individual mobility probabilities

	No back-commuting		Back-commuting	
Unemp. rate *1990*	2.29^{**}	(3.30)	-20.86^{**}	(-3.01)
Unemp. rate *1996*	-2.71^{**}	(-3.66)	17.12^{**}	(2.65)
Avrg. earnings *1990*	0.00	(0.10)	-0.04	(-0.50)
Avrg. earnings *1996*	0.03^{*}	(2.02)	0.06	(0.77)
Compl. pri. school	0.03	(0.65)	0.80^{**}	(3.31)
Vocat. sec. school	0.00	(0.12)	0.92^{**}	(3.76)
Secondary school	0.14^{**}	(3.50)	1.00^{**}	(4.12)
College	0.45^{**}	(10.58)	1.19^{**}	(4.82)
Age: 40-60	-0.09^{**}	(-5.06)	0.17^{**}	(3.15)
Age: 40-60	-0.63^{**}	(-32.75)	0.12^{*}	(-2.15)
Pseudo R^2	0.09		0.49	

Data: 1996 Microcensus. Heteroskedasticity robust asymptotic "t" statistics in parentheses. $**$ indicates significant difference from zero at least 1%, $*$ at least at 5% level, while no stars indicate other, higher levels. The hypothesis that the regressors jointly have explanatory power is rejected in all cases at all significance levels.

Figure 3: Agglomeration centres and counties

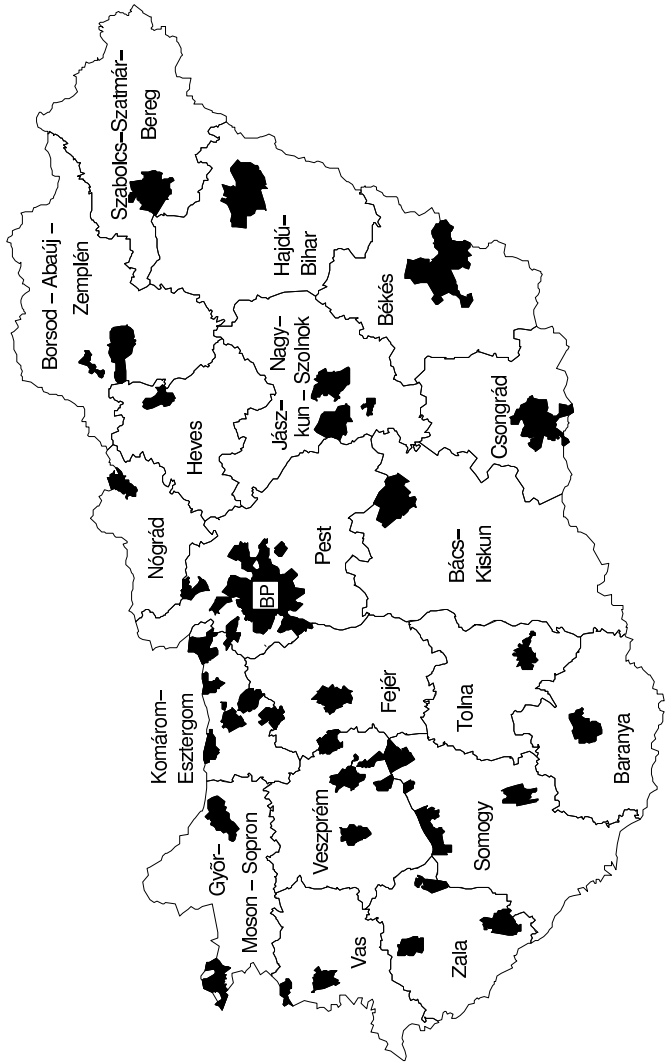

Figure 4: Net mobility rates by settlements, 1990-1992

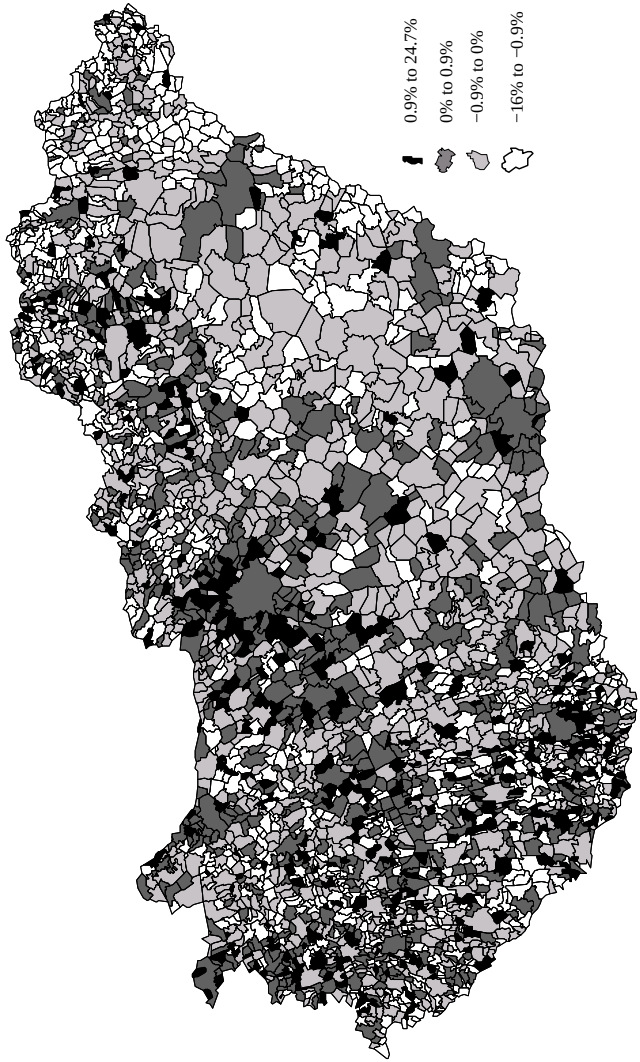

Figure 5: Net mobility rates by settlements, 1998-2000