CRISEI

Centro di Ricerca Interdipartimentale in Sviluppo Economico e Istituzioni

Discussion Paper Series

Twenty years of internal migration in Italy.

Answers from some economic and non-economic determinants

Mariangela Bonasia

Discussion Paper
No. 06
Giugno 2012

ISSN: 2280-9767

CRISEI - Università di Napoli - Parthenope

Università degli Studi di Napoli- Parthenope

CRISEI

Mariangela Bonasia

Dipartimento di Studi Economici S. Vinci

Università degli Studi di Napoli, Parthenope

Via Medina, 40 - 80133 – Napoli (Italy)
Tel. (+39) 081 547 47 36
Fax (+39) 081 547 47 50
URL: http://www.crisei.uniparthenope.it/DiscussionPapers.asp

Twenty years of internal migration in Italy. Answers from some economic and non-economic determinants ♦

Bonasia Mariangela
mariangela.bonasia@uniparthenope.it

Department of Economic Studies, Salvatore Vinci
University of Naples "Parthenope"

June 2012

Abstract

The aim of the paper is to examine the determinants of interregional migration in Italy. In addition to the conventional variables used to explained migration decision, the impact of housing prices and externalities variables were studied. The period considered is 1985-2006, during which different migration trends took place. Using a GMM dynamic panel, the results show that this model, due to the complexity of the internal migration process, omits some important economic and non-economic variables and may not be representative of migration flow in Italy. Furthermore, the analysis confirms the perception that in different periods could be different also the reasons behind the migration decision.

***JEL classification*: C23; R23**

***Keywords*: Internal Migration; Panel Data, House Prices**

♦ The author would like to thank the participants at the International Conference on poverty Traps in Naples, Italy, 2009 for comments and suggestions. Any remaining errors are the sole responsibility of the author.

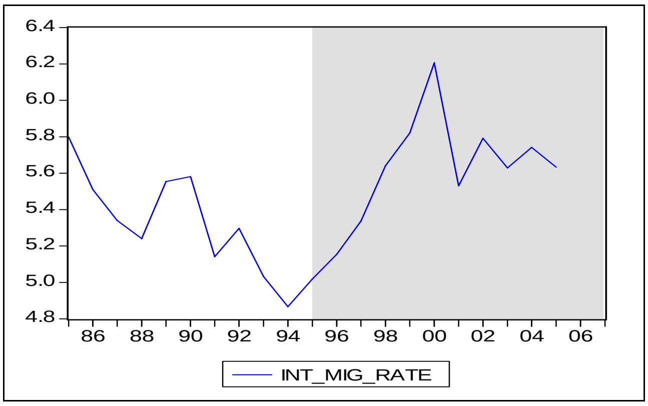
1. Introduction

Since the end of the Second World War interregional migration flows in Italy have been characterized by three main trends. The 1950s and 1960s experienced very intense, persistent migration flows, mainly from rural to urban areas and from South to North. From the early 1970s internal migration markedly declined, a trend which persisted till the mid 1990s. Internal migration flows started to grow again after the mid 1990s, with a significant flow of migrants form southern to northern regions.

The pioneering contributions to the economic literature of Todaro (1969) and Harris and Todaro (1970), considered one of the starting points of classical migration theory, identified the major factors behind migration in the real wage differentials and the probability of finding a job. Indeed, during the 1990s, the debate about regional development disparities focused on an evident contradiction: falling migration in the presence of a substantial increase in regional differentials in terms of unemployment rates and real per capita income, the so-called "empirical puzzle" (Faini *et al.*, 1997).

In view of the above changes in the traditional patterns of interregional migration, the aim of this paper is to investigate the role of other important factors ignored by traditional economic models in explaining the different trends experienced by Italy in the last two decades. A simple description of Italian internal migration flow during the period under analysis (1985-2006) is shown in Figure 1, which presents interregional migration rates for the whole sample[1]. The rate in question falls in the first decade (1985-1995) and then starts to grow again.

Figure 1 Internal Migration Rate



In this study, we modify the standard H-T model to include monetary and non-monetary costs involved when people move from one region to another. First, we argue that the regional differences in housing prices could play a very important role in explaining the falling trend of migration. As suggested by Cannari *et al.* (2000) "the cost of housing is likely to represent an important disincentive to move and to a considerable extent it accounts for the puzzling evidence of falling mobility levels in Italy. … Therefore, in order to avoid that a substantial cost of living effect is omitted, house price differentials should be explicitly considered"[2].

In this paper we use a new indicator of house prices in Italy characterized by broad geographical and temporal coverage. It is calculated by Zollino, Muzzicato and Sabbatini (2008) from the Bank of Italy. They use data taken from the *Il Consulente immobiliare* (CI) which reports highly detailed

[1] $\textit{Internal Migration Rate} = \dfrac{\sum \text{Inflows}_t = \sum \textit{Outflows}_t}{\textit{Total Population}_t} * 1000$

[2] Cannari et al. (2000) (pp. 1899-1900)

data for Italy, carrying out twice-yearly surveys of the average prices of sales made in a set of cities that includes all the provincial capitals and approximately 1,400 other municipalities. The new index is based on a method that has been amply revised compared with previous formulations and covers a period from 1980 to 2007. The same data from the CI were used by Cannari, Nucci and Sestito (2000) who construct a time-varying measure of housing price differentials between the two macro-areas of Italy (South and North) for a large time span (1965-1995).
In a second step, as Greenwood (1985) suggests, we take into account non-economic variables that may be partially reflected in the migration choice: population density, environmental conditions and crimes.
We address these issues using a dynamic panel "diff. GMM" estimation by Arellano and Bond (1991)[3], with data originating from the Italian National Institute of Statistics (ISTAT) and Istituto Guglielmo Tagliacarne from 1985 to 2006. In order to explain the different migration trends within Italy in the last two decades, in the estimation we first use the complete sample periods and then we estimate the same model for two sub-periods from 1985 to 1995 and from 1995 to 2006 in order to compare the two periods and seek an answer to our main question: have there been substantially different responses of the determinants of internal migration in Italy during the past two decades?
First of all, our results show that traditional H-T model is unable to explain the complexity of the internal migration process in Italy. Omission of some major economic and non-economic variables does not allow the traditional model to be representative of migration flow. Secondly, our analysis confirms our intuition that for different periods we have to take different determinants into account.
This work is organized as follows: section two gives a synopsis of the research that has been conducted on the impacts of different determinants on interregional migration in Italy and in other countries. Section three presents the empirical analysis. We recall the main data sources available in Italy. We also describe the method used for our analysis and the empirical results. Section four points out the implications of our findings and suggests a possible agenda for future research.

2. Brief literature review

The first migration models used the physical concept of gravity and explained migration as a function of the size of the origin and destination population, predicting it to be inversely related to distance. In the 1950s migration theory moved on to more sophisticated theories. Lewis (1954) introduced analysis of migration flows in dual-economy models in which migration occurs as a result of difference in the supply and demand of labour between the rural and urban sector. The new orthodoxy is due mainly to Todaro (1969) and Harris-Todaro (1970) (hereafter H-T) whose models provided a widely accepted theoretical framework for explaining internal and international migration as well as urban unemployment in many less developed countries. They showed that it can be perfectly rational to migrate, despite urban unemployment, due to a positive expected income differential. This model is based on perfect expectations and while the implication of income differentials is undisputable in labour migration decisions, it is probably not as extreme as Harris and Todaro depict it.
Stark *et al.* (1991) showed that when the migration choice is made by agents with asymmetric information, it could lead to the opposite migration flow to that based on wages differentials.
The subsequent H-T models of the 1970/80s augment these models to account for some empirical observations and to make the models specific to migration. Hence migration is not completely risk-free, because the migrant does not necessarily get a job upon arrival in the destination area. Therefore migration takes place on condition that the expected real income differential is positive. Expected income is a function of rigid wages and the destination employment rate.

[3] Dynamic panel GMM techniques were developed to offer instrumental-variable estimates in settings featuring endogenous regressors, based on relatively weak assumptions on the underlying data-generating process.

In this work we focus on internal migration in Italy, it is worth pointing out the main contributions to the empirical literature. The slow-down in internal migration in Italy during the 1980s along with its demographic and socio-economic characteristics has been amply analysed by Bonifazi (1992, 1999), Bonifazi and Heins (1999, 2000 and 2001), Bonifazi and Cantalini (1998) and Termote *et al* (1992). Faini *et al.* (1997) studied why, despite the increasing regional unemployment differentials, internal migration in Italy failed to start, the so-called "empirical puzzle". Their analysis concluded that the weak drive of migration in the presence of large and increasing differentials in unemployment was mainly due to the ineffective Italian labour market and high mobility costs.

Daveri and Faini (1999) studied migration decisions taken by risk-averse households using aggregate data from the regions of southern Italy. They found that risk is a significant determinant of the decision to migrate. It also emerged from their results that real wages had a negative effect on internal migration while unemployment rate did not affect it at all.

The determinants of net migration rates in the Italian provinces in the period when the internal migration flows were still in the declining phase (1991-1995) and the period when the internal migration flows increased (1996-2000) were analysed by Basile and Causi (2005) using a Seemingly Unrelated Regression (SUR) model. The results showed that in the first period, net migration was only weakly or negligibly influenced by classical variables such as unemployment and GDP per capita. In the second period, however, migration behaviour appears more consistent with the traditional theories in which economic variables play a crucial role in explaining internal migration. More recently, Piras (2005), Viesti (2005), Mocetti and Porello (2009) have analysed the internal migration in Italy looking at the skill composition of migrants. They found that the decision to migrate depends on the the educational attainment.

Etzo (2008), using panel data analysis on gross migration flows between regions, investigated the role of macroeconomic determinants during the period 1996-2002. The empirical results show that income is the main economic determinant and its strong effect is consistent when it performs both as a push and as an attractive factor. Moreover, another important variable in explaining the determinants of internal migration is the unemployment rate. Indeed, despite the lack of unambiguous empirical results on the last migration trend in Italy, it seems quite reasonable to think that it was the persistence and strengthening of differentials in unemployment rates that determined the new internal migratory flows.

3. Empirical analysis

The study of the determinants of internal migration presents several challenges. Firstly, other variables, which are often omitted in the empirical analysis, should be added to income and unemployment.. For example, expectations of future economic growth, employment opportunities and positive externalities might attract migrants to specific areas.

We start from the baseline model that tests the H-T (1972) hypothesis of net internal migration flow depending on wages differentials and unemployment variables. We treat the interregional migration baseline model as follows:

$$M_{i,t} = f(W_{i,t}, U_{i,t}),\ f_W > 0,\ f_U < 0 \qquad (3.1)$$

According to the theoretical assumptions and the above-discussed model, migration will increase when the wages differential between two regions increases, $f_W \succ 0$, and will decrease when the unemployment rates differential increases, that is $f_U \prec 0$.

For our empirical study we extend the baseline model, including housing prices and externalities and specifying net internal migration flows with panel data as follows:

$$M_{i,t} = \alpha + \alpha_{1,i} M_{i,t-1} + \alpha_{2,i} W_{i,t} + \alpha_{3,i} U_{i,t} + \alpha_{4,i} H_{i,t} + \alpha_{5,i} D_{i,t} + \alpha_{6,i} A1_{i,t} + \alpha_{7,i} A2_{i,t} + \varepsilon_{i,t}$$

(3.2)

where $M_{i,t}$ is the net migration flow (outflows – inflows) of region *i* with respect to the region's population. *W*, *U* and *H* are the relative wages, unemployment rate and house prices defined as the log of the ratio between each variable and the average of the same variable at the national level. $D_{i,t}$, $A1_{i,t}$ and $A2_{i,t}$ are population density, carbon dioxide emissions (C02) and juvenile delinquency, respectively.

In this work, due to difficulties in collecting consistent regional data on wages, we use per capita regional income as a proxy (regional per capita income differential could represent wealth expectations for a region respect to all other regions). Furthermore, the decision of using the GDP per capita has also been widely accepted in the empirical literature (Faini *et al.*, 1997, Cannari *et al.*, 2000, Basile and Causi, 2005, and Fachin, 2007). $\varepsilon_{i,t}$ is the stationary error with zero mean and finite variance and $i = 1,....,N$ and $t=1,....,T$.

We use three sample periods: case 1: 1985-2006; case 2: 1985-1994; case 3: 1995-2006.

These three sample cases start and end in different years. We employ these cases to examine whether our empirical results are robust to the chosen sample periods and to previous empirical results concerning interregional migration in Italy.

Several econometric problems may arise from estimating equation (4.2). First of all, the explanatory variables are assumed to be endogenous. Because causality may run in both directions – from the determinant's variables to migration and vice versa – these regressors may be correlated with the error term. Second, time-invariant regional characteristics such as geography and demographics, may be correlated with the explanatory variables. Third, the presence of the lagged dependent variable $M_{i,t-1}$ gives rise to autocorrelation. Fourth, the panel dataset has the dimension ($N = T=20$) when we consider the whole period, while with sub-samples it has a shorter time dimension ($T=10$ e $T=12$) and a larger region dimension ($N=20$).

To overcome these problems, panel data analysis allows us to study the dynamic nature of the migration decisions at the regional level. We use the Arellano–Bond (1991) difference GMM estimator first proposed by Holtz-Eakin, Newey and Rosen (1988). For panels with a limited number of years and a greater number of observations, Arellano and Bond (1991) suggest estimating equation (4.2) in first differences[4] and using all lags of the level of variables from the second lag as instruments.

We apply the Arellano and Bond (1991) one-step GMM estimator for our dynamic model which allows for heteroskedasticity across regions[5]. Concerning the instruments, we report the Sargan statistic, which tests the over-identifying restrictions. In addition, to check for the robustness of the results, we perform estimations also using the system GMM since this allows time dimension T to be as large as N and to choose a limited number of lags as instruments[6].

3.1 Data description

This data set, mainly derived from the Italian Statistics Institute (ISTAT), covers the 20 regions of Italy spanning the period 1985–2006. The externalities are obtained from the Istituto Tagliacarne. Each explanatory variable is measured in logarithms.

Our dependent variable is net migration flow (inflows minus outflows in each region), $M_{i,t}$ divided by total population in region "i" ,. In line with previous empirical work, our main focus is on per

[4] Using first differences eliminates the specific region effect, thus avoiding any correlation problem between unobservable region specific characteristics and explanatory variables.

[5] Several studies have reported that two-step (optional GMM) standard errors are biased downwards in small samples and recommend using a one-step estimator (Windmeijer, 1998)

[6] See Okui (2009) for the procedure for choosing the optimal number of instruments in GMM estimations.

capita income ($W_{i,t}$) and unemployment differentials ($U_{i,t}$) as traditional variables, both calculated as log of the ratio between the variable of the region "i" and the average value of the same variable at the national level. In addition, we consider the housing prices variable and three non-economic variables, namely population density, juvenile crime and carbon dioxide emissions. Housing prices and non-economic variables appear *a priori* as variables that could greatly influence the motivation of migration. It is thus useful to ascertain whether they have an influence on inter-regional migration.

Definitions of variables and descriptive statistics of the explanatory variables are provided respectively in Table 1 and 2.

Our sample regions contain 400 observations. It should be noted that the dispersion across regions is much higher for migration than for the other traditional and "social variables" (the coefficient of variation for migration is 9.25 while for all the other variables it is below one).

Table 1 - Definition of dependent and explanatory variables

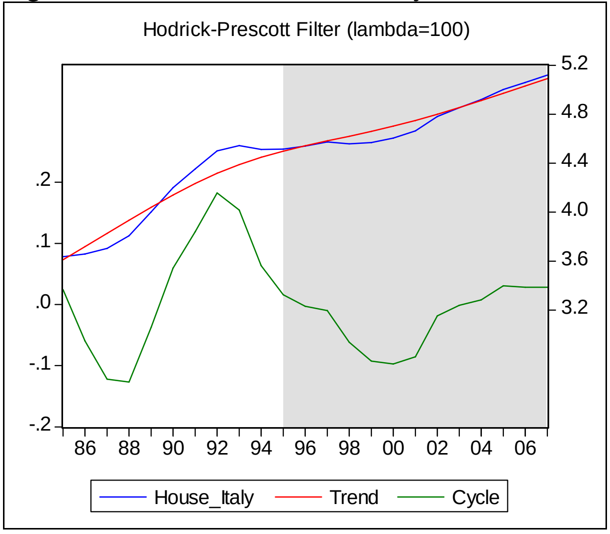
Variable	Description (source)
M_i	Net migration flow (inflows -outflows) of a region "i" with respect to the total population of the same region , where inflows are people that change their place of residence in the region *i*, while outflows are people that leave region i towards the rest of the country (source ISTAT)
W_i	log of the ratio between per capita GDP of the region "i" and the average per capita GDP at the national level (source ISTAT)
U_i	log of the ratio between unemployment rate of the region "i" and the average unemployment rate at the national level (source ISTAT)
H_i	log of the ratio between house prices index of the region "i" and the Italian housing prices index (source Zollino et al, 2008)
D_i	Log of population density defined as the ratio between the population and size of the region "i" (source ISTAT)
A1	juvenile delinquency index (%) (excluded thefts) (Total number of minors reported for every type of crime excluding theft on the total number of minors reported) (source Tagliacarne)
A2	carbon dioxide emissions (source Tagliacarne)

Table 2 - Summary Statistics

Variables	Mean	Maximum	Region with Max.	Minimum	Region with Min.	Std. Dev.	Coeff. of Variation
M	0.0259486	0.655195	Valle d'Aosta	-0.604449	Calabria	0.2400883	9.252457
W	15736.54	28959.25	Emilia Romagna	4369.457	Calabria	6177.038	0.392528
U	10.58489	26.8	Calabria	2.5	Abruzzi	5.576241	0.526811
H	92.26963	197	Lazio	29.8	Trentino A.A.	35.83689	0.388393
D	176.9444	430.7507	Campania	34.84953	Valle d'Aosta	105.443	0.59591
A1	2.120833	6.48	Valle d'Aosta	1.35	Sardinia	0.699144	0.329655
A2	60.75889	90.5	Molise	6	Valle d'Aosta	10.71869	0.176414

A simple graphical analysis of the performance of the new indicator of house prices obtained by Zollino *et al* (2008) allows us to identify two real estate market cycles in Italy as is shown in Figure 2. Looking at the first cycle it is clear that after a gradual downward trend of prices in 1985, prices then increased sharply, reaching their peak in 1992. The second cycle, beginning at the end of 1992, is still under way. House prices declined in Italy until the end of 1999 and the fall was considerably

Figure 2 House Prices, Trend and Cycle



smaller than the drop recorded in the same phase of the first period. Zollino *et al* (2008) noted that the acceleration recorded around 2002 coincided with a sharp drop in share prices, which shifted investment into the housing market. This acceleration was more pronounced in cities and large towns.

3.2 Empirical results

In this section, we present the estimation results of equation (3.2) for our three cases. In table 3 we present the H-T model and its modified versions for the whole sample (1985-2006). We first estimate the baseline model with the core variable (income and unemployment differentials). Subsequently we add one by one all the other explanatory variable both at level and with lags.
The results obtained using both methodologies (diff. and system GMM) without adding lags, show that the coefficients of the explanatory traditional variables have the correct signs and are highly significant, confirming the H-T theory. By adding lags to the core and non core variables, income turns out to be not significant and with the wrong sign, while the lagged income remains significant with the positive sign. The second core coefficients, i.e. unemployment, are significant and confirm the negative relation with the migration choice. The lagged unemployment coefficients are significant with positive signs. Looking at the cumulative effects of the this variable (summing the level and lagged coefficients), it is negative as predicted by the theory. The non core variables with and without lags do not prove to be very useful in describing migration decision. The coefficients of population density are significant only when diff. GMM is used. These results confirm that for the entire period the traditional H-T model seems to offer a good framework.

[table 3 about here]

However, recent empirical literature has shown (for the period 1985-1995) a decline in internal migration even against a substantial increase in regional differentials in terms of unemployment rates and real per capita GDP. After this period, there was an increase in migration in the presence of a substantial increase in regional differentials of fundamentals (Faini *et al.*, 1997, Cannari *et al.*, 2000 and Fachin, 2007).

Since our whole sample goes from 1985 to 2006, it may be divided into two subsamples that can better describe the behaviour of migration in Italy. In light of this, table 4 presents the results of the same estimations shown in table 3 for the sub-period 1985-1994. The income is weak in explaining the migration flows. In fact the estimations show ambiguous results: the sign of the coefficients are always positive but significant only with some estimation made with the system GMM. The coefficients of the unemployment in level are highly significant with the correct signs. The same coefficients of the lagged variable are not significant in each specification.

[table 4 about here]

Looking at the baseline model for the first decade, it seems that there could be other economic and social variables that could better capture migration flow within Italian regions. As we asserted above, regional differences in house prices could play an important role in explaining the falling trend of migration in this decade, constituting a considerable cost of living effect that could have been omitted. The augmented baseline models in table 4 show that overall the housing variable is significant both in level and with a lag. The lagged variable coefficients have the expected signs. These results are consistent with those in the previous research literature (Mocetti and Porello, 2010). In particular, the current house prices and lagged house prices can display different effects on migration flows. As argued by Achen (2001), there are cases in which the use of lagged dependent variable can reduce the explanatory power of some other independent variables. These could explain the different signs on the housing variable. However, when we analyse the cumulative effects of house prices (summing the level and lagged coefficients), these result to be negative as expected. The density variable coefficients are not significant but positive, implying that the agglomeration could create technological and knowledge spillovers in generating economic growth and thus attract people. We can conclude that during this period differences in income do not exert strong effects on internal migration. An increase in income differential does not seem to describe the migration pattern well. Our results could help to explain falling internal migration in Italy despite a substantial increase in regional differentials in terms of unemployment rates and real per capita income: the so-called “empirical puzzle”. Overall the empirical results presented in table 4 seem to confirm the intuition of the need to consider monetary and non-monetary cost as major determinants in the decision to migrate. This explains the reason why the house price differential turns out to be highly significant.

The final step of our empirical analysis focuses on the role of the determinants of internal migration in the period 1995-2006. In this step we replicate the estimates made in the previous period, still emphasizing the role of the housing market. Furthermore, we verify whether adding two new social variables (carbon dioxide emissions and juvenile delinquency) can better capture migration flows between regions. Unfortunately, due to a lack of the social variables data for the first decade, we can use them only for the second period. Table 5 shows the results for the second period for the baseline model and the augmented baseline models too. The core variables in this subsample have a strong influence on internal migration flow. Indeed, all the coefficients have the correct sign and are significant at different levels. The coefficients of lagged unemployment are highly significant with positive sign. However the cumulative effects of the this variable are, for most of the regressions, negative as predicted by the theory. The effects of house price differentials are ambiguous.. These, both at level and with lags do not appear to influence interregional migration in Italy.. Conversely, in the previous results (1985-1994) the same variable showed a more powerful influence on the dependent variable. This could be due to the different house price trends in the two decades shown in figure 2. In the first decade, the housing market could have played a major role as there was a sharp rise in prices, while in the second period it became negligible in explaining regional migration probably because house prices first declined and then started to accelerate but less sharply than in the first period. As regards the population density variable we found that it does not affect migration flows. However, it is worth pointing out that while it is not significant in either subsample, it affects migration for the period from 1985 to 2006. A possible explanation could be that this variable changes very slowly over time, which is why its effect may only be considerable in the long run. The last four columns in table 5 present the influence of two non-economic variables, namely carbon dioxide emissions (C02) and juvenile delinquency.

[table 5 about here]

The results obtained do not change the significance of the conventional variable and for housing prices. However, the crime variable is significant and with the correct sign. The CO2 variable is statistically significant with a positive sign only when we consider the model without lags. Despite the fact that carbon dioxide emissions should be seen as a cost for health and a disincentive to migrate, it is highly correlated with urban agglomeration which creates spillovers in generating economic growth. The crime variable is significant with a negative sign only with estimations made with the diff. GMM. A possible explanation of the negative relation with the decision to migrate rely on the fact that individuals tend not to migrate to regions with high crime levels. These results make it clear that region-specific externalities do matter.

4. Conclusion

In this paper we sought to capture the effects of new determinants of internal migration in Italy being added to the traditional H-T model. The aim was to explain the different trends that characterized migration flows in the period 1985-1994 and in the subsequent decade, 1995-2006, even in the presence of a substantial increase in regional differentials in terms of unemployment rates and real per capita income in both periods.

In addition to GDP per capita and unemployment differentials, the impact of house prices and externalities like population density, carbon dioxide emissions and juvenile delinquency were studied. Our main results can be summarized as follows. In the period with falling migration, an increase in wages differentials vis-à-vis national average wages fails to accurately describe the migration pattern, thereby confirming the existence of the empirical puzzle. We also found that differentials in house prices affected the migration flow in this particular period, supporting the need to take into account other important factors omitted by traditional models. Moreover, in the second period the wage differential and unemployment were found to be, once more, important determinants of internal migration. On the other hand, housing price differentials seemed to lose its power to explain migration from one region to another. Population density does not affect the migration flows in each subsample, although it affects migration for the period from 1985 to 2006. The crime variable has a negative effect on migration, as expected. Carbon dioxide emissions have a positive impact and help explain inter-regional movements. Despite the theoretical ambiguity of the impact of some externalities, like carbon dioxide emissions and population density on internal migration, our results showed that they are considered more as benefits than costs: they may be viewed as particularly effective proxies for agglomeration in cities.

The main implications of these findings are the following. First of all, the simple H-T model is unable to explain the complexity of the inter-regional migration process in Italy. The lack of some important economic and non-economic variables does not allow the traditional model to be representative of the migration pattern. Second, for different periods different determinants have to be taken into account. Our results make it easier to understand why finding a logical explanation for internal migration in Italy is likely to remain difficult. On the agenda for future research is the analysis of migration flows based on macro areas, which could shed light on the effective role of variables like housing and externalities as determinants of migration.

References

Achen C.H., 2001. “Why lagged dependent variables can suppress the explanatory power of other independent variables”. Political Methodology Working Paper

Arellano M. and S. R. Bond, 1991. ‘‘Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations,’’ Review of Economic Studies, 58, 277–297;

Basile R. and M Causi, 2005. “Le determinanti dei flussi migratori nelle province italiane: 1991-2001," *Departmental Working Papers of Economics* – n. 0049, Department of Economics - University Roma Tre.

Blundell, R. and Bond, S.,1998, “Initial conditions and moment restrictions in dynamic panel data models”, Journal of Econometrics, 87(1), pp.115-143

Bonifazi C. (a cura di), 1999. “Mezzogiorno e migrazioni interne”, Monografia 10, IRP-CNR, Roma;

Bonifazi C., 1992. “Saldi migratori e studio delle migrazioni interregionali: osservazioni sul caso italiano”, Genus, 1-2, 47-67;

Bonifazi C., Cantalini B., 1988. “Mobilità interna e migrazioni interregionali”, in IRP, Secondo rapporto sulla situazione demografica italiana. Contributo della demografia italiana alla conoscenza dei problemi della popolazione, *IRP-CNR*, Rome, 141-149;

Bonifazi C., Heins F., 1999. “Le migrazioni interprovinciali in Italia: un quadro di lungo periodo”, in C. Brusa (ed.), Immigrazione e multicultura nell’Italia di oggi Vol. II, Franco Angeli, Milan, 104-123;

Bonifazi C., Heins F., 2000. “Long-term trends of internal migration in Italy”, *International Journal of Population Geography*, 2, 111-131;

Bonifazi C., Heins F., 2001. “Le dinamiche dei processi di urbanizzazione in Italia e il dualismo Nord-Sud: un’analisi di lungo periodo”, *Rivista economica del Mezzogiorno*, 4, 713-747;

Bonifazi C., Heins F., 2003. “Testing the differential urbanisation model for Italy”, Tijdschrift voor Economische en Sociale Geografie, 1, 23-37;

Cannari L., Nucci F., Sestito P., 2000, "Geographic Labour Mobility and the Cost of Housing: Evidence from Italy", *Applied Economics*, Taylor and Francis Journals, vol. 32(14), pages 1899-1906, November.

Constantin D., Parlog C., Goschin Z., 2003.“Interregional migration in Romania during the 1990”*, 43rd Congress of the European Regional Science Association*, August 27-30;

Etzo I., 2007. “Determinants of Interregional Migration in Italy: A Panel Data Analysis, MPRA Paper No. 5307;

Fachin S., 2007. “Long-run Trends in Internal Migrations in Italy: a Study in Panel Cointegration with Dependent Units”, *Journal of Applied Econometrics*, vol. 22, pages 401–428;

Faini, R., G. Galli, P. Gennari and F. Rossi, 1997. “An empirical puzzle: falling migration and growing unemployment differentials among Italian regions”, *European Economic Review*, 41: 571-579;

Glaeser, E.L., Kallal, H.D., Scheinkman J.A. and A. Shleifer, 1992. “Growth in Cities”, *Journal of Political Economy* 100, 1126-1152;

Greenwood, M.J., 1985. “Human Migration: Theory, Models, and Empirical Studies”, *Journal of Regional Science* 25(4), 521-544;

Harris, J.R. and M.P. Todaro, 1970. “Migration, Unemployment and Development: A Two-Sector Analysis”, *American Economic Review* 60, 126-142;

Hazans, Mihails 2003. “Commuting in the Baltic States: Patterns, Determinants, and Gains,”*ZEI Working Paper* No. B02-2003, Bonn;

Lewis, W. A., 1954. “Economic development with unlimited supplies of labour”, *Manchester School of Economic and Social Studies*, vol. 22 (May), pp. 139-91;

Mocetti S. and C. Porello, 2010. “La mobilità del lavoro in Italia: nuove evidenze sulle dinamiche migratorie”, Banca d’Italia, *Questioni di Economia e Finanza (Occasional Paper) n.61*.

Okui, R, 2009. "The optimal choice of moments in dynamic panel data models," *Journal of Econometrics*, Elsevier, vol. 151(1), pages 1-16, July.

Piras, R., 2005. “Il contenuto di capitale umano dei flussi migratori interregionali: 1980-2002”, *Politica Economica*, vol. XXI, pp. 461-49;

Sjaastad, L.A., 1962. “The Costs and Returns of Human Migration”, *Journal of Political Economy* 70, 80-93;

Stark, O., M. R. Gupta, and D. Levhari, 1991.“Equilibrium Urban Unemployment in Developing Countries: Is Migration the Ulprit ?” *Economics Letters*, 37: 477- 482;

Termote M., Golini A., Cantalini B., 1992. “Migration and Regional development in Italy”, Monografia 4, IRP-CNR, Rome;

Todaro, M. P., 1969. "A Model of Labor Migration and Urban Unemployment in Less Developed Countries," *American Economic Review*, 69: 486-499;

Venturini, A., 2001. “Le migrazioni e i paesi sud europei. Un’analisi economica”, *UTET* libreria;

Viesti, G., 2005. “Nuove migrazioni. Il trasferimento di forza lavoro giovane e qualificata dal Sud al Nord”, *Rivista bimestrale di cultura e di politica*, 4, Il Mulino, pp.678-688.

Zollino F., S. Muzzicato and R. Sabbatini, 2008. “Prices of residential property in Italy: Constructing a new indicator.” *Questioni di Economia e Finanza (Occasional papers) no. 17*, Banca d’Italia;

Windmeijer F., 2005. “Finite sample correction for the variance of linear efficient two-step GMM estimator.” *Journal of Econometrics*, vol. 126, issue 1, pp 25-51.

.

Table 3 Panel eq. (3.2) – Difference and System GMM 1985-2006

Section 1, coefficient estimates												
	Baseline Model		*Baseline Model with lags*		*Baseline+ H*		*Baseline+ H with lags*		*Baseline+ H+D*		*Baseline+ H+D with lags*	
	Dif.GMM	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*
M_{t-1}	0.5206*** (0.000)	0.6053*** (0.000)	0.5201*** (0.000)	0.6086*** (0.000)	0.4895*** (0.000)	0.6351*** (0.000)	0.4874*** (0.000)	0.6424*** (0.000)	0.5012*** (0.000)	0.6305*** (0.000)	0.5029*** (0.000)	0.6376*** (0.000)
W	0.3308*** (0.010)	0.1586*** (0.000)	-0.069 (0.761)	-0.1181 (0.460)	0.3715*** (0.004)	0.1735*** (0.000)	-0.0416 (0.856)	-0.0817 (0.616)	0.4469*** (0.000)	0.1842*** (0.000)	0.0763 (0.742)	-0.0421 (0.798)
W_{t-1}			0.4923** (0.034)	0.2945* (0.070)			0.4822** (0.036)	0.2615 (0.113)			0.4268* (0.076)	0.2300 (0.167)
U	-0.0838*** (0.000)	-0.0946*** (0.000)	-0.1213*** (0.000)	-0.1302*** (0.000)	-0.0851*** (0.000)	-0.0808*** (0.000)	-0.1200*** (0.000)	-0.1232*** (0.000)	-0.0775*** (0.000)	-0.0818*** (0.000)	-0.1179*** (0.000)	-0.1231*** (0.000)
U_{t-1}			0.0541* (0.072)	0.048* (0.028)			0.0496* (0.095)	0.0548** (0.014)			0.0556* (0.063)	0.0518** (0.020)
H					0.0696* (0.089)	0.0185 (0.575)	0.1182 (0.104)	0.0829 (0.139)	0.0504 (0.215)	0.0079 (0.808)	0.1069 (0.145)	0.0739 (0.184)
H_{t-1}							-0.0545 (0.443)	-0.0776 (0.139)			-0.0618 (0.389)	-0.0787 (0.132)
D									1.0798** (0.060)	0.4104 (0.348)	1.0319* (0.076)	0.4124 (0.357)
Section2 Diagnostics:												
Sarg-test	316.28 [0.345]	445.83 [0.063]	306.43 [0.466]	433.19 [0.069]	339.42 [0.229]	479.02 [0.061]	329.63 [0.3148]	461.46 [0.121]	343.74 [0.5090]	499.81 [0.076]	333.36 [0.6208]	483.24 [0.157]
AB-test (AR1)	-9.705 [0.000]		-10.2 [0.000]		-9.676 [0.000]		-10.322 [0.000]		-9.7982 [0.000]		-10.377 [0.000]	
AB-test (AR2)	0.738 [0.4604]		0.872 [0.383]		0.789 [0.429]		1.0848 [0.278]		0.911 [0.3618]		1.241 [0.2143]	
Wald Test	227.55 [0.000] $\chi^2(3)$	2372.04 [0.000] $\chi^2(3)$	231.65 [0.000] $\chi^2(5)$	2349.00 [0.000] $\chi^2(5)$	233.72 [0.000] $\chi^2(4)$	2505.28 [0.000] $\chi^2(4)$	238.45 [0.000] $\chi^2(7)$	2474.55 [0.000] $\chi^2(7)$	268.41 [0.000] $\chi^2(5)$	2720.42 [0.000] $\chi^2(5)$	272.20 [0.000] $\chi^2(8)$	2687.78 [0.000] $\chi^2(8)$

z –statistics probability in brackets; *significant at the 0.10 level; **significant at the 0.05 level; ***significant at the 0.01 level ;
Sarg = Sargan test of overidentifying restrictions; AB-test = Arellano-Bond test for zero autocorrelation in first-differenced errors
Obs. (yearly) = 400

Table 4 Panel eq. (3.2) – Difference and System GMM 1985-1994

Section 1, coefficient estimates	*Baseline Model*		*Baseline Model with lags*		*Baseline+ H*		*Baseline+ H with lags*		*Baseline+ H+D*		*Baseline+ H+D with lags*	
	Dif.GMM	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*
M_{t-1}	0.1455*	0.3308*** (0.000)	0.14596* (0.078)	0.3101*** (0.000)	0.0915 (0.264)	0.4337*** (0.000)	0.0685 (0.411)	0.4211*** (0.000)	0.0792 (0.439)	0.4222*** (0.000)	0.1014 (0.213)	0.4134*** (0.000)
W	0.1021 (0.784)	0.2055*** (0.001)	0.0274 (0.950)	0.0394 (0.888)	0.4306 (0.266)	0.2142*** (0.000)	0.1025 (0.818)	0.1134 (0.703)	0.6882 (0.136)	0.2553*** (0.000)	0.1683 (0.713)	0.2213 (0.476)
W_{t-1}			0.1419 (0.740)	0.1622 (0.563)			0.0495 (0.910)	0.0714 (0.811)			-0.1255 (0.782)	0.0141 (0.964)
U	-0.1507*** (0.000)	-0.1304*** (0.000)	-0.1508*** (0.004)	-0.1159*** (0.001)	-0.1640*** (0.000)	-0.0973*** (0.000)	-0.1602*** (0.002)	-0.0955** (0.013)	-0.1973*** (0.000)	-0.938*** (0.000)	-0.1587*** (0.002)	-0.1022** (0.011)
U_{t-1}			0.0043 (0.928)	-0.0248 (0.503)			-0.0156 (0.745)	-0.0088 (0.820)			-0.0012 (0.980)	-0.0052 (0.891)
H					0.0907* (0.075)	-0.0137 (0.794)	0.2264*** (0.007)	0.1487* (0.075)	0.15497* (0.098)	-0.0289 (0.571)	0.2428** (0.019)	0.1204 (0.144)
H_{t-1}							-0.2419** (0.013)	-0.1957** (0.011)			-0.2502*** (0.010)	-0.1767** (0.020)
D									0.9641 (0.207)	0.4668 (0.457)	1.0045 (0.202)	-0.03412 (0.601)
Section2 Diagnostics:												
Sarg-test	134.62 [0.0631]	178.45 [0.0156]	132.24 [0.0644]	178.75 [0.0111]	137.22 [0.0161]	196.72 [0.0517]	132.66 [0.0189]	191.35 [0.0637]	138.78 [0.1886]	206.50 [0.0940]	134.08 [0.2142]	202.03 [0.1046]
AB-test (AR1)	-7.612 [0.000]		-8.011 [0.000]		-7.251 [0.000]		-7.693 [0.000]		-7.572 [0.000]		-7.9392 [0.000]	
AB-test (AR2)	0.629 [0.5292]		0.641 [0.5210]		0.624 [0.5322]		0.855 [0.3920]		0.768 [0.4424]		1.013 [0.3107]	
Wald Test	28.21 [0.000] $\chi^2(3)$	503.89 [0.000] $\chi^2(3)$	27.85 [0.000] $\chi^2(5)$	508.02 [0.000] $\chi^2(5)$	33.35 [0.000] $\chi^2(4)$	517.91 [0.000] $\chi^2(4)$	40.23 [0.000]	527.73 [0.000] $\chi^2(7)$	31.96 [0.000] $\chi^2(5)$	633.60 [0.000] $\chi^2(5)$	38.85 [0.000] $\chi^2(8)$	642.07 [0.000] $\chi^2(8)$

z –statistics probability in brackets; *significant at the 0.10 level; **significant at the 0.05 level; ***significant at the 0.01 level ;
Sarg = Sargan test of overidentifying restrictions; AB-test = Arellano-Bond test for zero autocorrelation in first-differenced errors
Obs. (yearly) = 180

Table 5 Panel eq. (3.2) – Difference and System GMM 1995-2006

Section 1, coefficient estimates																
	Baseline Model		*Baseline Model with lags*		*Baseline+ H*		*Baseline+ H with lags*		*Baseline+ H+D*		*Baseline+ H+D with lags*		*Baseline+ H+D+Externalities*		*Baseline+ H+D+Externalities with lags*	
	Dif.GMM	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*	*Dif.GMM*	*Sys. GMM*
M_{t-1}	0.5941*** *(0.000)*	0.6990*** (0.000)	0.5854*** (0.000)	0.7033*** (0.000)	0.5938*** (0.000)	0.7047*** (0.000)	0.5847*** (0.000)	0.7088*** (0.000)	0.5834*** (0.000)	0.7143*** (0.000)	0.5715*** (0.000)	0.7186*** (0.000)	0.4619*** (0.000)	0.6688*** (0.000)	0.563*** (0.000)	0.7208*** (0.000)
W	0.3832*** (0.007)	0.1991*** (0.000)	-0.2097 (0.352)	-0.2045 (0.170)	0.4024*** (0.005)	0.2127*** (0.000)	-0.1914 (0.376)	-0.1777 (0.240)	0.4432*** (0.002)	0.1905*** (0.000)	-0.1632 (0.448)	-0.1685 (0.267)	0.6263*** (0.002)	0.2246*** (0.000)	0.0238 (0.921)	-0.2260 (0.247)
W_{t-1}			0.6515*** (0.002)	0.4345*** (0.005)			0.6514*** (0.002)	0.4111*** (0.008)			0.6724*** (0.001)	0.3739** (0.016)			1.0694*** (0.000)	0.4885** (0.014)
U	-0.0393* (0.073)	-0.0643*** (0.000)	-0.1042*** (0.000)	-0.1230*** (0.000)	-0.0413* (0.060)	-0.0556*** (0.000)	-0.1041*** (0.000)	-0.1179*** (0.000)	-0.0354 (0.111)	-0.0597* (0.000)	-0.0995*** (0.000)	-0.1216*** (0.000)	-0.0101 (0.768)	-0.0537** (0.011)	-0.0927** (0.019)	-0.1316*** (0.000)
U_{t-1}			0.1034*** (0.001)	0.0847*** (0.000)			0.1006*** (0.001)	0.0837*** (0.000)			0.1044*** (0.001)	0.0814*** (0.000)			0.1362*** (0.004)	0.1258*** (0.001)
H					0.0798 (0.252)	-0.1306** (0.031)	-0.0627 (0.512)	-0.0723 (0.343)	-0.0753 (0.279)	0.1031** (0.087)	0.0498 (0.601)	-0.0448 (0.559)	-0.1404 (0.250)	-0.2007** (0.050)	-0.0362 (0.782)	-0.1036 (0.376)
H_{t-1}							0.0050 (0.949)	-0.0526 (0.410)			-0.0028 (0.972)	-0.0497 (0.439)			0.0920 (0.361)	0.0388 (0.650)
D									1.2177 (0.119)	0.4382 (0.460)	1.4793*** (0.050)	0.6545 (0.271)	1.3601 (0.174)	0.4750 (0.551)	1.5100 (0.134)	0.4819 (0.565)
A1 (crime)													-0.0012*** (0.006)	-0.0001 (0.394)	-0.0012*** (0.009)	0.0003 (0.215)
A2 (CO_2)													0.0303*** (0.005)	0.0146** (0.006)	0.0150 (0.179)	0.0019 (0.770)
Section2 Diagnostics:																
Sarg-test	242.95 [0.109]	305.26 [0.009]	233.98 [0.178]	291.51 [0.030]	240.78 [0.118]	322.21 [0.005]	231.41 [0.184]	308.561 [0.015]	240.24 [0.114]	335.38 [0.004]	230.73 [0.179]	322.81 [0.011]	155.13 [0.091]	225.31 [0.004]	135.78 [0.346]	191.89 [0.119]
AB-test (AR1)	-6.057 [0.000]		-6.167 [0.000]		-6.035 [0.000]		-6.128 [0.000]		-6.076 [0.000]		-6.186 [0.000]		-4.414 [0.000]		-4.928 [0.000]	
AB-test (AR2)	0.310 [0.756]		0.499 [0.617]		0.306 [0.759]		0.466 [0.640]		0.324 [0.745]		0.506 [0.612]		0.398 [0.690]		0.2553 (0.798)	
Wald Test	202.14 [0.000] $\chi^2(3)$	3100.55 [0.000] $\chi^2(3)$	228.90 [0.000] $\chi^2(5)$	3168.54 [0.000] $\chi^2(5)$	202.74 [0.000] $\chi^2(4)$	3250.32 [0.000] $\chi^2(4)$	227.82 [0.000] $\chi^2(7)$	3314.93 [0.000] $\chi^2(7)$	206.78 [0.000] $\chi^2(5)$	3294.31 [0.000] $\chi^2(5)$	234.51 [0.000] $\chi^2(8)$	3350.71 [0.000] $\chi^2(8)$	104.77 [0.000] $\chi^2(7)$	2915.78 [0.000] $\chi^2(7)$	127.28 [0.000] $\chi^2(10)$	2673.63 [0.000] $\chi^2(10)$

z –statistics probability in brackets; *significant at the 0.10 level; **significant at the 0.05 level; ***significant at the 0.01 level ;
Sarg = Sargan test of overidentifying restrictions; AB-test = Arellano-Bond test for zero autocorrelation in first-differenced errors
Obs. (yearly) = 220