



The Public Defense
of the Doctoral Thesis in Economics

by
Zsombor Cseres-Gergely

on

ESSAYS ON LABOUR MARKET BEHAVIOUR AT THE BEGINNING AND
END OF THE ACTIVE LIFE-CYCLE

will be held on

Thursday, November 19, 2009 at 3:00 pm

in the

Monument Building, Senate Room
Central European University (CEU)
Nádor Street 9, Budapest

Examination Committee

Chair:	László Mátyás	(Economics Department, CEU)
Members:	Gábor Kézdi	Supervisor (Economics Department, CEU)
	John Earle	Examiner (Economics Department, CEU)
	John Micklewright	External Examiner (Department of Quantitative Social Science, Institute of Education, University of London)
	Peter Benczúr	Internal Member (Economics Department, CEU)

The doctoral thesis is available for inspection
at the CEU Economics Department

Abstract

This thesis focuses on labour market behaviour of the young and the old and the connection between them with special regard to employment policy issues specific to these groups. Its main contribution is looking at mechanisms that play important role in the labour market career of these groups and doing so using data that are available in real life, rather than being an exotic exception. Such mechanism include the role of cognitive and non-cognitive traits in education, the effect of financial incentives in retirement, the possible interaction between the employment of young and older workers and the important role the pension system can play in employment policy, during the transition of Central and Eastern European Countries in particular.

Besides actively working on the availability of rich data for research and analysis, my aim throughout this dissertation was to apply economic theories and econometric methods to existing and available data. I believe that doing so not only help to generate new results in otherwise inaccessible scientific and regional areas, but also greatly benefits the application of existing scientific results. This thesis itself has a number of such conclusions, both contributing to scientific research and also applicable to real-life policymaking.

Being far apart within the life cycle, younger and older workers are similar in one respect: both are often unskilled relative to prime age workers, either because the lack of time to accumulate on the job experience, or because of the depreciation of human capital due to secular or individual changes. These peculiarities make the two groups similar in more than one way. Both are vulnerable on the labour market and accordingly, both are often the target of institutions trying to remedy this situation. *Chapter 2* of this thesis discusses and describes changes in activity and retirement in Hungary during the period after the economic transition. Looking at macrodata, it is apparent that the shock of the economic transition of post-socialist countries was absorbed differently by each of them: along with Poland, politicians in Hungary appear to have chosen to let the pension system absorb workers of destroyed workplaces. In order to see how this was possible, I lay out the institutional framework and discuss administrative data on pension claiming. Both confirm the hypothesis that the structure of the pension system was such that it strongly encouraged early retirement.

In the remaining part of the chapter, I use microdata from the Hungarian Labour Force Survey to describe the interaction of labour market behaviour and transitions to pensioner state both over historic time at different ages using transition matrices. Results from transition analysis show for example that despite the pension system being a truly final destination to many workers, it absorbed individuals in great numbers who were already inactive and not only those leaving state-owned companies. This does not only help us to understand the transition path of individuals, but also points to the particularly weak targeting of such a policy instrument. Results regarding to the post-2007 period are indicative that the pension reform in 1997 had considerable effect on the activity and employment rates of the affected age groups, showed by a

sharp rise in the employment rates of these specific cohorts. In addition to the effect of the pension system, changes in transition probabilities show also other effects being at work in affecting employment, including that of older workers. The increased stability of employment and the decreased transition probability to nonemployment is caused by a mixture of a genuine increase of employment probability, connected to the economic growth of the period and also by an autonomous increase in the share of cohorts with higher education levels. Nonparametric analysis of transition matrices is followed by parametric investigation through running multinomial logit regressions. Estimates showed a number of interesting features. Firstly, it appears that transition chances to and out of employment are strongly and monotonically affected positively by education in the first, but not so much in the second period. The differences appear mostly between the relatively few primary educated and the others. Age has a strong effect on retirement and tracks the shift in retirement ages, suggesting that it mostly captures the availability of old-age pension. Family relations and search behaviour have an expected positive effect on employment chances, largely unchanged over time. Regional unemployment rates show a positive correlation with transition to both type of retirement, lessening in importance in the case of old-age pension, but not in the case of disability.

Knowing that the pension system was effective in dampening the effects of increased nonemployment is important, but does not in itself tell a lot about incentives through which it operated. It is important to assess the workings of the pension system as an employment policy instrument for historic reasons, but also if one wishes to put it in other use, such as increasing employment through its parametric changes. *Chapter 3* looks at such mechanics and shows that pension regulation does have an effect on retirement possibilities, in particular the replacement rate offered by the pension system, but this effect is not as strong as the one of availability. After surveying the literature on retirement behaviour, I conclude that in Hungary – similarly to many other countries – state of the art “option value” models of retirement are not applicable directly, because sufficiently detailed data is lacking for that. A simpler model of claiming pension is laid out, which allows for the separate estimation of the effect of expected income both in a pensioner and a nonpensioner state, as well as the effect of availability of old-age pension. For this reason, it contains a decision and two autoregressive income equations describing pensioner and nonpensioner income streams, both featuring past period income. In order to deal with the possible selection into both pensioner and nonpensioner state on the basis of attributes not observable to us, a switching income model with selection to both states is employed.

The model used in this chapter is tailored to the use of household survey data lacking information on work-histories. The data actually used in the analysis is coming from such a source, the Hungarian Household Budget Survey, which gives a sufficient number of observations only in the case of connecting information from two consecutive time periods. Because of this, we have to use the populations choosing a certain option (ie. to claim pension or not) to predict expected income for those not choosing that option.

First I look at reduced-form estimates of the effect of groups of characteristics, finally concentrating on the group of working 40-65 year old individuals. After this, I turn to estimating the income equations first, predicting expected next period wages and pension. Finally I turn to the structural decision equation including these predicted income types.

The results enrich the stylised facts we have seen in the first chapter and are in line with those. Using predicted incomes successfully separates the indirect effect of explanatory variables. Because a 1 percent increase in expected wages (or pension income) is estimated to decrease (increase) the probability of claiming pension, financial incentives appear have a significant and independent effect on the retirement decision. This result holds true whether we are controlling for the effect of unobservable individual characteristics on claiming pension or not. Still, even controlling for financial incentives directly, the effect of the availability of the pension option seems to be a very strong predictor of retirement dominating the effect of replacement rates.

Having discussed matters connected to older workers so far, *Chapter 4* takes a sharp turn and looks at the other end of the age distribution, namely at teenagers, because recent research shows that later human capital and adaptability of individuals depends greatly on the training youth receive in this or earlier ages. Factors shaping the human capital and thus the labour market performance of individuals are of central importance in labour economics, especially in estimating wage functions. Although much of the interest was initially centred purely upon the effect of schooling, later also the effect of cognitive and recently that of noncognitive characteristics became an object of research. The weight of these factors in determining the labour market performance of an individual is of great importance, especially considering the significant amount of money required to operate the schooling and training system. This chapter contributes to this central question, asking which traits are important and why in determining higher education participation.

Using unique data from survey conducted in Budapest and following some 380 individuals from their early childhood until the age of 23, we are looking at the choice of higher education and the effect in light of the so called Big five test scores. Participation in higher education is a significant dividing line between individuals on the labour market, an important determinant of labour market success. Those with higher education enjoyed consistently high employment rates and wage rises throughout most of the two decades after the transition, for example. The Big Five scores are one of the most often used personality measures in psychology, gaining in popularity, but not routinely used in economics. It is the combination of this measure, the schooling outcome and the unique data that allows us to look at the conditional effect of extraversion, the dominant component of the Big Five score, on higher education participation (versus work).

Working with rarely-used data, first we take a look at descriptive statistics to document the gender differences in cognitive capacity (IQ) and extraversion scores by employment status and higher education attendance. Cognitive capacity is positively related to higher education and also to employment, if we are considering only those not attending higher education. One can also observe gender differences, men always scoring higher, but with less advantage in the case of students and more in the case of nonworking nonstudents. Extraversion shows a very different picture. It is negatively related to higher education, but positively related to employment among those not in school. Deviations from the mean are different in the case of the two sexes, men in school being significantly less extraverted than others, while men at work but not at school significantly more extraverted than others. Women show the opposite pattern. Those who attend school show above-average extraversion, while those not working and not in school show the lowest extraversion scores. Looking at the two traits at the same time, we find that the results hold true even if their effect is separated and measurement error is controlled. The explanation of this asymmetry between the two genders is the objective of the chapter.

In order to understand the means of how cognitive capacity and extraversion might affect higher education participation, we develop a simple model in which personality traits have an effect on earnings. In this model, individuals have to decide upon three options: to enrol in higher education in order to invest more in their human capital or not study further and realise the returns to already available human capital or do neither of these. In both cases, personality traits can help or hinder a particular choice influencing the cost and benefits of them, in particular that of choosing to enrol into higher education. Considering the value of each choice, as well as the cost of education, a conditional multinomial model emerges, which allows the estimation of most if not all key parameters.

Taking the model to the data, we choose a multinomial probit specification for flexibility. Using proxies for earlier behavioural problems during estimation and the model's structure to back out structural parameters, we can separate the previously combined effect of traits. These suggest that non-cognitive traits work mostly through increasing the returns of early entry to the labor market, rather than decreasing the cost of higher education. In terms of the observed differences between genders, this means that boys' higher than average IQ and lower average extraversion score is explained by a choice made on the basis of being capable to realise higher immediate payoff at work compared to girls, rather than having more difficulties with learning.

Finally, having looked at problems concerning older workers and youths, we turn to their interaction on the labour market in *Chapter 5*. The existence of such interaction is clear on the one hand, through direct competition on the labor market, but is unclear and feared by policymakers and the general public alike, operating through assumed direct effects on the other hand. One thing we know: policy itself can introduce some correlation between the two groups' employment chances. Early retirement policies of the eighties in

Europe were partly motivated by the idea that taking the old out of the labour market could help the young to avoid unemployment. With the ageing of industrialised societies, we are expecting the reverse of this trend after 2000 and thus governments are tightening retirement rules which make an increased employment rate of old plausible. Such an intervention is theoretically questionable, but naïve analysis of raw data seems to support it. This chapter aims at discussing the possible ways of measuring this crowding effect and showing the information content of employment-only data related to it.

To lay out the potential means of operation, first I survey the available literature and follow a simple model to show that a crowding out effect can exist, but can be easily confounded with other effects if investigation uses data with insufficient information. Apart from the correlation between the employment of the two types of labour resulting from optimising employer behaviour, the effect of employer protection legislation and that of “vacancy chains” appear to be influential. Casting the problem in a framework of production and factor demand, I look at the various elasticities that can be the theoretical counterpart of the crowding-effect. I derive a series of estimating equations from there, showing step by step the effect of missing one or other pieces of data on identification and estimation. Ultimately, it is clear that unless we observe data on prices and capital stocks, only very short-time effects, an analog of the technical rate of substitution can be estimated. Because this is negative by definition, it is unsuitable to estimate a longer-run trade-off between employment of the young and of the old.

In order to show effect of the lack of data, I use aggregate EU-level employment data to estimate the crowding-effect for the post-2000 period. The estimating equation uses first differences of transformed production function. Results show that one percent increase in the employment rate of the older is shown to be associated with an around 20 percent decrease in the employment rate of the young on the short run. This effect is substantial, but detectable only at the quarterly, but not at the yearly frequency, and goes away once we try to control for the effect of firm-level optimising behaviour. This reinforces the results of the theoretical discussion, namely that given data on employment, population and output only, the presence or the size of the medium- or long-term crowding effect between age groups is not detectable at any reasonable level of accuracy.

CURRICULUM VITAE

Zsombor Cseres-Gergely

Address:

Bercsényi u. 48. Budapest 1192, Hungary

Tel.: +36-30-8164261

E-mail: zsombor.cseres-gergely@budapestinstitute.eu

Education:

- 2002- PhD student at the Central European University, Budapest, Hungary. Department of Economics
- 2000-2002 MPhil studies at the University College London, Department of Economics
- 1993-1999 MSc degree from the Budapest University of Economics, majoring in finance

Languages:

Hungarian (Native), English (Fluent), German (Intermediate)

Research:

- 2008: Research on the co-relation between employment of young and older workers, as part of the research commissioned by EU DG Employment with number VS/2006/0592 and title „How could Hungary increase labour force participation?” delivered by the Institute of Economics, Hungarian Academy of Sciences
- 2007-2008: Research on the effect of cognitive and non-cognitive traits on labour market outcome supported by the RRC VII-37-es CERGE grant (with Gábor Kézdi)
- 2006: Research on the possibilities of medium- and long-term forecasting of local employment structure based on international panel data, within the framework of the HRDOP 1.2 measure (with Gábor Kézdi and Gábor Koltay)
- 2006: Research on the the access to data generated using public funds, commissioned by the National Telecommunications Authority (with Gergely Csorba)
- 2004-2006: Research on the consumption behaviour of Hungarian Households, funded by the OTKA grant T046151 (with György Molnár)
- 2004-2006: Research on the effect of economic incentives on retirement behaviour in the framework of the EBRD project “Unemployment and Labour Markets in Transition Economies”
- 2002: Research on mobility in Hungary in the EU 5. Framework Programme project „The EU enlargement: the effect of east-west migration on growth and enlargement”

Professional experience:

- 2008-ongoing: Partner of the Budapest Institute of Policy Analysis
- 2008-ongoing: Expert of the European Employment Observatory, member of the SYSDÉM network.
- 2008: Participation in the working group preparing the Hungarian Strategy for Ageing
- 2006-2007: Head of the Data Bank of the Institute of Economics
- 2006-2008: Designing the data analysis/econometrics curriculum of the Economics BA programme of the ELTE University
- 2006-2007: Participation in the preparation of the “Act on data accessibility for policy evaluation” for the government of Hungary as independent expert (act CI/2007)
- 2006-ongoing: Junior research fellow at the Institute of Economics, Hungarian Academy of Sciences
- 2002-2006: Research scholar at the Institute of Economics, Hungarian Academy of Sciences
- 2000-2001: Participation in the Committee set up to reform the Household Budget Survey of the Hungarian Central Statistics Office
- 1998-2000: Research assistant at the Institute of Economics, Hungarian Academy of Sciences.

Selected publications:

Households' consumption behaviour and welfare in Hungary after the transition [in Hungarian: Háztartási fogyasztói magatartása és jólét Magyarországon a rendszerváltás után], *Közgazdasági Szemle*, february 2008 Vol. LV.

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Incentive effects in the Hungarian pension system [in Hungarian: Ösztönzési hatások a magyarországi nyugdíjrendszerben], In: Cseres-Gergely, Zs., Á. Scharle, K. Fazekas (eds.) *The Hungarian Labour Market 2007*, IE HAS

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The effects of economic incentives on residential mobility and migration in Hungary 1990-1999 (2003, Nov) *Society and Economy*