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How Do Crises Affect Schooling Decisions? Evidence from Changing Labor Market Opportunities and a Policy Experiment

by

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Abstract[*]

This paper examines the effect of labor market opportunities on schooling-employment decisions in 12 urban areas in Argentina over 12 years, emphasizing the recession/crisis years 1998-2002. Over "typical" years deteriorating job rates increase the probability of attending school and decrease the probability of combining work and school, particularly for boys; the probability of being in school for secondary school children was about 6 percent higher in 2002 than in 1998. These estimates account for the fact that a new Federal Education Law (FEL) in 1996 extended mandatory education to 10 years. Differences across regions in implementation and differences in exposure across cohorts induced by the timing of the Law reveal that children in provinces fully implementing the FEL were 3 percent more likely to be in school and 1.6 percent points less likely to be working.

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1. Introduction

How might macroeconomic crises impact school enrollment and child labor in a developing country, and how effective are education policies in keeping children in school in Latin America (particularly during crises)? The ability of families to smooth economic shocks and the effectiveness of education policies have been of concern to policymakers who wish to minimize the long-term adverse implications of macroeconomic crises and also maintain high levels of human capital.

If children drop out of school and are sent into the labor market in reaction to a fall in household income, the likelihood that they return to school once the economic situation becomes more stable will be relatively small. This can lead to a permanent decline in human capital and (lifetime) earnings, particularly for less privileged youth.[1] This has been the main line of hypotheses tested in the literature for developing countries. However, the fact that households may cut back on expenditures on the education of their children during a crisis is plausible but not self-evident (Schady, 2004; Thomas et al., 2004; Beegle, Dehejia, and Gatti, 2005a).

Negative macroeconomic shocks might well depress employment and wage projections, and therefore the opportunity cost of going to school will fall. Ceteris paribus, this should lead to increases in investment in human capital. Nevertheless, a shock could also make borrowing constraints more binding and thus decrease the amount of schooling chosen. These crises (if persistent) might also lower expected lifetime earnings, thus changing the marginal benefit of attending school. Additionally, if the earnings of all individuals are reduced by the same share, the marginal benefit of one more year of education should be lower.[2] But crises need not have a homogeneous effect on (expected) earnings. As long as crises change the marginal costs and benefits of schooling, they may also affect their timing; and in particular, the degree to which children and youth combine school and work. Obviously, the effect of a crisis on adult or older siblings employment and incomes in the household will affect the schooling-employment decisions of children as well.

[1] For instance, five years subsequent to an experience of child labor, Beegle, Dehejia and Gatti (2005b) find significant negative effects on school participation and educational attainment, but also find substantially higher earnings for those (young) adults who worked as children.
[2] Lower in absolute but not in proportional terms.

The total effect will then depend on the relative size of the changes in the marginal costs and benefits, as well as on the cross-price elasticity of children's employment and adult/older-siblings' wages. Overall, the effect of macroeconomic fluctuations on schooling-employment decisions is uncertain in theory.

Combining these ambiguous effects with the implementation of a National Education Policy further complicates the analysis. However, some econometric approaches are helpful in analyzing the effects of such policies and disentangling them from other outcomes. These methods exploit variation in treatment intensity across different groups to identify the effect of the implementation of a given policy on variables such as school attendance, employment variables and others (Card and Krueger, 1994; Duflo, 2001). Given such tentative predictions from theory in terms of the effects of macroeconomic crises on schooling and the lack of systematic analysis of education polices in Latin America, careful country-specific empirical work is needed.

The classic "drop-out" story is that decreases in family income lead children to work outside the house or to undertake additional domestic tasks so that other household members can participate in the labor market; and this seems to hold for countries like Cote d'Ivoire and Vietnam (Jensen, 2000; Beegle, Dehejia, and Gatti, 2005a). However, some authors find positive effects on schooling after negative shocks (Goldin, 1999; Schady, 2004), while others suggest that by and large enrollment decisions are unaffected by macroeconomic crises, especially moderate ones (Jacoby and Skoufias, 1997; De Ferranti et al., 2000, Thomas et al., 2004). In sum, the effects of income shocks on schooling seem to vary considerably by country as well as by the nature of the crisis.

For Argentina, the scant existing evidence has so far been contradictory. España, Parandekar and Savanti (2003) find that the crises of the late 1990s and early 2000s did not change overall enrollment levels, while Rucci (2004) finds that shocks in Argentina led to declines in schooling over the 1998-2002 recession.[3] This paper moves away from the focus on the effects of shocks on credit constraints (or income effects) and considers the extent to which fluctuations in local labor markets opportunities and changes in the organization of the education system might also have effects on schooling and employment decisions.

[3] Rucci identifies the shocks with the trend of the Brazil-Argentina exchange rate over the 1998-2002 period. However, this instrument might be questioned.

I analyze these two effects with microdata on secondary school-age children in Argentina in the 1992-2003 period, using a multinomial logit to take into account the joint nature of school-employment decisions while controlling for other covariates. Most of the earlier studies on this topic have focused on the binary choice between school and work, but some focus on the fourfold choice among school, work, school and work, or neither. Although these studies have provided policymakers with information about the factors influencing schooling and labor decisions of school-age children, there is more to be learned from a further disaggregated analysis of this choice by also considering unemployed (i.e., those seeking work but not working) and inactive (i.e., no-work no-school) children. This is particularly relevant for a high-unemployment country like Argentina, in which the proportion of inactive youth is one of the highest in Latin America (about 15 percent of 15-18 year olds).[4] An analysis with this level of detail can be undertaken using the data provided by the Encuesta Permanente de Hogares (Argentine Permanent Household Survey, EPH hereafter), which allow me to distinguish between six choices facing school-aged children: school only, work only, school and work, inactive, unemployed only, school and unemployed. One of the contributions of this paper is that I show that it is not justifiable on statistical grounds to pool any of the six choices.

In terms of the identification strategy, the main difficulty is finding an appropriate proxy for the opportunity cost of children and also to be able to unravel the effect of education policy. Some studies include the child's wage as a proxy, but because not many children work, estimates of children's wages are subject to serious selectivity biases. In Brazil, the effects of local labor market opportunities on schooling have been identified by variation across states in wage movements (Duryea and Arends Kuenning, 2003). However, in Argentina unemployment has been one of the most important results of crises, even though "discouraged worker" effects were also a byproduct of the mid-1990s crises. Besides, urban-area level wages have not fluctuated as much as urban-area level employment rates. For this reason, the identification strategy relies on the variation across urban areas in job rates. The effects of macroeconomic swings on schooling decisions are examined with a focus on whether the income or substitution effect dominates as macroeconomic conditions change.[5]

[4] Moreover, the number of inactive children kept increasing until 1998, a feature which needs to be taken into account in the econometric model.

[5] The substitution effect story comes from two empirical observations. First, per capita household income decreased by almost 30 percent for all deciles and all levels of education during the 2000-2002 crisis, which seems to support a

Lastly, I make use of the exogenous change in the Federal Education Law (FEL) in 1996 in Argentina that extended mandatory education from seven to 10 years. This quasi-experiment can be used to disentangle the aggregate labor market effects and the effects of the Law itself, both identified at the urban area level. The education reform was gradual, in the sense that every year a new province (or set of provinces) adopted the F EL, providing variation that can be exploited in the empirical analysis.

The rest of the paper is structured as follows. The next section shows schooling and employment trends in Argentina from 1992 to 2003 and surveys the nature of the crises. Section 3 describes the Federal Education Law, while Section 4 gives details on the theoretical and econometrical framework of analysis. Section 5 briefly explains the data, while Section 6 describes the empirical strategy. Section 7 presents the results, and Section 8 concludes.

2. Schooling and Employment Trends

Before proceeding with the analysis of factors associated with youth educational outcomes I give a brief overview of basic indicators from 1992 to 2003. It is important to highlight that although Argentina is a developing country, the education sector ranks highly in comparison with other countries. Average years of schooling for the population aged 15 and over in 2000 were 8.8, significantly higher than the Latin American average of 5.9 years.[6] From 1991 to 2001 enrollment growth was 33 percent higher than population growth for those aged 15-17.

In terms of child labor, the law protects children from exploitation in the workplace and sets the minimum age for employment at 14 years, although in rare cases the Ministry of Education may authorize a younger child to work as part of a family unit. Children between the ages of 14 and 18 may work in a limited number of job categories and for limited hours if they have completed compulsory schooling, which normally ends at age 15.[7] In 2004 the National Commission for the Eradication of Child Labor (CONAETI) estimated that up to 1.5 million children, or 22 percent of children under the age of 15, worked in some capacity. Most illegal

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uniform across-the-board decrease in expected earnings. Secondly, the secular increasing trend in the marginal benefits to schooling stopped in 1998, just before the start of the recession in 1999. It therefore seems unlikely that changes in access to credit or in rates of return to education can explain patterns of attendance in Argentina, at least over the recession crisis period of 1998 to 2002.

[6] It is important to note that in 2004, 77 percent of students (initial, primary and secondary education) were in the public sector.

[7] See Section 3 for more details on Argentina's educational structure.

child labor took place in the informal sector, where inspectors had limited ability to enforce the law. Child labor in urban zones included work such as small-scale garment production, trash recycling, street sales, domestic service, and food preparation. Children also were involved in prostitution, sex tourism, and drug trafficking.

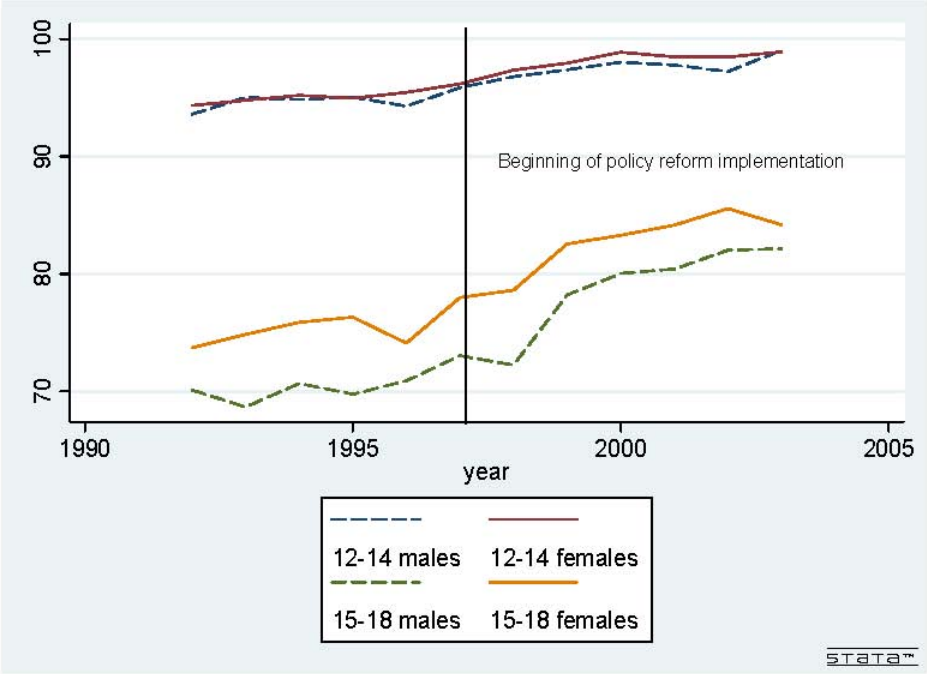
I present a synopsis of attendance, employment, unemployment and inactivity trends of 5-25 year old in Figures 4 to 6 in the Appendix. Attendance rates rose for all those aged 12-25 from 1992 to 2002, attaining 100 percent of attendance for 12-14 year olds by the end of the decade. Those aged 12-18 years had the largest increases in attendance rates. The greatest increase was for 16-year-olds, for whom the attendance rate went from 72 percent in 1992 to 83 percent in 2002.

On the other hand, employment rates went down, this effect being strongest for those aged 15-18 years from 1998 onwards. It is interesting to note that unemployment peaks at age 18-21 in 1992, and at age 20 in 1999 and 2002.[8] Figure 5 in the Appendix shows 12-17 year-olds combining work and school more in 1992 than in any other year (except for those aged 15).[9] However, the highest rate of youth combining employment and schooling at age 18 is found in 1999. Another turning point occurs at age 22, for which the rate of combined activities is higher in 2002 that in 1992. On the other hand, the proportion of 5-18 year-old "doing nothing" went down by 2.5 percentage points from 1992 to 2002. This decline was more pronounced for 12 to 18-year-olds, for whom this proportion decreased by 3.5 percentage points. For those over the age of 16 inactivity rates go up over time, reaching 20 percent for all those over the age of 20. The following figure summarizes the above information for children of secondary-school age by age group and gender.

[8] It should be noted that unemployment rates for workers under 20 years old are 3 times higher than the unemployment rates of workers aged 35 and over.

[9] I consider children to be combining work with school if they report e working in the reference week and at the same time report attending school.

Figure 1: Attendance over time, by secondary school age groups and gender



Source: Author's calculations based on Argentina EPH, May waves.

Table 1 shows the trend of the five possible states: school only, work only, school and work, inactive and unemployed only). There are two competing plausible explanations for these trends: aggregate macroeconomic effects on employment levels (Table 4) and the implementation of a new Federal Education Law extending the number of years that children have to stay in school.[10]

In 1995, Argentina suffered a shock caused by the contagion effect from the Mexican currency crisis. In consequence massive amounts of capital were pulled out of the country, unemployment rose to 18.4 percent and GDP fell by 2.8 percent. In 2002, the crisis was of a different nature. The Government could not sustain the peg of the national currency (the peso) and was forced to devalue by 40 percent. This devaluation was then followed by a historic debt default, GDP fell by 10.9 percent and unemployment went up to 21.5 percent. As shown in Figure 1, the 1995 shock negatively affected the enrollment rates of 15-18-year-old females,

[10] The fall in employment rates was particularly harsh for 15-18 year olds after 1998.

while the 2002 shock affected enrolllment rates for both genders equally by halting the increasing trend in attendance. I describe the Federal Education Law in detail in the next section.

3. The Federal Education Law

Following the pattern of educational polices in Latin American countries during the 1990s, a new reform program was launched by the Federal Government resulting in, among other laws: the Federal Education Law in 1993 (FEL hereafter). Despite the fact that this Law had been already sanctioned, the implementation only began in 1996. The reform was gradual, and from 1996 a different set of provinces implemented the reform each year, until the last of the implementing provinces, Mendoza, applied it in 2000. As of 2003, however, only 17 out of 24 provinces had carried out the reform completely, and five provinces were still in the phase of pilot programs or partial implementation.

The degree of implementation varied from one province to another. The reforms covered different areas, but I focus on only one: the extension of mandatory education from seven to 10 years.[11]All students are potentially subject to the effects of FEL and each province decides whether to implement it, as well as whether to engage in generalized or gradual implementation. This "pseudo-voluntary" adoption of the Law turns out to be crucial as I explain in the empirical strategy section.

The greatest change in this new organization of educations affects children aged 12 to 14 years through the following areas of curriculum reform: i) Nine years of General Basic Education—EGB1, EGB2 and EGB3—for 6-14 year old children (now mandatory) and ii) Three or four years of Polymodal or High School for 15 to 17-18 year olds (not mandatory).

As shown in the first column of Table 3, only two provinces (Buenos Aires and Cordoba) implemented the reform in 1996. At the time this paper was written, only two provinces (Rio Negro and Ciudad Autonoma de Buenos Aires) have not applied the reform. However, only a few provinces followed a full implementation policy.[12] Column (iv) shows the intensity with which the treatment was applied. This variable was constructed based on column (i) and taking as reference the year 2000. Nearly 75 percent of total gross enrolment in secondary school for

[11] Other areas of reforms were: (i) the transfer of national responsibilities to the provinces for secondary and technical education, and for teacher training institutions; (ii) curricular reform; (iii) administrative reforms and (iv) higher education reform.

[12] This was quite a common strategy, with nine provinces beginning with this modality (see column (iii) of Table 3).

the year 1996 was in provinces which fully implemented the FEL (column (v)). Buenos Aires province represents 37.3 percent of total enrollment (or 49.5 percent of all students in FEL provinces). I comment on the last column in the data and sample section. The following sections will explore whether the observed increase in attendance for 13 to 18-year-olds was a consequence of the lack of employment opportunities, this new Law or a combination of both factors.[13]

4. Theoretical and Econometric Framework

4.1 Theoretical Framework

Empirical research on schooling investment has been inspired by the standard neoclassical Becker model of human capital accumulation where individuals acquire education until the (expected) marginal benefit of an additional year of education equals the marginal cost (Figure 1 in the Appendix).[14] The underlying assumptions are: complete markets, the only cost of schooling is foregone earnings and fees, children earn nothing while at school and no value is attached to education as a consumption good (Rosen, 1977; Willis, 1986). However, in a developing country like Argentina, two features of the schooling decision problem are missing. The first is additional (i.e., part-time or full time) earnings which may lead to a lower cost of an additional year of education,[15] and the second, incomplete markets and borrowing constraints that may lead to under-investment in human capital (Becker; 1964; Galor and Zeira, 1993, Jacoby 1994). In a model with altruism (Andreoni, 1989), borrowing constraints will then prevent perfect smoothing of consumption, and the outcome will be, if labor displaces schooling

[13]Galiani and Schargrodsky (2001) used a different aspect of the same political experiment. They exploit the generated exogenous variation in the jurisdiction of administration of secondary schools across time and space in order to identify the causal effect of school decentralization on education quality, measured by the outcome of a standardized test of Spanish and Mathematics administered to students in their final year of secondary school. Crosta (2007) evaluates the relationship between the F EL, access to schooling and the quality of schooling. However, he does not use the nationally representative and comparable EPH surveys as he only has the Encuesta de Condiciones de Vida -2001 survey.

[14] As is common in the literature, I assume that parents decide investments in education for children under 18 years old.

[15] In Argentina, the organization of secondary school is such that a full-time "standard" job should not be possible to maintain while working. However, those 13-18 year-olds that report to be employed are working an average of 37 hours/week (vis-à-vis 44 hours/week for those employed aged 15-62), which is compatible with the definition of full- time employment. Only 35 percent of individuals 13-18 year old that are employed work 25 hours/week or less. Along these lines, Ravallion and Wodon (2000) found that child labor does not displace schooling in Bangladesh, but it displaces leisure time.

(Ravallion and Wodon, 2000), underinvestment in human capital as a byproduct of child labor (Basu and Van, 1998).

The marginal private benefit curve depends on the expected private gains (i.e., in wages/salaries in labor markets where, for instance, returns to education and unemployment rates will play a role) to human capital investment. The marginal private cost may increase with human resource investments because of the increasing opportunity costs of more time devoted to such investments and because of increasing marginal private costs of borrowing on financial markets (if such markets do not easily permit borrowing for such purposes, at some point the marginal private cost curve may become very steep or even vertical). Moreover, the possibility of working will have two effects: via the income effect it might reduce credit constrains and then decrease the private marginal cost of borrowing on financial markets, therefore leading to a higher investment in human capital. Via the opportunity cost, the substitution effect will in turn decrease investment in human capital. In this framework researchers have studied the effects of various factors such as household income shocks, returns to education and family background on the marginal costs and benefits of an additional year of education.[16]

There is also considerable evidence of convex rather than concave earnings-education profiles in developing countries (Söderbom et al., 2006), including Argentina (López Bóo, 2007). Therefore an individual needs to complete a considerable number of years of schooling in order to reap substantial gains from her investment. Consequently, a large education budget may be necessary if schooling is evaluated as a human capital investment, and one would therefore expect household income to matter in a very direct way when evaluating educational outcomes. Unsurprisingly, the developing country literature has found a systematic relationship between educational outcomes and family income (Behrman and Knowles, 1999). The positive impact of income is also used by many as evidence of binding credit constraints in developing countries.
In this paper I move away from credit constraints and the traditional determinants of schooling-employment decisions to concentrate on the effects of macroeconomic crises and the FEL, and

[16] It is well-known that variables like the occupation of the mother and the father, parental education (usually a proxy for permanent income) and the mother being in the labor force are strong predictors of schooling levels in Latin America. Sometimes these variables are even more important determinants of children's educational attaintment that household income is (Hausmann and Székely 2001; Behrman, Birdsall, and Székely 2000). This seems to be the case for the Greater Buenos Aires (GBA) until 1994 (Sosa and Marchionni, 1999).

explore whether income or substitution effects dominate with aggregate changes in local labor market opportunities.

4.2 Econometric Approach: Multinomial Logit Models for School-Employment Decisions

I employ a reduced-form production function approach to examine the effect of aggregate changes in labor market conditions and the FEL on attendance-work decisions of school-aged youth. This can be performed by means of a multinomial logit if one wants to take into account the joint nature of school-labor decisions for a child while controlling for other covariates. Most of the earlier studies have focused either on the binary choice between school and work (Rucci, 200; de Janvry et al., 2006), while some consider the four-fold choice between school only, work only, school and work, or neither (Duryea and Arends Kuenning, 2003). Although these studies have provided policymakers with crucial information about the factors influencing school-labor decisions of school-age children, there is more to be learned by further disaggregation. This can be done using the data provided by EPH, which allow me to distinguish between six choices facing school-aged children: school only, work only, unemployed only, school and work, school and unemployed and inactive. I show by means of Hausman tests of independence of irrelevant alternatives (IIA) that it is not justifiable on statistical grounds to pool any of the six choices.[17]

I model the schooling-employment decision following the literature on occupational choice, using a latent variable approach. Following Bourguignon, Fournier and Gurgand (2007), the latent variable is the propensity to sort into a given activity. Only the outcome and not the underlying propensity are actually observed:

$$yj = Z\gamma j + \eta j \quad (1)$$

Depending on whether I condition on "some activity" I can have three or four *j* categories. If I condition on activity then the three activities are: only studying (*s*), only working (*l*) and combining work with school (*c*). In the empirical model I also use a classification with five activities (adding the inactive and the unemployed category to the above classification).[18]

[17] However, in order to take into account small sample sizes when splitting age groups I pool some categories (unemployed and employed as active in some regression, while those in school and reporting being unemployed (about 10 observations per year) will be merged into the school only category.

[18] The number of inactive children increased until 1998 and then fell until 2002. This can potentially matter for selection issues.

However the key points can be made across these three activities outcomes (a). The outcome variable $yj*$ is observed if and only if category j is chosen, which happens when

$$ya > \max(yj*) \quad (2)$$

The key assumptions that underlie the model concern the determinants of the propensity to "sort" into a given activity a (the observables in Z and the unobservables, ηj).

This paper focuses on the unbiased estimation of labor market effects and FEL in times of change. For this reason, I go into the details of the specification, the variables of interest, controls and identification issues of both labor market effects and the FEL in the Empirical and Identification Strategy section.

4.3 Hypothesis Testing

Within this framework, one could expect to test at least five hypotheses on schooling-employment decisions. I am interested in the first three, while the last two serve as robustness tests. First, whether human capital investment goes up because fewer jobs are available (substitution effect). This can be tested with a set of urban-area labor market variables that will act as a measure of the opportunity cost of staying in school.

Second, whether human capital investment among school-aged youth goes down during crises or unemployment peaks because fewer jobs and/or depressed wages are available to those who would have liked to combine work and school (income effect). Here the same labor markets variables will be interpreted differently depending on the sign of the coefficient and on the activity category. For instance, job rates are expected to have a positive impact on those children combining school and work because it increases the probability of funding their studies.

Third, human capital might also go up due to the "illegality" of not being in school arising from the Federal Education Law (FEL). I should be able to identify this effect by performing a before and after FEL comparison for each group of provinces that implemented the Law in different years. That is, I look at children in provinces j at $t - 1$ and at t and in subsequent years (t being the year when the FEL is implemented).

Fourth, human capital investment might also go down during crises for a different reason. If school-aged youth have to take jobs because crisis/unemployment has affected some jobs more than others (e.g., parents/older siblings lose their jobs) and their households are unable to smooth

consumption, then this will increase their marginal cost of attending school, leading to a slower (if school is combined with work) or lower investment (if drop-out occurs) in human capital (income effect). As a robustness test, I use the same labor market variables but split by age groups. I expect the unemployment rate at the urban-area level of adults and older siblings to have a negative effect on enrollment, and a positive effect on the probability of working.

Fifth, human capital might go up due to incentives arising from the increasing returns to college over this period, in particular, higher marginal benefits for those at the margin of deciding whether to continue into college education or not.[19] For this test I use wages (both unskilled and skilled wages) as a measure of the opportunity cost.

For each one of the hypotheses above I perform the analysis by gender, as outcomes are suspected to be different for girls and boys for two reasons:[20] the acceptability of child labor may differ by gender, and the employment opportunities may be different for boys and girls.[21]

5. Data and Sample

5.1 Data

All of the following regressions are estimated using all available individual and household level observations from the 1992–2003 May rounds of the Encuesta Permanente de Hogares or Argentine Permanent Household Survey (EPH hereafter). The survey is conducted twice per year (May and October) in urban areas by the Instituto Nacional de Estadísticas y Censos (INDEC).

As the last available year (2003) only has comparable data available for the May wave, I have decided to take only May waves for all calculations.[22] This implies that only 13 out of 31 urban areas were left, with these urban areas surveyed for all Mays between 1992 and 2003. Table 4 presents the basic statistics of the variables used in the analysis below.

[19] Returns to college education have increased dramatically in Argentina over the last 15 years, while returns to secondary and primary education barely changed (López Bóo, 2007; Fiszbein et al., 2005).
[20] Marchionni and Sosa Escudero (1998) found that drop out rates were higher for boys than for girls aged 13-19 in the Greater Buenos Aires. Rucci (2004) finds that 12-17 year-old males were more likely to drop out of school during the 1998-2002 Argentine crises, while 12-17 year-old girls were not as likely to do so.
[21] For instance in Argentina the types of (urban) jobs available for 13-18-year-olds seem to be better suited to boys than to girls (e.g., cardboard collection, car window cleaning and other informal street jobs). Unfortunately, if girls are working at home, this activity is not going to be recorded in the household surveys.
[22] Given that surveys cover only urban areas, most statistics are not significantly affected by seasonality issues.

5.2 Sample

For the analysis of school-employment decisions across urban areas I take the sample of 13-18 year-olds (secondary school-aged) in the cross section (e.g., I compare 13-18 year olds in 1992 with 13-18 year olds in 1997, and the same group in 2002). I only take those that have already completed mandatory primary school (85 percent of the sample of this cohort). This is the group that is closest to marginal decisions in terms of schooling-employment for various reasons, the first of which is that almost all 5-12 year olds are attending school by the end of the period under analysis (Figure 4). In fact, 96 percent of 12-14 year olds were already attending school in 1997 (the year in which the education reform process began). The sample of children between the ages of 14 and 18 is then particularly interesting as they work in a limited number of job categories and for limited hours. The Ministry of Education claims that this group can only work if they have completed compulsory schooling, which normally ends at age 15 (since the FEL in 1997; before then compulsory schooling ended at age 12).[23]

Last, the last column of Table 3 shows whether the province is available in my dataset for every year. I have comparable data from 1992 to 2003 for 10 out of 24 provinces (or 7 out of 17 that fully implemented the Law). The sample represents 62 per cent of total enrollment for 12-18 year olds.

6. Empirical and Identification Strategy

As explained in the Econometric approach in Section 4.2 I estimate:

$$y_{iakt} = Z\gamma_{iakt} + U\delta_{kt} + F\ EL\tau_{kt} + \eta_a + \nu_{iakt} \quad (3)$$

Following the literature on education and labor supply decisions, the determinants of the propensity of a child *i* to sort into a given activity *a* in urban area *k* at time *t*, *yiakt*, will depend on: *Z*, a control matrix of observables at the child (or child's household) level, with plausible determinants of expected earnings, schooling participation and the reservation wage as independent variables; *U*, a set of urban area variables; and *FEL*, the binary variable that takes the value 1 for individuals that reside in urban area *k* that have completely implemented the *FEL* in the cross-section. That is, in 1997 this dummy will capture only those children living in the

[23] Before the reform, the minimum age required to start high school was 13 years as of the 30th of June of the entry year. With this reference, an 18-year old student will be in the last year of high school.

two provinces that have implemented the Law (vis-à-vis the provinces that did not implement the Law), while in 1999 it will capture children in those four provinces that implemented the Law between 1996 and 1998.[24]

Thus the empirical strategy consists of the following steps. First, I estimate the determinants of the schooling-work decision which was at the core of the theoretical and econometric model, distinguishing between people that are: only in school, only employed (any type: i.e., self, salaried formal or informal, in the public or private sector), both attending school and employed, unemployed and inactive (i.e.,"doing nothing"). This schooling-employmentchoice is modelled using a multinomial logit.[25,26] In Z I have age dummies to take account of the fact that how close a child is to marginal schooling decisions will make a difference in the decision to continue with school or to drop out. I also include a male dummy. Z also includes a vector of household/family characteristics that may determine the reservation wage and parental decisions regarding human capital investment of children, including the education level of the head of the household as a control for permanent income, household size as a measure of the quality-quantity trade-off for children (i.e., whether larger households do not send their children to school as much as smaller households), and the log of per capita income of the household (excluding children's earnings).[27] Household income matters for at least two reasons. First, the convexity in the earnings-education profile makes a large budget necessary when considering education as an investment. Second, it serves as a control for transitory income effects. Education of the spouse and other adults in the household will also be included as controls. These variables will determine the sorting decisions.

In the second step of the empirical strategy I add urban-area level labor market variables (U) to identify the effects of local labour market conditions. This follows the existing literature on the effects of economic shocks and changing local labour market conditions on schooling and employment (Beegle, Dehejia, and Gatti, 2005a; Duryea, Lam, and Levison, 2007; de Janvry et

[24] The Statistics Institute surveys urban areas within provinces, so I actually have 12 urban areas distributed in eight provinces.
[25] In principle, and for simplification, I pool both full-time and part-time work, but I split these two as a robustness check later.
[26] In theory, the variables in Z might differ for each alternative (only employment, only school, etc.) but I simplify this for now.
[27] I consider children as secondary workers; in other words, child labor or schooling decisions are made after the income of the household adults has been determined.

al., 2006). These variables serve to test for the hypotheses I presented in Section 4.3. I exploit the variation in labor market variables over time and across urban areas in Argentina as a way of testing the "pull" effect from different opportunities in different regional labor markets and see whether this effect holds over crises. A vector of urban-area labor market variables measures the opportunity costs, on the one hand, and the increasing incentives to invest in education due to the fewer "opportunities" available to combine school and work (income effect) on the other hand.[28] For this purpose I include the following measures: (i) Job rates (i.e., number of jobs for unskilled adults (with less than 12 years of education) divided by the total 30-35 year-old unskilled population in urban area *k*) as another measure of the opportunity cost of attending school but also as a proxy of the income effect for those combining work with school. I chose this variable because the number of jobs available is a better indicator than employment rates for labour market shocks in Argentina, given the persistence of the "discouraged worker" effect;[29] (ii) Unemployment rates by skill level and age group in order to test the effect of unemployment on schooling and inactivity. For instance, I calculate the unemployment rate of persons 30-35 years old. This variable serves to test for "additional worker" effects. Finally, I include (iii) Wages of low-skilled workers, defined as the average wage of those aged 30-35 in urban area *k*.[30] 30

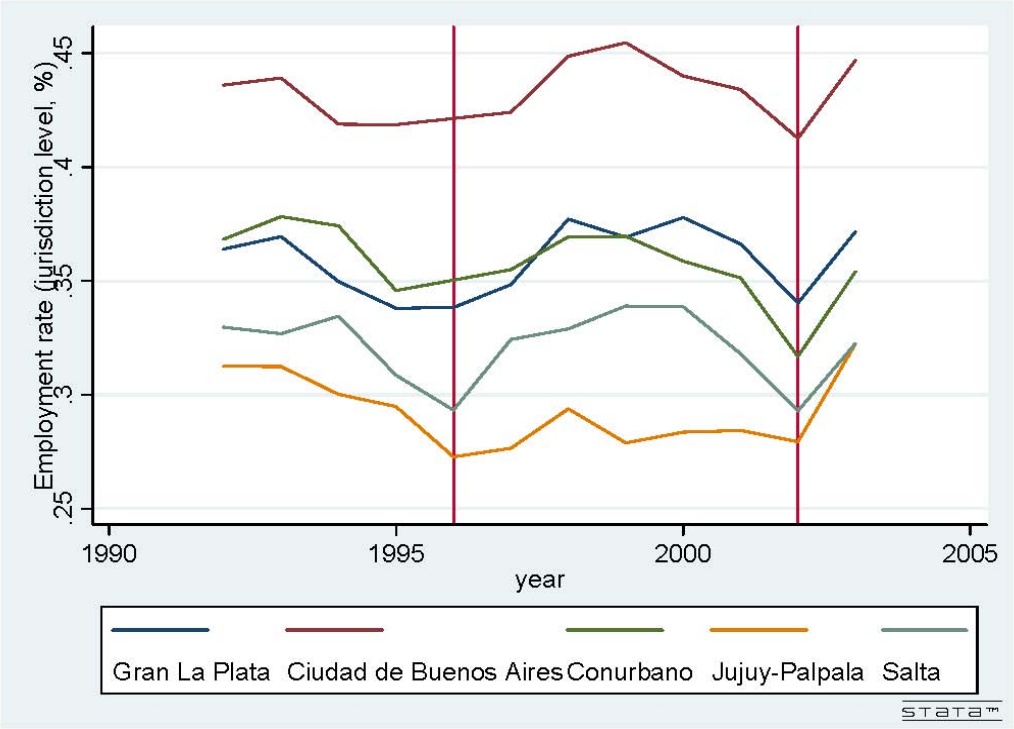
My main measure of the opportunity cost (job rate at the urban-area level) is represented in Figure 2.

[28] Following Ham (1986) regional unemployment/employment variables are included in the model to allow for disequilibria, as "not everyone who demands a job can have it."

[29] Note that the denominator is the 30-35 year old unskilled workers as to consider the total of the 30-35 year old might have confused the effects as there would have been both a high number of unemployed but also a high number of skilled workers in the denominator.

[30] This is the wage rate that children would expect if they decide to enter the labor force.

Figure 2. Job Rates of Unskilled Adults 30-35 Years of Age in Selected Urban Areas



Source: Author's calculations based on Argentina EPH, May waves.

Thirdly, to identify the effect of the Federal Education Law (over and above labor market effects at the urban area level), I add the dummy FEL (the "treatment" shown in column (ii) of Table 3) in the years when the FEL was adopted in a particular set of provinces (FEL=1 if individual *i* is in province *j* where the Federal Education Law was fully implemented in year *t*).

Following Card and Krueger (1994) and Duflo (2001), I exploit the variation in treatment intensity induced by the timing of the program across regions and cohorts to identify the effect of the implementation of the Law on school attendance and employment. This relies on a "pseudo" differences-in-differences strategy. Conditioning this political experiment on urban area fixed effects generates plausible exogenous variability in the implementation, which allows greater precision in the identification of its effect. As a robustness test, I also use the variable *YearFEL* (shown in column (iv) of Table 3), which reflects the intensity of the treatment.

Urban area fixed effects are always included when running the regression on pooled data, so that I identify variation in local labor market conditions effects from the variation in employment within each urban-area. In all the tables, the estimated coefficients of the

multinomial logits reflect the effect of each explanatory variable on the likelihood of becoming either: student only, employed only, student and employed, unemployed or idle.

Lastly, as a robustness check I consider age groups (13/14, 15/16, 17/18) separately because different factors (including returns to education, family background and other labor market conditions) may have differential effects depending on how close a child is to marginal schooling decisions. A further advantage of considering the age groups separately is that this lessens the risk of biases due to more able children progressing more in school (i.e., school continuation selectivity on the basis of unobserved ability).[31]

7. Results

7.1 Determinants of Schooling-Employment Decisions: trends

Figure 3 provides a graphical representation of the estimates from the multinomial logit in Table 5 (basic specification). The y-axis shows the predicted probability of ending up in each category restricted for an individual 13-18 year old and a given education level for the household head, holding all other characteristics constant at the sample means. The x-axis shows the number of years of education. These probabilities sum to one for all education groups. I estimate this by gender for 1992, 1996, 1998 and 2002, and I consider the correlation between the education level of the head and the predicted probabilities of entering each activity.

The predicted probabilities of both school only and work only increase rapidly with years of education both for males and females. The probability of working (either combining it with school or not) decreases in size substantially over time, and it is always substantially lower for females. From 1995 until 2001 the probability of doing nothing increases sharply, but this tendency reverses in 2002.[32] The main contrast between males and females is in the inactivity category vis-à-vis the only working category. Females 15-18 years old with less than completed primary school (seven years of education) have a much higher predicted probability of being

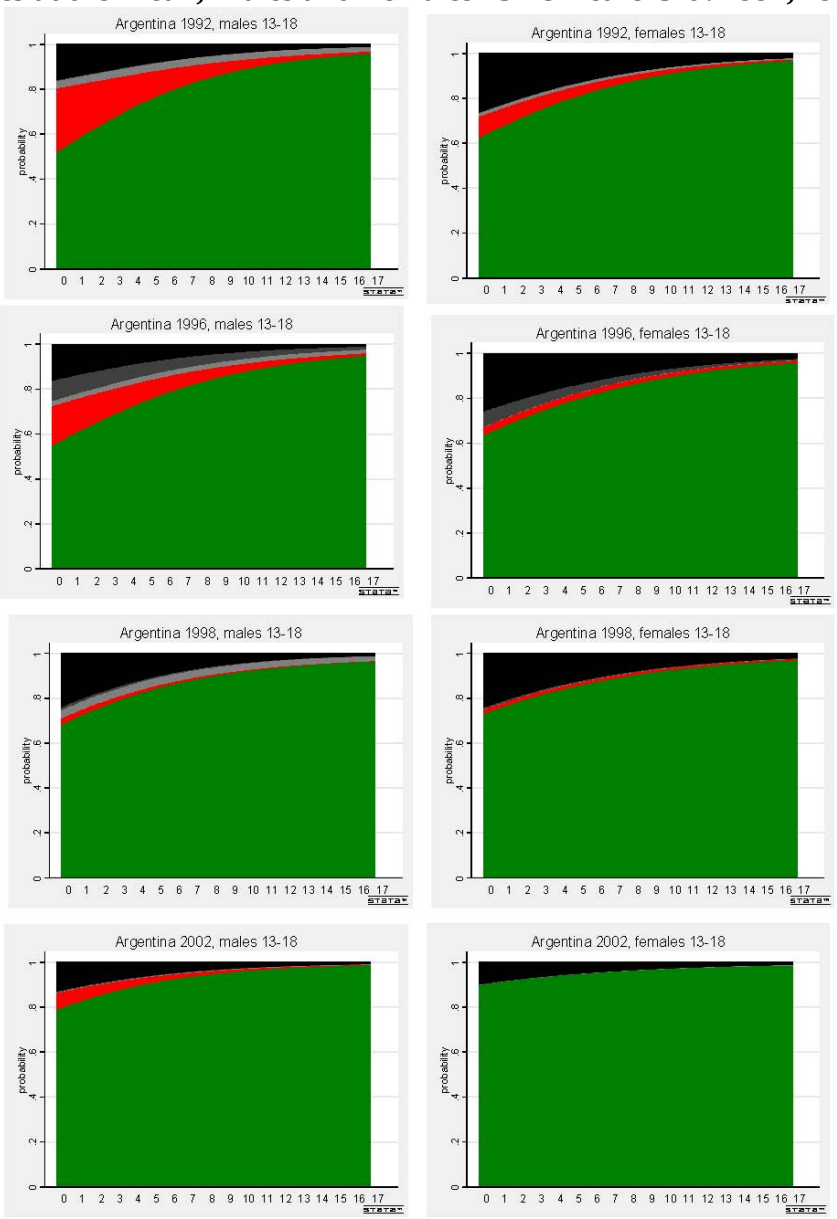
[31] Cameron and Heckman (1998), for instance claim that most of the literature on the effects of parental background on children's attainment concludes that the effect of family background declines after secondary schooling but that these estimates suffer from omitted ability bias because more able children normally progress further in the education system. This biases estimates of family background effects.

[32] There is an extensive literature on the "discouraged worker" effect and its impact on inactivity levels in Argentina (Altimir and Beccaria, 2001)

neither at school, nor in the labor force. The predicted probability of being idle for both boys and girls decreases strongly after 1998.

The marginal effects for the basic specification are shown in Table 5 for 13-18 year olds by selected year. Age dummies, gender and household-level variables have the expected sign and do not change across specifications.

Figure 3. Predicted Choice by Education Level of Household Head, Holding Other Characteristics at the Mean, Males and Females 13-18 Years Old: 1992, 1996, 1998, 2002



Source: Authors' calculations based on Argentina EPH, May waves. Predicted probabilities after MNL estimation in Table 5. From bottom to top, the five categories are only school (green), only work (red), school and work (light grey), unemployed (dark grey) and inactive (black).

As expected, attendance is a decreasing function of age. This is particularly evident for the 18-year olds who have a lower predicted probability of attending school only and a higher predicted probability of either combining work with school or only working. The (negative) marginal effect of the male dummy decreases over time, particularly after 1998, showing a smaller gap between males and females in attendance and a quite stable predominance of young males in the labor force (note the positive and significant sign of the male dummy in the only work, work and school and unemployed categories).

The importance of the schooling of the head of the household decreases over time, in particular from 1998, for all categories. This may reflect the declining importance of "permanent income." Moreover, this variable it is not significant for those combining work with school. The household size estimate reflects the same decreasing trend. The relationship between the size of the household and the probability of ending up in school (working) is negative (positive) and significant.

7.2 The Effect of Local Labor Market Opportunities and the FEL on Schooling-Employment Decisions

In Table 5 I add household and child characteristics thought to influence the supply of child labor and schooling, and therefore controlled as much as possible by labor supply shifters. I now test whether urban areas variables and the FEL remain significant if included in this specification. If the relationship between child labor and urban labor markets is entirely due to variation in labor supply, and the additional controls adequately capture this variation, then the urban area variables and the FEL dummy should no longer be significant.[33] The preferred specifications are in Tables 6 and 7. In these tables I test whether labor market variables, which are supposed to proxy for opportunity costs, have (i) any effect on schooling-employment decisions and (ii) whether those effects vary during crises.

Job rates have the expected sign for all categories (negative for tonly school and positive for all others). However, the exception is the crisis year of 2002. For non-crisis years, the opportunity cost draws children away from school as shown in the first panel of both tables, and labor markets are competing for children's time, as shown in the coefficient for those working or

[33] Age dummies and gender and household variables do not change in size or magnitude when including urban area variables

searching for a job in the second, third and fourth panel. In a crisis year such as 2002 the substitution effect behaves differently: the effect of the job rate on schooling is positive and significant in Table 6, while its marginal effect is very small and no longer significant in Table 7.

For the first category (only school), the largest coefficient on job rates is for 1994 (unsurprisingly, a high employment year), while the lowest marginal effect is found in 2002 (a very low employment rate year). For the second category (only work), it is interesting to note that the estimate on job rates is negative in 2002, perhaps reflecting some non-linearities of the effect of jobs rates below a threshold level. Also, the effect on those combining work and school in 2002 is 10 times smaller than in 2000.

Another important point to note is that even if the job rate actually experienced by youth is lower than the unskilled adult rate, differences across urban areas and over time are likely to be similar for the youth rate and the unskilled adult rate, as they are moved by the same macroeconomic conditions.

In Table 7, unemployment rates, in turn, are partly measuring opportunity cost but also act as a control for the increases in inactivity rates fueled by the high unemployment rates over the mid-1990s. The effect of unemployment on inactivity is significant and positive until 1998, when it turns negative, becoming insignificant afterwards. On the other hand, the effect of unemployment on those combining work and school or only working is an interesting example of how this relationship might change with the macroeconomic environment. For both categories the estimate is positive, but it becomes much smaller in 2002 (and is not significant for the working only category).[34]

As robustness checks, I have replicated Table 7 for various sub-samples. These are available for the 15/16-year-old and for the 17/18-year-old samples. The results show that different age cohorts behave systematically differently, namely in that older cohorts are more sensitive to changes in the labor market variables.

Figure 3 showed that the probability of being inactive is positively related to being female regardless of the macroeconomic conditions. This may be an indication that labor market variables do not have any pull effect on them and that more structural variables are behind their behavior.

[34] The specification where I use unskilled adult wage rate as a measure of the opportunity cost instead of job rates or unemployment is available upon request.

Table 8 concentrates on boys vis-à-vis girls and shows that labor market variables are significant in both samples but also significantly different. For both genders, the "2002 result" still holds (i.e., the coefficient of job rates on the likelihood of being in school switches sign from negative to positive). However, in general, labor market variables, despite having the expected sign, show larger coefficients for boys than for girls, which is perhaps the reflection of different attitudes by parents towards child labor of boys versus girls. Another gender difference is the effect of temporary income shocks: household (per capita) income has a large effect on attendance for girls in 2002, while it is not significant for boys. Income decreases the probability of being only working for girls in 2002, but it does not seem to affect it for boys.

Lastly, Table 6 shows the marginal effects that will allow me to obtain estimates for the different scenarios I present in Table 2, due to both the FEL and labor market fluctuations. In other words, I present the marginal effects of the relevant variables for three baseline years: one non-crisis year (1992), one start-of-crisis year with end of implementation of the Federal Education Law (2000), and lastly a crisis year (2002).

I demonstrate with this summary table that in "typical" years deteriorating job rates increase the probability of attending school and decrease the probability of combining work and school. After controlling for household and individual characteristics, a 10 percent decrease in the job rate alone has been responsible for a 5.4 percent increase in the probability of school attendance since 2000 (0.054 in Table 2). This substitution effect becomes positive in 2002 (in contrast to -0.046 in the same table). These estimates account for the fact that a new Federal Education Law (FEL) in 1996 extended mandatory education to 10 years and might have affected schooling outcomes. Differences across regions in implementation and differences in exposure across cohorts induced by the timing of the Law allow me to show that children in provinces fully implementing the FEL in 2000 (when the last set of provinces implemented the Law) were only 3 percent more likely to be in school and 1.6 percent less likely to be working in 1998. But when I compute the probability conditional on the number of years since the implementation of FEL, that increase in the "intensity" (i.e., higher exposure to the Law) does not imply an increase in the probability of being only in school (not reported).

7. Conclusions

This article examines the patterns of investment in human capital over the 1992-2003 period for secondary-school aged children in Argentina covering the profound economic crisis of the 1998-2002 period. The main finding is that households, including poor households, were very reluctant to make cutbacks in key human capital investment. There is no evidence of a drop in school attendance. Indeed, the probability of being in school (and not working) increased by 6 percentage points over the crisis period. This increase was at the expense of being inactive (-2.5 percentage points), combining work and school (-1.9 percentage points) and only working (-1.6 percentage points). During the 2002 crisis, children were almost 1.8 percentage points less likely to combine work with school than in 1998, and 3 percentage points less likely than in 1994 (a high employment year). This first result suggests that macroeconomic crises do not always slow human capital accumulation.

I was able to disentangle the aggregate labor market effects of the crisis and the effects of the Law itself, both identified at the urban area level, on schooling decisions. I used adult unskilled (less than 12 years of education) job rates to identify the effect of fluctuating labor markets and a dummy (=1 if child *i* is in a province that has fully implemented the Law) to identify the "treatment" of the new Education Policy.

The effects of macroeconomic swings on schooling decisions are examined with a focus on whether the income or substitution effect dominates as macroeconomic conditions change. Overall, the pull effect from labor markets has been much larger in high employment years than in low employment years, and it disappeared in 2002. However (and despite smaller marginal effects on schooling decisions), absolute changes in employment from 1998 to 2002 have been strong enough to provoke increasing attendance rates.

At the same time, by May 2000 the Federal Education Law increased attendance rates by 3 percentage points in those provinces implementing the Law compared to those not implementing it. [35] However, the 6 percentage point decrease in the average job rate from 1998 to 2002 has increased the proportion of children in school by 3 percentage points (evaluated at the 2000 coefficient), or half of the total observed increase in attendance.[36] Boys are more affected

[35] As FEL provinces are 54 percent of the sample, this implies a total increase in attendance of 1.6 percent (0.54 times 0.03).
[36] The job rate went down from 54 percent in 1998 to 48 percent in 2002 (or 6 percentage points).

by labor market variables than girls, and earnings differentials also reflect this. This might be related to how households view work for boys versus girls, or to boys having more, or better, job opportunities than girls.

The main message of these findings is not that macroeconomic shocks have no social costs. The quality of education may still suffer due to reductions in both private and public spending as well as the health status of children and other household welfare measures. Rather, there are two major policy implications. First, given the discrepancy in findings reported in the literature, further research is needed to understand which macroeconomic crises lead to a slowdown in schooling. Second, where aggregate fluctuations in income do not seem to worsen schooling outcomes, it is more sensible to establish policies to protect the quality of education (i.e., repetition, t-scores, etc.), consumption and health rather than focus on reducing schooling drop-out rates.

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Appendix

Definitions of Variables in Regressions

Dependent variable in equations: Schooling decision

- =1 if attending school only
- =2 if working only
- =3 if working and in school
- =4 if unemployed only
- =5 if inactive

Age dummies: Built based on the continuous variable age in years

(Household Head) Schooling years: Years of education completed (computed at average of educational category for period 1992-1994)

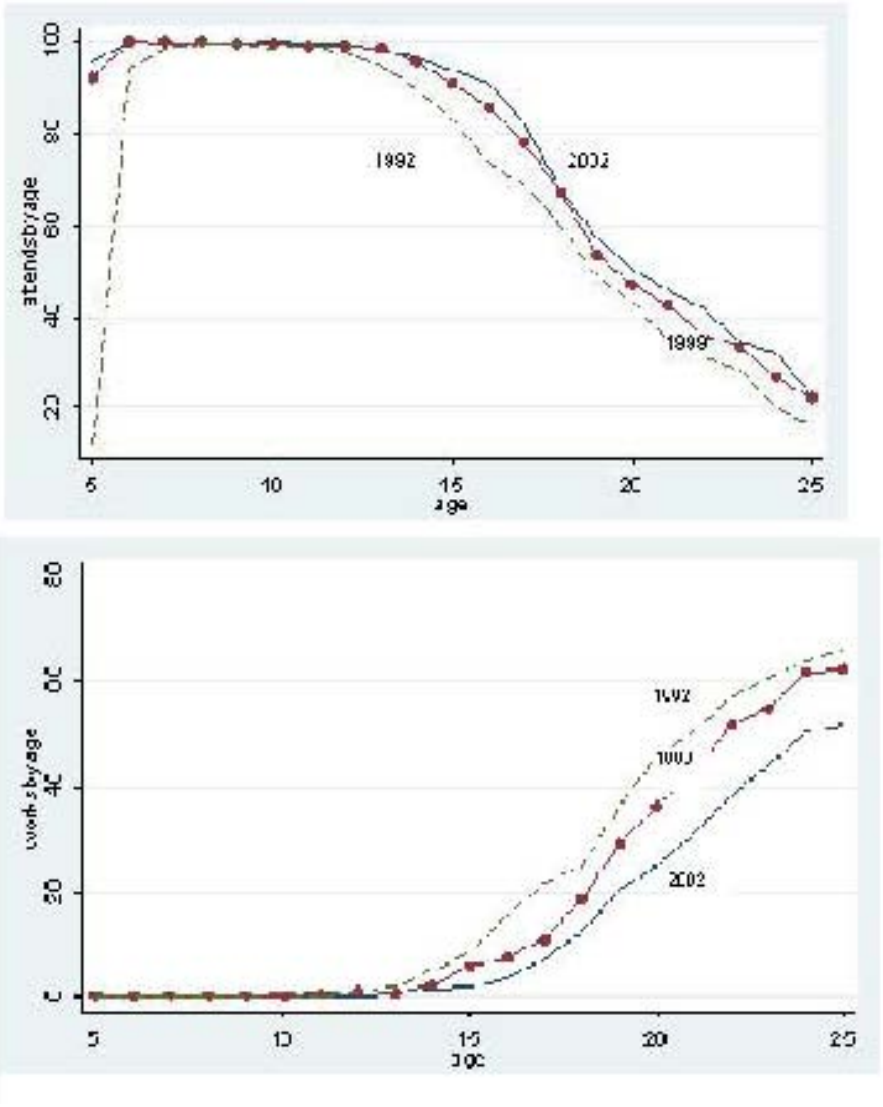
Log per-capita household income (excluding child earnings): Log of per-capita real household income (at 1998 prices) excluding the earnings of all those less than 18 year-old in the household.

Job rate (urban-area level): Number of adult individuals unskilled (less than 12 years schooling) employed divided by the total of unskilled 30-35 year old in the urban area, regardless of their activity condition.

Unemployment (urban-area level): Number of adult unemployed individuals who unskilled (less than 12 years schooling), divided by the unskilled labor force (i.e., 18-62-year-olds reporting that they are actively looking for a job in the reference week).

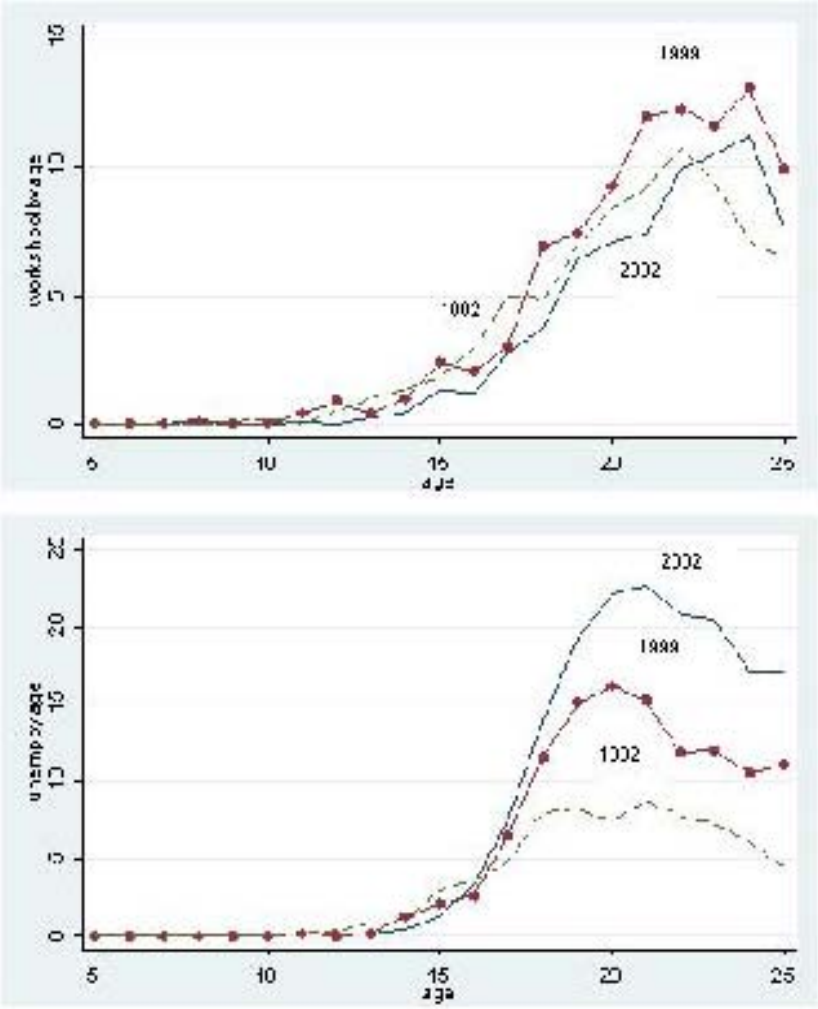
Treatment dummy (Federal Education Law): =1 if individual *i* is in province *j* where the Federal Education Law was fully implemented in year *t*.

Figure 4. Schooling Attendance and Employment Rate, by Age



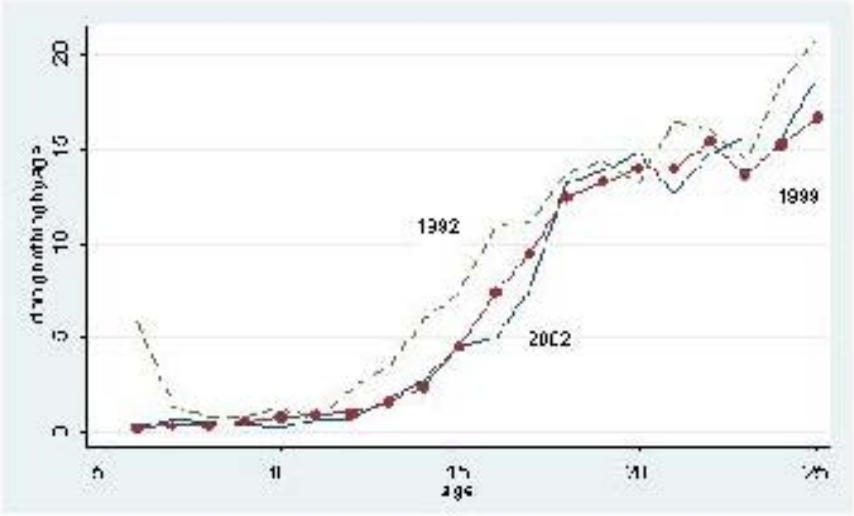
Source: Authors' calculations, EPH, Permanent Household Surveys Argentina. May waves, 5-25 year–old, 1992, 1999 and 2002.

Figure 5. Combining School and Work and Unemployment Rate, by Age



Source: own calculations, EPH, Permanent Household Surveys Argentina. May waves, 5-25 year–old, 1992, 1999 and 2002.

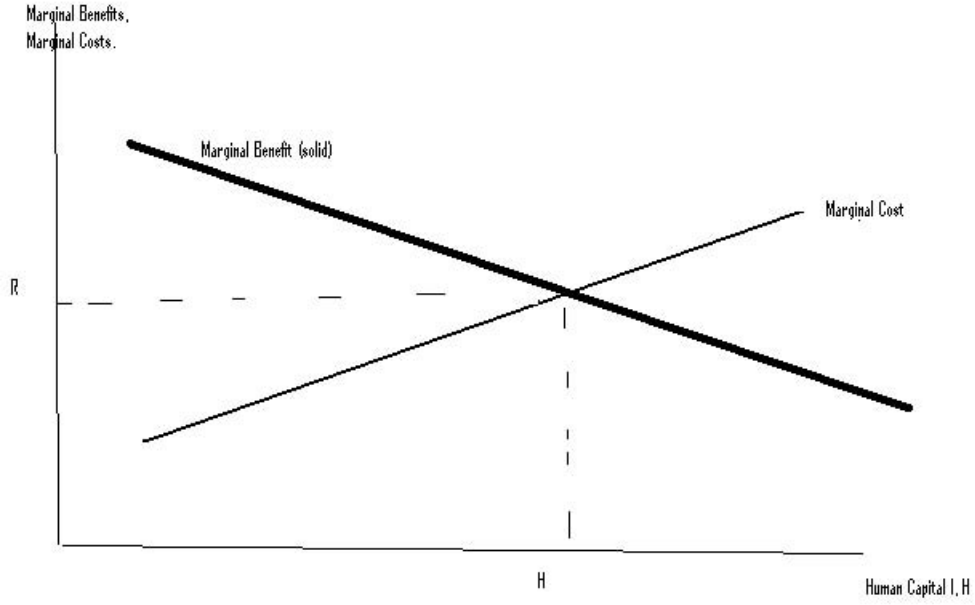
Figure 6. Not Working, Studying or Unemployed, by Age



Source: own calculations, EPH, Permanent Household Surveys Argentina. May waves, 5-25 year–old, 1992, 1999 and 2002.

Additional Figures

Figure 1: Private marginal benefits and private marginal costs of human capital investments



Tables

Table 1: Summary statistics 13-18 year olds. Weighted sample averages

	Pooled		1992		1994		1996		1998		2000		2002	
5 categories	N	%	N	%	N	%	N	%	N	%	N	%	N	%
in school only	48,635	78.86	4,168	76.39	4,581	75.61	4,286	76.41	3,866	78.61	3,531	83.69	3,336	86.31
working only	4,030	6.53	508	9.31	517	8.53	397	7.08	305	6.2	187	4.43	110	2.85
in school and work	1,533	2.49	148	2.71	222	3.66	110	1.96	127	2.58	118	2.8	64	1.66
unemployed only	2,992	4.85	183	3.35	279	4.6	332	5.92	242	4.92	165	3.91	160	4.14
inactive	4,482	7.27	449	8.23	460	7.59	484	8.63	378	7.69	218	5.17	195	5.05
Total	61,672	100	5,456		6,059		5,609		4,918		4,219		3,865	
	Test of difference between means for 'in school only' category (t-test)													
1992=2003	t= 74.83	p = 0.000												
1998=2000	t =96.45	p = 0.000												
1998=2002	t =86.45	p = 0.000												

Table 2: Marginal effects for jointly determined outcomes

	Prob. in school only	Change from baseline
baseline 1992	0.850	
10% decrease in job rate	0.972	0.122
baseline 2000	0.900	
10% decrease in job rate	0.954	**0.054**
Federal Education Law	0.931	**0.030**
baseline 2002	0.948	
10% decrease in job rate	0.902	**-0.046**
	Prob. works only	Change from baseline
baseline 1992	0.038	
10% increase in job rate	0.096	0.058
baseline 2000	0.023	
10% increase in urban area job rate	0.049	**0.026**
Federal Education Law	0.007	**-0.016**
baseline 2002	0.007	
10% increase in job rate	-0.005	**-0.012**
	Prob. in school and works	Change from baseline
baseline 1992	0.021	
10% increase in job rate	0.067	0.045
baseline 2000	0.021	
10% increase in job rate	0.031	**0.010**
Federal Education Law	0.016	**0.005**
baseline 2002	0.002	
10% increase in job rate	0.004	0.002

See notes Table 5. Baselines are evaluated using all variables kept at their means, including urban area job rates. Note that I evaluate the scenario of decreasing job rates for the probability of being in school only, and of increasing job rates for the other two probabilities. I believe this change provides a more intuitive final result.

Table 3: The process of the Federal Education Law (FEL) implementation in Argentina's provinces.

	Implementation				Enrolment	Available data (**)	
	Year	Full	Mode	Years(*)	% 1996	1992/2002	1996 & 2001
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
CABA (***)		No	No	0	9.02	Yes	Yes
Buenos Aires	1996	Yes	U	5	37.28	Yes	Yes
Catamarca	1999	Yes	P	2	0.95	No	Yes
Cordoba	1996	Yes	U	5	8.82	Yes	Yes
Corrientes	1997	Yes	U	4	2.42	No	Yes
Chaco	1997	No	P	0	2.53	No	Yes
Chubut	1999	Yes	P	2	1.29	Yes	Yes
Entre Rios	1997	Yes	U	4	3.16	Yes	Yes
Formosa	1998	Yes	U	3	1.29	No	Yes
Jujuy	1998	No	P	0	2.19	Yes	Yes
La Pampa	1997	Yes	U	4	0.74	Yes	Yes
La Rioja	1999	Yes	P	2	0.80	No	Yes
Mendoza	2000	No	P	0	4.17	No	Yes
Misiones	1998	Yes	U	3	2.14	No	Yes
Neuquén	1998	No	P	0	1.51	Yes	Yes
Río Negro		No	No	0	1.60	No	Yes
Salta	1998	No	P	0	3.59	Yes	Yes
San Juan	1997	Yes	U	4	1.61	No	Yes
San Luis	1998	Yes	U	3	0.94	Yes	Yes
Santa Cruz	1998	Yes	U	3	0.60	Yes	Yes
Santa Fe	1997	Yes	U	4	8.08	No	Yes
Stg del Estero	1998	Yes	U	3	1.8	No	Yes
Tucumán	1998	Yes	U	3	3.19	No	Yes
Tierra del Fuego	1998	Yes	P	3	0.29	No	Yes
students covered						62 %	100%

Source: own calculations, EPH, Permanent Household Surveys Argentina, May waves; Education Ministry (www.me.gov.ar/cgecse/index.html) and (**?**) . Note 1: In modality of implementation (column (iii)), No=No implementation, U=generalized implementation, P=gradual implementation. Note 2: (*) Years since implementation are measured at 2000. (**) Even if I do not have all provinces I do have a comparable panel of provinces from 1992 until 2002. (***) Ciudad Autónoma de Buenos Aires (Capital of the country).

Table 4: Means and standard deviations, by year

	Pool		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean
age13	0.17	0.37	0.18	0.38	0.17	0.38	0.17	0.38	0.17	0.38	0.16	0.37	0.16	0.36	0.16	0.37	0.16	0.37	0.17	0.38	0.17	0.37	0.16
age14	0.17	0.37	0.18	0.38	0.18	0.38	0.17	0.38	0.16	0.37	0.17	0.37	0.16	0.37	0.17	0.37	0.15	0.36	0.17	0.37	0.18	0.38	0.17
age15	0.17	0.37	0.17	0.38	0.17	0.38	0.18	0.38	0.16	0.37	0.16	0.37	0.17	0.38	0.17	0.37	0.16	0.37	0.15	0.36	0.17	0.37	0.17
age16	0.17	0.37	0.17	0.37	0.16	0.37	0.17	0.37	0.17	0.38	0.17	0.38	0.16	0.37	0.18	0.38	0.17	0.37	0.15	0.36	0.16	0.37	0.17
age17	0.17	0.37	0.16	0.37	0.16	0.36	0.16	0.37	0.17	0.37	0.17	0.38	0.17	0.38	0.16	0.37	0.19	0.39	0.16	0.37	0.16	0.37	0.17
age18	0.16	0.37	0.14	0.35	0.16	0.37	0.15	0.35	0.16	0.37	0.17	0.37	0.18	0.38	0.17	0.38	0.16	0.37	0.19	0.39	0.17	0.38	0.16
male	0.51	0.50	0.51	0.50	0.51	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.52	0.50	0.51	0.50	0.51	0.50	0.51	0.50	0.51	0.50	0.50
head S	8.81	3.98	8.48	4.02	8.56	4.04	8.59	3.99	8.71	4.00	8.68	3.95	8.72	3.99	8.90	4.02	9.00	4.00	9.03	3.94	9.17	3.94	9.17
lnphhy	6.06	0.79	6.16	0.68	6.20	0.72	6.22	0.70	6.18	0.72	6.12	0.74	6.13	0.77	6.09	0.79	6.03	0.79	6.00	0.83	5.93	0.87	5.67
LPlata	0.06	0.25	0.07	0.25	0.07	0.25	0.06	0.24	0.07	0.26	0.07	0.26	0.08	0.27	0.09	0.28	0.05	0.23	0.06	0.23	0.05	0.22	0.05
Parana	0.07	0.26	0.08	0.27	0.08	0.27	0.08	0.27	0.08	0.28	0.07	0.25	0.05	0.22	0.06	0.24	0.07	0.25	0.07	0.25	0.07	0.25	0.07
Co Riv	0.07	0.25	0.06	0.24	0.06	0.23	0.06	0.24	0.06	0.24	0.06	0.25	0.08	0.26	0.08	0.26	0.08	0.27	0.08	0.28	0.07	0.26	0.08
Crdoba	0.08	0.27	0.09	0.29	0.09	0.29	0.09	0.28	0.09	0.28	0.08	0.28	0.08	0.27	0.07	0.26	0.07	0.25	0.08	0.27	0.08	0.27	0.08
Nequen	0.07	0.25	0.08	0.26	0.07	0.26	0.07	0.25	0.07	0.26	0.05	0.21	0.06	0.23	0.06	0.23	0.06	0.24	0.07	0.26	0.08	0.27	0.08
Jujuy	0.09	0.29	0.09	0.28	0.10	0.30	0.10	0.30	0.10	0.30	0.11	0.31	0.06	0.25	0.07	0.26	0.08	0.27	0.08	0.27	0.09	0.29	0.08
Galleg	0.07	0.26	0.08	0.27	0.07	0.26	0.07	0.26	0.08	0.27	0.09	0.28	0.09	0.29	0.05	0.23	0.06	0.24	0.06	0.24	0.06	0.23	0.06
Salta	0.09	0.29	0.12	0.32	0.11	0.31	0.11	0.31	0.06	0.25	0.07	0.26	0.08	0.27	0.08	0.27	0.09	0.28	0.10	0.30	0.10	0.30	0.10
S.Luis	0.08	0.28	0.08	0.26	0.08	0.27	0.08	0.27	0.09	0.29	0.10	0.30	0.11	0.31	0.10	0.31	0.12	0.32	0.07	0.25	0.05	0.21	0.05
S.Rosa	0.07	0.26	0.07	0.26	0.08	0.27	0.08	0.27	0.08	0.28	0.09	0.28	0.10	0.30	0.10	0.30	0.05	0.22	0.05	0.22	0.05	0.22	0.06
CABA	0.04	0.20	0.04	0.20	0.04	0.19	0.04	0.19	0.04	0.20	0.04	0.20	0.04	0.20	0.04	0.19	0.05	0.22	0.06	0.23	0.06	0.24	0.06
Partid	0.17	0.38	0.16	0.36	0.17	0.37	0.17	0.37	0.17	0.37	0.17	0.37	0.17	0.38	0.20	0.40	0.22	0.41	0.21	0.42	0.20	0.42	0.20
Unemp	12.79	5.13	6.61	2.33	8.72	2.91	9.21	1.98	14.75	4.65	14.77	3.85	14.26	4.12	12.38	3.15	13.11	3.86	14.12	4.51	15.11	4.04	20.38
Jobs	53.04	4.24	55.74	3.22	55.01	3.08	54.47	3.61	52.08	3.95	50.78	4.26	52.47	4.19	54.11	4.01	53.58	3.96	53.12	3.98	52.84	3.84	48.37
FEL	0.54	0.50											0.33	0.47	0.16	0.37	0.18	0.38	0.08	0.28			

Source: Own calculations based on EPH, May waves, 13–18 year olds. *headS* is years of schooling of head, *lnphhy* is the log of per capita household income (excluding child earnings). CABA stands for the Ciudad Autonoma de Buenos Aires. Unemployment and job rates are at the urban area level and for unskilled adults (30-35 year olds). The Federal Education Law (*FEL*) is at the urban area level (within a province).

Table 5: Marginal effects, School-Employment choice, 13-18 year olds

	(1) 1992	(2) 1994	(3) 1996	(4) 1998	(5) 2000	(6) 2002
1__Attending_school_only						
male	-0.0220*	-0.0428***	-0.0248**	-0.0305***	-0.0155*	-0.00106
	(-2.37)	(-4.30)	(-2.59)	(-3.36)	(-2.13)	(-0.21)
Householdhead's schooling years	0.0177***	0.0145***	0.0168***	0.0117***	0.00747***	0.00566***
	(12.30)	(10.40)	(11.62)	(8.94)	(6.37)	(6.14)
Household size	-0.0125***	-0.0174***	-0.0137***	-0.00966***	-0.00479**	-0.00341*
	(-5.22)	(-6.83)	(-5.61)	(-4.53)	(-2.74)	(-2.55)
logpchhy	0.0561***	0.0889***	0.0754***	0.0326***	0.0349***	0.0184***
	(6.35)	(9.78)	(8.95)	(5.05)	(5.94)	(4.54)
2__Working_only						
male	0.0390***	0.0408***	0.0277***	0.0330***	0.0138***	0.00812***
	(7.88)	(8.19)	(6.29)	(6.80)	(3.98)	(3.56)
Householdhead's schooling years	-0.00693***	-0.00478***	-0.00399***	-0.00328***	-0.00207***	-0.00107***
	(-9.18)	(-7.70)	(-6.26)	(-6.16)	(-3.98)	(-3.34)
Household size	0.00437***	0.00410***	0.00282***	0.00249***	0.00141*	0.00108**
	(4.06)	(3.87)	(3.34)	(3.60)	(2.42)	(2.89)
logpchhy	-0.0205***	-0.0285***	-0.0192***	-0.0118***	-0.00646***	-0.00456***
	(-5.46)	(-6.64)	(-5.77)	(-4.41)	(-3.35)	(-3.37)
3__Attending_school_and_working						
male	0.0159***	0.0180***	0.0120***	0.0173***	0.00567	0.00154*
	(4.00)	(3.88)	(3.75)	(4.18)	(1.66)	(2.50)
Householdhead's schooling years	-0.000771	-0.000697	-0.000205	-0.0000254	-0.000606	0.0000306
	(-1.28)	(-1.07)	(-0.51)	(-0.04)	(-1.18)	(0.33)
Household size	0.00206*	0.00399**	0.00139	0.00207*	0.000517	-0.0000231
	(1.97)	(2.94)	(1.46)	(2.22)	(0.67)	(-0.18)
logpchhy	-0.0152***	-0.0176***	-0.00742**	-0.00792**	-0.00993***	-0.00142***
	(-4.39)	(-4.14)	(-2.96)	(-3.17)	(-4.47)	(-4.01)
4__Unemployed						
male	0.000706***	0.0152***	0.0130***	0.000159***	0.00730**	0.00143***
	(3.46)	(4.73)	(3.66)	(3.32)	(2.93)	(3.43)
Householdhead's schooling years	-0.000138***	-0.00136***	-0.00333***	-0.0000282***	-0.00139***	-0.000138**
	(-4.61)	(-3.45)	(-5.59)	(-4.03)	(-3.49)	(-2.76)
Household size	0.000191***	0.00216**	0.00320***	0.0000212*	0.00100	0.000194**
	(4.04)	(3.11)	(3.99)	(2.09)	(1.93)	(2.90)
logpchhy	-0.000666**	-0.0146***	-0.0192***	-0.000139***	-0.00612**	-0.000758***
	(-3.16)	(-5.41)	(-5.78)	(-5.02)	(-3.20)	(-3.43)
5_Doing_nothing						
male	-0.0336***	-0.0312***	-0.0279***	-0.0199**	-0.0113**	-0.0100*
	(-5.05)	(-5.42)	(-4.40)	(-3.23)	(-2.68)	(-2.28)
Householdhead's schooling years	-0.00991***	-0.00770***	-0.00925***	-0.00833***	-0.00340***	-0.00448***
	(-9.38)	(-8.91)	(-9.67)	(-8.67)	(-5.28)	(-5.43)
Household size	0.00591***	0.00714***	0.00633***	0.00508***	0.00186	0.00216
	(3.70)	(5.33)	(4.19)	(3.37)	(1.79)	(1.86)
logpchhy	-0.0197**	-0.0282***	-0.0296***	-0.0128**	-0.0124***	-0.0117***
	(-2.90)	(-5.26)	(-5.55)	(-2.77)	(-3.92)	(-3.31)
Observations	5,456	6,059	5,609	4,918	4,219	3,865
$Pseudo - R^2$	0.193	0.182	0.188	0.200	0.204	0.211
p-value	0.000	0.000	0.000	0.000	0.000	0.000

t statistics in parentheses

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

Note 1: Estimates based on a MNL where base category (=5) is"inactive" I report marginal effects based on logit coefficients for each independent variable pertaining to the probability of entering the activity in each heading. Note 2: The Hausman-test indicates that the specification of school-employment choices above estimated does not violate the IIA assumption. Further details and logit coefficients are available from the author. Note 3: Age and urban area dummies are all significant at 99% level.

Table 6: Marginal effects, School-Employment choice, Jobs and the Federal Education Law, 13-18 year olds

	(1) 1992	(2) 1994	(3) 1998	(4) 2000	(5) 2002
1__Attending_school_only					
Householdhead's schooling years	0.0256***	0.0214***	0.0206***	0.0156***	0.00806***
	(9.14)	(9.78)	(13.69)	(9.92)	(6.19)
log pchhy	0.0703**	0.117***	0.0809***	0.0529***	0.0256***
	(3.23)	(9.35)	(7.53)	(4.98)	(4.72)
Job rate(urban area)	-0.0122***	-0.0123***	**-0.00981*****	**-0.00538*****	**0.00463*****
	(-12.55)	(-15.33)	(-20.74)	(-14.52)	(12.14)
Treatment (LFE)			**0.029*****	**0.0308*****	
			(5.02)	(6.06)	
2__Working_only					
Householdhead's schooling years	-0.0118***	-0.00794***	-0.00571***	-0.00365***	-0.00191***
	(-14.27)	(-8.13)	(-7.41)	(-5.12)	(-4.49)
logpchhy	-0.0327***	-0.0415***	-0.0234***	-0.0190***	-0.00815***
	(-3.83)	(-6.74)	(-5.32)	(-4.81)	(-3.89)
Job rate(urban area)	0.00580***	0.00435***	0.00263***	0.00190***	-0.00123***
	(14.42)	(13.28)	(15.78)	(11.20)	(-4.35)
Treatment (LFE)			**-0.007*****	**-0.0158*****	
			(-4.31)	(-8.94)	
3__Attending_school_and_working					
Householdhead's schooling years	-0.00103	-0.000785	-0.000419	-0.000752	0.0000247
	(-1.10)	(-1.07)	(-0.84)	(-1.34)	(0.20)
logpchhy	-0.0172***	-0.0190***	-0.00892***	-0.0111***	-0.00139***
	(-4.63)	(-4.90)	(-4.16)	(-4.36)	(-6.67)
Job rate(urban area)	0.00451***	0.00510***	**0.00142*****	**0.00104*****	**0.000225*****
	(20.13)	(27.92)	(11.72)	(11.57)	(7.97)
Treatment (LFE)			**-0.00580*****	**-0.00525*****	
			(-3.97)	(-3.42)	
4__Unemployed					
Householdhead's schooling years	-0.000230***	-0.00255***	-0.00399***	-0.00250***	-0.000174*
	(-3.61)	(-3.43)	(-6.39)	(-7.16)	(-2.03)
logpchhy	-0.00111**	-0.0254***	-0.0264***	-0.0127***	-0.000940***
	(-3.21)	(-5.54)	(-7.92)	(-4.81)	(-3.76)
Job rate(urban area)	0.000146***	0.00468***	0.00445***	0.000656***	-0.0000239
	(7.99)	(13.89)	(13.14)	(5.58)	(-1.82)
Treatment (LFE)			- 0.0018***	-0.0298***	
			(-5.96)	(-7.05)	
5_Doing_nothing					
Householdhead's schooling years	-0.0126***	-0.0101***	-0.0104***	-0.00873***	-0.00600***
	(-7.10)	(-8.48)	(-11.24)	(-11.78)	(-6.11)
logpchhy	-0.0193	-0.0310***	-0.0221***	-0.0101*	-0.0152***
	(-1.47)	(-4.96)	(-4.02)	(-2.34)	(-3.46)
Job rate(urban area)	0.00179**	-0.00183***	0.00131***	0.00178***	-0.00360***
	(3.26)	(-4.06)	(5.04)	(10.16)	(-10.14)
Treatment (LFE)			0.014***	0.0201***	
			(4.01)	(6.62)	
Observations	4,471	5,009	4,321	3,735	3,235
$Pseudo - R^2$	0.217	0.199	0.233	0.217	0.239
p-value	0.000	0.000	0.000	0.000	0.000
t statistics in parentheses			* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

See Notes Table 5. Robust Huber-White standard errors in parenthesis clustered at urban area level.

Table 7: Marginal effects, School-Employment choice and local labour markets, 13-18 year olds

	(1) 1992	(2) 1994	(3) 1996	(4) 1998	(5) 2000	(6) 2002
1__Attending_school_only						
Householdhead's schooling years	0.0235***	0.0188***	0.0218***	0.0166***	0.0110***	0.00778***
	(8.36)	(9.68)	(10.11)	(7.91)	(9.73)	(5.66)
logpchhy	0.0715***	0.115***	0.103***	0.0483***	0.0479***	0.0273***
	(3.33)	(9.61)	(10.93)	(5.56)	(5.30)	(5.02)
Unemployment rate(urban area)	-0.0166***	-0.0283***	-0.0181***	-0.0278***	-0.0106***	-0.00809***
	(-19.65)	(-82.59)	(-40.61)	(-15.59)	(-21.69)	(-9.43)
Job rate(urban area)	-0.00790***	-0.0287***	-0.0160***	-0.0140***	-0.0113***	-0.000601
	(-7.70)	(-62.24)	(-24.18)	(-15.56)	(-17.13)	(-0.69)
2__Working_only						
Householdhead's schooling years	-0.0108***	-0.00733***	-0.00626***	-0.00437***	-0.00353***	-0.00164***
	(-12.28)	(-8.56)	(-5.58)	(-5.28)	(-5.31)	(-4.06)
logpchhy	-0.0328***	-0.0412***	-0.0302***	-0.0153***	-0.0110***	-0.00724***
	(-3.85)	(-6.69)	(-9.63)	(-4.28)	(-3.80)	(-3.44)
Unemployment rate(urban area)	0.00614***	0.00805***	0.00377***	0.00359***	0.00149***	-0.000132
	(14.39)	(30.25)	(14.60)	(8.62)	(9.26)	(-1.41)
Job rate(urban area)	0.00233***	0.0107***	0.00510***	0.00314***	0.00201***	-0.00128***
	(5.62)	(41.53)	(18.38)	(11.44)	(11.14)	(-4.41)
3__Attending_school_and_working						
Householdhead's schooling years	-0.000829	-0.000370	0.0000157	0.000130	-0.000642	0.0000314
	(-0.80)	(-0.59)	(0.03)	(0.19)	(-1.33)	(0.17)
logpchhy	-0.0174***	-0.0186***	-0.00925***	-0.00960**	-0.0114**	-0.00210***
	(-4.74)	(-4.73)	(-3.75)	(-3.25)	(-3.29)	(-6.20)
Unemployment rate(urban area)	0.00113***	0.00842***	0.00107***	0.00189***	0.00433***	0.000208***
	(6.68)	(29.46)	(9.55)	(5.67)	(10.37)	(3.67)
Job rate(urban area)	0.00457***	0.00370***	0.00127***	0.00160***	0.00372***	0.000476***
	(17.52)	(26.54)	(8.06)	(7.93)	(13.60)	(6.31)
4__Unemployed						
Householdhead's schooling years	-0.000198**	-0.00217**	-0.00484***	-0.00147***	-0.00235***	-0.000617
	(-3.09)	(-2.89)	(-8.68)	(-6.81)	(-6.44)	(-1.83)
logpchhy	-0.00119**	-0.0246***	-0.0281***	-0.00738***	-0.00998**	-0.00362***
	(-3.14)	(-5.85)	(-8.71)	(-8.85)	(-3.16)	(-4.08)
Unemployment rate(urban area)	0.000589***	0.00692***	0.00460***	0.0238***	0.00456***	0.00821***
	(9.93)	(16.44)	(24.60)	(10.51)	(14.32)	(11.05)
Job rate(urban area)	0.000319***	0.00714***	0.00455***	0.00868***	0.00353***	0.00505***
	(9.93)	(17.34)	(18.64)	(11.07)	(11.32)	(10.89)
5_Doing_nothing						
Householdhead's schooling years	-0.0116***	-0.00889***	-0.0107***	-0.0109***	-0.00445***	-0.00556***
	(-6.31)	(-8.42)	(-6.47)	(-8.14)	(-8.93)	(-5.57)
logpchhy	-0.0201	-0.0303***	-0.0357***	-0.0160***	-0.0156***	-0.0143**
	(-1.56)	(-5.14)	(-5.42)	(-3.64)	(-5.88)	(-3.20)
Unemployment rate(urban area)	0.00871***	0.00492***	0.00867***	-0.00144**	0.000209	-0.000198
	(19.58)	(19.87)	(19.14)	(-2.71)	(1.37)	(-1.12)
Job rate(urban area)	0.000674	0.00721***	0.00506***	0.000571	0.00203***	-0.00364***
	(1.10)	(21.65)	(13.59)	(1.17)	(11.69)	(-8.82)
Observations	4,465	5,001	4,691	4,124	3,495	3,225
$Pseudo - R^2$	0.217	0.199	0.205	0.233	0.217	0.239
p-value	0.000	0.000	0.000	0.000	0.000	0.000

t statistics in parentheses

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

See notes Table 5. Robust Huber-White standard errors clustered at urban area level.

Table 8: MNL School-Employment choice. Males and females 15-18 year old

	y92	y94	y96	y98	y2000	y2002	pool
				Males			
				only attending			
Schooling of head	.194 (.054)***	.151 (.040)***	.178 (.043)***	.199 (.024)***	.121 (.026)***	.191 (.061)***	.123 (.014)***
log pchhy (net of childs)	.286 (.255)	.707 (.168)***	.743 (.184)***	.247 (.100)**	.640 (.117)***	.219 (.265)	.632 (.067)***
Unemployment rate (urban area)	-.102 (.011)***	-.215 (.008)***	-.171 (.005)***	.037 (.007)***	-.059 (.006)***	.061 (.011)***	-.141 (.017)***
Job rate (urban area)	-.046 (.014)***	-.162 (.011)***	-.051 (.014)***	-.009 (.007)	-.131 (.012)***	.157 (.011)***	**-.118** (.036)***
				only working			
Schooling of head	-.032 (.044)	-.007 (.037)	.0005 (.048)	-.0009 (.034)	-.074 (.039)*	-.010 (.067)	-.049 (.009)***
log pchhy (net of childs)	-.353 (.185)*	-.179 (.187)	.083 (.166)	-.268 (.118)**	.056 (.145)	-.349 (.332)	-.022 (.025)
Unemployment rate (urban area)	.060 (.008)***	-.048 (.007)***	-.067 (.004)***	1.935 (.031)***	.024 (.006)***	.047 (.010)***	-.111 (.008)***
Job rate (urban area)	-.051 (.012)***	.093 (.007)***	.075 (.013)***	.717 (.012)***	.004 (.010)	.073 (.018)***	-.033 (.012)***
				attending and working			
Schooling of head	.163 (.056)***	.128 (.048)***	.148 (.047)***	.189 (.026)***	.006 (.046)	.192 (.100)*	.082 (.012)***
log pchhy (net of childs)	-.532 (.370)	-.090 (.189)	.151 (.200)	-.327 (.140)**	.088 (.216)	-.464 (.270)*	-.004 (.044)
Unemployment rate (urban area)	-.029 (.015)**	.030 (.009)***	-.051 (.007)***	.079 (.011)***	.097 (.010)***	.124 (.016)***	**-.097** (.016)***
Job rate (urban area)	.101 (.014)***	-.011 (.012)	.057 (.016)***	.038 (.009)***	.053 (.015)***	.344 (.016)***	.0009 (.037)
Obs.	1760	1990	1890	1684	1410	1290	19574
$Pseudo - R^2$	0.128	0.139	0.169	0.181	0.171	0.192	0.144
				Females			
				only attending			
Schooling of head	.166 (.027)***	.150 (.015)***	.161 (.031)***	.141 (.028)***	.140 (.032)***	.108 (.032)***	.142 (.012)***
log pchhy (net of child)	.468 (.168)***	.504 (.117)***	.532 (.108)***	.258 (.087)***	.249 (.139)*	.508 (.103)***	.469 (.044)***
Unemployment rate (urban area)	-.159 (.009)***	-.063 (.005)***	-.098 (.007)***	-.027 (.006)***	.023 (.007)***	-.051 (.007)***	-.032 (.019)*
Job rate (urban area)	-.049 (.011)***	-.116 (.007)***	-.092 (.006)***	-.009 (.009)	-.008 (.007)	.029 (.008)***	-.043 (.030)
				only working			
Schooling of head	-.023 (.032)	.046 (.025)*	.061 (.043)	.080 (.038)**	.071 (.048)	.068 (.052)	.041 (.017)**
log pchhy (net of childs)	-.122 (.178)	-.233 (.178)	-.385 (.140)***	-.476 (.166)***	-.159 (.289)	-.430 (.241)*	-.241 (.074)***
Unemployment rate (urban area)	-.098 (.007)***	.112 (.007)***	-.030 (.008)***	-.048 (.011)***	.083 (.010)***	.581 (.014)***	.005 (.024)
Job rate (urban area)	.065 (.011)***	-.005 (.009)	.042 (.009)***	.022 (.011)**	.031 (.009)***	-1.121 (.023)***	.022 (.040)
				attending and working			
Schooling of head	.078 (.054)	.140 (.033)***	.156 (.042)***	.169 (.075)**	.164 (.058)***	.158 (.087)*	.133 (.019)***
log pchhy (net of child)	-.135 (.266)	-.327 (.333)	-.184 (.329)	.020 (.205)	-.291 (.209)	-.237 (.276)	-.156 (.053)***
Unemployment rate (urban area)	-.095 (.013)***	.306 (.010)***	-.095 (.016)***	.048 (.017)***	1.574 (.045)***	.011 (.015)	-.019 (.027)
Job rate (urban area)	.182 (.024)***	-.021 (.013)*	-.007 (.022)	.030 (.019)	.740 (.022)***	.178 (.022)***	.054 (.037)
Obs.	1,729	1,968	1,855	1,624	1,377	1,301	18,978
$Pseudo - R^2$	0.203	0.19	0.219	0.212	0.197	0.205	0.185

See notes Table 5. Robust Huber-White standard errors in parenthesis clustered at the urban-area level