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**Working Paper**

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# EUROMOD

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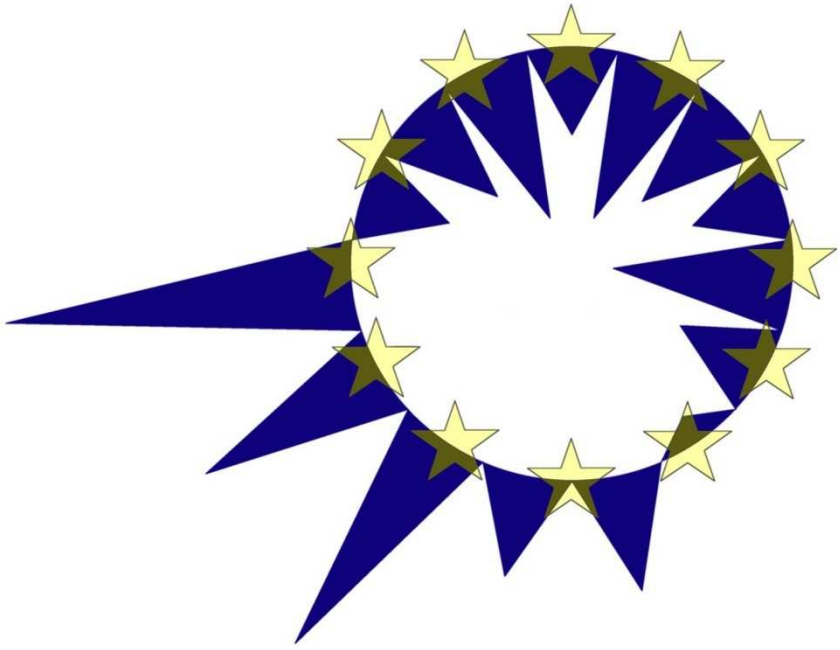

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**Increasing labour market activity of the poor and females: Let's make work pay in Macedonia**

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October 2013

# Increasing labour market activity of the poor and females: Let's make work pay in Macedonia[1,2]

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## Abstract

The objective of this paper is to simulate the effects of two alternative social policies – individual and family in-work benefits – on labour market choices in Macedonia, with special focus on the poor and females. To that end, we use ex-ante analysis relying on a combination of a tax and benefit micro-simulation model for Macedonia (MAKMOD) and a structural model for labour supply, both utilising the 2011 Survey of Income and Labour Conditions. Results suggest that the proposed reforms will have a considerable effect on the working choices of Macedonians. The family in-work benefit is found to be more effective for singles and would potentially increase employment by 6 percentage points. On the other hand, the individual in-work benefit works better for couples where employment would increase by 2.5 percentage points. In addition, the effects are found to be larger for the poor and for females, the categories that are most prone to inactivity in Macedonia.

**JEL Classification:** H55, J22

**Keywords:** in-work benefits, making work pay policies, reform of the social system, Macedonia

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[2] This paper used MAKMOD, a microsimulation tax-benefit model which has been constructed using EUROMOD version 2.8 as a platform. EUROMOD is continually being improved and updated and the results presented here represent the best available at the time of writing. The views expressed are those of the authors.

## 1. Introduction

The Macedonian labour market faces several challenges, including low activity and high informal employment (Mojsoska-Blazevski, 2012a). According to the Labour Force Survey (LFS) data, about 36% of the Macedonian population in 2012 was inactive, which is the highest in Europe, with the exception of Malta. Moreover, specific categories of the working-age population are especially prone to inactivity: females, young workers and low-educated workers. In addition, only 44% of those within working age in Macedonia were employed in 2012, which is 30% below the EU-28 average. The gender gap in employment is 17 p.p., much higher than that of the EU-28. Data from LFS show that informal employment amounts to about a quarter of the labour force and is more widespread across males, with 26% of then working without a written contract.

Unemployment and inactivity are the main determinants of poverty. While the overall poverty rate in 2010 was 27.3%, the poverty rates of unemployed and inactive persons were as high as 50.6% and 34.6%, respectively.[3] The poverty rate for employed persons is 10%, though part-time employed persons face a much higher poverty rate of 26%. The incidence of low pay among wage employees is 10.8%.

The country has a relatively good system of social protection and social assistance in place. The targeting of social policy is satisfactory as social transfers considerably reduce the risk of poverty: the at-risk poverty before social transfers is 42.8%. However, at the same time, it creates some disincentives for the recipients to become self-sufficient. First, the lack of activation policies for the recipients of social assistance and unemployment benefit results in low incentive for individuals to take up jobs and strong benefit-dependence. Second, disincentives arise due to the sudden withdrawal of social assistance and family benefits once a person accepts formal work. Third, the labour taxation system is characterised by a regressive structure[4], making low-paid jobs unattractive for workers.

Across Western countries, social welfare systems have produced large payoffs in terms of poverty reduction. However, at the same time, they promoted social exclusion by keeping less-productive workers out of the labour market. In recent years there has been a shift towards policies that promote self-sufficiency for the most disadvantaged citizens (Bargain and Orsini, 2006) given that employment is considered as a major element of a welfare state (Socol et al. 2010). These policies, widely known as in-work benefits or "making work pay" (MPW) policies are designed to simultaneously achieve both poverty reduction (the redistributive role) and to increase employment (the social inclusion role).

[3] These are the latest data published by the State Statistical office, based on the Survey of Income and Living Standards. The SILC was first introduced in 2010. The poverty line is set at 60% of the median equalised income.

[4] The minimum basis for payment of social contributions brings higher tax wedge at lower wage levels (for more details see Mojsoska-Blazevski, 2012a).

Given the within-system disincentives for taking up (low-paid) jobs in Macedonia, there is a need to reform the system of social assistance and benefits so as to reduce inactivity and increase formal employment. The objective of this paper is to propose novel "making work pay" policies in Macedonia, by estimating their effects on employment, with special reference to the poor and females. As with most studies on the topic, our paper is focused on the supply side of the labour market only, ignoring the labour demand (see Bargain and Orsini, 2006; Immervoll and Pearson, 2009; Randjelovic et al. 2013).[5] This paper makes a pioneering quantitative effort to argue how policymakers may make work pay in Macedonia, with a positive impact on activity, employment and poverty reduction. In this endeavour, we rely on the newly built MAKMOD tax and benefit model for Macedonia within the EUROMOD[6] family and the adjacent labour supply model.

The paper is structured as follows. The next section presents some labour market and poverty indicators in Macedonia in a comparative perspective. Section 3 discusses the disincentives to work in the country created by the existent social welfare system. Section 4 offers a brief overview of the literature related to MWP policies and proposes a design of the MWP in Macedonia. Section 5 reviews the methodological design of the study and the data used. Section 6 presents the results and offers a discussion. The concluding section proposes recommendations to policymakers in Macedonia.

## 2. Labour market and poverty in Macedonia: further motivation

The Macedonian labour market is confronted with serious challenges. These include: high inactivity among the working-age population, low employment rates, high (involuntary) unemployment, and a large share of employment in the shadow economy. Table 1 shows activity rates by different characteristics of the working-age population in Macedonia and the EU-28. About 64% of the Macedonian population aged 15-64 was active in the labour market in 2012, which 11 % lower compared to the EU-28 average. Apparently, this large gap is created by the low participation of Macedonian females. This is related to the largely traditional role of females in Macedonia as care-takers of the home and dependants (children and the elderly). Only one third of the young population in Macedonia is active in the labour market, which is much lower than the EU counterpart. In addition, activity is very low among low-educated individuals (42%) where the gap compared with the activity of primary educated workers in EU-28 is 22 %. This might point to a presence of barriers and/or disincentives for labour market activity of females, young people and low-educated individuals, as well as their social exclusion.

[5] The overall impact of the MWP policies which are related to the supply-side labour market constraints on employment depends indispensably on labour demand. Weak labour demand in Macedonia is addressed by polices which reduce labour costs and promote labour demand (such as wage subsidies and reduction of the tax wedge).

[6] For more information on EUROMOD see Sutherland and Figari (2013).

**Table 1 – Activity rates in Macedonia and EU by individual characteristics, in % (2012)**

| Activity rates | MK | EU-28 | Diff (in %) |
|---|---|---|---|
| **Total** | 63.9 | 71.7 | -10.9 |
| ***Gender*** | | | |
| **Male** | 76.6 | 77.9 | -1.7 |
| **Female** | 50.8 | 65.5 | -22.4 |
| ***Age*** | | | |
| **15-24** | 33.6 | 42.5 | -20.9 |
| **25-49** | 79.5 | 86.0 | -7.6 |
| **50-64** | 56.7 | 63.1 | -10.1 |
| ***Education*** | | | |
| **Primary** | 41.9 | 54 | -22.4 |
| **Secondary** | 73.1 | 75.2 | -2.8 |
| **Tertiary** | 87.8 | 87.1 | 0.8 |

*Source: Eurostat database.*

In addition, only 44% of the working-age population (aged 15-64) in Macedonia were employed in 2012, which is 30% below the EU-28 average (Table 2). The gender gap in employment is 17 p.p., much higher than that of EU-28. Young workers in Macedonia face a very low employment rate: only 1.5 of 10 young persons hold a job.

**Table 2 – Employment rates in Macedonia and EU by individual characteristics, in % (2012)**

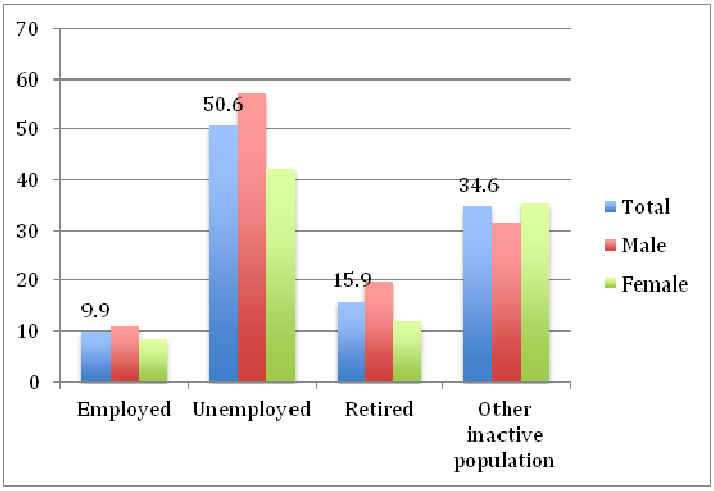
| | MK | EU-28 |
|---|---|---|
| **15-64** | 44.0 | 64.1 |
| **20-64** | 48.2 | 68.4 |
| **15-24** | 15.5 | 32.8 |
| | | |
| **Males** | 52.4 | 69.6 |
| **Females** | 35.3 | 58.5 |

*Source: Eurostat database.*

Although unemployment is high among all individuals, low-educated workers and young people are particularly prone to unemployment. There is no gender gap in unemployment.

As Figure 1 shows, despite the overall high poverty rate (27.3%), employed persons face a relatively low risk of poverty. On the other hand, unemployment and inactivity are strong predictors of poverty. Females face a lower risk of poverty, which is mainly due to the low poverty of female pensioners. Regarding the household type, households with dependent children face a greater poverty rate than the national average (29.6%).

**Figure 1 – At-risk of poverty rates by activity status and gender, 2010**




*Source: State Statistical Office, Survey of Income and Living Standards.*

About 11% of the employed workers (wage employees) receive low earnings (Table 3). As expected, informal workers, females, young workers and those at low-skill levels are more likely to receive low wages and potentially live in poverty.

**Table 3 - Incidence of low pay among wage earners, Q2-2012**[7]

| | Q2-2012 |
|---|---|
| **All wage earners** | 10.8 |
| | |
| **Formal workers** | 8.5 |
| | |
| **Men** | 4.4 |
| **Women** | 14.1 |
| | |
| **Young workers (15-24)** | 19.5 |
| **Prime age group (25-54)** | 10.8 |
| **Older workers (55-64)** | 6.5 |
| | |
| **High skills (ISCO 1-3)** | 2.2 |
| **Medium (ISCO 4-8)** | 13.9 |
| **Low (ISCO 9)** | 23.6 |

*Source: Authors' calculations based on micro data from LFS.*

The analysis above suggests that some categories of workers in Macedonia are more likely to face social exclusion and barriers and/or disincentives for being economically active and working. To a certain extent, those barriers and disincentives are likely to be related to the design of the social assistance and benefit systems, as well as labour taxation. The next section investigates this issue.

[7] It is usual to use 2/3 of the median wage as a benchmark to distinguish low-pay wages. In our case, given that wages instead of wage levels are reported in the LFS, we consider all wages below MKD 8,000 as low wages (actually wages below the wage range of MKD 8,001-10,000). Specifically, 2/3 of the median wage is at about 9,000 MKD which is a mid point in the range of 8,001-10,000.

## 3. Disincentives to work in Macedonia

There are three types of constraints that poor and disadvantaged individuals face in their transition to labour market activity and/or employment. These include: participation barriers, employment barriers and benefit disincentives (World Bank, 2013). Participation constraints are related to some non-market barriers which prevent work-age individuals from supplying their labour. These can include taking care of the household and dependants (mainly relevant for women), lack of information about labour demand, etc. For example, if the potential labour income of a low-educated female is lower than the cost of taking care of children, then she chooses not to supply her labour. Barriers to employment can arise from lack of skills and knowledge which are demanded by employers. The last type of barriers are those associated with the design of the tax and benefit system. In particular, if social transfers change the value that an individual (or household) places on leisure over work, then most probably activity will be reduced. In addition, the system of social protection might be designed so as to act as an effective tax on earnings, particularly among low-productivity workers. While the first two types of barriers are important, this study is focused on the inherent characteristics of the social assistance and tax system that prevent self-sufficiency of poor citizens. Hence, in what follows we focus on the Macedonian tax and benefit system and the (dis)incentives it generates.

Similar to most European countries, Macedonia has a comprehensive system for social protection which comprises: i) contributory benefits (such as pension and disability insurance), ii) passive and active labour-market programmes, and iii) social assistance programmes for protecting income and the consumption of the poor. Passive policies are represented by the contribution-based unemployment benefit which is conditional on previous work history. However, given that about 80% of the unemployed in Macedonia are long-term unemployed, the coverage of the benefit in 2012 was only 9% (of the unemployed). Moreover, it is of short duration. Hence, the main safety net programme in Macedonia is the social financial assistance (SFA), which is the major social assistance programme. The SFA is targeted at households whose members are able to work but are unable to make themselves materially secure. The amount of the benefit is related to family size (up to 5 members), and a maximum of MKD 5,515 (in 2012,) or approximately EUR 90 per month, can be granted. It is means tested, meaning that the actual amount transferred to a household is calculated as the maximum amount (for the particular family size) reduced by any income earned by the family/household. The eligibility is lost if the family earns more than the SFA level.

The total spending on social assistance (SFA, child and family protection, non-contributory disability benefits, and war-related benefits) in Macedonia in 2011 was slightly above one percent of GDP, which is below the average regional standard (World Bank, 2013). The SFA programme alone accounts for about 0.3% of GDP. Across the region, Montenegro spends close to 0.5% of GDP, and Kosovo up to 0.7%.

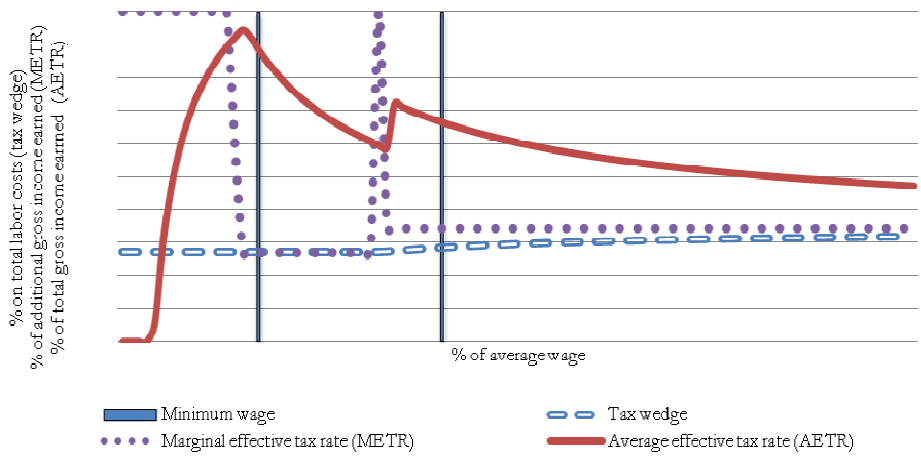
The social protection programmes have undergone several reforms in recent years aimed at improving targeting and efficiency. The introduction of the Management Information System (MIS), which provides an electronic connection among the social work centres (SWCs), has substantially decreased the number of SFA users through elimination of duplicative and flawed claims. Among the new programmes and measures introduced in the social protection system, the conditional cash transfer programme for secondary education is of greatest importance. The programme offers a top-up financial support to SFA-receiving households conditional upon regular attendance of their children at secondary school.

As elsewhere, while the SFA programme is aimed at safeguarding the income and social integration of poor citizens, there are some concerns about its potentially negative impact on the labour supply and welfare dependency. Vidovic et al. (2012) argue that there are two interrelated elements in the process of the activation of benefit recipients and their labour market integration. The first one is a demanding element; that is, whether an active job search is promoted by the legal environment. On the other hand, the enabling element should support poor and socially disadvantaged individuals in their job search efforts, as those individuals are likely to face some barriers to participation and/or employment. The assessment of the demanding and enabling environment in Macedonia shows that national legislation and policies do not provide a strong support for activity of the beneficiaries of the SFA (World Bank, 2013). Though there are some incentives in the social system for speeding up the transition from SFA to work, such as: a) the declining benefit schedule (the benefit drops to 50% of the eligible amount after three years of receipt) and b) the legal pledge for keeping the entitlement to SFA while the beneficiary is engaged in a public work programme.

In contrast, the system provides strong disincentives for the participation/employment of the beneficiaries. Firstly, the means-tested nature of the benefit implies that any income that is formally earned reduces the amount of the benefit received. This creates disincentives for the beneficiaries to accept any formal job, but instead increases their preference for non-participation and/or informal jobs. Second, earned income above the benefit amount results in an immediate withdrawal of the benefit. This implies a 100 percent marginal effective tax rate on earnings for a single-earner family with two children, going up to about 15% of the average wage when the benefit eligibility is lost (Figure 2).[8] This, however, might not significantly affect employment as the benefit is withdrawn at very low levels of earnings (or other income); much less than the national statutory minimum wage (MKD 8,050 in 2013).

[8] Additionally, the marginal and average effective tax rates increase at about 33% of the average wage.

**Figure 2. Tax wedge and effective tax rates for a single-earner couple with two children in Macedonia (2012)**




*Source: World Bank (2013)*

*Note: The figure reflects the situation when the household earnings are related to working days in a week. The rise of earnings from 0 to 100 percent of the average wage is linked to the increase of working days from 0 to 5 (full-time). The tax wedge is defined as the proportional difference between the costs of a worker to their employer (wage and social security contributions, i.e. the total labour cost) and the amount of net earnings that the worker receives (wages minus personal income tax and social security contributions, plus any available family benefits). The METR is defined as (1 – Δne/Δge) where Δne is equal to the change in net earnings, and Δge is the change in gross earnings experienced by the household, where the marginal change is 1 percent of the average wage. The AETR is defined as (1 – Δne/Δge) where Δne is equal to the change in net earnings, and Δge is the change in gross earnings experienced by the household, where the total change is from 0 to x percentage of the average wage (from 1 to 100 percent, as indicated on the x axis).*

Further disincentives are created by some additional entitlements conditional upon SFA receipt, such as cheap telephone and television packages (of about USD 2.5 per month); financial reimbursement for energy bills; personal computers from the government; in-kind support from nongovernmental organisations and the like. These additional entitlements make the receipt of a SFA more attractive for a household rather than the two adults (parents) working at the minimum wage; they considerably increase the opportunity cost of a formal job (Mojsoska-Blazevski, 2012b).

Besides the social and benefit system, the income tax system is likely to reduce the work incentives of low-productive workers also. Indeed, the Macedonian labour taxation system is characterised by a regressive structure at low wage levels (below and at the average wage) created by the minimum wage floor for payment of social contributions set at 50 percent of the average wage. Such a tax structure makes low-paid jobs unattractive to workers and hence discourages labour supply, while it is "expensive" for employers (Mojsoska-Blazevski, 2012a). Moreover, high labour taxation makes the work in the informal economy more attractive and might be related to a high informal economy in a country (Bird and Zolt, 2008).

**Table 4. Comparison of tax wedge in Macedonia, peer countries and the EU (as % of labour costs, single person)**

| % of average wage | | 50% | 67% | 100% | 167% |
|---|---|---|---|---|---|
| **Country** | Year | | | | |
| **Macedonia** | 2006 | 44.3 | 39.2 | 40.2 | 41 |
| | 2007* | 41.2 | 37.8 | 38.6 | 39.2 |
| | 2008* | 40.7 | 36.8 | 37.5 | 38 |
| **Serbia** | 2007 | 37.6 | 38.4 | 39.2 | 39.7 |
| **Albania** | 2006 | 34.1 | 27.9 | 28.9 | 29.8 |
| **Croatia** | 2008 | | 38.1 | 40.1 | 44.4 |
| **Slovenia** | 2007 | | 40 | 44 | 50 |
| **EU-27** | 2008 | | 37 | 40.6 | 45.1 |
| **EU-15** | 2008 | | 38.1 | 42.4 | 47.6 |
| **NMS-12** | 2008 | | 35.6 | 38.5 | 42 |
| **"Excess" of tax wedge Macedonia/EU-12 (2008)** | | | 1.2 | -1 | -4 |

*Source: Mojsoska-Blazevski (2012a).*
** The reform and reduction of the personal income tax in 2007 and 2008 reduced the tax wedge.*

Table 4 compares the tax wedge in Macedonia with neighbouring and peer countries, and EU countries, at different wage levels. The high tax wedge in Macedonia, especially at low wage levels, is related to the expensive social security system that matches those in high-income Western European countries, a common feature of all ex-socialist countries (Rutkowski and Walewski, 2007).

Over the last years, the Government has reformed the labour taxation and costs system, *inter alia*, to increase formal employment, given the distortive effect of taxes on labour supply and labour demand. These consisted of the introduction of a proportional personal income and profit tax system (the so-called "flat tax") in 2007, reduction of the tax rates to 10%, as well as a reduction of the social-contributions rates as of 2009.[9] The reduction of the social contributions rates in 2009 reduced the tax wedge to below 38% for average and above average wages, and to 39% for low wages.

In summary, while the social assistance and benefit systems manage to reduce poverty, their design is likely to reduce the incentives for work, hence exacerbating the social exclusion of poor and disadvantaged citizens. Hence, it is important to assess the potential effects of the implementation of policies which reduce poverty but also provide incentives to work and to reform of the system.

[9] In 2009, the Government implemented a gross wage reform that consisted of several elements: introduction of a gross wage concept of wage negotiation and contracting from the previous net wage system, incorporation of tax-free allowances into wages, integrated collection of PIT and social insurance contributions by the Public Revenue Office, and transfer of the liability for payment of contributions from the employer to the employee.

## 4. "Making work pay": Literature overview and policy design in Macedonia

In-work benefits (IWB) or "making work pay" (MWP) policies aim at increasing employment by creating work incentives, while at the same time reducing poverty. They can be characterised as "paternalistic social welfare functions" given they include or signal the social value assigned to work (Moffitt, 2006). They are in nature different from the "traditional" social assistance measures which may be effective if well targeted but at the same time are found to create disincentives to accept a job, as we argued in Section 3. The USA's *Earned Income Tax Credit* (EITC) and UK's *Working Family Tax Credit* (WFTC) were the pioneering steps in what are today well-known and widespread in-work benefits.

When assessing the effectiveness of these types of programmes one needs to take into consideration the intended policy objectives, i.e. whether poverty reduction or increased participation is the main policy objective. Moreover, the effectiveness also depends on the design of the programme and its interference with the general tax and benefit environment in the country, as well as the distribution of income and wages, labour supply elasticities, and so on (Bargain and Orsini, 2004). The common conditionality or eligibility criteria include: work eligibility (minimum hours of work per week), family eligibility (children in full-time education or younger) and income eligibility (income below a certain threshold level). In the majority of cases, these benefits grow in proportion with the gross income up to a threshold (phase-in) and then are progressively withdrawn (phase-out) so as to target individuals with specific earning levels or working hours. In addition, benefits could be conditional either on family/household income or individual income (Orsini, 2006).

A multitude of studies have assessed the effects of in-work benefits, though mainly for the advanced economies. For instance, Meyer and Rosenbaum (2001) found that EITC is responsible for a large share of employment increases in the US: out of the 12 percentage point increase in employment rates of single mothers between 1984 and 1996, as much as 60% of it was attributable to EITC. Similarly, Meyer and Sullivan (2004) examined the impact of EITC on the material well-being of single mothers and their families in the period 1984-2000 in the US. Results showed that the level of total consumption of single mothers increased in real terms throughout this period.

Other strands of literature conduct ex-ante analyses, offering recommendations for policymakers to implement certain type of schemes based on simulations. Relying on EUROMOD, Bargain and Orsini (2006) simulated two types of IWB: British Working Family Tax Credit (WFTC) and the individualised wage subsidy scheme for three European countries that experienced severe poverty traps: Finland, France and Germany. They found that the overall female employment decreased after the introduction of the working tax credit. The participation of married women also declined in all three countries, especially in France, but it had a small positive impact on single women's labour supply in Finland and Germany. On the other hand, however, results showed that both WFTC and the

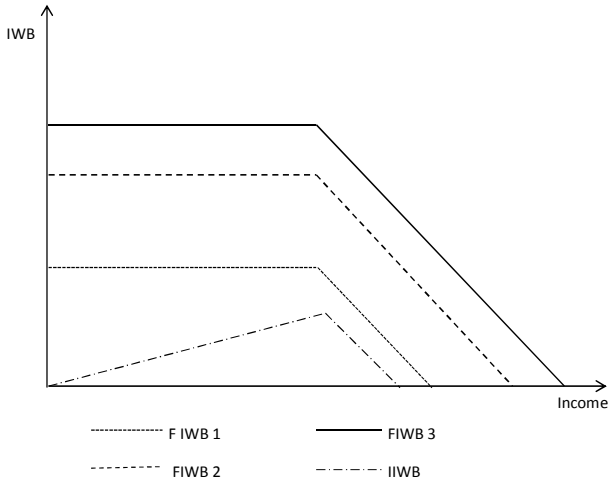
individualised wage subsidy achieved significant poverty reduction in France, and to a lesser extent in Germany, as the increased participation of poor single women induced by the former substantially contributed to poverty reduction.

Orisini (2006) assessed the impact of two major reforms on the labour market in Belgium in the period 2001-2004: the introduction of a refundable earned tax credit (CIBARP) and a reduction in social security contributions. He focused on the sub-population of households where both spouses are of working age and have a flexible labour supply (i.e. not in full-time education, nor disabled nor retired). Results suggested that reforms had positive but moderate effects on participation and hours worked. Similarly, Blundell et al. (2000) found a relatively satisfying distributional effect of WTFC in the UK, while they predict a mitigated effect on employment. Participation of single women was estimated to increase by 34,000 individuals at the expense of 20,000 married women with employed partners who it was estimated would stop work. Consequently, the distributional impact of the reform, rather than the incentive effect, has been appealed to justify the large cost of the reform. Using a behavioural micro-simulation model, Figari (2011) predicted that the introduction of the family in-work benefits in Italy would lead to an average increase of female labour supply of 3 percentage points. The individual IWB would have an even stronger incentive effect for married women. Its introduction would increase the labour supply by almost 5 percentage points. Similar results for Italy are found in Marcassa and Colonna (2011) and De Luca et al. (2012).

To our knowledge, only the study of Randjelovic et al. (2013) simulates the impact of the introduction of a family IWB (FIWB) and individual IWB (IIWB) on the labour supply and income distribution in a transition country, Serbia. Results suggested that both FIWB and IIWB triggers a decline in non-participation, the effects of FIWB being larger for singles, while those of IIWB is larger for married individuals. Both schemes would have a larger impact on stimulating the labour supply of individuals in the first decade of the income distribution, suggesting that they have an inequality-reducing power.

Similarly, as in the mainstream literature, below we test and compare the effects of two hypothetical IWB: family IWB (FIWB) and individual IWB (IIWB). The latter comes in one scheme, while the former in three different schemes (Figure 3, Table 5).

**Figure 3. Structure of in-work benefits**




*Source: Authors' policy design*

The IIWB is created to provide incentives for people with low hourly wages and not only for those with low earnings. It treats all workers alike regardless of their family status and is characterised by non-linearity as it phases-in at a rate of 0.36 and, after the maximum is reached, phases-out at a rate of 0.37. The FIWB comes in three alternatives and is linear until a certain threshold is reached, after which it phases out. The details are contained in the following table:

**Table 5. Policy design**

| Scheme | Conditions | Amount of benefit MKD p/a | Upper limit of income MKD p/a | Phase-in rate | Phase-out rate |
|---|---|---|---|---|---|
| **IIWB** | - Individuals in working age<br>- Number of working hours at least 16 in formal economy | - | 50.000 | 0.36 | 0.37 |
| **FIWB 1** | - Single person in working age<br>- No dependents<br>- Number of working hours at least 16 in formal economy | 63.000 | 90.000 | - | 0.37 |
| **FIWB 2** | - Lone parents working between 16 and 39 hours or<br>- Couples with children working between 16 and 39 hours or<br>- Couples without children working between 30 and 39 hours<br>- All working in formal economy and in working age | 85.000 | 90.000 | - | 0.37 |
| **FIWB 3** | - Lone parents or Couples in working age with or without children<br>- Number of working hours at least 40 in formal economy | 95.000 | 90.000 | - | 0.37 |

*Source: Authors' policy design*

These parameters have been chosen so that the total cost of the reform equals the current cost of the social assistance, i.e. 0.3% of GDP.

## 5. Methodological framework

While providing incentives to work through the tax benefit system emerges as an imperative in the Macedonian economy, no research has been done on the possible impact of the changes in the system on the labour supply. This has been due to two constraints: data and analytical tools for such a simulation and analysis. However, these two have been overcome recently, as we explain in this section.

### 5.1Data

This study is based on the first wave of the Survey of Income and Labour Conditions (SILC, 2011) in Macedonia. Earlier, micro-data suitable for this analysis were not available. The survey covers about 13,810 individuals living in approximately 4,000 households. Given this is the first dataset of this kind in Macedonia, we hereby base an ex-ante analysis on a combination of a tax and benefit micro-simulation model for Macedonia (MAKMOD) and a structural model for the labour supply, as we explain in Sections 5.2 and 5.3, respectively. Descriptive statistics of the population are presented in Table 6.

**Table 6 – Descriptive statistics**

| | **Males** | | **Females** | |
|---|---|---|---|---|
| | Mean | Std.Dev. | Mean | Std.Dev. |
| | (1) | (2) | (3) | (4) |
| *Demographic statistics* | | | | |
| Age | 40.381 | 12.808 | 41.355 | 11.905 |
| Married | 0.668 | 0.471 | 0.792 | 0.406 |
| Children <3 | 0.136 | 0.373 | 0.107 | 0.330 |
| Children >3 and <6 | 0.186 | 0.479 | 0.218 | 0.509 |
| | | | | |
| *Educational variables* | | | | |
| Primary education | 0.241 | 0.428 | 0.439 | 0.496 |
| Secondary education | 0.602 | 0.490 | 0.401 | 0.490 |
| Tertiary education | 0.157 | 0.363 | 0.160 | 0.367 |
| | | | | |
| *Labour market status* | | | | |
| Employed | 0.556 | 0.497 | 0.369 | 0.483 |
| Unemployed | 0.432 | 0.495 | 0.286 | 0.452 |
| Inactive | 0.012 | 0.107 | 0.345 | 0.475 |
| | | | | |
| *Hours worked and wages* | | | | |
| Monthly wage* | 23,491 | 13,166 | 21,460 | 10,445 |
| Hours worked | 23.573 | 21.645 | 15.214 | 20.245 |

*Source: SILC, authors' estimations.*
** Conditional on being in employment*

### 5.2Micro-simulation model - MAKMOD

MAKMOD is a micro-simulation model within the EUROMOD family. It runs the SILC data and allows the simulation of income assistance, child benefits, unemployment benefits, taxes and social security contributions. For more details, see Mojsoska-Blazevski and Petreski (2013). MAKMOD allows the reproduction of the budget constraint for each household, i.e., the latent set of working hours and household disposable income alternatives, while the labour supply model rationalises observed behaviour (Randjelovic et al. 2013).

### 5.3Labour supply model

The structural labour supply model we use here is a discrete choice one (van Soest, 1995), appearing in two sub-models: one estimates the preferences for singles and the other one for couples. The computation of the model relies on a maximum-likelihood estimation of a conditional logit function.

Discrete choice models of labour supply are based on the assumption that a household can choose among a finite number of working hours. Each hour corresponds to a given level of disposable income and each discrete bundle of working hours and income provides a different level of utility, the latter being also dependent on a bunch of household characteristics (mathematic expression of the utility function can be found in Orsini, 2006, p. 9). The assumption is that each partner in a couple may work 0, 20 or 40 hours, corresponding to non-participation, part-time and full-time employment, respectively, leading to nine alternatives for a couple and providing sets of disposable income and working hours of the female and the male partner. Total income is the sum of net labour and non-labour income, pensions and social benefits, whereby only the labour income and social assistance are dependent on the choice of the working hours and the respective wage rates. Hence, depending on the person's choice of working hours, he/she may be or not eligible for social benefits. The disposable income we use here is the one computed within the MAKMOD (Section 4.2).

For inactive and unemployed workers the hourly wage is not observed, though. We rely on the predictions from Heckman's (1979) selection model for their estimation.[10] Then, the imputed hourly wages are used to calculate the labour income of the non-employed for the three working time alternatives and the corresponding sets of disposable income.

Estimates of the wage equation are presented in Table 7. All coefficients have the expected sign and the inverse Mill's ratio (lambda) suggests a significant selection bias, i.e. a non-random selection of both males and females into the labour force. However, unobserved factors that make employment more likely tend to be associated with lower wages for males and higher for females.

[10] The estimation disregards the following groups: non-employed persons under 18 and over 64 years of age, students, pensioners, persons with a disability due to inflexible labour supply; employed with zero wages as these are likely not the result of their human capital, but a specific situation in the labour market; and self-employed due to the different factors affecting their wages.

**Table 7. Wage equation for females and males, with Heckman correction**

| | Females | Males |
|---|---|---|
| **Hourly wage rate (ln)** | | |
| *Secondary education | 0.550*** | 0.092*** |
| *Tertiary education | 1.151*** | 0.464*** |
| *Age | 0.053*** | 0.005*** |
| *Age squared | -0.001*** | 0 |
| **Constant** | 2.444*** | 4.389*** |
| | | |
| **Employment (1 = in employment)** | | |
| *Secondary education | 1.283*** | 0.773*** |
| *Tertiary education | 2.260*** | 1.416*** |
| *Child | -0.076*** | 0.061* |
| *Partner | 0.061 | 0.301*** |
| *Age | 0.139*** | 0.181*** |
| *Age squared | -0.002*** | -0.002*** |
| *Receiving benefits | -0.010* | -0.065*** |
| **Constant** | -4.196*** | -4.073*** |
| | | |
| **Rho** | 2.307*** | -0.337*** |
| **Sigma** | -0.789*** | -1.014*** |
| **Lambda** | **0.363**** | **-0.113***** |
| | | |
| **Observations** | 2,799 | 2,843 |
| **Wald test: independency of equations [Chi2 (1)]** | 379 | 21 |
| **Prob > Chi2** | 0.000 | 4.70E-06 |
| *Source: Authors' calculations. *,** and *** denote statistical significance at the 10.5 and 1% level, respectively. Primary education is the referent category.* | | |

After we calculate the disposable income for all choices and for all individuals, employed and non-employed, the next step is to apply the ML method on a conditional logit function so as to find out the preference parameters in the utility function. As in Randjelovic et al. (2013), we estimate the labour supply effects by comparing the predicted probability of each choice under the pre-reform and post-reform conditions. Predicted probabilities of the post-reform scenarios are based on the optimal behaviour conditional on the pre-reform budget constraints, i.e. the same estimates from the pre-reform conditional logit coefficients, and the new income, from the post-reform scenario.

## 6. Results and discussion

Parameter estimates for the behavioural model are shown in Tables 8 and 9, referring to singles and couples, respectively. In the case of singles, income is found insignificant which may be explained by factors like underreporting of informal income; family/household income being more important than individual income, i.e. the case where spending decisions are made by somebody else in the household (World Bank, 2008); and lack of accessible and affordable childcare for singles with children. On the other hand, results suggest increasing marginal disutility of hours worked. The marginal disutility of hours worked is larger for females as they likely assign greater value to home-related tasks, although the difference is statistically insignificant. Further, the marginal disutility of hours worked decreases

with the level of education, but only for females, given the higher rewards of education compared to males (see Table 7).

**Table 8. Preference estimates for singles**

| | Total | Females | Males |
|---|---|---|---|
| **Income** | **0.004** | **0.000** | **-0.025** |
| *Age | 0.001 | 0.002 | 0.002 |
| *Age squared | 0.000 | 0.000 | 0.000 |
| *Secondary education[(a)] | -0.026*** | -0.029 | -0.011 |
| *Tertiary education | -0.024*** | -0.031 | -0.022 |
| *Children[(b)] | 0.002 | 0.021 | 0.002 |
| **Income squared** | 0.000 | 0.000 | 0.000 |
| | | | |
| **Hours of work** | **-0.450*** ** | **-0.415*** ** | **-0.375*** ** |
| *Age | 0.003 | 0.002 | -0.001 |
| *Age squared | 0.000 | 0.000 | 0.000 |
| *Secondary education[(a)] | 0.103*** | 0.110*** | 0.053 |
| *Tertiary education | 0.108*** | 0.119** | 0.112 |
| *Children[(b)] | -0.010 | -0.039 | -0.010 |
| **Hours squared** | 0.007*** | 0.006*** | 0.006*** |
| | | | |
| **Income*Hours of work** | 0.000 | 0.000 | 0.001 |
| **Fixed costs** | (omitted) | (omitted) | (omitted) |
| | | | |
| N (c) | 4,491 | 1,698 | 2,793 |
| AIC | 2041.417 | 720.68 | 1339.435 |
| Pseudo R Square | 0.388 | 0.445 | 0.36 |
| Wald test: joint significance [Chi2 (16)] | 1277.829 | 552.949 | 735.181 |
| Prob > Chi2 | 0.000 | 0.000 | 0.000 |
| *Source: Authors' calculations.* | | | |
| *Notes: (a) Primary education omitted; .(b) Dummy variable for single family with child* | | | |

In the case of couples (Table 9), marginal utility of income increases with the age of males only, which may be related to the increased need for spending in more mature families. On the other hand, marginal utility declines with hours worked, but the decline is constrained by the level of education, especially for women. In addition, parenthood gains significance in the case of couples – likely due to the small number of single parents – and it increases the utility of income and reduces disutility of working hours.

**Table 9. Preference estimates for couples**

| | Total | Females | Males |
|---|---|---|---|
| **Income** | -0.392 | | |
| *Age | | -0.005 | 0.024*** |
| *Age squared | | 0.000 | -0.000** |
| *Secondary education[(a)] | | 0.002 | 0.021 |
| *Tertiary education | | 0.01 | 0.03 |
| * Children[(b)] | 0.067* | | |
| **Income squared** | 0.000 | | |
| | | | |
| **Income * Hours of work** | | 0.000 | -0.001 |
| | | | |
| **Hours of work** | | -0.408*** | -0.283*** |
| *Age | | 0.003 | -0.001 |
| *Age squared | | 0.000 | 0.000 |
| *Secondary education[(a)] | | 0.038*** | 0.019** |
| *Tertiary education | | 0.050*** | 0.022 |
| * Children[(b)] | | -0.020** | -0.018 |
| * Female and male hours interaction | | 0.000*** | |
| **Hours squared** | | 0.007*** | 0.007*** |
| **Fixed costs** | | (omitted) | (omitted) |
| | | | |
| N [(c)] | 13,239 | | |
| AIC | 3720.3 | | |
| Pseudo R Square | 0.433 | | |
| Wald test: joint significance [Chi2 (30)] | 2800 | | |
| Prob > Chi2 | 0.000 | | |

*Source: Authors' calculations.*
*Notes: (a) Primary education omitted; (b ) Dummy variable for single family with child; (c) Number of couples in the sample (1,543) multiplied by number of choices (9)*

The coefficients we obtained here determine the elasticity of labour supply. The mean elasticities are presented in Table 10. Elasticities for single females are lower than those for single males, but the regularity reverses in couples. On the other hand, the findings for couples are largely aligned with some imminent characteristics for patriarchal-minded and traditional societies, as Macedonia is, whereby the males have the role of house providers. In addition, the finding that married males have a lower labour supply elasticity than single males may be associated with the higher living costs once a family has been established (Randjelovic et al. 2013).

**Table 10. Hours of work and participation elasticity for singles and couples**

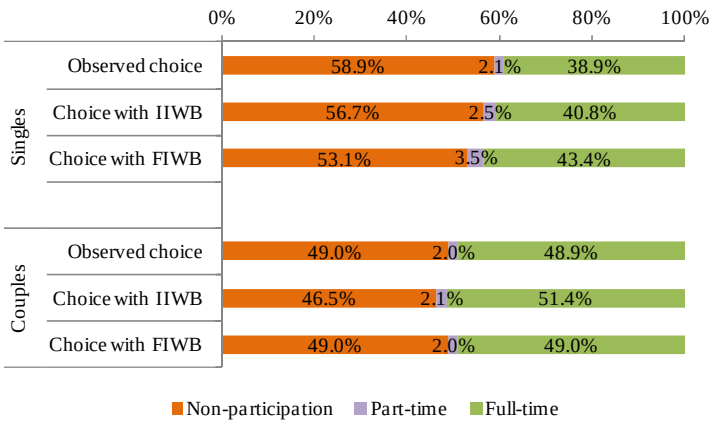
| | Singles | | Couples | |
|---|---|---|---|---|
| | Females | Males | Females | Males |
| **Hours elasticity** | 0.365 | 0.483 | 0.455 | 0.348 |
| **Participation elasticity** | 0.354 | 0.474 | 0.444 | 0.339 |

*Source: Authors' calculations.*
*Note: Elasticities have been computed numerically by increasing by 1% the gross wage of males and females and re-computing optimal labour supply. Labour supply responses are averaged up over the whole sample.*

The result for singles, both men and women, are outside the ranges established in the literature: for example, Meghir and Phillips (2010) document a range for females of (0.65; 1.41) and for males (0.00; 0.23). Larger labour elasticities are obtained in the advanced economies, even for couples. However, these deviations could likely be associated with the large and persistent unemployment and the large informal employment in Macedonia, causing workers to become less elastic in terms of supply on the labour market. The large presence of discouraged workers among the inactive population is also likely to contribute to this phenomenon.

Based on the estimated preferences in the utility function and the simulated changes in disposable income due to the introduction of in-work benefits using MAKMOD, we present the probabilities associated with different labour supply choices (non-participation, part time and full time) under the two proposed reforms: individual and family in-work benefits (Figure 4). Both reforms would result in a lower non-participation of singles (reduction by 5.8 p.p.) contributing to an increase of both part-time employment (by 1.4 p.p.) and full-time employment (by 4.5 p.p.), the effect being larger under FIWB. In the case of couples, only the IIWB reduces non-participation and increases employment and the effect is smaller than in the case of singles. Consequently, IIWB reform would be more efficient in reducing non-participation of married persons, while FIWB would be more efficient in tackling the issue of inactivity of single individuals.

**Figure 4. Labour market participation choices**

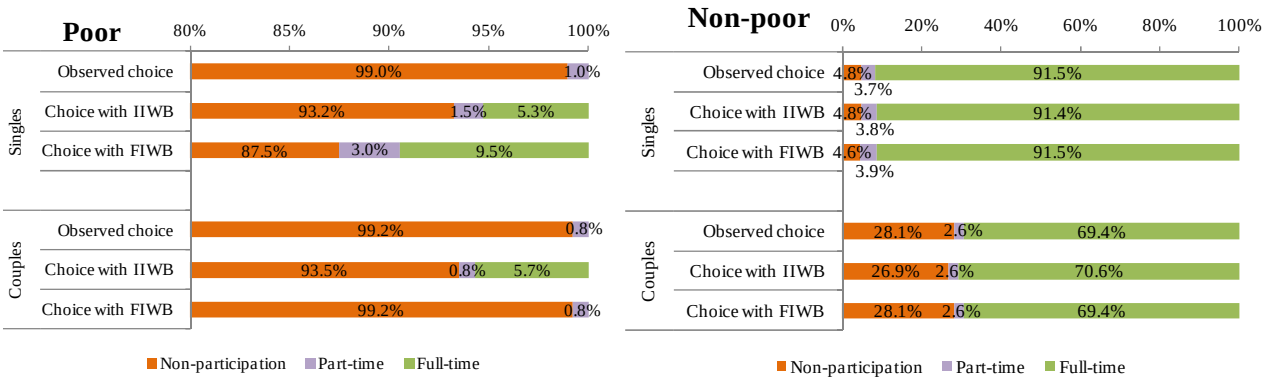



*Source: Authors' calculations.*

In the next figure, we split the sample between poor and non-poor households and observe the labour market choices of singles and couples. We treat a household as poor if the disposable household income is below 60 percent of the median, which is a usual measure for poverty in the literature and poverty calculations. Such a partition of the sample is interesting since labour market inactivity is more imminent for poor families, as is observed in Figure 5 (left panel) (see also Figure 1). An introduction of in-work benefit produces sizeable results for poor singles: the share of full-time employment increases from virtual zero to 5.3% in the case of IIWB and to 9.5% in the case of FIWB.

Part-time employment also exhibits positive movements under the two reforms, but overall the FIWB reduces inactivity by a substantial 11.5 p.p. With respect to couples, only the IIWB reduces inactivity by steering full-time employment to increase from zero to 5.7%.

**Figure 5. Labour market participation choices for poor and non-poor**

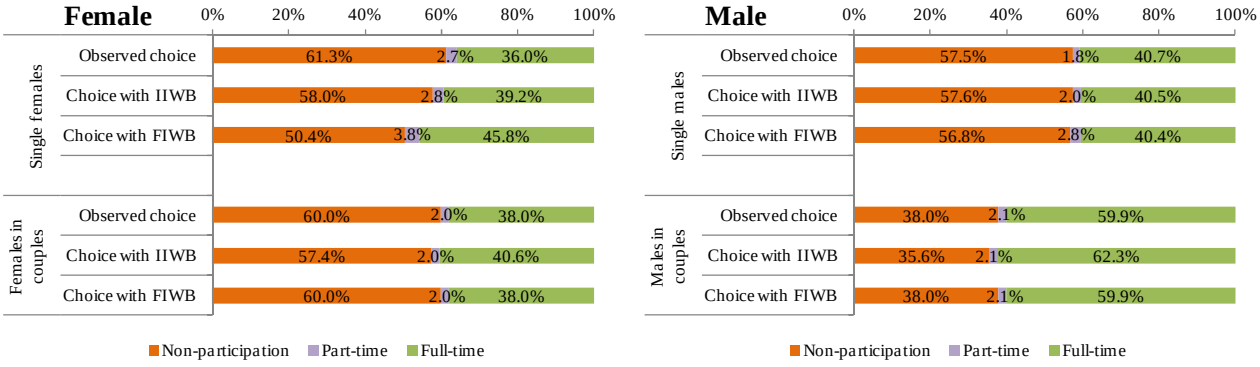



*Source: Authors' calculations.*

*Note: Figures for couples are simple averages of the male and female participation choices.*

In the case of non-poor (Figure 5, right), the effects are much smaller. The family IWB is slightly more beneficial for singles, while the family IWB is for couples, as it slightly reduces the inactivity for full-time employment. This type of analysis suggests that both reforms would produce sizeable labour supply effects for low-wage earners, hence significantly affecting the poverty in the country.

**Figure 6. Labour market participation choices for females and males**




*Source: Authors' calculations.*

Finally, we observe the choices of males and females – both singles and in couples – separately (Figure 6). As expected, results suggest that the proposed reforms will have a larger impact on females: FIWB would result in an increase of the desire of single females to work by a sizeable 10.9 p.p. (both full and part time), while IIWB would increase the desire of women in couples to work by 2.6 p.p. These are comparable magnitudes to those established in the literature (see, e.g. Figari, 2011,

for the Italian case). The respective changes in the case of males are much smaller in size: 0.7 p.p. and 2.4 p.p.

Overall, the analysis suggests that the proposed reforms will have a considerable effect on the working choices of Macedonians. In general, the family in-work benefit is found to be more effective for singles, while the individual one is more effective for couples. However, the effects will mainly accrue among poor and females, as these are the categories most prone to inactivity in Macedonia.

## 7. Conclusion

The objective of this paper is to estimate the effects of two alternative social policies – individual and family in-work benefits – on labour market choices in Macedonia. As labour market inactivity is especially pronounced among the poor and females, the paper puts the focus on their working choices should in-work benefits be introduced. As in most of the studies of this type, we use ex-ante analysis relying on a combination of a tax and benefit micro-simulation model for Macedonia (MAKMOD) and a structural model for the labour supply. MAKMOD belongs to the EUROMOD family and allows simulating income assistance, child benefits, unemployment benefits, taxes and social security contributions. The structural labour supply model is a discrete choice, *à la* van Soest (1995). We use the newly conducted 2011 Survey of Income and Labour Conditions, which feeds the MAKMOD model. The simulated wage for the unemployed and inactive persons is obtained from the predictions of a Heckman selection model. Then, MAKMOD produces the disposable income subject to the choices of working hours of individuals and households for the labour supply model. Finally, the ML method is applied on a conditional logit function so as to find out the labour-market preference parameters in the utility function.

Results suggest that the proposed reforms will have a substantial effect on the working choices of individuals and couples in Macedonia. In general, the family in-work benefit is found to be more effective for singles, while the individual one is more effective for couples. Namely, both reforms would result in a lower non-participation of singles (reduction by 5.8 p.p.) with a positive effect both on part-time employment (increase by 1.4 p.p.) and full-time employment (increase by 4.5 p.p.), the effect being larger under FIWB. In the case of couples, only the IIWB reduces non-participation and increases employment and the effect is smaller than for the case of singles. However, the effects are found to be larger, particularly for the poor and females, as these groups are the most prone to be in the inactivity categories in Macedonia. FIWB reduces the inactivity of poor singles by a substantial 11.5 p.p., while IIWB reduces the one of couples by steering full-time employment to increase from zero to 5.7%. On the other hand, the family IWB is still beneficial for couples, as it slightly reduces inactivity to the benefit of full-time employment. As expected, results suggest that the proposed reforms will have a larger impact on females: FIWB would result in an increase of the desire of single

females to work by a sizeable 10.9 p.p., while IIWB would increase the desire of women in couples to work by 2.6 p.p. The respective changes in the case of males are much smaller in size: 0.7 p.p. and 2.4 p.p.

Important policy recommendation emerges from this analysis: the government – the Ministry of Labour and Social Policy – should consider the introduction of the in-work benefits in the tax and benefit system of Macedonia, so as to combat inactivity and unemployment, and reduce social exclusion, especially among the poor and females who are among the most vulnerable groups in the economy. When considering the policy recommendations, though, two important caveats should be borne on mind: i) this analysis assumes that females are not labour-supply constrained; in particular if there are large fixed costs to working such as child care unavailability, these estimates may be higher than what would be observed if the reforms were introduced; and ii) the analysis does not consider labour-demand issues.

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