INTRODUCTION

The marginalisation of Roma is widespread in Europe and takes various forms; it encompasses almost all aspects of life spanning from education and employment to health and housing (FRA, 2018; O’Higgins & Ivanov, 2006). In order to improve the Roma situation, there is a strong political willingness and commitment in the EU (European Parliament 2011). It is surprising, however, how little robust scientific evidence regarding potential costs and benefits of Roma integration policies has supported the policy design and implementation so far.

To narrow this evidence gap and provide policymakers with the missing scientific evidence, the present study undertakes a comparative analysis of long-term economic, budgetary and fiscal costs and benefits of alternative Roma integration policies in the areas of education and employment in five EU Member States with the largest share of the Roma population—Bulgaria, the Czechia, Hungary, Slovakia and Romania.1 We employ a general equilibrium approach that allows us to assess not only the direct impact of selected Roma integration policies but also to capture all induced feedback effects.

In the five studied EU Member States from the Central and Eastern Europe (CEE) live around 4 million Roma (Council of Europe, 2012). Many Roma communities are among the most socially and economically marginalised groups in these countries; they perform worse than the mainstream society in almost all socioeconomic spheres of life, being relegated to the fringe of society. On average, Roma are found to have lower income level, higher poverty rate regardless of the poverty metrics applied (Ivanov & Kagin, 2014), and higher unemployment rate (FRA, 2018), and they are less educated, face higher incidence of undernourishment, and have lower life expectancy, higher child mortality, less access to drinking water, sanitation and electricity, etc. (Kertesi & Kézdi, 2011; O’Higgins & Ivanov, 2006).

These evident and sizeable well-being differences between Roma and the mainstream population make the Roma inclusion issue high on the policy agenda in EU Member States. The key priorities of
inclusion policies include the integration of Roma into the schooling system, labour markets and improving access to social services and infrastructure (Achim, 2004; Ciaian & Kancs, 2016; Ringold, Orenstein, & Wilkens, 2005). At the European level, two policy initiatives (and policy frameworks) highlight the political importance of the Roma inclusion: the Decade of Roma Inclusion (2005–15) and the EU Framework for National Roma Integration Strategies (2011–20). Similarly important is the Paris Declaration,\(^2\) which aims at mobilising the education system to prevent and tackle marginalisation, intolerance, racism and radicalisation, and to preserve a framework of equal opportunities for all, including an inclusive education for all children, independent of the social background. Further, the European Commission has increased its policy support under the European Semester of the Europe 2020 strategy and has linked the EU funding to the policy implementation. For example, in 2016 the European Commission issued Country Specific Recommendations to improve access to the schooling and employment of Roma in five EU Member States with most acute marginalisation challenges, that is, Bulgaria, the Czechia, Hungary, Romania and Slovakia. In addition, there is also legislation for fighting discrimination against Roma (the Racial Equality Directive),\(^3\) as well as European Structural and Investment Funds can be used for the Roma inclusion in the EU.\(^4\) At the national level, policy instruments include targeted national Roma integration strategies and measures, reforms of mainstream policies impacting Roma and the enforcement of an anti-discrimination legislation. Both national and EU funds are being used either for Roma-targeted measures or for inclusive mainstream reforms (European Commission, 2019).

Despite a growing demand for and supply of Roma integration policies, the existing evidence base supporting the design, implementation and evaluation of Roma integration policies is scarce and inconclusive. On the one hand, there are only few studies in the scientific literature looking at these questions systematically. On the other hand, the few existing studies apply at most a partial equilibrium approach or undertake a reduced form analysis to estimate costs and benefits of Roma integration policies. For example, Kertesi and Kézdi (2006) have estimated long-term budgetary effects of investments in Roma children in the secondary education in Hungary. Bogdanov and Angelov (2007) have estimated costs and benefits of an improved education of Roma in Bulgaria. Marcinčin and Marcinčinová (2009) and a team of the World Bank experts have conducted a similar analysis for Slovakia (World Bank, 2012). There have been also attempts to estimate economic and fiscal costs and benefits of the Roma inclusion in the labour market in the Czechia and Romania. Despite providing some evidence, an important limitation of reduced form/partial equilibrium analyses is that they do not take into account economy-wide interactions and medium to long-run feedback effects and adjustments on labour markets. As a result, not accounting for all direct and indirect rebound effects provides only a partial and/or biased picture of true policy effects.

In order to narrow this evidence gap, the present study undertakes a holistic analysis of long-run economic, budgetary and fiscal costs and benefits of selected Roma inclusion policies in five EU countries from the CEE: Bulgaria, the Czechia, Hungary, Slovakia and Romania. We have selected these five countries, because more than two-thirds of the total EU Roma population reside in these EU Member States. The second reason for choosing these countries is that the Roma marginalisation is particularly widespread and represents an acute and rapidly growing socioeconomic problem in these countries (see Appendix S1). They cause frictions not only at the national level, but may also have

\(^2\)Declaration on promoting citizenship and the common values of freedom, tolerance and non-discrimination through education adopted by the Commissioner Navracsics and Education Ministers in 2015; see https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/images/1/14/Leaflet_Paris_Declaration.pdf.

\(^3\)Council Directive 2000/43/EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0043

\(^4\)ESIF Investment priority 9(ii) “Integration of marginalised communities such as the Roma.”
EU-wide implications, for example, through migration (Halasz, 2009; Korando, 2012). From the EU policy perspective, these five countries are the only EU Member States with country-specific recommendations regarding Roma issued by the European Commission.

By complementing previous findings, the current study undertakes a comparative analysis of long-run economic, budgetary and fiscal impacts of alternative Roma integration policies by following the modelling approach of Tanaka, Farre, and Ortega (2018) and Kancs and Lecca (2018) implemented for the five Member States based on the methodology of the European Economic Modelling system (EU-EMS) and the Global Trade Analysis Project (GTAP). This modelling framework allows us to undertake a holistic analysis of long-run social, economic and fiscal impacts of alternative Roma integration policies. The modelling of education is based on Tanaka et al. (2018), who propose an education model in the context of immigrants versus natives with two channels of adjustment: the education quantity and quality. Given that Roma are long-term immigrants with important differences in educational attainment rates and in the education quality with respect to the mainstream population in host countries, we adopt this approach in the present study. The labour market is modelled following Bonacich (1975), who proposes a split labour market between migrant and native workers. The empirical implementation of the split labour market follows Kancs and Lecca (2018).

We have designed two alternative Roma integration policy scenarios and assess long-run economic, budgetary and fiscal effects. In addition to assessing the impacts of Roma integration policy initiatives currently being planned/implemented in the five EU Member States, we also design and simulate a hypothetical—universal basic income—scenario, where the same amount of public funding for the Roma integration is disbursed in the form of direct cash transfers. According to the existing evidence (Aizer, Eli, Ferrie, & Lleras-Muney, 2016; Jones & Marinescu, 2018; Kela 2018; Marinescu, 2018; Nikiforos, Steinbaum, & Zezza, 2017; Parelius sen, Hwang, & Viittamäki, 2018), there are several reasons why direct cash transfers to poor/marginalised households, such as Roma, may generate higher policy effects compared to complex supply-side programmes conditioned on many factors. Indeed, Roma integration policies that attempt to increase the supply of certain public services, for example, education, are often being criticised: key drivers of low educational attainment rates are not tackled, private costs of Roma households often exceed social benefits, wrong incentives are created, and high administrative costs are imposed that significantly reduce the net amounts actually arriving at Roma households. In the long run, this top-down approach facilitated by layers of intermediaries makes participatory approaches more difficult to implement ultimately encouraging a culture of dependency of the communities commonly referred to as “target groups” (FRA, 2018). For these and other reasons, direct cash transfers to poor households and marginalised communities are being increasingly implemented not only in developing but also in developed countries, such as the USA, Canada and Finland (Bassett, 2008; de Janvry & Sadoul et, 2004; Kela 2018).

Our simulation results suggest that although the Roma integration, for example, by providing targeted education assistance services and reducing the labour market discrimination, would be costly for the public budget, in the medium-to-long run, economic, budgetary and fiscal benefits may significantly outweigh short to medium-run Roma integration costs. Depending on the integration policy scenario and the analysed country, the annual long-run GDP effect would be between 16.47 and 109.93 million euro above the baseline growth, and the full repayment of the integration policy investment (positive net present value) would be achieved after 7 to 9 years. In terms of the GDP, employment and earnings, the universal basic income scenario outperforms currently implemented Roma integration policies, particularly in the medium-to-long run.

5 Among others, discussions during the European Commission’s workshop on Roma communities in Europe “Taking stock of current science-based knowledge and what is needed for effective policy development.”
The rest of the paper is organised as follows. Section 2 sketches the underlying modelling framework, whereas Section 3 details the construction of alternative policy scenarios and main assumptions behind each of them. Section 4 presents simulation results, whereas the final section concludes.

2 | MODELLING FRAMEWORK

As noted in the introduction, the existing evidence base supporting the design and implementation of Roma integration policies is scarce and inconclusive. The few existing studies estimating costs and benefits of Roma integration policies apply at most a partial equilibrium approach or undertake a reduced form analysis. A key limitation of reduced form/partial equilibrium analyses, which are being used to assess Roma integration policies, is that they do not take into account economy-wide interactions and medium to long-run feedback effects and adjustments on labour markets. For example, usually, they assume that policy-induced investments in the human capital of Roma would not change wages and employment probabilities of the mainstream population. Justifications for such rather limiting assumptions are provided by evidence that Roma are minorities in countries where they reside and their share in the total labour force is relatively small. However, from the dual labour market theory (e.g., Dickens and Lang 1985) we know that an integration policy that would improve the labour market participation and employment of the economically inactive population would shift the labour supply, which in turn would affect labour market outcomes in the medium-to-long run. Furthermore, the inclusion of Roma into labour markets is expected to generate more economic activity, which will affect demand, the tax revenue of government, etc. Although both types of general equilibrium effects affect the overall costs and benefits of the Roma integration policy in the medium-to-long run, they are not accounted for in reduced form/partial equilibrium analyses.

Capturing general equilibrium feedback effects and the above-discussed sizeable differences between Roma and non-Roma in education and labour markets poses challenges to the analytical framework. First, the model must be able to identify Roma and non-Roma children in education and workers on the labour market separately, as the Appendix S1 suggests sizeable differences between the two population groups. Second, the modelling framework should be able to capture all short and long-run policy-induced general equilibrium feedback effects on labour markets, public budget, etc. Third, the modelling framework should allow for an integration policy-induced social mobility.

Taking these aspects into consideration, in the present study we follow the modelling approach of Tanaka et al. (2018) and Kancs and Lecca (2018) based on the methodology of the European Economic Modelling system (EU-EMS) and the Global Trade Analysis Project (GTAP) that allows us to undertake a holistic analysis of long-run social, economic and fiscal impacts of alternative Roma integration policies. The modelling of education and labour markets is less traditional; therefore, all key equations are presented and discussed in detail. The rest of the underlying model (firms, government, equilibrium conditions) is rather standard; therefore, its description is kept concise. The modelling of education is based on Tanaka et al. (2018), who propose an education model in the context of immigrants versus natives with two channels of adjustment: the education quantity and quality. Given that all main results of this model apply also to Roma (who share key patterns of exclusion and discrimination based on social constructs and prejudice because of their “otherness”), we adopt the Tanaka et al. (2018) approach in the present study. The labour market is modelled following Bonacich (1975), who proposes a split labour market between migrant and native workers (see Kancs & Lecca, 2018).
2.1 | Overview of the model

Key economic “agents” in the model are households, firms and government; key production factors are different types of labour and capital. The model economy is represented by five EU Member States: Bulgaria, the Czechia, Hungary, Slovakia and Romania; the rest of the EU; and the rest of the world. Being a general equilibrium, the model captures all flows of goods and services of the global economy in the base year. Through international trade linkages, the model covers also the rest of the world, which for the sake of simplicity is modelled in a fairly aggregated way though.

Each EU Member State’s economy is composed of a number of economic sectors, the supply of educational services representing one such sector. Each economic sector produces goods or services for the intermediate and final use by combining inputs from materials, capital and labour according to a nested constant elasticity of substitution (CES) production function framework. In each sector, goods are either vertically differentiated (education services) or horizontally differentiated (all other sectors). In sectors producing horizontally differentiated goods, the competition between firms is monopolistic, implying that many small firms offer similar products or services, which however are not perfect substitutes. Barriers to entry and exit in each economic sector are sufficiently low, such that the production/pricing decision of any one firm does not directly affect that of its competitors. The equilibrium nature of the model implies that all revenues from the production of goods and services are allocated either to households (as returns to labour or capital), to other industries as payments for the intermediate output, or to government as taxes.

The demand for goods and services produced in all economies stems from households, firms in the same or other sectors and the public sector (government). As usual, the government budget (net of taxes, subsidies, transfers and savings) is allocated among different commodities according to a CES utility function.

2.2 | Education

Each of the five EU Member States is populated by heterogenous households. Following Tanaka et al. (2018), households are differentiated according to their ethnic origin, \( f \), that include mainstream society’s households and Roma households. Households between different ethnic origin groups differ with respect to the number of children, the preference for education, costs of education (opportunity costs of a child labour in household) and the disposable income.

Following Tanaka et al. (2018), households have a nested utility structure, where at the top level, households with the ethnical background, \( f \), derive utility, \( u_f \), from the consumption of horizontally differentiated goods and services, \( C \), and from vertically differentiated education services, \( E_f \) (in per-child units):

\[
\begin{align*}
  u_f = \frac{1}{\alpha} (C)^{\alpha} + \frac{\gamma_f}{\alpha} (E_f)^{\alpha},
  
  \text{Consumption goods} & \quad \text{Education services}
\end{align*}
\]

The SAM data set to which the model is calibrated provides a considerable flexibility to re-aggregate the model into different sectoral groupings, which we exploit intensively in a sensitivity analysis, in order to assess the impacts on low-tech versus high-tech sectors, skill-intensive versus skill-extensive sectors, etc. In this study, we employ a five-sector version of the model: Low-skill manufacturing; Medium-skill manufacturing; High-skill manufacturing; Education; and the Rest of the economy.

See Lutz and Turrini (2006) for vertically differentiated skills.

Country subscripts are omitted in this section for the sake of brevity.
where $\alpha < 1$ is the parameter determining the share of the aggregate income devoted to education by the government, that is, implicit tax rate determining the tax elasticity of demand for educational services; and $\gamma_f > 0$ is a preference parameter for education relative to consumption that is common to all households from the same ethnic group.

As regards consumption goods, the modelling of the household consumption behaviour follows a rather standard nested CES utility structure (see, e.g., Kancs & Lecca, 2018). As regards education services, at the second tier households decide on a particular education quality from a range of vertically differentiated education services, each firm in the education sector supplying a different quality education services. All firms in the education sector receive a per-student subsidy from government, denoted by $b \geq 0$. This education subsidy constitutes a public cost of education that is financed through taxes, $t$. In addition, households face also a private cost of education, for example, school fees, $z_f \geq 0$, that are education quality-specific: higher quality education costs more to households and vice versa. Households choose their preferred education quality among a range of vertically differentiated education services indexed by the quality premium, $z_f$. The household indirect utility can then be rewritten as:

$$u_f = \max_{z_f \geq 0} \frac{1}{\alpha} \left( y_f (1 - t) - c_f n_f z_f \right)^{\frac{1}{\alpha}} + \frac{\gamma_f}{\alpha} \left( b + z_f \right)^{\alpha},$$

which is increasing in the disposable (net of taxes, $t$) household income, $y_f$ and education units (quality), $b + z_f$. The household utility is decreasing in education costs, $c_f n_f z_f$, where $c_f$ captures ethnic origin-specific education costs that are not related to schools, for example, the opportunity cost of a child labour in household or cost of additional language courses that are not equal/relevant for all ethnic groups, for example, the mainstream population. Whereas $b$ is an exogenous policy variable, $z_f$ is an endogenous decision variable of households.

Following Tanaka et al. (2018), from Equation (2) the utility-maximising education quality, $z_f$, chosen by household with $f$ ethnical background, $n$ number of children and $y$ income level can be expressed as:

$$z_f = \frac{y_f (1 - t) - \left( \frac{y_f}{c_f n_f} \right)^{\frac{1}{\alpha}}}{\left( \frac{y_f}{c_f n_f} \right)^{\frac{1}{\alpha}} + c_f n_f}.$$

According to Equation (3), households with higher disposable income, $y_f (1 - t)$, or ethnic groups with higher taste for education, $\gamma_f$, will choose higher education quality that is more expensive. In contrast, households with more children, $n_f$, or facing higher opportunity costs of sending children to school, $c_f$, will choose relatively lower quality education that is less expensive.

This adopted education modelling framework of Tanaka et al. (2018) allows us to capture fundamental education differences between Roma and non-Roma in the five CEE study countries. On average, Roma households have lower level of income and more children than non-Roma households (see Ciaian & Kancs, 2018). According to the FRA-European Commission's 2011 survey data, Roma children have lower educational attainment compared to non-Roma children in terms of both quality and quantity. Third, the education demand of Roma households is decreasing in opportunity costs, for example, of the child labour in household. In contrast, higher preference for education of non-Roma households contributes to higher educational outcomes. Further, the quality of education positively affects the returns to education. According to Castelló-Climent and Hidalgo-Cabrillana (2012), there are increasing marginal returns to the education quality. Hence, a further implicit result of the model is...
that those households that choose lower quality schools will have lower marginal returns to education and vice versa.

2.3 | Labour markets

Households own production factors—capital and labour—which they rent to firms. Labour is disaggregated according to skill levels into three categories: low-skill (primary and lower secondary education, ISCED 0–2); medium-skill (upper-secondary and post-secondary education, ISCED 3–4); and high-skill: (tertiary education, ISCED 5–6). Net wage differences between low, medium and high-skill workers together with employment probabilities determine the share of low-, medium- and high-skill workers in each country in the long run.

The labour market is represented by a downward sloping labour demand curve and a wage curve determining the relationship between wage and unemployment. The slope and position of each curve is skill-specific, implying that also the wage rate and employment are differentiated between the low, medium and high-skill labour. In order to account for the ethnically split labour market widely observed in the CEE (Ciaian & Kancs, 2016), we follow Bonacich (1975) and further introduce two types of parallel labour markets—Roma and non-Roma (see Kancs & Lecca, 2018 for details). According to Bonacich (1975), there may be several reasons for the existence of a split labour market: (a) discrimination from the mainstream population; (b) differences and the quality of education and/or professional qualifications; (c) differences in worker preferences (e.g., reservation wage), etc. In our model, the split labour market is country-specific; it depends on differences in the education quality between Roma and non-Roma. According to the data that we use to calibrate the model, the larger is the education quality gap (measured by national test scores of schools with predominantly Roma children and predominantly non-Roma children), the larger are wage differences for a comparable work between the two parts of the split labour market. On the labour demand side, the two types of workers are substitutable (though not perfectly), implying that each mainstream economy's firm can hire either Roma workers or non-Roma workers for the production of goods and services.

3 | SCENARIO CONSTRUCTION

3.1 | Baseline and set-up

In order to undertake a comparative scenario analysis and assess the impacts of selected Roma integration policies in the five CEE countries, first, a baseline scenario is constructed and simulated. Alternative policy scenarios will be measured against this baseline. In the context of the European Roma, one of the key assumptions regards the future Roma population growth. As detailed in Ciaian and Kancs (2018), Roma is one of the fastest growing population groups in Europe. In order to account for this fact, we use Eurostat's population projections for the general population, which provide “what-if” scenarios about the likely future size and structure of population groups, based on assumptions about fertility, mortality and migration (Eurostat, proj_15nps). We complement Eurostat data with FRA/European Commission's 2011 survey data for Roma to derive projections about the future Roma population growth, the rate of which, as detailed in Ciaian and Kancs (2018), is considerably higher than that of the mainstream population.

Second, alternative integration (counterfactual) scenarios for the marginalised Roma inclusion are constructed and simulated. In the designed alternative integration policy scenarios, the education and labour market outcomes of Roma depend on implemented Roma integration policies. Together with marginalised community inclusion policymakers and Roma experts in the five studied countries and
the European Commission, we have designed two Roma integration scenarios that could be useful for better understanding of the potential magnitude and distribution of economic, budgetary and fiscal costs and benefits of policy options regarding the Roma integration:

- Policy status quo scenario;
- Universal basic income scenario.

The policy status quo scenario is based on estimates of actual current/future policy expenditure data, in which already allocated and/or foreseen Roma integration policy expenditures serve a starting point. Subsequently, improvements in the Roma educational and labour market outcomes are projected, and finally using the model, economic, budgetary and fiscal effects are simulated.

Most of Roma integration policies currently implemented in the EU and simulated in the policy status quo scenario aim at expanding the supply of social and economic services (both availability and quality) by improving the education, health and other socioeconomic infrastructure. Whereas supply-side policies may be effective in increasing the supply of educational services, according to OECD (2017) they do not always lead to the desired uptake and use of these services. The European Court of Auditors has voiced similar concerns in its special report on EU policy initiatives and financial support for Roma integration (European Court of Auditors (ECA), 2016). Even when costs for these services are kept low or even free, nevertheless, supply-side policies often fail to satisfactory increase the use of these services (Bassett, 2008; de Janvry & Sadoulet, 2004; World Bank, 2010).

In order to address deficiencies of supply-side policies, the use of direct cash transfers is becoming more and more popular in many countries (both developing and developed), as they can more effectively help to overcome liquidity constraints preventing the use of supplied public services by poor/marginalised households and are less costly in terms of their implementation (OECD, 2017; Tabor, 2002). The idea of direct cash transfers is not new, and it is rooted in the neoclassical economics, according to which individuals make rational decisions to maximise their own well-being by taking into consideration benefits and costs associated with each decision. When liquidity constrained households receive cash transfers, their cost–benefit considerations change, which in turn affects their decision-making calculus. For example, a direct income transfer can reduce the household opportunity cost of sending children to school, making the benefits of the schooling & education decision outweigh the costs (Bassett, 2008; de Janvry & Sadoulet, 2004).

The second scenario—universal basic income—is a hypothetical scenario, in which we analyse policy impacts under “what would happen if” assumptions. In particular, we assess economic, budgetary and fiscal effects by assuming that the same amount of Roma policy expenditure as under the policy status quo scenario would be disbursed in the form of direct cash transfers. The analysis investigates the impact of direct cash transfers, but it does not call for such transfers to be targeting only Roma. To the contrary, they might be more cost-efficient tool for addressing the multiple poverty, deprivation and discrimination any other group at risk of marginalisation faces, as previous studies suggest (see Section 3).

Four types of assumptions need to be made when constructing Roma integration scenarios: the magnitude and distribution of policy costs (Section 3.2); associated improvements in the educational

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9 Main ideas and key inputs for the Roma integration scenario construction were crystallised at the European Commission's workshop on Roma communities in Europe “Taking stock of current science-based knowledge and what is needed for effective policy development.”

10 A universal basic income, also referred to as a guaranteed minimum income or income guarantee, is a cash transfer that everyone within a geographic territory or social community receives on a regular basis with no conditions on a long-term basis (Thigpen, 2016).
attainment (Section 3.3); policy-induced improvements in labour market outcomes (Section 3.4); and policy financing sources and methods (Section 3.5).

3.2 | Policy costs

We can distinguish between two types of education and training programmes and their related costs in the policy status quo scenario. (a) Roma-specific education and training programmes. Costs of these programmes include, for example, teacher salaries and school buildings for Roma children. (b) Education programmes for children from a socially disadvantaged environment in general. Costs of these programmes include, for example, equipment in classrooms designated for the instruction of children from socially disadvantaged environments through the use of special teaching aids, didactic media and teaching technology.

Roma-specific education and training programmes cover policy initiatives that are designed and implemented specifically for Roma. These costs (per child) differ substantially between the five studied countries. In counterfactual policy scenarios, these costs are also identified by the educational attainment level, wherever possible. Costs of other education and training programmes, which cannot be associated to children from a particular educational attainment level as main beneficiaries, are assumed to incur to all educational attainment levels (primary, secondary and tertiary) proportionally.

Education assistance programmes for children from socially disadvantaged environments include, among others, children from marginalised Roma families. Per-child costs of these programmes differ significantly between the five studied countries. However, in our simulations they are not specific to a particular educational attainment level, as many of education assistance programmes for children from socially disadvantaged environments, for example, the early childhood development and preschool education, are beneficial for children from all educational attainment levels (primary, secondary and tertiary).

An overview of total Roma integration policy cost estimates in the policy status quo scenario in each of the five studied countries during 2014–20 is provided in Table 1. The expenditure estimates reported in Table 1 suggest that in terms of the total funding, the marginalised Roma community in Romania (721.82 million euro) followed by Hungary (675.70 million euro) would be the largest beneficiaries of those Roma integration policies that are analysed in the present study. The total funding made available for Roma integration policy measures that we simulate in counterfactual policy scenarios is considerably lower in Bulgaria (254.35 million euro), the Czechia (276.48 million euro) and Slovakia (272.72 million euro).

For the sake of comparability between the two policy scenarios, in the universal basic income scenario we assume that the same total amounts of the Roma integration funding are made available to Roma in each of the five studied countries as under the policy status quo scenario (Table 1). The key difference between the two policy scenarios is that in the universal basic income scenario, these funds are disbursed directly to marginalised Roma households. Specifically, we assume that direct cash transfers are disbursed without coupling them to any spending condition. Being administratively simple, low-cost and fundamentally market neutral, unconditional cash transfers do not introduce any market distortions (Standing, 2007).

11Note that these selected funds do not correspond to entire policy expenditures on Roma integration in the five studied EU countries.

12In sensitivity analyses, we also explore a potential value added of conditional cash transfers. For that purpose, we construct an additional sub-scenario where cash transfers to Roma households are conditioned on the children school attendance. In order to account for costs associated with verifying and imposing the compliance with transfer conditionalities, we follow Caldes, Coady, and Maluccio (2006) and assume that policy implementation and verification costs burn 24% of total policy expenditures in the conditional cash transfer scenario.
As shown in Figure 1, education costs consist of two parts: private and public (Mehrotra, Nigam, & Thet, 1996; Tsang, 1988). Both types of education costs are captured explicitly in the underlying model. Whereas education demand-side policies attempt to reduce mainly private education costs (see the right panel of Figure 1), education supply-side policies are related mainly to public education costs (see the left panel of Figure 1).

### 3.3 | Policy impact on education

We can distinguish between policy-induced improvements in educational outcomes and improvements in labour market outcomes. As regards educational outcomes, their impact depends on policy implementation details (parameter $\alpha$ in Equation (1) and variable $b$ in Equation (2) and also on a number of household-specific factors, which in the underlying model are captured through decision variables (variable $z_e$ in Equation (2)). Two important elasticities governing the policy impact on the Roma education are the income elasticity of demand for education and the price elasticity of demand for education.

According to the previous literature (Dur & Teulings, 2003), an important determinant of the education policy impact is the price elasticity of demand for education. Among others, the elasticity of demand for education with respect to the schooling cost determines the effectiveness of supply-side education policies in increasing the stock of the human capital through education. Households choose their demand for education such that the marginal return to education is equal to its cost. A supply-side education policy reduces the education cost and hence also the marginal return. The larger

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**Table 1** Policy costs: yearly amounts made available under selected national, EU and international measures for the Roma integration in the five study countries during 2014–20

|               | Bulgaria | Czechia | Hungary | Romania | Slovakia |
|---------------|----------|---------|---------|---------|----------|
| Million euro  |          |         |         |         |          |
| 2014          | 36.05    | 39.33   | 98.67   | 102.81  | 41.08    |
| 2015          | 36.57    | 40.14   | 94.31   | 106.04  | 40.83    |
| 2016          | 37.72    | 38.49   | 98.65   | 103.03  | 37.93    |
| 2017          | 35.48    | 39.76   | 98.05   | 100.86  | 39.38    |
| 2018          | 36.68    | 39.05   | 93.57   | 98.54   | 39.38    |
| 2019          | 35.63    | 39.66   | 95.25   | 106.43  | 37.42    |
| 2020          | 36.23    | 40.06   | 97.21   | 104.11  | 36.69    |
| Total         | 254.35   | 276.48  | 675.70  | 721.82  | 272.72   |

|               |          |         |         |         |          |
| Percentage of GDP | 0.090 | 0.026 | 0.101 | 0.073 | 0.057 |
| 2015          | 0.092    | 0.027   | 0.096   | 0.075   | 0.057    |
| 2016          | 0.095    | 0.026   | 0.101   | 0.073   | 0.053    |
| 2017          | 0.089    | 0.027   | 0.100   | 0.071   | 0.055    |
| 2018          | 0.092    | 0.026   | 0.096   | 0.070   | 0.055    |
| 2019          | 0.089    | 0.027   | 0.097   | 0.075   | 0.052    |
| 2020          | 0.091    | 0.027   | 0.099   | 0.074   | 0.051    |
| Average       | 0.091    | 0.026   | 0.099   | 0.073   | 0.054    |

Source: Authors’ estimates based on national Roma integration authorities, European Commission and Roma Education Fund data.
is the elasticity of demand for schooling with respect to its cost, the lower is the amount of a policy intervention that is required for a given increase in the mean level of the human capital, and hence, the smaller is the adverse effect on the income distribution. The sensitivity of demand for education to supply-side education policies is particularly important, when the innate ability of individuals and the education demand are complementary. The baseline value of this elasticity is adopted from Campbell and Siegel (1967) and is set to $-0.44$. In sensitivity analyses, we explore the impact in 5% steps of up to 50% lower/higher elasticities (see Section 4.2).

As regards the **income elasticity of demand for education**, generally, the previous literature suggests positive relationship, implying that an increase in the household income results in higher demand for education (Becker, 1990). However, the relationship between the education demand and household income is complex and non-linear, as the demand for education depends, among others, on household preferences and budget constraints faced by (marginalised) households, both in turn being influenced by the household income. For example, given the labour-supply potential of children in poor households, higher household income decreases (lower income increases)—as in the universal basic income scenario—the opportunity cost of sending children to school. Overall, an increase in the household income is expected to positively influence schooling decisions, particularly of poor households. Also the baseline value of this elasticity is adopted from Campbell and Siegel (1967) and is set to $1.20$. In sensitivity analyses, we explore the impact in 5% steps of up to 50% lower/higher elasticities (see Section 4.2).

In line with the previous literature (Tsang, 1988), we assume that Roma policies implemented through the **policy status quo** scenario function primarily through lowering costs, by covering, for example, personnel costs such as teachers and administrative staff, non-personnel costs such as textbooks, utilities and the school maintenance, and capital costs such as buildings, land, equipment and furniture, and hence increasing the supply of educational services (see the right panel of Figure 1 as captured by parameter $\alpha$ in Equation (1) and variable $b$ in Equation (2)). Building new

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**FIGURE 1**  
Education costs: public versus private  
*Source: Based on Tsang (1988) [Colour figure can be viewed at wileyonlinelibrary.com]*
schools/classes in a close proximity to Roma communities reduces the cost of accessing educational services. This reduction however risks contributing to the segregation of Roma children in education diluting the potential benefits from reduced costs through a substandard quality of education services provided and underdeveloped social skills necessary for a sustainable integration of children in the mainstream society after completing education. Similarly, training teachers to new integrated education methods increases the accessibility of education for Roma children (Kertesi & Kézdi, 2011). Hence, educational outcomes in the policy status quo scenario will depend primarily on the price elasticity of the household demand for education as well as on the implementation of policy measures to offset the potential negative implications of focused interventions (e.g., through an increased segregation).

In line with the previous evidence (Aizer et al., 2016; Marinescu, 2018; Nikiforos et al., 2017), we further assume that Roma policies implemented through the universal basic income scenario function primarily through increasing the household income and hence provide additional financial resources to households for lowering, for example, opportunity costs of a child work in household, covering tuition and other school fees, uniforms, books and transportation costs (see the left panel of Figure 1 as captured by variable $z_e$ in Equation (2), resulting in higher demand for education. Increasing a household income that is not related to household economic activities may also optimise consumption/investment decisions, resulting in more efficient allocation of household resources, including education. Hence, educational outcomes in the universal basic income scenario will depend primarily on the income elasticity of the household demand for education. Finally, the universal basic income scenario has important empowerment implications reinforcing the agency of marginalised populations that are difficult to factor in the model but should be kept in mind when interpreting simulation results.

Differences in the channels of adjustment (reducing public versus private education costs) and in values between the income elasticity and price elasticity of demand for education will result in different educational outcomes between the policy status quo and universal basic income scenarios. In line with Roma policy expenditure data discussed in the previous section, we assume that Roma education-related policy expenditures improve children educational attainment rates in all three levels (primary, secondary and tertiary). Further, we also assume that the quality of education improves, which will reduce the Roma/non-Roma labour market segregation. Note that there will be important differences in educational outcomes (in terms of policy-induced improvements in the education quality and quantity) between the two simulated policy scenarios.

3.4 Labour market outcomes

As regards policy-induced improvements in labour market outcomes, in line with the empirical evidence (O'Higgins, 2012; O'Higgins & Ivanov, 2006), in both scenarios higher educational attainment rates and higher education quality of Roma children result in better labour market outcomes of Roma—employment and earnings—increase. In order to link policy expenditures on the Roma education to labour market outcomes (i.e., the employment rate and wage rate) in both the policy status quo and universal basic income scenarios, we base our estimates on European Commission's data, according to which there are substantial differences in unemployment rates between those Roma who have completed a tertiary, secondary or primary education or have less than the primary education. On average, in the five studied countries, respective unemployment rates are 29%, 38%, 55% and 81%. These figures are comparable to those reported in O'Higgins and Ivanov (2006) for Roma in nine CEE countries. Note that in both scenarios, we assume the same relationship between policy-induced improvements in educational outcomes and labour market outcomes. Hence, an equivalent increase in
the educational attainment in the *policy status quo* and *universal basic income* scenarios will result in an equal increase in the employment probability and wage rate.\(^{13}\)

Key assumptions linking policy-induced improvements in educational attainment rates and higher education quality and labour market outcomes of Roma—employment and earnings—are summarised in Table 2. As shown in the table, one extra year of schooling has higher impact on the Roma unemployment than earnings. The opposite is true for the increase in test scores by one standard deviation. For comparison, in Table 2 we have also provided the estimated impact of marginal labour market effects of one extra year of schooling and one standard deviation increase in test scores on employment and earnings for the USA, Canada, the UK and OECD countries.

### 3.5 Policy financing methods and sources

In the *policy status quo* scenario, we simulate impacts of selected national government, EU and internationally funded programmes of the Roma inclusion. Nationally funded Roma integration programmes simulated in the present study include both Roma-specific programmes and general programmes for marginalised society groups from which Roma benefit, for example, programmes for children from a socially disadvantaged environment. As for EU funds, we have selected the European Structural and Investment Funds (ESIF), which provide allocations to Roma under the investment priority “Integration of marginalised communities such as the Roma” for the 2014–20 programming period. As for the international funding of the Roma integration, we have chosen programmes managed by the Roma Education Fund, which include allocations to the Roma education under the heading “Programs and Grants.”

Table 3 provides an overview of the total funding made available under national, EU and international financing tools for the Roma integration simulated in the present study during 2014–20, by the source of funding. The expenditure estimates reported in Table 3 suggest that from those Roma integration funds considered in the present study, the ESIF make available the largest funding (1,284.00 million euro), followed by national Roma integration programmes (881.94 million euro) and the Roma Education Fund (35.13 million euro).\(^{14}\)

For the sake of comparability between the two policy scenarios, in the *universal basic income* scenario we assume not only the same total amounts in each country but also the same funding sources as under the *policy status quo* scenario.

Important for both scenarios is that in the general equilibrium framework adopted in the present study, all expenditures have to be covered through an additional government revenue (or an equivalent reduction in the existing government expenditure), at either the national, EU or international level. Note, however, that there are important differences between the three financing sources of Roma integration programmes, and these differences are fully accounted for in our model. Whereas national Roma integration policies are entirely financed from respective Member State budgets, EU funds are financed by all EU taxpayers. This implies that EU-level Roma integration programmes are partially

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\(^{13}\) We are aware of the significant role of the quality of education (the breadth and depth of knowledge acquired). We assume, however, that quality remains the same under both scenarios.

\(^{14}\) Note that for those Roma integration policies for which there is available information also about planned expenditures in future, we use these data. For example, the ESIF provide allocations to EU Member States under the investment priority “Integration of marginalised communities such as the Roma” for the entire 2014–20(+)3 programming period. For other programmes, for which no expenditure data about future Roma integration programmes are available year by year for 2014–20, for example, national Roma integration programmes and the Roma Education Fund, we use average expenditures from the last 3 years (2014–16) also for the remaining period (2017–20).
financed by other EU Member States, as the distribution of net contributing and receiving payments across EU Member States according to the EU budgetary data of the European Commission is fully captured in the model. As regards internationally funded Roma inclusion programmes, such as the Roma Education Fund, their financing is not modelled explicitly, and they are considered as pure financial transfers from the rest of the world.
4 | SIMULATION RESULTS

4.1 | Main results

Aggregated simulation results are reported in Figure 2, where we plot the percentage deviation in the GDP from baseline values for the two alternative Roma integration scenarios (policy status quo and universal basic income) for the five studied countries (Bulgaria, the Czechia, Hungary, Romania and Slovakia) for the 2014–40 period.\(^{15}\) Whereas the solid and dashed lines denote GDP impacts of the policy status quo and universal basic income scenarios, respectively, bars represent policy costs as a share of the GDP. Note that bars correspond to figures reported in Tables 1 and 3. For the sake of comparability, both policy costs and impacts are plotted on the same scale—as percentage of the GDP—and hence are directly comparable.

Generally, our simulation results suggest that in the first years of the policy implementation, policy costs (bars in Figure 2) would be higher than the GDP growth generated through Roma integration in labour markets. Second, in the medium-to-long run both types of Roma integration policies would have a positive and significant impact on the GDP (solid and dashed lines in Figure 2) (in addition to likely positive humanitarian and other non-economic effects, which are not considered here). However, there are remarkable differences in terms of the economic impact between the five studied countries, the two Roma integration scenarios and the time period considered.

From the very first year of the integration policy implementation, the positive impact on the GDP increases continuously in all five studied countries. The policy-induced GDP growth reaches its peak in 7–10 years, after which it starts to decline. It is not surprising to observe a declining impact on the GDP, as in our simulations the Roma policy funding stops after 2020(+3). Depending on the policy scenario and country, the policy-induced long-run growth path stabilises at around 0.01% to 0.10% above the baseline growth (see Figure 2). While all five countries share a similar short-run dynamic, differences in the GDP impact between countries become more visible when, because of the Roma integration, the labour force and hence economies expand.

The result that the medium-term impact on the GDP is larger than the long-run effect is due to the fact that the simulated Roma integration policy measures imply a combination of one short-run demand-side shock and one long-run supply-side shock. In the short-to-medium run, on the demand side there is an increase in current government expenditures related to policy costs of the Roma integration into the labour market and the corresponding reduction in the disposable household income (due to lower transfers/higher taxes). The latter effect arises, because we account for the fact that all integration policy costs are fully financed by EU Member States.\(^{16}\) On the supply side, the integration of Roma into labour markets increases the labour supply in EU Member States in the medium-to-long run. As detailed in Section 3, the increase in the labour force is Member State, skill and year-specific and differs between the two Roma integration policy scenarios. Peak in the policy-induced GDP growth is reached after 7–10 years, when the demand-side shock is still present and in addition also the supply-side shock already materialises.

\(^{15}\)We are aware also of the positive non-monetary implications of integration policies. We assume, however, that these are correlated with the GDP impact that can be quantified.

\(^{16}\)We believe that by assuming that integration policy costs could be financed through a government borrowing could bias the interpretation of simulation results. For example, more integration policy expenditures could be always better than less, if associated policy costs were not borne by economic agents through appropriate financing mechanisms. Therefore, we assume that all Roma integration policies are fully financed by households in the form of a reduction in government transfers to the household income or, equivalently, an increase in income taxes.
The integration policy-induced growth rate of the GDP is comparably high in all five studied countries in the short run. It is a remarkable result in the light of the negligible share of the Roma population in the total labour force (see the first years in Figure 2). According to our simulation results, in the short run, the strongest positive GDP effect can be expected in Romania, followed by the Czechia and Bulgaria. The lowest short-run GDP growth rate can be expected in Hungary. In the medium run, as more educated and trained Roma workers enter the labour market, all five economies continue to expand, though the marginal effect is decreasing.

After a transitionary dynamic, GDP growth rates reach a new steady state above the baseline growth path of the GDP. In terms of the GDP level, under the universal basic income scenario expected policy-induced deviations above the base line are significantly larger in the long run than in the short run, which is consistent for all five studied countries. This, however, is not true under the policy status quo scenario, implying that policy demand-side effects are stronger than policy supply-side effects in the medium-to-long run.

Comparing GDP impacts between the two Roma integration scenarios, we can notice that in the short run, the policy status quo scenario generates more economic activities, resulting in higher GDP effects compared to the universal basic income scenario (see Figure 2). In the medium-to-long run (starting from year 5), however, the policy-induced GDP growth generated under the universal basic income scenario becomes larger than under the policy status quo scenario. It is also interesting to notice that in all five studied countries, the GDP reaches the highest impact earlier under the policy status quo scenario than under the universal basic income scenario (2020–21 and 2023–24, respectively). This result is in line with previous studies on assessing impacts of the universal basic income,

The simulated impact on the GDP and policy costs in percentage of the GDP in the five studied countries under the policy status quo and universal basic income scenarios.

Notes: Y-axis: percentage of the GDP; X-axis: years. See Section 4.2 for lower/upper bounds.

Source: Authors’ simulations.
which find that conditioning a public policy support to marginalised society groups can sooner pro-
duce higher impact in terms of GDP, income and employment (Akee, Copeland, Keeler, Angold, &
Costello, 2010; Butcher, 2017; Colombino, 2015; Hum & Simpson, 1993; Kela, 2018; Nikiforos et al.,
2017; Pareliussen et al., 2018). In the medium-to-long run, however, the positive effect remains below
that of universal basic income policies.

Turning to country-specific results, we notice that Hungary, followed by Bulgaria, has the highest
potential to boost the GDP through the Roma integration under the universal basic income scenario.
The long-run GDP deviation above the baseline scenario can be expected at +0.10% for Hungary and
+0.09% for Bulgaria under the universal basic income scenario (see Figure 2). These results are in line
with our expectations, considering that the education gap between Roma and non-Roma in Hungary
and Bulgaria is particularly large, and the Roma share in these countries (8% and 10%, respectively)
is among the highest in the EU. Note, however, that these two countries would have to allocate a
significant funding to reap such benefits from the Roma inclusion. In contrast, the lowest long-run
GDP effect can be expected in the Czechia (+0.03%), followed by Slovakia (+0.06%), under the full
integration scenario (see Figure 2). Also these results are not surprising, when considering the lower
amounts of funding allocated for Roma inclusion programmes and the projected share of Roma in the
total population in these countries. A similar cross-country pattern can be observed also for the policy
status quo scenario, though all five countries can expect a comparably lower GDP growth effect under
the policy status quo scenario.

Whereas Figure 2 reports year-by-year GDP results as percentage deviations above baseline,
Table 4 provides an overview of long-run GDP results expressed in million euro. Also these results
confirm that the long-run GDP impact would be positive under both types of integration policies
in all five studied countries. Table 4 suggests that in nominal terms (million euro), Romania fol-
lowed by Hungary would benefit most from the simulated Roma integration policies. Bulgaria, in
contrast to Figure 2, would benefit the least, as in these computations the size of economies plays
a role as well. According to Table 4, the positive GDP effects generated under the universal basic
income scenario are considerably larger than under the policy status quo scenario (as already seen
in Figure 2). Aggregated for the five studied countries, annually, the universal basic income sce-
nario would generate more than two times higher GDP impact than the policy status quo scenario:
142.69 and 333.75 million euro, respectively (the last column in Table 4). Cumulatively, the differ-
ence in the discounted net GDP effect is even larger: by 2040, the universal basic income scenario
would have generated almost 2 billion more GDP than the policy status quo scenario (2,557.75 and
620.99 million euro, respectively).

Finally, the general equilibrium nature of the model allows us to identify policy leakages to
non-targeted groups/expenditures of Roma integration policies. According to our simulation results,
the main source of a potential policy leakage in the policy status quo scenario is the inter-house-
hold competition for additional/less costly education services stemming from non-Roma households.
Between 16.9% and 47.1% of Roma integration policy expenditures end up in non-Roma households
in the five study countries. In the universal basic income scenario, the main source of a potential
policy leakage is the intra-household competition for additional financial resources from other (non-
education) expenditures of Roma households. Between 24.3% and 55.8% of Roma integration policy
expenditures result in non-education expenditures of Roma households. These two sources of po-
tential policy leakages need to be kept in mind when designing and implementing Roma integration
policies in the EU.

Next, we investigate whether and to what extent the costs associated with Roma integration poli-
cies would be offset by positive economic, budgetary and fiscal benefits generated from the increase
in workforce in the long run. To identify relative policy benefits, we compute the net present value
(NPV) associated with each integration scenario until 2040, as it should provide an idea of the time in which the economy is able to fully absorb the exogenous demand shock. The NPV is calculated as a difference between the discounted present value of the policy-induced GDP growth above baseline values and the discounted present value of government expenditures. Following the EU Better regulation guidelines (https://ec.europa.eu/info/better-regulation-guidelines-and-toolbox_en) the discount rate applied in these calculations is equal to 0.04.¹⁷ NPV results for the five studied countries for both scenarios are reported in Figure 3.

Results from NPV computations suggest that the NPV is negative in initial years but then eventually becomes positive in the medium-to-long run (Figure 3). More important is the fact that the NPV becomes positive under both Roma integration scenarios. Depending on the scenario and country of analysis, the full repayment of the integration policy investment (positive net present value) would be achieved after 7 to 9 years. Note that the NPV gives us the size of the (discounted) financial multiplier effect in each period. Hence, even if the NPV is negative in the short-to-medium run, not necessarily the overall impact on the economy is negative. These results could simply imply that the financial multiplier effect is lower than one. Hence, our results suggest that in order to be able to gain from the full potential of the Roma integration in EU labour markets, taxpayers should be prepared to accept certain costs in the short run. Moreover, even these short-run disadvantages are associated with positive growth effects in all five studied countries (Figure 2).

Comparing the two alternative integration policy scenarios, we notice that in the short run, the policy status quo scenario is associated with higher NPV. In the medium-to-long run, however, the generated benefits in terms of an additional GDP growth are higher under the universal basic income scenario. In order to assess robustness of presented simulation results with respect to alternative discount rate assumptions, we perform NPV computations with 1 percentage point lower/higher discount rates, the results of which are reported as shaded areas around main NPV results (solid line for the policy status quo scenario and dashed line for the universal basic income scenario) in Figure 3. These

¹⁷ In order to assess differences in the simulated policy impact under alternative discount rates, we perform sensitivity analyses with 0.03 and 0.05 discount rates.
results suggest that there are no qualitative changes in the simulated NPV when applying different (±1 percentage point) discount rates in a reasonable range.

### 4.2 Sensitivity analysis and robustness checks

In order to ensure that our simulation results are robust with respect to reasonable changes in underlying parameter values and assumptions, we undertake a global sensitivity analysis of the parameterised model and the two Roma integration scenarios, selected results of which are presented in Figure 2. Given that the objective of the present study is to simulate, assess and compare the impacts of alternative Roma integration policies, those assumptions that govern the scenario construction are particularly critical for the robustness of our simulation results. Therefore, all these assumptions are scrutinised extensively in sensitivity and uncertainty analyses.

Because of its prominent role, we report and discuss the results of the sensitivity analysis obtained under alternative assumptions of the integration policy elasticities (the income elasticity of demand for education and the price elasticity of demand for education; see Section 3), as these assumptions have been identified among key determinants driving simulation results. In this exercise, we decrease and increase default policy elasticities by 5% to 50% (see Table 5), respectively, and compare model results with those under our default assumptions. The main purpose of this exercise is to evaluate the extent to which marginal changes in underlying model assumptions would alter the direction and magnitude of the projected policy impacts reported in the preceding sections.
The sensitivity analysis results for these two key parameters (the income elasticity of demand for education and the price elasticity of demand for education) are reported as shaded areas in Figure 2, which reports the possible outcome range (lower/upper bounds) identified in these simulations. For each scenario, we show a case where policy elasticities are reduced (lower), augmented (upper) and kept at their default (central) value.

Sensitivity analysis results reported in Figure 2 suggest that in both Roma integration scenarios, the short-run impact of altering policy elasticities in a reasonable range does not generate qualitatively different and statistically significant deviations in simulation results. However, as the labour force expands and economies grow due to the integration of Roma workers into labour markets, the impact of higher/lower policy elasticities realises more prominently. In line with our expectations, by lowering policy elasticities, the simulated GDP impact is lower, whereas by increasing policy elasticities, the GDP impact becomes larger. We do not observe, however, qualitative changes in simulation results under alternative policy efficiency assumptions.

In addition to the above-presented sensitivity analysis results, we have also performed further sensitivity analyses with respect to the Roma population growth in the five studied countries, key model assumptions and parameter values. Also these sensitivity analysis results suggest that the underlying simulation model is robust with respect to qualitatively reasonable changes in baseline assumptions, key model assumptions and values of behavioural parameters. Hence, we may conclude that the results presented in this study are robust and therefore can be made available for an evidence-based policy support.

4.3 | Comparison with previous studies

The results reported in the previous two sections that unconditional income transfers to poor and marginalised households (as simulated under the universal basic income scenario) have a positive and statistically significant impact on children education, adult earnings and employment and the GDP in the medium-to-long run are supported by the previous literature. Our main findings could be summarised by the words of Marinescu (2018):

Providing cash directly to individuals has often been met with criticism, suspicion, and fear: the thinking goes that people who need financial assistance are not to be trusted, as their financial position reflects a moral failing rather than a societal one. These objections to cash transfer programs are rooted more in myth than empirical evidence.

Hum and Simpson (1993) review research from five universal basic income experiments in Canada and the USA. In order to make results for different unconditional income transfer programmes comparable, the authors account for differences in the designs of policy experiments. The primary focus of

| Elastícies of demand for education | Elasticities of demand for education |
|----------------------------------|----------------------------------|
| Income elasticity                | Price elasticity                 |
| Lower value                      | 0.60                             | −0.66                           |
| Central value                    | 1.20                             | −0.44                           |
| Upper value                      | 1.80                             | −0.22                           |

Source: Education elasticity values based on Campbell and Siegel (1967).
Hum and Simpson (1993) is the work-incentive issue, both non-structural estimates of the experimental effects and elasticity estimates of structural labour-supply functions, though the authors also provide initial estimates of non-structural and structural models for the Canadian universal basic income experiments. Hum and Simpson (1993) find only few adverse effects from the universal basic income. More importantly, those adverse effects found, such as the work response, were smaller than suggested by the economic theory.

Kertesi and Kézdi (2006) estimate the expected long-term budgetary benefits from investing into the Roma education in Hungary. The authors estimate the net benefit of an extra investment (on top of the existing preschool and primary school financing) that enables a young Roma to successfully complete secondary school. The results of Kertesi and Kézdi (2006) indicate that an investment that makes one young Roma successfully complete secondary school would yield significant direct long-term benefits to the national budget. According to benchmark estimates discounted to age 4, the net present value of future benefits is about 70,000 euro relative to the value the government would collect on the representative Roma person in case if she had not continued her studies after the primary school.

Akee et al. (2010) study the role of an exogenous increase in the household income due to government transfers that are unrelated to household characteristics on children’s long-run outcomes. The authors look at households in which incomes have been increased exogenously and permanently through a governmental transfer programme without regard to the parental human capital, ability or other household characteristics. Akee et al. (2010) find that children in treated households have higher levels of education in their young adulthood and lower incidence of criminality; however, effects differ by the initial household poverty status. On average, an unconditional income support of US$4,000 per year for the poorest households increases the educational attainment by 1 year at age 21.

Also Colombino (2015) finds that if correctly designed and implemented, a guaranteed unconditional basic income might be an important policy innovation for redistributing the gains from automation and globalisation, building a buffer against shocks and systemic risks, and generating positive labour-supply incentives among poor people. Colombino (2015) also notes that while an unconditional basic income policy is simple and transparent with low administration costs, financing it might require higher taxes (which however is the case of any public policy).

Aizer et al. (2016) estimate the long-run impact of cash transfers to poor families on children’s educational attainment, nutritional status, longevity and income in adulthood. To do so, the authors have collected individual-level administrative records of applicants to the Mothers’ Pension programme—the first government-sponsored welfare programme in the USA (1911–35)—and matched them to census, WWII and death records. The results of Aizer et al. (2016) suggest that male children of accepted applicants lived 1 year longer than those of rejected mothers. Male children of accepted mothers received one-third more years of schooling, were less likely to be underweight and had higher income in adulthood than children of rejected mothers.

Butcher (2017) surveys the empirical literature on the long-run impact on children of unconditional cash transfers, food and nutrition programmes, health care and health insurance and housing initiatives. Butcher (2017) finds mounting and dramatic evidence that transfers to low-income families early in children’s lives greatly manifest later in their lives. These findings lead to conclude that children’s environment in the prenatal, neonatal and early childhood periods can profoundly affect the capacities that children develop. According to Butcher (2017), these capacities persist into adulthood, affecting earnings, health and other life outcomes.

Nikiforos et al. (2017) examine three versions of unconditional cash transfers: US$1,000 a month to all adults, US$500 a month to all adults and a US$250 a month child allowance. For each of the three versions, the authors assess the macroeconomic effects of these transfers using two different financing plans—increasing the federal debt, or fully funding the increased spending with increased
taxes on households. Nikiforos et al. (2017) find that the economy can not only withstand large increases in federal spending, but could also grow thanks to the stimulative effects of cash transfers on the economy. Under the smallest spending scenario, US$250 per month for each child, the GDP is 0.79% larger than under the baseline forecast after 8 years. The largest cash programme—US$1,000 for all adults annually—expands the economy by 12.56% over the baseline after 8 years. These macroeconomic model-based results are directly comparable to our results.

Kela (2018) is currently evaluating the guaranteed basic income experiment in Finland. During the basic income experiment that runs from 2017 to 2018 (2019), a total of 2,000 unemployed persons between 25 and 58 years of age receive a monthly payment of 560 euro, unconditionally and without means testing. The policy evaluation is being done by comparing the treated group of 2,000 persons with a control group of about 173,000. The control group is made up of persons included in the target population who were not selected for the study. The preliminary evidence suggests that there are positive and significant differences in employment rates between those receiving and those not receiving a guaranteed basic income.

Pareliussen et al. (2018) at the OECD compare the currently implemented Finland's benefit system with two benefit reform scenarios: a uniform benefit for all (“income”) and a universal tapering rule (“universal credit”). The policy scenarios are modelled with the OECD TaxBen model and the TUJA micro-simulation model. Pareliussen et al. (2018) find that replacing current benefits with a universal basic income would improve work incentives for many poor households, though it may be also associated with a redistribution of income. Merging working-age benefits with similar aims and coordinating their tapering against earnings would on the other hand consistently improve work incentives and transparency, while preserving or improving social protection.

Jones and Marinescu (2018) study the effects of universal and permanent cash transfers on the labour market. Using data from the Population Survey and a synthetic control method, the authors show that the universal basic income had no adverse effect on employment and increased part-time work by 1.8 percentage points (17%). Although the economic theory suggests that individual cash transfers may decrease the household labour supply, Jones and Marinescu (2018) interpret their results as evidence that general equilibrium effects of widespread and permanent transfers tend to offset this effect, at least on the extensive margin. Consistent with their results, Jones and Marinescu (2018) provide suggestive evidence that tradable sectors experience employment reductions, while non-tradable sectors do not.

Marinescu (2018) explores how unconditional cash transfers affect the behaviour of recipients in three major natural experiments in the USA. While the amounts dispersed and time periods were distinct in each policy experiment, each of them has provided money without setting conditions and without a means test. As regards education, Marinescu (2018) found that the school attendance, grades and test scores for the children of negative income tax recipients were typically higher than the control population, especially for younger and poorer children. An additional US$4,000 per year for the poorest households in the casino dividend programme increased educational attainment by 1 year. Further, the programmes analysed suggest either no effect on the labour market supply or a slight reduction in work. Results, however, do not suggest that an average worker will drop out of the labour force when provided with an unconditional cash transfer, even when the transfer is large.

5 | CONCLUSIONS

The present study undertakes a comparative analysis of long-term economic, budgetary and fiscal costs and benefits of alternative Roma integration policies in the areas of education and employment in five EU Member States with the largest share of the Roma population—Bulgaria, the Czechia,
Hungary, Slovakia and Romania. We employ a general equilibrium approach that allows us not only to assess the direct impact of selected Roma integration policies but also to capture all induced feedback effects.

Our simulation results suggest that although the Roma integration (e.g., by providing education assistance services and a targeted professional training) would be costly for the public budget, in the medium-to-long run, economic, budgetary and fiscal benefits may significantly outweigh the short to medium-run Roma integration costs. Second, the policy status quo scenario creates higher GDP growth in the short run, whereas the universal basic income scenario generates higher GDP growth in the medium-to-long run. Depending on the integration policy scenario and the analysed country, the annual long-run GDP effect would be from +16.47 million euro to +109.93 million euro above the baseline GDP, and the full repayment of the integration policy investment (positive net present value) would be achieved after 7 to 9 years. Finally, our results suggest that there would be no displacement effects to mainstream worker employment/wages. In contrast, by filling vacancies, the Roma workers included in the labour market would generate an additional economic activity, which in turn would contribute to the growth of the GDP, exports, public tax revenue, etc.

Our results have important policy messages. First, these findings suggest that investing into integration policies that facilitate the inclusion of Roma into the school education and labour markets is important not only for ethical, humanitarian and fundamental rights reasons, but may be beneficial also for economic, budgetary and fiscal reasons in the medium-to-long run. Second, we show that integrated Roma workers can play an important role in filling vacancies with specific skill requirements, addressing Europe’s alarming demographic challenges, improving the ratio of economically active to those who are inactive—a ratio that is decreasing in many Member States—and boosting jobs and growth in the EU. In terms of the GDP, employment and earnings, the universal basic income scenario outperforms currently implemented Roma integration policies, particularly in the medium-to-long run.

Turning to limitations of our study, we recognise that in the presented analysis, we have focused solely on socioeconomic impacts (both costs and benefits) of the Roma integration. In reality, however, there are many more aspects, such as humanitarian, fairness, equality and fundamental rights, which all need to be taken into account by policymakers, when designing Roma integration policies. Analysing all these aspects in an integrated framework comprises a promising though also challenging avenue for the future research. Second, our simulation results depend on a large number of assumptions that yield uncertainties both in the scenario construction and in the underlying simulation model. While we have been using the best data available to date, have attempted to be as transparent as possible about all key assumptions underlying our simulations and have been running extensive sensitivity and uncertainty analysis to test the simulation result sensitivity with respect to them, the robustness of the presented findings would benefit significantly from complementary micro-econometric analysis (e.g., econometric estimation of the household demand for education), which invites for a follow-up research on Roma integration policies in future. Third, in the present study we have focused on the main channels of household adjustment to policies shocks. A promising area for the future research would be, for example, to endogenise the number of children per household (by household type), and consequently also the cost of education.

Finally, the analysis conducted on the specific group (Roma) might be expanded to other groups vulnerable to discrimination and social exclusion. Although we intuitively expect unconditional cash transfers under a basic minimum income scheme to yield similar results for other vulnerable groups, additional research is required to generate sound evidence in this regard.
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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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