Cost-Benefit Analysis of Tax Incentives in Serbia

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Abstract

Serbia has introduced several tax incentives into its corporate income tax system to promote research and development, employment, and the provision of financing of innovative enterprises. This study undertakes a comprehensive analysis of five corporate income tax incentives, conducted through the application of a cost-benefit analysis (CBA) framework. This study will serve as input to the tax policy discussion towards improving Serbia's tax system and an analytical framework for evaluating alternative tax policy proposals. The justification of these tax incentives depends on the impact they are expected to have on the return on investment for the targeted firms.

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EXECUTIVE SUMMARY

Serbia has introduced several tax incentives into its corporate income tax system to promote research and development, employment, and the provision of equity financing of innovative enterprises. This report contains an analysis of five of these tax incentives. This study will serve as input to the tax policy discussions toward improving Serbia's tax system and an analytical framework for evaluating alternative tax policy proposals.

A Cost-Benefit Analysis approach is used to evaluate these tax incentives. The subsequent sections provide key findings of each tax incentive.

Evaluation of Tax Incentive 1: Allowing for Double Expensing of R&D Costs (Article 22g)

The double expensing of R&D expenditures to reduce income taxes has a relatively small impact on the firm's profitability if it does not currently have taxable income. It only raises the rate of return of R&D investment less than 1 percentage point above what would be a normal return for either the case of earning income from a 10-year patent lease or a 15-year patent lease. In the case of a firm that currently has taxable income, the incentive has an incredibly significant impact. It raises the rate of return by over 3 percentage points for either the case of a 10-year patent lease or a 15-year patent lease.

Given that the motives of any R&D tax incentive are to increase the rate of return for new technology and encourage its development, it is the firm that currently does not have taxable income that needs the incentive the most. The impact of this tax incentive is much higher for a firm that currently has taxable income than for a firm that does not have taxable income. The question then is, why would the government want to provide a greater incentive to a firm already making profits than to firms that are new venture capital financed R&D firms that have yet to earn profits? This is also a situation where the size of the tax expenditure by the government is also significant.

Evaluation of Tax Incentive 2: Tax Incentive Exempting 80% of Income Received from Patent (Article 25b)

Before this tax incentive can be applied to the income received from leasing the right to a patent, an amount of income must be fully taxed equal to all the R&D expenses associated with developing this innovative idea that created the patent. Only after this income is fully taxed can the firm exempt 80% of the income from subsequent income earned from the patent lease to other firms. Four different cases are considered in evaluating this tax incentive. The impact of the tax incentive varies across each of these other cases.

In the case of an R&D firm that does not currently have taxable income, the tax exemption incentive only raises the rate of return of the R&D investment by less than 0.4 percentage point for either in the case of a 10-year patent lease or by 0.6 percentage point in the case of a 15-year patent lease. This insignificant impact of the tax incentive for a firm that does not have currently taxable income arises because the losses are cumulatively carried forward until the firm generates taxable income. After the firm starts to generate taxable income, the income is fully taxed until an amount of income is taxed equal to the investment costs of the R&D that has already been expensed. Furthermore, suppose the R&D firm that does not currently have taxable income is also taking advantage of the incentive to take a double deduction of its R&D expense. In that case, this additional tax incentive has no impact on the profitability of this firm in the case of either a 10-year or a 15-year patent lease.

In the case of an R&D firm that currently has taxable income and immediate expensing of the investment costs of creating the R&D, the incentive raises the rate of return by 1.2 percentage points for the cases of either a 10-year patent lease or a 15-year patent lease. However, suppose the firm has already been able to take advantage of the provision allowing for the double expensing of the costs of producing R&D. In that case, the additional impact of this 80% tax exemption is minimal. The incremental benefit to the firm is only 0.5 percentage point for the cases of either a 10-year patent lease or a 15-year patent lease. The impact of the double expensing provision dominates this 80% tax exemption provision on the income from patent leasing.

Evaluation of Tax Incentive 3: A 10-Year Income Tax Holiday Incentive (employing at least 100 permanent employees) (Article 50a)

This section evaluates the 10-year tax holiday incentive as the third tax incentive. The tax holiday aims to promote the expansion of operations by increasing the capital invested and employment by firms. With this tax holiday, new firms are exempted from the burden of income taxation for ten years. This 10-year tax holiday is available for companies with a minimum investment in property, plant, and equipment (PPE) of 1 billion RSD. A taxpayer must employ at least 100 new workers for ten years to qualify for the credit. However, the firm must maintain at least this level of employment continuously throughout the period that it is receiving this tax holiday.

Two different scenarios are built to evaluate the value of this incentive. The first scenario estimates the effectiveness of this tax incentive to the firm and the cost to the Treasury in a capital-intensive industry. In the case of the capital-intensive firm, we assume that 100 workers will be employed with a fixed investment costing one billion RSD. The second scenario evaluates the impact of the tax incentive on the value of the firm and the cost to the Treasury in the case of a labor-intensive industry. In this case, it is assumed that 150 workers will be employed in conjunction with the minimum fixed investment amount required to be eligible for this incentive.

In both of these situations, the 10-year income tax holiday has a positive and significant impact on both the NPV of the participating firm and its internal rate of return.

The tax incentive raises the rate of return on the investment by 1.5 percentage point for both cases of a capital-intensive firm or a labor-intensive firm.

In the case of a capital-intensive firm, whereby only 100 employees are employed with a fixed investment of 1 billion RSD (Scenario 1), the incentive provides a wage subsidy equal to 13.23% of the wage bill for 100 workers for the first ten years or a 10.31% subsidy of wage bill if the project were to continue in operation for 18 years.

Suppose the firm is a labor-intensive firm whereby 150 workers are employed along with a new investment costing 1 billion RSD (scenario 2). In that case, the incentive provides a wage subsidy equal to 8.87% of the wage bill for 150 workers for the first ten years or a 6.91% subsidy of the wage bill if the project were to last for 18 years in continuous operation.

One positive aspect of this incentive is that it is tied to the level of incremental employment by a particular firm. On the other hand, to ensure that the firm provides this additional employment, the penalties imposed in the law are very severe for non-compliance. No matter how long the firm has been able to comply by providing this additional employment if its employment levels drop below the number in the initial agreement, the firm would have to repay all the taxes that were exempted for the entire period the firm enjoyed this tax exemption. If a firm reduces its level of employment due to a downturn in the business cycle or an event outside of its control (e.g., COVID-19), the repayment of all back taxes exempted might force the firm into bankruptcy. Hence, it is expected that the firms might be reluctant to enter into such an incentive arrangement, given the contingent liability it must accept simultaneously.

Evaluation of Tax Incentive 4: Tax Credit for Additional Investment in Financing New Equity Investment in Innovative Start-up Firms (Article 50j)

The provision of a tax credit of up to 100,000,000 RSD to investors making equity investments in innovative start-up firms is the fourth tax incentive evaluated.

In each of the six situations studied, we found that the 30 percent credit for investing in innovative start-up firms significantly impacts the expected rate of return of this equity investment. Even when the equity is held only for 6 years and is subject to capital gains taxation, this tax credit will still raise the expected rate of return by at least two percentage points. We found that this tax credit provides the investor with a subsidy with a present value that ranges from 10.60 percent of the initial equity investment made to 25.35 percent. This range depends on the speed at which the investor can use the tax credits against other taxes due, the length of time the investment is held, and the exact legal specification of the determination of taxable capital gains for such financial investments. Such a subsidy will offset a portion of the risk premium associated with the equity of innovative start-up firms.

Considering the risk associated with holding these shares for a longer period, it would be advantageous for an equity investor to sell the shares after five years. This way, they could reinvest the funds in a similar firm and be eligible to receive the tax credit again. Such tax credits always favor short-term investments over long-term ones.

An important advantage of the design of this incentive is that it is tied directly to the desired action of the public policy. This policy objective is to increase the supply of funds from a diversified set of equity investors in innovative firms. If such financing is not forthcoming as expected, then the amount of the tax expenditures incurred by the government will likewise be reduced.

Evaluation of Tax Incentive 5: Employment Tax Incentive in Serbia

The employment incentive in Serbia allows an employer who hires a long-term unemployed worker a 65% reduction of the social security contributions and income tax that they would normally withhold and remit to the tax authorities on the employee's wages. Under this incentive program, they must hire someone unemployed for an extended period of time.

This tax incentive program is highly beneficial to all stakeholders to the degree it results in the employment of these disadvantaged individuals in either permanent or temporary jobs. The employers obtain workers at a reduced cost that justifies the employment of these individuals. Both the workers and the government benefit.

For workers who have been given permanent jobs, the value of the net labor externality is 59% of the total cost of their employment. Of these externalities, 40% accrues to the workers, and 60% accrues to the government. The government gains some income taxes and social security payments and, at the same time, benefits from the reduced costs of the social welfare programs that have been given to these long-term unemployed individuals. When these individuals are employed in temporary jobs, the total labor externalities are approximately 37% of the total employer's wage bill. Of this total externality, 65% accrues to the workers and 35% to the government.

When we consider the magnitude of the labor externalities, we find that the total value of this externality created by employment in temporary jobs is only 49%, as significant as it would be if employed in permanent jobs. For the labor employed in temporary jobs, their net benefits are 78% as large as those employed in permanent jobs. Furthermore, the net benefits received by the government from workers finding permanent jobs is 3.5 times as large as when the workers are employed in temporary jobs. The reduced benefits to the government are mainly due to the reduced time the workers are employed over these five years. When unemployed, the government incurs the cost of the unemployment insurance program.

Overall, this is a very well-designed tax incentive that will improve both social welfare and economic efficiency to the degree that it effectively increases the employment of

these long-term unemployed workers. The analysis also shows the importance of finding permanent jobs for these workers compared to temporary jobs. Temporary sector jobs tend to refresh these individuals' ability to receive subsidized periods of unemployment. This is both expensive for the government and inefficient for the economy.

1. Introduction

Many countries worldwide use tax incentives to attract investment, promote economic activity, reduce unemployment, and enhance technological development. Governments have traditionally used tax incentives as tools to promote specific economic or social goals. They cover an array of preferential tax treatments offered to a select group of taxpayers, including tax exemptions, tax holidays, tax credits, investment allowances, preferential tax rates, and deferral of tax liabilities.

Serbia has introduced several tax incentives into its corporate income tax system to promote research and development, employment, and the establishment of innovative enterprises. This report contains an analysis of five of these tax incentives.
This analysis aims to develop a framework for estimating the benefits and costs of these tax incentives. The study will serve as input to the policy discussions toward improving Serbia's tax system and as an analytical framework for evaluating alternative tax policy proposals.

2. Methodology

This study employs a cost-benefit analysis (CBA) to evaluate these tax incentives. The justification of the tax incentive depends on their expected impact on the return on investment in the R&D firm. The impact on the financial profitability of the investment can be measured by considering its impact on the project's net present value NPV(P_e). This NPV(P_e) is equal to the net operating benefits of the project PV (B_0 - C_0), less the present value of the investment costs of the project PV (I_c), less the present value of all taxes paid on the taxable income of the firm PV (T_e).

$$\text{NPV}(P_e) = \text{PV} (B_0 - C_0) - \text{PV} (I_c) - \text{PV} (T_e)$$

Another metric used to measure the effect of the tax incentive on the return on investment is the project's internal rate of return IRR, which describes the rate of return on investment. It is expressed as a percentage rather than as a monetary value.

3. Research and Development Expensing and Taxation Preferences (Corporate Income Tax Law)

Research and development (R&D) investment is believed to be a driver of innovation and economic progress. A preferential tax on R&D expenditure has been a common legislative tool to promote these activities by the private sector. A popular objective for the use of R&D tax incentives has been to reduce the financial cost of R&D expenditures. Two such R&D tax incentives will be evaluated in this report.

3.1 Tax Incentive Allowing for Double Expensing of R&D Costs (Article 22g)
The tax incentive allowing for double expensing of R&D is the first tax incentive evaluated in this report.

3.1.1 Nature of the Tax Incentive: Allowing for Double Expensing of R&D Costs (Article 22g)

As of 2019, the CIT Law provides an income tax incentive whereby the expenses directly related to R&D activities performed in the Republic of Serbia can be deducted in the calculation of taxable income in double the actual expenditures made[1].

Research is defined as the originally planned investigation undertaken to gain new scientific or technical knowledge and understanding. Development is defined as the application of research findings or other knowledge to a plan or design to produce new or substantially improved materials, devices, products, processes, or services before the start of commercial production. This tax incentive is not applicable for research expenses whose objective is to find or develop oil, gas, or mineral resources in the extractive industry.

3.1.2 Evaluation of Tax Incentive: Allowing for Double Expensing of R&D Costs (Article 22g)

The primary purpose of evaluating this government tax policy is to determine the extent to which the policy's aim is fulfilled and whether the benefits to society generated by the policy are larger than the cost.

A cost-benefit analysis can help policy makers demonstrate the direct cost (tax revenue foregone) incurred by the government and compare these costs to the pursued economic benefits. In this analysis, the evaluation will involve constructing integrated investment models to estimate and analyze each of the incentive's potential value to the target enterprises and their fiscal impacts. The details of the data used to evaluate this tax incentive are presented in Annex 1.

3.1.3 Model Parameters and Assumptions: Allowing for Double Expensing of R&D Costs (Article 22g))

To quantify and measure the impact of this tax incentive, a model of R&D investment is built. It is assumed that the R&D firm is investing 1 billion RSD in equal amounts over five years. After undertaking this five-year R&D research program, a patent is attained, which the firm is able to lease to other firms for an annual lease payment. The annual revenue from the patent lease is estimated to be 30% of the undiscounted value of the cost of the R&D investment program.

To conduct the model analysis, two different lengths of periods of patent leasing incomes were used; the first type of patent leasing period is assumed to be 10 years, while the second is 15 years.

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[1] Deloitte. (2019). *Guide for Investing in Serbia: At your glance* (p. 40).

In addition, two different types of R&D firms were evaluated; the first type of R&D firm is a firm with no currently taxable income, while the second type of R&D firm is a firm that currently has taxable income from other business activities. In other words, to what extent is the tax incentive effective if a firm utilizes it with no current tax liability or by a firm with current tax liabilities?

3.1.4 Model Analysis Results: Allowing for Double Expensing of R&D Costs (Article 22g)

I. R&D firm with no currently taxable income (using Article 22g tax incentive)

In this case, we want to see how effective the tax incentive is if the R&D firm has no currently taxable income but will have income from the lease of the patent for either a 10-year or a 15-year period after five years.

Table 1: R&D Firm with No Currently Taxable Income (Using Article 22g Tax Incentive)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 1: Without Incentive[2] (2)		Financial Outcome of a Firm Case 2: With Incentive[3] (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	182.9 M'RSD	NPV@12%	234.4 M'RSD	PV@12%	51.5 M'RSD
		IRR	15.6%	IRR	16.4%	PV@5%	94.5 M'RSD
						PV@3%	113.3 M'RSD
2	15-Year	NPV@12%	371.0 M'RSD	NPV@12%	422.5 M'RSD	PV@12%	51.5 M'RSD
		IRR	17.7%	IRR	18.4%	PV@5%	94.5 M'RSD
						PV@3%	113.3 M'RSD

A 10-Year Income Flow *(Using Article 22g Tax Incentive)*

Using the above assumptions of the R&D investment and the income tax treatment from a 10-year patent lease. The results are presented in Table 1 for an R&D firm that does not have any taxable income during the investment phase of this activity.

First, we start the base model analysis by estimating the NPV using a 12% discount rate for an R&D firm without tax incentive (i.e., a non-taxable firm without the double expensing of its costs). This is estimated to be 182.9 million RSD at a 12% discount rate (Table 1, row 1, col. 2). By comparison, the NPV for this type of R&D firm after receiving the tax incentive is estimated to be 234.4 million RSD (Table 1, row 1, col. 3). Using the defined parameters, with the incentive, the NPV of the R&D firm became better off by 29% (i.e., from 182 million RSD to 234.4 million RSD). The IRR for a non-taxable R&D firm without tax incentive is estimated to be 15.6% (Table 1, row 1, col. 2). In comparison, the IRR for this R&D firm with incentive is estimated to be 16.4% (Table 1, row 1 col. 3).

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[2] Without Incentive: No Double Expensing of R&D Costs.
[3] With Incentive: With Double Expensing of R&D Costs.

The present value (PV) of the firm's tax savings (benefits) is 51.5 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing of the Treasury is 5%, and if this tax expenditure were not created, the government would have the fiscal space to finance 94.5 million RSD of additional borrowing today. Alternatively, if the Treasury's borrowing cost is 3%, the government would have the fiscal space to finance 113.3 million RSD of additional borrowing today (Table 1, row 1, col. 4).

A 15-Year Income Flow *(Using Article 22g Tax Incentive)*

Using the above assumptions of the R&D investment, in this case, the period of the income inflow is for a 15-year patent lease. The results for a currently non-taxable R&D firm are also presented in Table 1. The NPV for this R&D firm without tax incentive is estimated to be 371.0 million RSD (Table 1, row 2, col. 2). By comparison, the NPV at a 12% for such an R&D firm with the tax incentive application is estimated to be 422.5 million RSD (Table 1, row 2, col. 3). Using the defined parameters, with the incentive, the NPV of the R&D firm was improved by 14% (i.e., from 371.0 million RSD to 422.5 million RSD).

The IRR for a non-taxable R&D firm without tax incentive is estimated to be 17.7% (Table 1, row 2, col. 2). By comparison, the IRR for the same R&D firm with the incentive is estimated to be 18.4% (Table 1, row 2, col. 3).

The present value (PV) at a 12% discount rate of the firm's tax savings (benefits) is 51.5 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the Treasury's borrowing cost is 5%, the government would otherwise have had the fiscal space to finance 94.5 million RSD of additional borrowing today. Alternatively, if the Treasury's borrowing cost is 3%, the government would have had the fiscal space to finance 113.3 million RSD of additional borrowing today (Table 1, row 2, col. 4).

II. R&D firm that currently has taxable income (using Article 22g tax incentive)

In this case, we want to see how effective the tax incentive is for an R&D firm with currently taxable income and earns additional income from a patent lease for either a 10-year or a 15-year period.

Table 2: R&D Firm with Currently Taxable Income (using Article 22g tax incentive)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 3: Without Incentive[4] (2)		Financial Outcome of a Firm Case 4: With Incentive[5] (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	229.3 M'RSD	NPV@12%	350.4 M'RSD	PV@12%	121.1 M'RSD
		IRR	16.9%	IRR	20.5%	PV@5%	136.4 M'RSD
						PV@3%	141.5 M'RSD
2	15-Year	NPV@12%	417.4 M'RSD	NPV@12%	538.5 M'RSD	PV@12%	121.1 M'RSD
		IRR	19.0%	IRR	22.3%	PV@5%	136.4 M'RSD
						PV@3%	141.5 M'RSD

A 10-Year Income Flow *(Using Article 22g Tax Incentive)*

Using the above assumptions of the R&D investment and the income tax treatment from a 10-year patent lease. The results for a taxable R&D firm are presented in Table 2.

First, we start the base model analysis by estimating the NPV for a taxable R&D firm without tax incentive (i.e., a non-taxable firm without double expensing its costs). The NPV for a taxable R&D firm without tax incentive is estimated to be 229.3 million RSD (Table 2, row 1, col. 2). In comparison, the NPV for a currently taxable R&D firm with a tax incentive is estimated to be 350.4 million RSD (Table 2, row 1, col. 3). The IRR for a taxable R&D firm without tax incentive is estimated to be 16.9% (Table 2, row 1, col. 2). In comparison, the IRR for a currently taxable R&D firm with incentive is estimated to be 20.5% (Table 2, row 2, col. 3).

The present value (PV) of the firm's tax savings (benefits) is 122.1 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing of the Treasury is 5%, and if this future tax expenditure were not created, the government would have the fiscal space to finance 136.4 million RSD of additional borrowing today. Alternatively, if the Treasury borrowing cost is 3%, and if this future tax expenditure was not created, the government would have the fiscal space to finance 141.5 million RSD of additional borrowing today (Table 2, row 1, col. 4).

A 15-Year Income Flow *(Uusing Article 22g Tax Incentive)*

Using the above assumptions of the R&D investment and the income tax treatment from a 15-year patent lease. The following results for a taxable firm are presented in Table 2. The NPV for a taxable R&D firm without tax incentive is estimated to be 417.4 million RSD (Table 2, row 2, col. 2). In comparison, the NPV for a taxable R&D firm with tax incentive is estimated to be 538.5 million RSD (Table 2, row 2, col. 3).

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[4] Without Incentive: No Double Expensing of R&D Costs.
[5] With Incentive: With Double Expensing of R&D Costs.

The IRR for a taxable R&D firm without tax incentive is estimated to be 19.0% (Table 2, row 2, col. 2). By comparison, the IRR for a currently taxable R&D firm with incentive is estimated to be 22.3% (Table 2, row 2, col. 3).

The present value (PV) of the firm's tax savings (benefits) is 122.1 million. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the Treasury is 5%, the present value of this tax expenditure would be 136.4 million RSD. Alternatively, if the Treasury's borrowing cost is 3%, the present value of this tax expenditure would be 141.5 million RSD (Table 2, row 2, col. 4).

3.1.5 Summary Conclusion on the Tax Incentive Analysis: Allowing Double Expensing of R&D Costs (Article 22g)

The double expensing of R&D expenditure has a negligible impact if the firm does not currently have taxable income. It only raises the rate of return of R&D investment to less than 1 percentage point for either the case of a 10-year patent lease or a 15-year patent (Table 1, rows 1 & 2). In the case of a firm that currently has taxable income, the incentive has a very significant impact, raising the rate of return of over 3 percentage points for either the case of a 10-year patent lease or a 15-year patent (Table 2, rows 1 & 2).

Given that the motives of any R&D tax incentive are to increase the rate of return for new technology and encourage its development (i.e., reducing its tax burden, which increases the profitability of the firm), it is the firm that currently does not have taxable income that needs the incentive the most. The impact of this tax incentive is much higher for a firm that currently has taxable income than for a firm that does not currently have taxable income. The question then is, why would the government want to provide a greater incentive to a firm already making profits than to new venture capital-supported R&D firms?

3.2 Tax Incentive Exempting 80% of Income Received from Patent (Article 25b)

The second tax incentive analyzed designed for R&D businesses in Serbia is the exemption of 80% of the income received from patent fees.

3.2.1 Model Parameters and Assumptions: Exempting 80% of Income Received from Patent fees (Article 25b)

To quantify and measure the impact of this tax incentive, the same assumptions and parameters are used in the model as above (Article 22g). Again, the impact of this tax incentive is analysed for a currently taxable and non-taxable R&D firm.

Before this tax incentive can be applied to the income received from the leasing out of a patent, an amount of income must be fully taxed equal to all the R&D expenses associated with developing this innovative idea that created the patent. The details of the data used to evaluate this incentive are reported in Annex 2.

3.2.2 Model Analysis Results: Exempting 80% of Income Received from Patent fees (Article 25b)

I. R&D Firm with No Currently Taxable Income (using Article 25b tax incentive without double expensing of R&D costs)

First, the impact of this tax incentive on an R&D firm is evaluated for a firm that does not have any current taxable income and, at the same time, is not eligible for the double expensing of the initial investment costs of the R&D developments. The analysis results for this type of firm are presented in Table 3 for two different lengths of a patent lease.

Table 3: R&D Firm with No Currently Taxable Income (using Article 25b tax incentive without double expensing of R&D costs)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 1: Without Incentive[6] (2)		Financial Outcome of a Firm Case 2: With Incentive[7] (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	182.9 M'RSD	NPV@12%	211.2 M'RSD	PV@12%	28.3 M'RSD
		IRR	15.6%	IRR	16.0%	PV@5%	64.3 M'RSD
						PV@3%	82.2 M'RSD
2	15-Year	NPV@12%	371.0 M'RSD	NPV@12%	425.9 M'RSD	PV@12%	54.9 M'RSD
		IRR	17.7%	IRR	18.3%	PV@5%	143.1 M'RSD
						PV@3%	191.2 M'RSD

A 10-Year Income Flow *(Using Article 25b Tax Incentive)*

The NPV for such an R&D firm not receiving the tax incentive is estimated to be 182.9 million RSD (Table 3, row 1, col. 2). By comparison, the NPV for such a non-taxable R&D firm with tax incentive is estimated to be 211.2 million RSD (Table 3, row 1, col. 3). The benefit of this exemption of 80% of income only marginally increases the profitability of the investment in R&D activities. Before the incentive can be taken, the firm must have earned taxable income equal to the expenses deducted from taxable income to create this patent.

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[6] W*ithout Incentive: Without 80% Exemption of Income Received from Patent Fee & Without Double Expensing of R&D Costs.*
[7] *With Incentive*: With 80% Exemption of Income Received from Patent Fee & Without Double Expensing Of R&D Costs.*

The IRR for a non-taxable R&D firm without the tax incentive is estimated to be 15.6% (Table 3, row 1, col. 2). By comparison, the IRR for a non-taxable R&D firm with the incentive is estimated to be 16.0% (Table 3, row 1, col. 3). This is a very marginal increase in the rate of return.

The present value (PV) of the firm's tax savings (benefits) is 28.3 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the Treasury's borrowing cost is 5%, the present value in year 0 if this tax expenditure is 64.3 million RSD. Alternatively, if the cost of borrowing from the Treasury is 3%, the present value of the cost to the Treasury is 82.2 million RSD (Table 3, row 1, col. 4).

A 15-Year Income Flow *(Using Article 25b Tax Incentive)*

The NPV for a non-taxable R&D firm without the tax incentive is estimated to be 317.0 million RSD (Table 3, row 2, col. 2). In comparison, the NPV for a non-taxable R&D firm that receives the tax incentive is estimated to be 425.9 million RSD (Table 3, row 2, col. 3).

The IRR for a non-taxable R&D firm without tax incentive is estimated to be 17.7% (Table 3, row 2, col. 2). In comparison, the IRR for a non-taxable R&D firm enjoying the incentive is estimated to be 18.3% (Table 3, row 2, col. 3). This impact on the profitability of a firm in his situation is again only marginal.

The present value (PV) of the firm's tax savings (benefits) is 54.9 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the Treasury's borrowing cost were 5%, the government would have a fiscal loss of 143.1 million RSD. Alternatively, if the Treasury's borrowing cost is 3%, the government would have created a 191.2 million RSD tax loss (Table 3, row 2, col. 4).

II. R&D firm with no currently taxable income (using Article 25b tax incentive with double expensing of R&D costs)

In this analysis, the impact of this tax incentive on a currently non-taxable R&D firm is evaluated when it also can take advantage of the double expensing of R&D costs. Suppose the firm enjoys both double expensing of R&D expenditures and the 80% exemption of patent lease income. In that case, the income tax exemption only becomes effective after an amount of income is taxed equal to twice the R&D expenditure that has been expensed.

As presented in Table 4, the additional tax provision eliminating 80% of the taxable income on the income from patents has no impact on the profitability of the innovative firm once the firm has taken advantage of the incentive to take double expensing of investment expenditures in R&D as a deduction from taxable income. This result

remains consistent for both cases, whether the period of the patent lease is 10 years or 15 years, as their rates of return do not change with the tax incnetive.

Table 4: R&D Firm with No Currently Taxable Income (using Article 25b tax incentive with double expensing of R&D costs)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 3: Without Incentive[8] (2)		Financial Outcome of a Firm Case 4: With Incentive[9] (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	234.4 M'RSD	NPV@12%	234.4 M'RSD	PV@12%	0 M'RSD
		IRR	16.4%	IRR	16.4%	PV@5%	0 M'RSD
						PV@3%	0 M'RSD
2	15-Year	NPV@12%	422.5 M'RSD	NPV@12%	429.8 M'RSD	PV@12%	7.3 M'RSD
		IRR	18.4%	IRR	18.4%	PV@5%	24.2 M'RSD
						PV@3%	34.6 M'RSD

III. Evaluation Article 25b tax incentive combined with immediate expensing of R&D costs for a firm that currently has taxable income from other sources

Having estimated the impact of the 80% exemption of income from patent fees in the case of an R&D firm without current income, we then proceed to evaluate the case of an R&D firm that currently has taxable income.

The analysis will first consider the impact of the exemption when the costs of the investment in R&D are immediately expensed. This is followed in section IV, where this 80% tax exemption is applied in addition to the double expensing of the R&D investment costs.

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[8] W*ithout Incentive*: Without 80% Exemption of Income Received from Patent Fee & With Double Expensing of R&D Costs.*
[9] W*ith Incentive*: With 80% Exemption of Income Received from Patent Fee & With Double Expensing of R&D Costs.*

Table 5: R&D Firm with Currently Taxable Income (using Article 25b tax incentive with immediate expensing of R&D costs)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 5: Without Incentive[10] (2)		Financial Outcome of a Firm Case 6: With Incentive[11] (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	229.3 M'RSD	NPV@12%	298.8 M'RSD	PV@12%	69.5 M'RSD
		IRR	16.9%	IRR	18.1%	PV@5%	139.9 M'RSD
						PV@3%	172.9 M'RSD
2	15-Year	NPV@12%	417.4 M'RSD	NPV@12%	513.4 M'RSD	PV@12%	96.0 M'RSD
		IRR	19.0%	IRR	20.2%	PV@5%	218.6 M'RSD
						PV@3%	281.9 M'RSD

A 10-Year Income Flow *(Using Article 25b Tax Incentive)*

In the base case without the tax incentive, the NPV for a taxable R&D firm is estimated to be 229.3 million RSD (Table 5, row 1, col. 2). On the other hand, the NPV for a taxable R&D firm using this tax incentive is estimated to be 298.8 million RSD (Table 5, row 1, col. 3).

The IRR for a taxable R&D firm without tax incentive is estimated to be 16.9% (Table 5, row 1, col. 2). By comparison, the IRR for a taxable R&D firm with incentive is estimated to be 18.1% (Table 5, row 1, col. 3).

The present value (PV) of the firm's tax savings (benefits) is 69.5 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the Treasury is 5%, the PV of the cost to the government would be 139.9 million RSD. Alternatively, if the Treasury's borrowing cost is 3%, the present value of the cost to the government would be 172.9 million RSD (Table 5, row 1, col. 4).

A 15-Year Income Flow *(Using Article 25b Tax Incentive)*

If the R&D firm can receive these payments for 15 years, its NPV without the tax incentive is estimated to be 417.4 million RSD (Table 5, row 2, col. 2). By comparison, the NPV for the same taxable R&D firm with tax incentive is estimated to be 513.4 million RSD (Table 5, row 2, col. 3).

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[10] W*ithout Incentive: Without 80% Exemption of Income Received from Patent Fee & With Immediate Expensing Of R&D Costs.*
[11] Wi*th Incentive: With 80% Exemption of Income Received from Patent Fee & With Immediate Expensing Of R&D Costs.*

The IRR for such a taxable R&D firm without tax incentive is estimated to be 19.0% (Table 5, row 2, col. 2). By comparison, the IRR for a taxable R&D firm with incentive is estimated to be 20.2% (Table 5, row 2, col. 3).

The present value (PV) of the firm's tax savings (benefits) is 96.0 million RSD. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the Treasury is 5%, this tax has a present value (PV) cost of 218.6 million RSD today. Alternatively, if the cost of borrowing from the Treasury is 3%, the cost of this tax expenditure is 281.9 million RSD today (Table 5, row 2, col. 4).

IV. Evaluation Article 25b tax incentive combined with double immediate expensing of R&D costs for a firm that currently has taxable income from other sources

This analysis of the impact of the 80% exemption of income from patent lease fees is combined with the double expensing of R&D investment costs.

A 10-Year Income Flow *(Using Article 25b Tax Incentive)*

The analysis begins by measuring the impact of the 80% exemption of income arising from the fees of a 10-year lease of a patent when the firm is already enjoying the benefits of double expensing of the capital expenditures used to undertake the R&D. The NPV for a taxable R&D firm without the tax incentive is estimated to be 350.4 million RSD (Table 6, row 1, col. 2). In comparison, the NPV for the same firm taxable R&D firm with tax incentive is estimated to be 378.7 million RSD at a 12% discount rate (Table 6, row 1, col. 3). This improvement provided by this incentive is minimal. The immediate expensing of double the R& D investment costs completely overwhelms the effect of the 80% exemption of the future income from the lease of the patents.

The IRR for a taxable R&D firm without tax incentive is estimated to be 20.5% (Table 6, row 1, col. 2). In comparison, the IRR for such an R&D firm with the incentive is estimated to be 20.9% (Table 6, row 2, col. 3). The change of the IRR is also insignificant.

Table 6: R&D Firm with Currently Taxable Income (using Article 25b tax incentive with immediate expensing of double the R&D costs)

	Period of Patent Lease (1)	Financial Outcome of a Firm Case 7: Without Incentive* (2)		Financial Outcome of a Firm Case 8: With Incentive* (3)		Cost to Treasury (4)	
1	10-Year	NPV@12%	350.4 M'RSD	NPV@12%	378.7 M'RSD	PV@12%	28.3 M'RSD
		IRR	20.5%	IRR	20.9%	PV@5%	64.3 M'RSD
						PV@3%	82.2 M'RSD
2	15-Year	NPV@12%	538.5 M'RSD	NPV@12%	593.4 M'RSD	PV@12%	54.9 M'RSD
		IRR	22.3%	IRR	22.8%	PV@5%	143.1 M'RSD
						PV@3%	191.2 M'RSD

The present value (PV) of the firm's tax savings (benefits) is 28.3 million RSD, and the cost to the Treasury is the same amount if its discount rate is 12%. The cost to the Treasury is 64.3 million RSD if its discount rate is 5% or 191.2 million RSD if the cost of borrowing is 3% (Table 6, row 1, col. 4).

A 15-Year Income Flow *(Using Article 25b Tax Incentive)*

In this situation, the currently taxable R&D firm is expected to receive patent leasing income for 15 years while at the same time, it can immediately expense twice as much as it has invested in R&D. In this case, the NPV of the R&D firm without tax incentive is estimated to be 538.5 million RSD (Table 6, row 2, col. 2). By comparison, the NPV for a taxable R&D firm with tax incentive is estimated to be 593.4 million RSD (Table 6, row 2, col. 3).

The IRR for the taxable R&D firm without the tax incentive is estimated to be 22.3%. In comparison, the IRR of this taxable R&D firm with incentive is estimated to be 22.8% (Table 6, row 2, col. 3). The effect on the profitability of their firm is relatively small.

The present value (PV) of the firm's tax savings (benefits) is 54.9 million RSD at a 12% discount rate. This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the Treasury is 5%, the loss to the Treasury is 143.1 million RSD. Alternatively, if the Treasury's borrowing cost is 3%, the cost of the tax expenditure created by the tax incentives is 191.2 million RSD (Table 6, row 2, col. 4).

3.2.3 Summary Conclusion on the Tax Incentive Analysis: Exempting 80% of Income Received from Patent Fees (Article 25b)

In evaluating this tax incentive, four different cases were carried out, as shown above.

Given that before this tax incentive can be applied to the income received from the leasing out of a patent, an amount of income must be fully taxed equal to all the R&D expenses associated with the development of this innovative idea that allowed the creation of the patent, the impact of the tax incentive varies across each of the different cases as stated above.

In the case of an R&D firm that does not currently have taxable income without doubling the expense of its cost, the tax exemption incentive only raises the rate of return of the R&D investment by less than 0.4 of a percentage point for either in the case of a 10-year patent lease or by 0.6 of a percentage point in the case of a 15-year patent lease arising from the R&D program (Table 3, row 1 & 2). This insignificant impact of the tax incentive for a firm that does not have currently taxable income arises because the losses are cumulatively carried forward until the firm generates taxable income. After the firm starts to generate taxable income, then the income is fully taxed until an amount of income is taxed equal to the investment costs of the R&D that has already been expensed.

In the case of an R&D firm that does not have currently taxable income and has also already taken advantage of doubling its R&D expense, the tax incentive has no impact on the profitability of this firm in the case of either a 10-year or a 15-year patent lease (Table 4, row 1).

In the case of an R&D firm that currently has taxable income and immediate expensing the investment costs of creating the R&D, the incentive raises the rate of return by 1.2 percentage points for the cases of either a 10-year patent lease or a 15-year patent lease. However, suppose the firm has already been able to take advantage of the provision allowing for the double expensing of the costs of producing R&D. In that case, the additional impact of this 80% tax exemption is small. The incremental benefit to the firm is only 0.5 percentage point for the cases of either a 10-year or 15-year patent lease period. The impact of the double expensing provision dominates this 80% tax exemption provision on the income from patent leasing.

4. A 10-Year Income Tax Holiday Incentive To Increase Employment (employing at least 100 permanent employees) (Article 50a)

This section evaluates the 10-year tax holiday incentive as the third tax incentive. The objective of this tax holiday is to promote the expansion of operations and employment by firms. With this tax holiday, new firms are exempted from the burden of income taxation for ten years. Sometimes, this grace period is extended to a subsequent period where income is taxed at a reduced rate.

4.1 Nature of the Tax Incentive: 10-Year Income Tax Holiday (Article 50a)

A 10-year tax holiday is available for companies with a minimum investment in property, plant, and equipment (PPE) of 1 billion RSD. To qualify for the credit, a taxpayer must employ at least 100 new workers for a 10-year period.

The tax holiday is available for the ten years in proportion to the investment made. The number of employees employed in the tax period in which the taxpayer qualified for the tax holiday must be retained throughout the whole tax holiday period[12]. If its level of employment should fall below the initial commitment, then the firm must repay all the taxes it has saved via this provision from the initial date of the tax holiday.

4.2 Evaluation of a 10-Year Income Tax Holiday Incentive to Increase Permanent Employment (Article 50a)

To assess the effectiveness of this tax incentive to the firm and the cost to the Treasury, first, we need to define the set of model parameters and assumptions needed to evaluate this tax incentive. The following model parameters and assumptions are expressed below, and further details of the data used in the evaluation are reported in Annex 3.

4.3 Model Parameters and Assumptions: A 10-Year Income Tax Holiday Employment Incentive (Article 50a)

Two different scenarios are built to evaluate the value of this incentive. The first scenario is to estimate the effectiveness of this tax incentive to the firm and cost to the Treasury in the case of a capital-intensive industry. In the case of the capital-intensive firm, we assume that 100 workers will be employed with a fixed investment costing one billion RSD. Given the parameter values used in the analytical model, the share of labor in gross value added is equal to 0.41 in the capital-intensive firm. This is approximately 20% more capital-intensive than the average business operation in Serbia[13].

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[12] PwC 2021, Serbia Corporate Tax Credits and Incentives.

[13] The International Labor Organization. ILOSTAT, Estimate of the Labor share in Gross Value Added in Serbia is 0.523 in 2017.

The second scenario evaluates the impact of the tax incentive on the firm and the cost to the Treasury in a labor-intensive industry. In this case, it is assumed that 150 workers will be employed in conjunction with a fixed investment costing one billion RSD. Thus, the share of labor in gross value added is equal to 0.51, while the share of labor in net value added is equal to 0.63 in the case of the labor-intensive firm. These ratios for labor-intensive firms are the same as the average estimated by the ILO and others for Serbia[14].

The fixed investment cost is assumed to be the minimum fixed investment amount required to be eligible for this incentive. This fixed investment cost equals 1 billion RSD for scenarios 1 and 2 (i.e., capital-intensive and labor-intensive firms). Of the total fixed investment cost, 50% of the investment cost is attributed to the building construction. In comparison, the remaining 50% of the investment cost is estimated to be the cost of the plant and machinery. In both scenarios, the average monthly salary paid is estimated to equal the factory and manufacturing average salary in Serbia. This is equal to 95,700 RSD[15] per month. Furthermore, the targeted real rate of return without the incentive case is 12%. In other words, without the 10-year income tax holiday, the firm's targeted real rate of return is estimated to be equal to 12%.

4.4 Model Analysis Results: A 10-Year Income Tax Holiday Employment Incentive (Article 50a)

Using the model, parameters, and assumptions about the nature of the firm as outlined above, Table 7 presents the summary results of two different types of industries using the tax incentive of (10-year income holiday). The project cycle is assumed to be 20 years, of which the investment duration is equal to 1 year (i.e., Year 1), the operating period of 18 years (i.e., from Year 2-Year 19), and the liquidation year in Year 20.

Without the incentive, the targeted real rate of return to the firm is assumed to be a real (net of inflation) rate of 12%. For a capital-intensive firm (i.e., Scenario 1; employing 100 workers) without the incentive, the NPV of the taxable firm is estimated to be equal to 3.48 million RSD, while its IRR is estimated to be equal to 12.06% (Table 7, row 1, col 2). This is close to the assumed target return.

With the tax incentive (i.e., with a 10-year income tax holiday) for a capital-intensive firm (Scenario 1), the NPV is estimated to be increased to 89.31 million RSD. The IRR is estimated to increase from 12.06% to 13.55% (Table 7, row 1, col 3).
For a capital-intensive firm (i.e., Scenario 1, employing 100 workers), the present value (PV) of the tax savings (benefits) to the firm is 85.83 million RSD at a 12% discount rate (Table 7, row 1, col 4). This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the

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[14] Izyumoy and Vitaly, 2015 Estimate of the Labor share in Net Value Added in Serbia is 0.66.
[15] Factory and Manufacturing Average Salaries in Serbia, @SalaryExplorer 2021.

Treasury is 5%, the present value of this tax expenditure equals 123.09 million (Table 7, row 1, col 5). Alternatively, if the Treasury's borrowing cost is 3%, the present value of this tax expenditure is 137.89 million RSD (Table 7, row 1, col. 5).

Table 7: Stakeholder Analysis of the Impact of a 10-Year Tax Holiday Employment Incentive (Article 50a)

	Scenario (1)	Financial Outcome of a Firm Without Incentive (2)		Financial Outcome of a Firm With Incentive (3)		Benefit to Firm (Tax Savings) (4)		Cost to Treasury (5)	
1	Scenario 1	NPV @12%	3.48 M'RSD	NPV @12%	89.31 M'RSD	PV @12%	85.83 M'RSD	PV@12%	85.83 M'RSD
		IRR	12.06%	IRR	13.55%			PV@5%	123.09 M'RSD
								PV@3%	137.89 M'RSD
2	Scenario 2	NPV @12%	7.06 M'RSD	NPV @12%	93.5 7M'RSD	PV @12%	86.32 M'RSD	PV @12%	86.32 M'RSD
		IRR	12.12%	IRR	13.62%			PV@5%	123.76 M'RSD
								PV@3%	138.63 M'RSD

In the case of a labor-intensive firm (i.e., Scenario 2, employing 150 workers), without the incentive, the NPV of the taxable firm is estimated to be equal to 7.06 million RSD, while its IRR is estimated to be equal to 12.12% (Table 7, row 2, col 2). With the tax incentive (10-year income tax holiday) for a labor-intensive firm (Scenario 2), the NPV is estimated to be increased to 93.57 million RSD. In contrast, its IRR rate is estimated to be increased from 12.12% to 13.62% (Table 7, row 2, col 3).

For a labor-intensive firm, the present value (PV) of the tax savings (benefits) to the firm is 86.32 million RSD (Table 7, row 2, col 4). This is also the present value of the tax cost to the Treasury if the discount rate of the Treasury is also 12%. If the cost of borrowing from the Treasury is 5%, the present value of the tax will increase to 123.76 million (Table 7, row 2, col 5). Alternatively, if the Treasury's borrowing cost is 3%, the present value of the tax expenditure increases to 138.63 million RSD (Table 7, row 2, col. 5).

4.5 Summary Conclusion on the Tax Incentive: A 10-Year Income Tax Holiday Employment Incentive (Article 50a)

In both of these situations, the 10-year income tax holiday has a positive and significant impact on both the NPV of the participating firm and its internal rate of return.
The tax incentive raises the rate of return on the investment by 1.5 percentage point for either the case of a capital-intensive or labor-intensive firm.

In the case of a capital-intensive firm, whereby only 100 employees are employed with a fixed investment of 1 billion RSD (Scenario 1), the incentive provides a wage subsidy equal to 13.23% (Table 8, row 1, col 5) of the wage bill for 100 workers for the first ten

years or a 10.31% subsidy of wage bill if the project were to continue in operation for 18 years (Table 8, row 1, col 7).

Table 8: Tax Savings Ratio to the Labor Expense of the Project of the Firm and Tax Cost to the Treasury (Article 50a)

PV@3% of the Tax Cost to the Treasury (millions RSD) (1)	PV@5% of the Tax Cost to the Treasury (millions RSD) (2)	PV@12% of the Tax Savings to the Firm (millions RSD) (3)	PV@12% of the First 10-year Labor Expense of the Project (millions RSD) (4)	% Ratio of the Tax Savings to the First 10-Year Labor Expense of the Project (%) (5)	PV@12% of the Total Labor Expense of the Project (millions RSD) (6)	% Ratio of the Tax Savings to the Total Labor Expense of the project (%) (7)
			Scenario 1			
137.89	123.09	85.83	648.87	13.23%	832.55	10.31%
			Scenario 2			
138.63	123.76	86.32	973.31	8.87%	1,248.83	6.91%

Suppose the firm is a labor-intensive firm whereby 150 workers are employed along with a new investment costing 1 billion RSD (scenario 2). In that case, the incentive provides a wage subsidy equal to 8.87% (Table 8, row 2 col 5) of the wage bill for 150 workers for the first ten years or a 6.91% subsidy of the wage bill if the project were to last for 18 years in continuous operation (Table 8, row 2, col 7).

One positive aspect of this incentive is that it is tied to the level of incremental employment by a particular firm. However, to ensure that the firm provides this additional employment, the penalties imposed in the law are very severe for non-compliance. No matter how long the firm has been able to comply by providing this additional employment if its employment levels drop below the number in the initial agreement, the firm would have to repay all the taxes that were exempted for the entire period the firm enjoyed this tax exemption. Suppose a firm reduced its level of employment due to a downturn in the business cycle or an event outside of its control (COVID-19); in that case, the repayment of all back taxes exempted might force the firm into bankruptcy. In any case, it is expected that the firms might be reluctant to accept such an incentive given the contingent liability it must accept simultaneously.

5. Tax Credit of up to 100,000,000 RSD for Additional Investment in Financing New Equity Investment in Innovative start-up firms (Article 50j)

The tax incentive of a tax credit of up to 100,000,000 to start-up firms is the fourth tax incentive evaluated in this report.

5.1 Nature of the Tax Incentive:

The Corporation income tax law introduced a tax incentive for taxpayers who are not themselves deemed to perform an innovative business activity but who provide equity financing to innovative start-up firms. This provision was implemented on 1 January 2019[16]. A taxpayer who invests in the share capital of a newly established company performing innovative business activities has a right to a tax credit in the amount of 30% of such investment.

The taxpayer may use the tax credit:

i. Who, before investment, independently or with all related entities, did not own more than 25% of the shares, i.e., voting rights in the newly established company performing innovative business activities in which it invests,

ii. Only based on fully paid-in monetary investments that increase the capital of the newly established company performing innovative business activities,

iii. Under the condition that the taxpayer did not decrease its investment continuously for a period of three years from the date of the investment – tax credit can be used for the first time in the tax period following the period in which this condition was fulfilled.

The maximum amount of the tax credit which could be used by the individual taxpayer based on the investment in the newly established company performing innovative business activities amounts to 100,000,000 dinars (approx. EUR 850,000), while the maximum amount of the tax credit, regardless of the number of investments, which could be used in one tax period by the taxpayer amounts to 50,000,000 dinars (approx. EUR 425,000). An exception to the general rules applies to related entities having the right to use this tax credit.

Any unused part of the tax credit may be carried forward, but not longer than five years.

5.2 Evaluation of Tax Credit for Equity Investments in Start-ups (Article 50j)

To assess the effectiveness of this tax incentive to the investor and the cost to the Treasury, first, we need to define the set of model parameters and assumptions needed to evaluate this tax incentive. The assumption being made here is that the firm receiving this financing is an independent, innovative firm. We are assessing the impact of this tax credit on the profitability of equity investment.

The details of the data used to evaluate this tax incentive are presented in Annex 4.

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[16] Deloitte. (2019). *Guide for Investing in Serbia: At your glance* (p. 25)

5.3 Model Parameters and Assumptions: Tax Credit for New Equity Financing in Start-ups (Article 50j)

It is assumed that this equity investor can obtain a real rate of return of 12 percent if investing in the equity of an average non-dividend-paying firm in Serbia. The investor's strategy is to make the investment and hold the shares for capital gains.
There are two scenarios appraised under this tax incentive.

In the first scenario, the investor is assumed to hold the shares for ten years and then sell them to obtain capital gains income that will not be subject to capital gains taxation. The initial investment will be 333,333,333 RSD to be eligible for the most significant tax credit, which is 100,000,000 RSD (30% of the investment). This tax credit is assumed to be taken in two different manners. In the first case under this scenario, it is assumed that the investment firm has substantial taxable income to claim the maximum tax credit of 50,000,000 RSD in the first and second years after investing in the innovative firm. In the second case, it is assumed that it has sufficient income from other sources to claim a tax credit of only 20,000,000 RSD in Years 1 to 5.

In the second scenario, the investor is assumed to hold the shares for six years and then sell them to earn capital gains income that will be subject to capital gains taxation. We also carry out a further variation to the second scenario. In this case, the investor is assumed to hold the shares for six years, where the capital gains will be subject to capital gains taxation. However, the cost basis of the share is reduced by the tax credit amount. The legislation is unclear on how the cost basis of the shares is determined in order to estimate the amount of taxable capital gains. In some countries, the cost basis of the shares would be reduced by the amount of tax credits received when the shares were purchased; hence, this further analysis is carried out to illustrate the impact of such tax treatment.

5.4 Model Analysis Results: Tax Credit for Investments in Start-ups (Article 50j)

Using the model parameters and assumptions stated above, Tables 9, 10, and 11 present the effectiveness of the tax credit incentive.

Scenario 1: Shares are sold for capital gains after 10 Years (Without 15% capital gains tax)

Table 9 presents the results of the effectiveness of the tax credit incentive for the first scenario (i.e., it is assumed that the investor will hold the shares for ten years and then sell them to obtain capital gains income that will not be subject to capital gains taxation).

Table 9: Scenario 1; 10-Year Period of Shares Holding with No 15% Capital Gains Tax

	(1)	Equity's Perspective Without Incentive (2)		Equity's Perspective With Incentive (3)		Benefit to Investor (Tax Savings) (4)		Cost to Treasury (5)	
1	A[17]	NPV@12%	0.0 M'RSD	NPV @12%	84.50 M'RSD	PV@12%	84.50 M'RSD	PV@12%	84.50 M'RSD
		IRR	12%	IRR	15.17%			PV@5%	92.97 M'RSD
								PV@3%	95.67 M'RSD
2	B[18]	NPV@12%	0.0 M'RSD	NPV @12%	72.10 M'RSD	PV@12%	72.10 M'RSD	PV@12%	72.10 M'RSD
		IRR	12%	IRR	14.57%			PV@5%	86.59 M'RSD
								PV@3%	91.59 M'RSD

In the first scenario, if the tax credit is taken at its maximum amount of 50,000,000 RSD a year for two years and the investors hold the shares for ten years, the IRR of this investment is increased from 12% to 15.17 % for an estimated to increase of 3.17 percentage points (Table 9, row 1, col 2 & 3)

If the tax credit is spread over five years, at 20,000,000 RSD each year, the IRR on this equity investment increases from 12% to 14.57%, or an increase of 2.57 percentage points (Table 9, row 2, col 2& 3). This tax credit incentive can be considered a subsidy by the government to offset the higher costs of risk associated with equity investments in these start-up innovative firms. In both cases, the tax benefits are substantial at 84.5 million RSD in the first case and 72.1 million RSD in the second.

Scenario 2: Shares are sold for capital gains after 5 Years (With 15% capital gains tax)

Table 10 reports on the impact of this tax incentive on the shareholder's return when the investor only holds the shares for a minimum of 5 years and sells the shares in the sixth year. As a result, the capital gains from the shares become subject to the 15 percent capital gains tax.

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[17] Scenario 1A: Tax credit spread over 2 years; 10-Year Period of Share Holding with No 15% Capital Gains Tax.
[18] Scenario 1B: Tax credit spread over 5 years; 10-Year Period of Share Holding with No 15% Capital Gains Tax.

Table 10: Scenario 2; 6-Year Period of Share Holding with 15% Capital Gains Tax

	(1)	Equity's Perspective Without Incentive (2)		Equity's Perspective With Incentive (3)		Benefit to Investor (Tax Savings) (4)		Cost to Treasury (5)	
1	A[19]	NPV@12%	0.0 M'RSD	NPV@12%	53.41 M'RSD	PV@12%	53.41 M'RSD	PV@12%	53.41 M'RSD
		IRR	12%	IRR	15.41%			PV@5%	70.817 M'RSD
								PV@3%	76.92 M'RSD
2	B[20]	NPV@12%	0.0 M'RSD	NPV@12%	41.00 M'RSD	PV@12%	41.00 M'RSD	PV@12%	41.00 M'RSD
		IRR	12%	IRR	14.45%			PV@5%	64.43 M'RSD
								PV@3%	72.84 M'RSD

From row 1, columns 1 and 3, we find that when the tax credit is taken at the maximum rate, the estimated rate of return for this equity investment rises from 12% to 15.41% for an increase of 3.41 percentage points. This is a slightly greater value than the previous situation, where the investor gained 3.17 percentage points but held the share for ten years to avoid paying capital gains taxation.

When the tax credits can only be taken in equal amounts over five years, the rate of return is increased from 12% to 14.45% for an increase of 2.45 percentage points. In contrast, this increase is slightly less than the previous situation, where there were no capital gains. Considering the risk associated with holding these shares for a longer period of time, it would be advantageous for an equity investor to sell the shares after five years. In this way, they could reinvest the funds in a similar firm and be eligible to receive the tax credit once again. Such tax credits always favor short-term investments over long-term ones.

Scenario 3: Case where cost basis for estimating taxable capital gain is adjusted for tax credit

Some countries would consider the tax credits when determining the cost basis of the shares to estimate the amount of taxable gains. Table 11 reports on the impact of this tax incentive on the shareholder's return, in this case, if the tax credits are deducted from the investment cost to determine the cost basis of the shares. In other words, the cost basis for the shares becomes 233,333,333 RSD instead of 333,333,333 RSD, and the amount of taxable gains is increased by 100,000,000 RSD.

Even in this case, this share purchase tax credit of 30% of the investment in the start-up firm will increase the rate of return from 12 percent to 15.07 percent in the case

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[19] Scenario 2A: Tax credit spread over 2 years; 6-Year Period of Share Holding with 15% Capital Gains Tax.

[20] Scenario 2B: Tax credit spread over 5 years; 6-Year Period of Share Holding with 15% Capital Gains Tax.

where the maximum amount of the credit can be claimed over two years. Or an increase in the rate of return of 3.07 percent. When the tax credit is taken in equal amounts over five years, the increase in the rate of return increases from 12% to 14.13%.

Table 11: Scenario 3; 6-Year Period of Share Holding with 15% Capital Gains (Cost basis adjusted for tax credit for estimating taxable capital gains)

(1)		Equity's Perspective Without Incentive (2)		Equity's Perspective With Incentive (3)		Benefit to Investor (Tax Savings) (4)		Cost to Treasury (5)	
1	A[21]	NPV@12%	0.0 M'RSD	NPV@12%	47.73 M'RSD	PV@12%	47.73 M'RSD	PV@12%	47.73 M'RSD
		IRR	12%	IRR	15.07%			PV@5%	62.46 M'RSD
								PV@3%	67.55 M'RSD
2	B[22]	NPV@12%	0.0 M'RSD	NPV@12%	35.33 M'RSD	PV@12%	35.33 M'RSD	PV@12%	35.33 M'RSD
		IRR	12%	IRR	14.13%			PV@5%	56.08 M'RSD
								PV@3%	56.08 M'RSD

5.5 Summary and Conclusions of Analysis: Tax Credit of up to 100,000,000 RSD for Additional Investment in Financing New Equity Investment in Innovative Start-up Firms (Article 50j)

In each of the cases above, we find that the 30 percent credit for investing in innovative start-up firms significantly impacts the expected rate of return from this investment. Even when the equity is held only for 6 years and is subject to capital gains taxation, this tax credit will still raise the expected rate of return by at least two percentage points.

Table 12 shows that this tax credit provides the investor with a subsidy with a present value ranging from 25.35 percent of the initial investment made to 10.60 percent. This range depends on the speed at which the investor can use the tax credits against other taxes due, the length of time the investment is held, and the exact legal specification of the determination of taxable capital gains for such investments. Such a subsidy will offset a portion of the risk premium associated with the equity of innovative start-up firms.

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[21] Scenario 3A: Tax credit spread over 2 years; 5-Year Period of Share Holding with 15% Capital Gains Tax (cost basis adjusted for tax credit for estimating taxable capital gains).
[22] Scenario 3B: Tax credit spread over 5 years; 5-Year Period of Share Holding with Capital Gains (cost basis adjusted for tax credit for estimating taxable capital gains).

Table 12: Summary Table Using Article 50j - Tax Credit of 100 million RSD

		PV@3% of the Tax Cost to the Treasury (million RSD) (1)	PV@5% of the Tax Cost to the Treasury (million RSD) (2)	PV@12% of the Tax Savings to the Firm (million RSD) (3)	PV@12% of the new Equity Investment (million RSD) (4)	% Ratio of the Tax Savings to Equity Investment (%) (5)
		Scenario 1				
1	A	95.67	92.97	84.50	333. 333333	25.35%
2	B	91.59	86.59	72.10	333.333333	21.63%
		Scenario 2				
3	A	76.92	70.81	53.41	333.333333	16.02%
4	B	72.84	64.43	41.00	333.333333	12.03%
		Scenario 3				
5	A	67.55	62.46	47.73	333.333333	14.32%
6	B	63.47	56.08	35.33	333.333333	10.60%

One advantage of the design of this incentive is that it is tied directly to the desired action of the public policy. This policy objective is to increase funds from a diversified set of equity investors in innovative firms. If such investments are not forthcoming as expected, then the amount of the tax expenditures incurred by the government will likewise be reduced.

Because this tax incentive is designed as a tax credit, it creates an incentive for the investor to sell the equity as soon as it is allowed (after holding the investment for five years) and reinvest the money to receive the tax credit again.

6. Employment Tax Incentive in Serbia

The employment tax incentive is the fifth tax incentive evaluated in this report.

6.1 Nature of the Tax Incentive: Employment Tax Incentive

The employment incentive in Serbia allows an employer who hires a long-term unemployed worker a 65% reduction of the social security contributions and income tax that they would normally withhold and remit to the tax authorities on the employees" wages. Under this incentive program, they must hire someone who has been unemployed for an extended period of time.

It is important to note that these long-term unemployed individuals would have exhausted their unemployment insurance payments before obtaining this job through this incentive program. However, as registered unemployed, they are eligible for other social benefits, such as health and pension insurance, social assistance benefits, subsidized childcare, local transport, and access to active labor market programs[23]. These services provide a benefit to the unemployed individual but are a fiscal cost to the government.

To measure the net economic benefit of employing such unemployed workers, we need to evaluate the worker's marginal product to the employer when employed. This measures the economic value or benefit of what the individual contributes to the economy when employed. In addition, we need to estimate the minimum wage net of tax the worker would accept to undertake such employment. This is the main component of the social or economic cost of employing the individual in the particular job they are being offered.

To evaluate the net social benefit of hiring a long-term unemployed worker, we wish to estimate the labor externality created because of this program. A labor externality is created when the wage rate paid by the project differs from the economic opportunity cost of labor (EOCL)[24]. In other words, the labor externality is the difference between what the employers pay (project wages plus the cost of other benefits) and the value of what the newly employed worker is willing to work for on this job worker's supply price). The details of the data used to evaluate this tax incentive are presented in Annex 5.

6.2 Evaluation of the Employment Incentive

This employment incentive has the positive attribute of being targeted to address the failure of the labor market to adjust so that all workers who are willing to work can find

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[23] Employment Policy Review, Serbia. Prepared by the International Labor Office and the Council of Europe in 2005 and 2006.

[24] Jenkins, G. P., Kuo, C.-Y., & Harberger, A. C. (2019). *Economic Opportunity Cost of Labor Chp. 12 in Cost-Benefit Analysis for Investment Decisions. Kindle Direct* Publishing.

employment. By lowering the total cost of employee compensation, this incentive brings the marginal expense of hiring these types of workers to be approximately equal to the value of the marginal product that they can create for the firm.

When considering the ultimate economic impact that such employment creates, there is a need to differentiate between hiring workers for permanent jobs or temporary jobs.
In this study, permanent jobs are those where an individual works for a firm for at least five years. No consideration is given to the value of any credits cumulated by the employee that would provide unemployment insurance benefits in the future. If there is no unemployed time, then these credits never turn into costs for the government. Temporary employment or jobs are those that are expected to last for one year or less. These jobs are typically in industries such as construction or seasonal. In these types of employment, a benefit to the worker (and cost to the government) is the increased eligibility of the worker for unemployment benefits when they become unemployed in the future. The cost of unemployment insurance income benefit becomes a cost when the worker claims this benefit.

The analysis of this issue is divided into two parts. The first part measures the financial cost of hiring a long-term unemployed worker due to the incentive. A major determinant of the financial cost is the wage rate the employer will need to pay the new employees. In this analysis, we assume that employers will set the wage rate so that these incentivized employees[25] will earn the same take-home pay as their regular hired employees (i.e., employees outside the incentive program). Due to labor market norms (perhaps labor union sensitivities), it may be difficult for employers to pay a wage rate that would incentivize employees to receive a different take-home pay than ordinary workers. Other assumptions about the wage determination could be employed in this model, but this assumption appears plausible.
The second part of the analysis measures the social net benefit or cost resulting from the employment incentive. In other words, measuring the labor externality from hiring a long-term unemployed worker.

6.2.1 Part I – Estimation of the Financial Value of Employing an Incentivized Worker

Estimation of the Total Monthly Cost of Employing Ordinary Worker[26]

The model begins with the base analysis that measures the labor cost of hiring an ordinary worker. To illustrate this analysis, there is a need to assume a wage rate earned by the ordinary worker competing for the job being offered to the incentivized employees. The wage assumed for the working employee outside of this incentive program is the average of all wages earned by employees in Serbia. This wage in 2021

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[25] An employed worker who was previously unemployed for a long time.
[26] The ordinary worker is referred to a worker outside the incentive program.

is estimated to be 60,000 RSD/month[27]. The Social Security Contributions (SSC) rates[28] in Serbia that employers are expected to pay on this wage rate are pension and disability insurance of 11.5% and health insurance of 5.15%. Hence, the total SSC rate for an employer is 16.65%. The monthly average full cost of employing an ordinary worker now becomes 69,990 RSD, as shown in Table 13.

Table 13: Average Monthly Labor Cost of an Ordinary Worker

		%	Financial Cost (RSD)
	Average monthly wage (Net of SSC)		60,000
[+]	SSC rate (for employer)	16.65%	9,990
	Monthly Labor cost (per worker)		69,990

The take-home pay of an ordinary worker after all the taxes and contributions are made for social security will be a net income of 43,254 RSD. The derivation of this net income for an ordinary worker is shown in Table 14.

Table 14: Average Monthly Net Income of an Ordinary Worker

		%	Financial Cost (RSD)
	Average monthly wage (Net of SSC)		60,000
[-]	SSC rate (for employee)	19.9%	11,940
	Taxable Income		48,060
[-]	Income Tax	10%	4,806
	Net Income Monthly Wage (per worker)		43,254

Estimation of the Total Monthly Cost of Employing Incentivized Worker

As stated previously, the estimation of the impact of this employment incentive assumes that the newly employed workers who were previously unemployed will get a monthly net of tax earnings equal to that of an ordinary worker, i.e., 43,254 RSD (Table 14).

With the employment incentive of a refund of 65% of the total SSC and income tax on wages, the employer's monthly labor cost is reduced from 69,900 RSD to 50,986 RSD. This means that with the incentive, the official monthly gross tax wage offered by the firm to these employees must be at least equal to 48,178 RSD, as shown in Table 14. The SSC rate with the incentive equals 5.83% of the gross tax wage (i.e., 35% of 16.65%). When the employer's contribution to social security is added to this amount, the monthly total cost to the employer becomes 50,986 RSD.

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[27] Stotz, J. (2021, April 28). Average and Minimum Salary in Belgrade, Serbia. *Check in Price*. https://checkinprice.com/average-minimum-salary-belgrade-serbia/

[28] PwC 2021, Serbia individual other taxes, https://taxsummaries.pwc.com/serbia/individual/other-taxes

Table 15: Average Monthly Total Labor Cost of an IncentivizedWorker -With Incentive

		%	Financial Cost "With Incentive" (RSD)
	Average monthly wage (Net of SSC)		48,178
[+]	SSC rate "with incentive" (for employee)	5.83%	2,808
	Monthly Labor cost (per worker)		50,986

In other words, the employer's full labor cost per worker per month with the incentive will be reduced by 27% from 69,990 RSD (Table 13) to 50,986 RSD (Table 15).

6.2.2 Part II – Estimation of the Economic Value of Employing an Incentivized Worker

Having formulated the tax incentive (employment incentive) financial analysis, we can then proceed to the economic analysis.

The following questions are addressed: (i) What is the value of the marginal product of labor? (ii) What are the social benefits or costs (labor externalities) that arise as a result of this incentive? (iii) How are these externalities distributed?

6.2.2.1 Value of the Marginal Product of Labor (VMPL)

The marginal product of labor (MPL) refers to a company's increase in total production when one additional unit of labor is added (one additional employee) while all other factors of production remain constant. In other words, the MPL is the additional output a company can produce after hiring another worker. If the firm is profit-maximizing, it will generally not pay more (in terms of wages and benefits) for a worker than the value of their marginal productivity to the firm.

In this analysis, the value of the marginal product of the newly employed worker (incentivized worker) will be approximately equal to 50,986 RSD, which is equal to the cost of the firm (W_p) of hiring another employee. This is shown in Figure 1.

The value of the marginal product can be illustrated as a downward-sloping curve (Figure 1) because of the diminishing marginal product of labor[29]. The incentivized worker's monthly gross wage (W') is estimated to be equal to 48,174 RSD (Figure 1), while the net tax wage (W_n) is estimated to be equal to 43,254 RSD (Figure 1). The supply price net of tax of the worker (W_s) is estimated to be equal to 31,000 RSD (Figure 1).

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[29] The falling MP_L is due to the law of diminishing marginal returns. The law states, "as units of one input are added (with all other inputs held constant) a point will be reached where the resulting additions to output will begin to decrease; that is marginal product will decline (*Samuelson, W. and S. Marks, Managerial Economics, 4th ed. Wiley 2003, p. 227).*
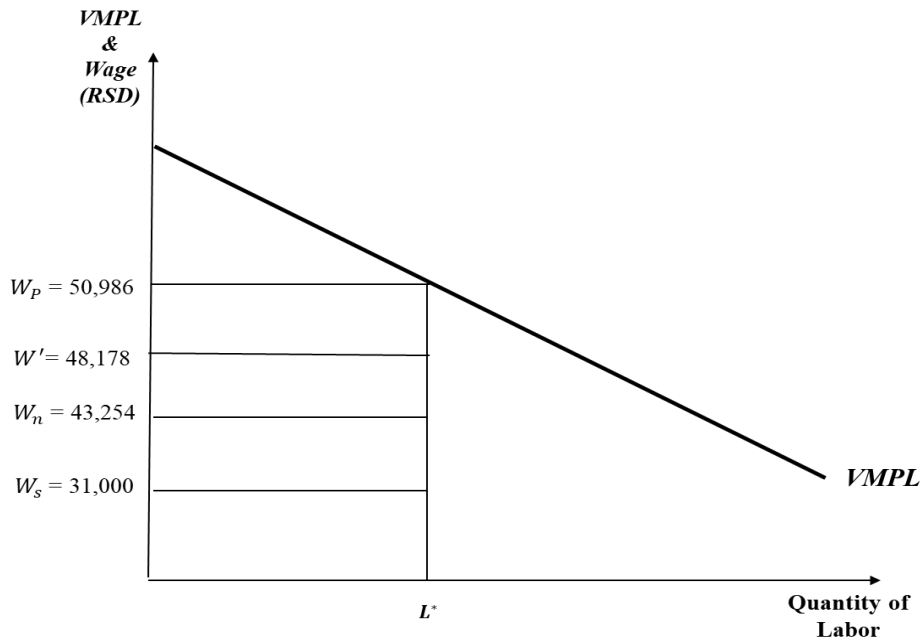
VMPL
&
Wage
(RSD)

$W_P = 50,986$

$W' = 48,178$

$W_n = 43,254$

$W_s = 31,000$

VMPL

L^*

Quantity of
Labor

Figure 1

6.2.2.2 The Case of Providing Permanent Employment

Labor Externality

A labor externality (**LE**) is created when the wage rate paid by the firm (W_P) differs from the economic opportunity cost of labor (**EOCL**). This externality can be expressed for a specific type of labor (i) as:

$$LE = Wp - EOCL \qquad\qquad Equ.\ 1$$

The minimum wage required to induce these workers to be employed in these jobs is referred to as the supply price of labor. The EOCL is the supply price of the workers adjusted for any changes in fiscal expenditures that will occur when these individuals leave their state of unemployment. We note that these newly employed workers were previously unemployed for a long time. These unemployed individuals would have run out of their unemployment insurance payments when they have been unemployed. However, the registered unemployed is eligible for other social benefits, such as health and pension insurance, social assistance benefits, subsidized childcare, local transport, and access to active labor market programs[30].

To estimate the labor externality, we start by setting this worker's supply price (net of tax) equal to 31,000 RSD. This value is equal to the net of tax minimum wage in

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[30] Employment Policy Review, Serbia. Prepared by the International Labor Office and the Council of Europe in 2005 and 2006.

Serbia[31]. This rate is higher than the value they would have received in terms of the social welfare benefits (social benefits are not taxed) if unemployed but less than the legal minimum wage in Serbia. We assume that the cost of these social benefits is equal to a fraction (*f*=25%) of the minimum wage (**Wm)** in Serbia (41,000 RSD) or 10,250 RSD per month. Hence, the EOCL of employing this worker is estimated to be equal to 20,750 RSD, which is less than the worker supply price. The derivation of the EOCL is shown in the equation below (**Equation 2**)

$$\textbf{\textit{EOCL = Supply Price (Ws) - f(Wm)}} \qquad \textbf{\textit{Equu. 2}}$$

$$\textbf{= 31,000 – 0.25(41,000)}$$
$$\textbf{EOCL =20,750}$$

Following **Equation 1** above, the labor externality is estimated.

$$\textbf{LE = W}\textit{p} \textbf{ – EOCL}$$
$$\textbf{LE = 50,986 - 20,750}$$
$$\textbf{LE   =30,236 RSD}$$

The labor externality equals 30,236 RSD, which is the difference between the wage paid **(Wp***)* by the employer (cost) and the economic opportunity cost of labor (**EOCL)** of this type of worker. This labor externality reflects the net economic benefit provided by this wage incentive scheme.

Distribution of the Labor Externality in the Case of Permanent Employment/Job
It is important to determine specifically who the program's beneficiaries are and how much each stakeholder benefits. We can determine how these externalities are distributed between the workers and the government.

*Labor benefit (Permanent Employment/Job***)**

In this case, the externality to the labor is the difference between the net project wage they receive (i.e., the project wage minus the SSC and income tax) and their net supply price (Table 16).

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[31] Stotz, J. (2021, April 28). Average and Minimum Salary in Belgrade, Serbia. *Check in Price*. https://checkinprice.com/average-minimum-salary-belgrade-serbia/

Table 16: Labor Benefit (per worker/month)

		%	Net Project Wage (RSD)	Net Supply Price (RSD)
	Monthly Gross project wage		50,986	31,000
[-]	SSC rate "with incentive" (for employer)	5.83%[32]	2,808	-
[-]	SSC rate "with incentive" (for employee)	6.97%	3,356	-
[-]	Income tax "with incentive" (for employee)	3.50%	1,569	-
	Net Income (per worker)		43,254	31,000
	Labor Benefit (per worker)	12,254 RSD/Month		

Labor benefits equal 12,254 RSD per month, which is the difference between the net project wage of 43,254 RSD and the net supply price of 31,000 RSD.

Government Fiscal benefit (Permanent Employment/Job)

In this case, the government net fiscal benefits per month are equal to 17,982 RSD (Table 17, row 5). This is the sum of 2,808 RSD employer's SSC), 3,356 RSD employee's SSC), and 1,569 RSD employee's income tax). Added to this is the savings from the elimination of the cost of providing the social benefit that would have been received by the unemployed worker when not working in Serbia (i.e., as an initial estimate, we have taken it to be a fraction (*f*=25%) of the minimum wage (**Wm)** in Serbia of 41,000 RSD or 10,250 RSD per month).

Table 17:Government Fiscal Benefit (per worker/month)

		Payments to Government (RSD/Month)
1	Employer's SSC	2,808
2	Employee's SSC	3,356
3	Employee's income tax	1,569
4	Savings in the cost of providing unemployment social benefits to a worker when unemployed	10,250
5	Total Payments to the Government	17,982

Estimation of the Total Annual Cost of Employing on a Permanent Basis an Incentivized Worker (Five-Year Period)

The estimation result above was carried out on a monthly basis. Now we will assume that the workers who are hired into permanent jobs are employed for 5 years without any spells of unemployment. After 5 years, it is expected that these workers will have gained the skills and experience to be treated as ordinary workers. The present values of eachstakeholder's position are calculated for the 5-year period for a typically employed individual[33].

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[32] 5.83% equals to 35% of 16.65%, given that the employment incentive allows 65% refund of the SSC and income tax. The same calculation applies to the employee's SSC and income tax.

[33] Please see accompanying spreadsheet for quantitative analysis

Table 18: Stakeholder Analysis of Employing an Incentivized Worker for 5 Years (Permanent Employment)

	Financial Cost (Million RSD)			Labor Externalities (Million RSD)		
	Employer's Cost/Benefit (Labor cost inclusive of SSC) (1)	Employee's Net Income (Net of SSC & Income Tax) (2)	Total Payments to the government (3)	Total Labor Externalities (4)	Labor Benefit (5)	Government Benefit (6)
1	2.47	2.10	0.37	1.46	0.59	0.87
2	100%	85%	15%	100%	40%	60%

For a 5-year period, the present value of the total labor cost to the employer per worker equals 2.47 million RSD (Table 18, row 1, col 1) with the incentive. This is also equal to the economic benefit the employee creates for the employer and society. The present value of the annual net income to the employee equals 2.10 million RSD (85%, Table 18, col 2). The difference between the employer's cost (2.74) and employee's income (0.37) equals the total SSC and income tax payments made to the government (15%, Table 18, col 3).

The present value for a 5-year period of the total labor externalities net economic benefit is equal to 1.46 million RSD or 59% of the total labor cost to the employer (Table 18, row 1, col 4). The employee benefits (labor benefit) by an amount equal to 0.59 million RSD due to the incentive program (40%, Table 18, col 5). The present value for a 5-year period of the government benefit would be equal to 0.87 million RSD/person employed due to the incentive program (60%, Table 18, col 6). Because these workers would have been otherwise unemployed, there is no net cost to the government from providing this reduction in tax rates. This is an economic policy that indicates that it is a win-win situation.

6.2.2.3 The Case of Providing Temporary Employment

When a worker accepts a temporary job, the EOCL must reflect the cost of the unemployment income compensation credits that are accumulated when they are employed and ultimately claimed during spells of unemployment. Temporary jobs tend to be for periods of one year or less. Hence, because of the temporary nature of their employment, we should expect that these individuals will take advantage of the opportunity to use the unemployment insurance benefits to the maximum degree possible.

The unemployment insurance credits cumulated for people working 1 to 5 years provide unemployment income compensation for a period of up to 3 months[34]. We will assume that temporary jobs provide employment for 1 month to 12 months. Hence, for every month worked, the worker will cumulate 25% of a month of unemployment insurance

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[34] Law on Employment and Unemployment in Serbia

credit up to a maximum of three months of credits. The unemployment income compensation is estimated to be 50% of their gross wage (W'_T) (i.e., 24,089 RSD) for three months after working for 12 months. It is expected that workers hired in temporary jobs will take advantage of unemployment insurance when they become eligible for this benefit at some point in the future. As their work spells are intermittent, it is relatively easy for them to organize their time to be able to receive this amount and not have to work.

For modelling this labor market behavior, we assume a pattern of work and unemployment where an individual works for 12 months, followed by three months of unemployment over time. Over a five-year interval, the worker will have four periods of working of 12 months each and four spells of unemployment of three months each. Other patterns of time employed and time unemployed can be assumed and evaluated. In the case of temporary employment, the monthly economic opportunity cost of labor is as follows:

$$EOCL_T = W^s_T - 0.25 Wm + 0.25(0.5 PVW'_T)$$

$$EOCL_T = 31,000 - 0.25(41,000) + 5608$$

$$EOCL_T = 26,358 \text{ RSD}$$

Where;

W^s_T is the minimum supply price of the individual who will work for a temporary job
0.25Wm is the fiscal savings from reduced social benefit when a worker is employed per month in a temporary job (*Wm is denoted as the minimum wage*)
0.25(0.5PVW$'_T$) is present value cost of the unemployment insurance benefit credits they accrue when working (*W'_T is denoted as the gross of tax wage received by the employee*)

In this case, the monthly economic opportunity cost of labor for a temporary job is equal to 26,358 RSD. Hence, the labor externality in the case of a temporary job is estimated to be equal to 24,628 RSD, as shown in the expression below.

$$LE_T = Wp - EOCL_T$$

$$= 50,986 - 26,358$$

$$LE = 24,628 \text{ RSD}$$

Distribution of the Labor Externality in the Case of Temporary Employment/Job

Labor benefit (Temporary Employment/Job)

During the periods that these individuals are employed in a temporary job, the externality to the labor is the difference between the net project wage (W^P_n) they receive (i.e., the project wage minus the SSC and income tax) and their net supply price (W^S_n). Hence, the labor benefit is equal to 12,254 RSD per month, as shown in the equation below.

$$\text{Labor Benefit} = W_n^P - W_n^S$$
$$= 43{,}254 - 31{,}000$$
$$\text{Labor Benefit} = 12{,}254 \text{ RSD/month}$$

Note when this temporary employee is working, their labor benefits are also equal to a permanent worker's labor benefit, as shown in Table 16.

Government Fiscal Benefit (Temporary Employment/Job)

In this case, the government benefits per month are equal to 12,375 RSD. This is the sum of the employer's SSC (W_{SSC}^P), employee's SSC ($W_{SSC}^{P\prime}$), employee's income tax ($W_T^{P\prime}$). In addition, is the fiscal savings from reduced social benefit when a worker is employed per month *(0.25Wm)* less the present value of the fiscal cost of unemployment social benefits to the worker when unemployed **(0.25(0.5$PVW_T^{\prime}$ or 5,608 RSD/month).**

Government Fiscal Benefit $= W_{SSC}^P + W_{SSC}^{P\prime} + W_T^{P\prime} + 0.25\text{Wm} - 0.25(0.5PVW_T^{\prime}).$
$$= 2{,}808 + 3{,}356 + 1{,}569 + 10{,}250 - 5608$$
$$= 12{,}374 \text{ RSD}$$

Estimation of the Total Cost of Employing on a Temporary Basis an Incentivized Worker (Five-Year Period)

Over a 5-year period, this incentivized temporary worker will be working for a total of 48 months and will be unemployed and receiving wage unemployment compensation and unemployment benefits in total for 12 months.

The present values of each stakeholder's position are calculated for the five-year period for a typically employed individual. The present value of the financial total labor cost to the employer during the periods the incentivized worker worked is estimated to be equal equals 1.90 million RSD (Table 19, row 1, col 1). This is also equal to the gross economic benefit the employee creates for the employer and society. The present value of the net tax income to the employee over the 48 months when he/she works is estimated to be equal to 1.61 million RSD (Table 19, col 2). The difference between the employer's cost and the employee's income equals the total SSC and income tax payments made to the government by an amount of 0.29 million RSD (Table 19, col 3) in the case of temporary employment.

The present value of the total labor externalities (i.e., both the case the employee is employed and unemployed) for a five-year period is estimated to be equal to 0.71 million RSD or 37% of the total labor cost to the employer (Table 19, row 1, col 4). The present value of the labor benefit for a five-year period in the case of temporary employment is estimated to be equal to 0.46 million RSD (Table 19, col 5). The present value of the government benefits in temporary employment is estimated to be equal to 0.25 million RSD (Table 19, col 6).

Table 19: Stakeholder Analysis of Employing an Incentivized Worker for (Temporary Employment)

	Financial Cost (Million RSD)			Labor Externalities (Million RSD)		
	Employer's Cost/Benefit (Labor cost inclusive of SSC) (1)	Employee's Net Income (Net of SSC & Income Tax) (2)	Total Payment to the Government (3)	Total Labor Externalities (4)	Labor Benefit (5)	Government Benefit (6)
1	1.90	1.61	0.29	0.71	0.46	0.25
2	100%	85%	15%	100%	65%	35%

6.3 Discussion and Conclusions on Employment Tax Incentive

This tax incentive program is highly beneficial to all stakeholders to the degree it results in the employment of these disadvantaged individuals in either permanent or temporary jobs. The employers obtain workers at a reduced cost that justifies the employment of these individuals. Both the workers and the government benefit.

For workers who are given permanent jobs, the value of the net labor externality is 59% of the total cost of their employment. Of these externalities, 40% accrues to the workers, and 60% accrues to the government. The government gains some income taxes and social security payments and, at the same time, benefits from the reduced costs of the social welfare programs that have been given to these long-term unemployed individuals. When these individuals are employed in temporary jobs, the total labor externalities are approximately 37% of the total employer's wage bill. Of this total externality, 65% accrues to the workers and 35% to the government.

When we consider the magnitude of the labor externalities, we find that the total labor externality created by employment in temporary jobs is only 49% as large as it would be if employed in permanent jobs. For the labor employed in temporary jobs, their net benefits are 78% as large as those employed in permanent jobs. Furthermore, the net benefits received by the government from workers finding permanent jobs is 3.5 times as large as when the workers are employed in temporary jobs. The reduced benefit to the government is largely due to the reduced amount of time the workers are employed over these 5 years, and when unemployed, the government incurs the cost of the unemployment insurance program.

Overall, this is a very well-designed tax incentive that will improve both social welfare and economic efficiency to the degree that it effectively increases the employment of these long-term unemployed workers. The analysis also shows the importance of finding permanent jobs for these workers as compared to temporary jobs. Temporary sector jobs tend to serve to refresh the ability of these individuals to receive subsidized periods of unemployment. This is both expensive for the government and inefficient for the economy.

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Annexes

Annex 1: Model Parameters and Assumption for Tax Incentive 1

Article 22g: Tax Incentive Allowing for Double Expensing of R&D Costs

1. Investment in Research Program

Total Expenditure for R&D	1000M'RSD
Target real net of tax rate of return on R&D program	12%
Duration of R&D Program	5 years

2. R&D Expenditure Components

   (as % of the total undiscounted R&D Expenditure)

Wages and Salaries	45%
Materials	22%
Utilities and Maintenance	23%
Land & Building (Lease)	3%
Plant and Equipment (Lease)	7%

3. Financing

Equity	100%

4. Corporate Income Tax

Corporate Income Tax	15%

5. Patent Fees

Annual revenue from patent leases (as % of total undiscounted expenditure of R&D program)	30%

6. Two Scenario of Patent Lease Periods

Scenario 1	10-Year Period of Patent lease
Scenario 2	15-Year Period of Patent Lease

Annex 2: Model Parameters and Assumption for Tax Incentive 2

Article 25b: Tax Incentive Exempting 80% Income Received from Patent Fees

1. Investment for Research Program

Total Expenditure for R&D	1000M'RSD
Target real net of tax rate of return on R&D program	12%
Duration of R&D Program	5 years

2. R&D Expenditure Components

   (as % of the total undiscounted R&D Expenditure)

Wages and Salaries	45%
Materials	22%
Utilities and Maintenance	23%
Land & Building (Lease)	3%
Plant and Equipment (Lease)	7%

3. Financing

Equity	100%

4. Corporate Income Tax

Corporate Income Tax	15%

5. Patent Fees

Annual revenue from patent leases (as % of total undiscounted expenditure of R&D program)	30%

6. Percentage of Income Exempted

% of income exempted	80%

7. Two Scenario of Patent Lease Periods

Scenario 1	10-Year Period of Patent lease
Scenario 2	15-Year Period of Patent Lease

Annex 3: Model Parameters and Assumption for Tax Incentive 3

Article 50a: Tax Incentive Allowing for 10-Year Income Tax Exemption

1. Fixed Investment Cost

Total Fixed Investment Cost	1000M'RSD

Breakdown of the fixed investment cost

Building (as a % of the total fixed cost)	50%
Machinery & Equipment (as a % of the total fixed cost)	50%

2. Employee Expense

Average monthly salary	95,700 RSD
No. of Employees (Scenario 1)	100
No. of Employees (Scenario 2)	150

3. Gross Value Added

Gross Value Added (Scenario 1: Labor Intensive)	282M'RSD
Gross Value Added (Scenario 2: Capital Intensive)	340M'RSD

4. Tax & Economic Depreciation

Building useful life (straight-line depreciation)	40 Years
Machinery & Equipment economic % depreciation (declining balance depreciation)	20%
Machinery & Equipment useful life	10 Years

5. Tax

Corporate Income Tax	15%
Duration of corporate income tax holiday	10 Years

6. Project Timing (Year)

Investment Period (Beginning Year)	Year 1
Operation Period (Duration)	18 Years
Liquidation Year	Year 20
Total Project Appraisal Life Span	20 Years

Annex 4: Model Parameters and Assumption for Tax Incentive 4

Article 50j: Tax Credit for Additional Investment in Financing New Equity Investment of 333,333,333 RSD Innovative Start-up Firms (100,000,000 RSD Tax Credit)

1. Equity Financing

Equity Financing (Article 50j)	333,333,333RSD

2. Tax

Corporate Income Tax	15%
Tax Credit maximum amount in a year	50M'RSD
No. of years for the given amount of tax credit	2
Maximum Amount of Tax Credit	100M'RSD
Five Year Period of Tax Credit	5
Annual amount of tax credit for 5-year period	20M'RSD

3. Other

Discount rate	12%
Average inflation rate in Serbia	5.00%

4. Scenarios

Scenario 1; holding shares for 10 years

Scenario 2; holding shares for 6 years

Scenario 3: holding shares for 6 years (cost basis adjusted for tax credit for estimating taxable capital gains)

Annex 5: Model Parameters and Assumption for Tax Incentive 5

Employment Tax Incentive in Serbia

Labor Salary		
	Average monthly salary	60,000 RSD
	Monthly wage *"with incentive"*	48,178 RSD
Employee SSC		
	Pension and Disability Insurance	14%
	Health Insurance	5%
	Unemployment Insurance	1%
Employer SSC		
	Pension and Disability Insurance	12%
	Health Insurance	5%
Tax		
	Personal Income Tax Rate	10%
Labor Externality		
	Supply wage **(Ws)**	31,000 RSD
	Minimum wage **(Wm)**	41,000 RSD
	fraction of the social benefit (as a %)	25%
	0.5 of the gross project wage to the employee (as a %)	50%
	Present value of the fiscal unemployment social benefit $0.25(0.5*(PVW\,'_T))$	5,608 RSD
Other		
	Annual Discount rate	12%
	Monthly Discount rate	0.9488%