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Introduction to the **Ministry of Finance** and its role

The Ministry of Finance supports the government in pursuing sound economic policies and ensures innovation and efficiency in the public sector. This includes the government's Budget Bill and ongoing budget analyses, analyses of macro-economic developments, international economic co-operation, negotiations concerning financial and economic issues with local authorities and the county authorities, and administrative policy contributing to ensuring efficient public institutions. The Ministry thus plays an important role in underpinning economic development through contact with Ministries, agencies, NGOs, and other external partners.

The Ministry of Finance is an analytical power centre, where employees can realise their full potential and develop into leaders of tomorrow. The Ministry of Finance acts as a single corporation and is a role model for efficient management and development of operations in the Danish public sector.

As a newly educated economist employed in the Ministry of Finance, you will get to use both your analytical toolbox and analytical approach, getting to know different interesting fields in the process, and get to apply your general understanding of economic interactions. A large part of the job for an economist employed at the Ministry of Finance is focused on initiatives, reforms, and various policy matters founded on well-rounded analysis that are the hallmark of how we solve problems and attain beneficial solutions.

Tax Policy as a Tool

Taxation in Denmark serves multiple purposes with significant implications. Firstly, revenue from taxation is used to fund public expenditure, and as such has a redistributive effect as wealth is reallocated across society. This redistribution is the result of political decisions, concerning both tax policy as well as direct income transfers or indirect support through investments in healthcare, education, and other public services. Consequently, taxation becomes a tool for policymakers to address societal inequalities and ensure a basic standard of living for all citizens. Furthermore, there may also be other motivations for redistribution, such as economic stability.

Secondly, taxation has a substantial impact on individual behaviour. Policymakers can utilise tax policies to influence important elements of society, such as consumption patterns and employment rates.

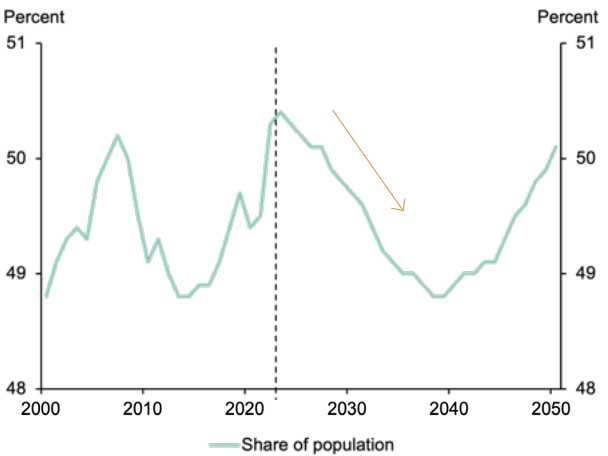
In Denmark, the tax system is characterised by a progressive design, featuring both a lower bracket tax rate and a top bracket tax rate, as well as many different types of deductions. This design allows for the isolation of the effects of tax changes on different income groups, enabling policymakers to tailor their fiscal strategies to achieve desired goals.

A Demographic Challenge

The Danish economy has proved to be relatively robust to recent tests such as a global pandemic as well as war in Europe. However, other challenges are on the rise for the Danish economy. Changes in the demographic composition of the Danish population will result in children and elders making up an increasing share of the population in the coming decades, since the generations leaving or nearing their exit from the labour market are being replaced by much smaller generations. As a result of this, the labour force is expected to constitute a smaller share of the total population.

As children and elders make up a growing share of the population, the demand for public services increases. Hence, it is necessary to increase the supply of labour if we wish to both maintain the current level of public services and ensure growth in the private sector simultaneously. For this reason, it is a political priority to enact reforms increasing the labour supply, thereby strengthening the Danish economy's capacity to grow in the coming years. Enacting a tax reform is one potential tool that will allow the government to achieve their goal.

FIGURE 1: The share of population in structural employment decreases between 2023 and 2040



Source: Denmark's Convergence Programme 2023 Figure 5.3



Consequently, taxation becomes a tool for policymakers to address societal inequalities and ensure a basic standard of living for all citizens.



Economic Turbulence

The current economic situation is characterised by the highest inflation rates in close to four decades. The European Central Bank has raised interest rates and the Danish central bank has followed in an effort to lower demand and reverse real price increases.

During this period of high inflation, households have lowered their propensity to consume, possibly as a precaution, reflecting decreases in real wages. In the coming years, real wages are expected to increase, as the economy adjusts. Likewise, inflation levels are expected to return to ~2% by 2025.

FIGURE 2: Real wage in 2024 is expected to return to 2021 level

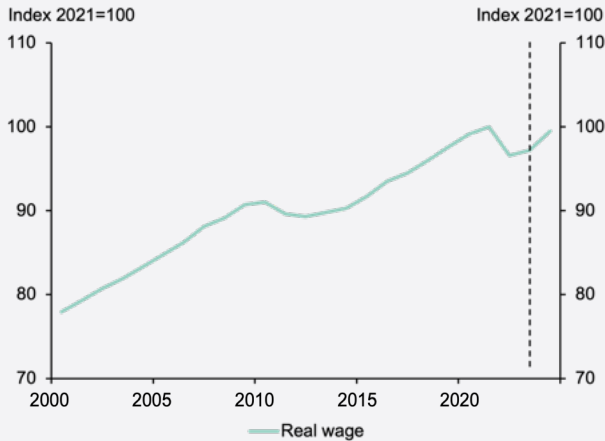
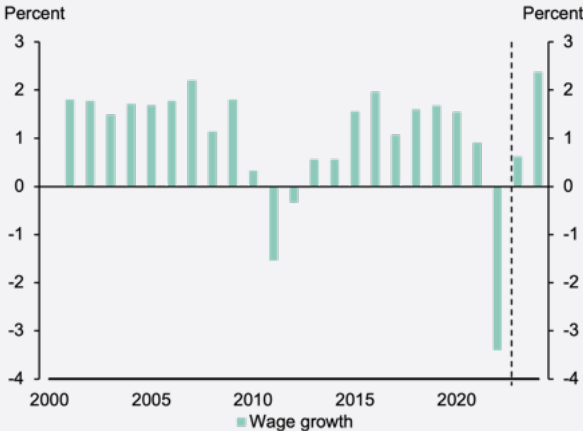


FIGURE 3: Growth in wages



NOTE: The real wage is calculated as the hourly wage in the DA area deflated by the consumer price index.

Source: Economic Survey, August 2023 Figur 3.2

Source: Economic Survey, August 2023 Figur 3.2

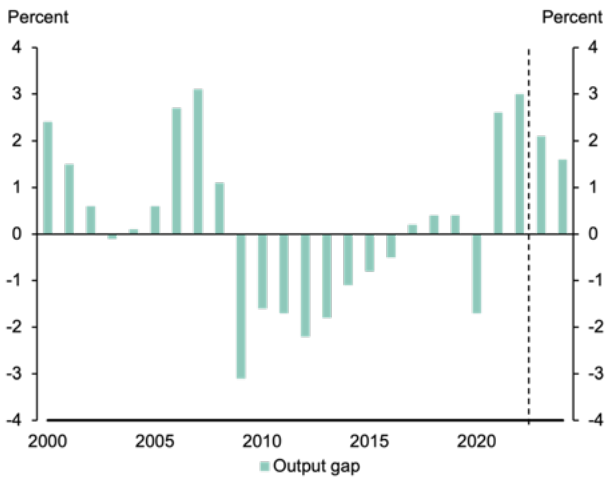
FIGURE 4: Significant decrease in inflation



NOTE: The employment gap is the difference between actual and estimated structural employment.

Source: Economic Survey, August 2023 Figure 5.14

FIGURE 5: Positive output gap

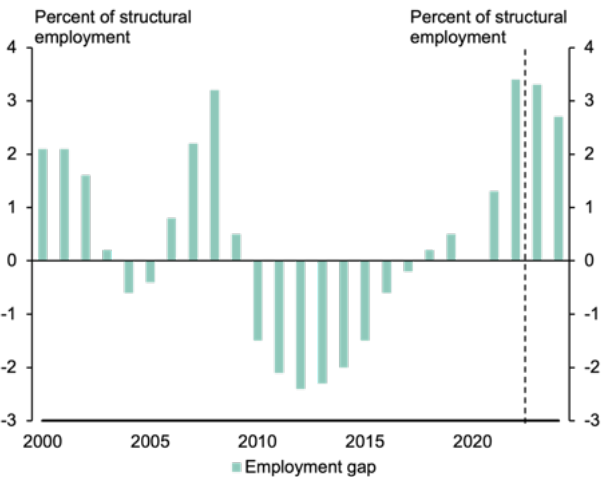


NOTE: The output gap indicates how far output (GVA) is estimated to be from the structural level. Employment is calculated excluding people on leave.

Source: Economic Survey, August 2023 box 1.1 a

In spite of turbulent economic conditions, GDP has continued to lie above its structural level and, in 2022, the output gap was estimated at 3.1% of GDP. An output gap of this magnitude has not been observed since the period leading up to the financial crisis of 2008. For this reason, it is expected that the level of economic activity

FIGURE 6: Despite the slowdown in the labour market, pressure remains high in the forecast period



NOTE: The employment gap is the difference between actual and estimated structural employment.

Source: Economic Survey, August 2023 Figure 5.14

will have to gradually adjust towards the structural level, that is, the level corresponding to stable wage and price developments. In order to achieve a smooth transition, it is important that fiscal policy does not increase inflationary pressure in the coming years.

STRUCTURAL GVA (GROSS VALUE ADDED)

Structural GVA is the long-term economic production, in the absence of short-term economic fluctuations.

STRUCTURAL EMPLOYMENT

Structural employment represents the level of employment in an economy, in which the labour market neither increases or decreases the inflationary pressure. Structural employment is unaffected by short-term economic fluctuations.

OUTPUT GAP

The output gap refers to the distance between the actual production (GVA) and its structural level. A positive output gap indicates a higher than normal production, and can indicate the presence of domestic inflationary pressure.

EMPLOYMENT GAP

The employment gap refers to the distance between employment and its structural level. A positive employment gap indicates that the demand for labour outweighs the structural labour supply, leading to an increase in wages.



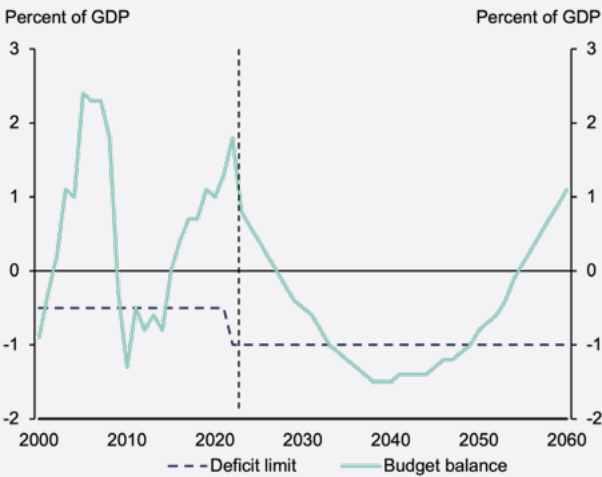
A Lack of Hands and Other Considerations

While employment in 2023 is expected to exceed the structural level, the economic challenges apparent in the coming years make it a priority for the government to increase the structural level of employment. This is the case as the government wishes to ensure the future capacity to maintain public service levels while simultaneously enabling further private sector growth in the future. Danish fiscal policy is planned within the boundaries of the Budget Law and the medium term plans. The Budget

Law states that the annual structural deficits must not exceed the established deficit limit of 1% of GDP. In the medium term, the government has a deficit target of 0.5% of GDP in 2030. This target is set to ensure fiscal sustainability and a sustainable level of long-term debt. Hence, all fiscal policies are proposed with this in mind and any proposed initiatives to increase structural employment would be no different.

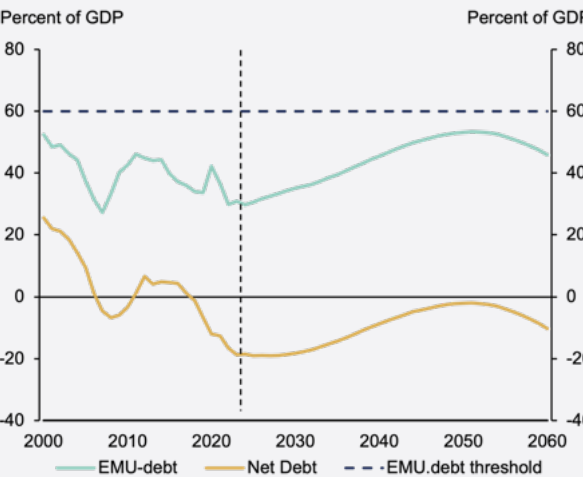


FIGURE 7: Demographic development puts pressure on the budget balance after 2025



NOTE: Actual and structural budget balance is technically assumed equal after 2028.
Source: Convergence Program Denmark Figur 5.1

FIGURE 8: Net debts and EMU debt remains below 60



NOTE: Actual and structural budget balance is technically assumed equal after 2028.
Source: Convergence Program Denmark 2023 Figure 5.2





The Case

Analysing Effects of Tax Reductions

In this year's case competition, you will be stepping into the shoes of the analysts at The Ministry of Finance. You will be working for a fictive government, as described in **Box 1**.

The fictive government has allocated DKK 4b towards reducing income taxes. Your task is to provide the government with a comprehensive analysis of the effects of tax reductions.

Your analysis should be structured into three main components:

- 1) A comparison between the economic impacts of decreasing the lower bracket tax rates and the upper bracket tax rates.
- 2) A proposal for the government, using the information from part one.
- 3) A section that introduces alternative ideas for the government to consider.

Your analysis should inform politicians, highlight key points tailored to their needs, and clearly present the pros, cons, and rationale behind your proposal.



1

Tax Reductions: A Closer Look (65%):

A. CRUNCHING THE NUMBERS:

Calculate the effects of a DKK 4b tax reform directed towards:

- i. Reducing the lower bracket tax rate
- ii. Reducing the upper bracket tax rate

Calculate the size of the reduction in tax rates, measured in percentage points, and the corresponding change in after-tax income for two illustrative individuals. Additionally, calculate general impacts on the economy, including the effects on

- 1) structural labour supply
- 2) the current economic activity (fiscal effect),
- 3) the Gini coefficient, as per the provided background material.

The calculations for this part should be done for the two tax reductions separately.

B. CHARTING THE UPS AND DOWNS:

Compare the economic impacts of the two reform options (i and ii) from your calculations and outline their strengths and weaknesses. Your comparison should describe relevant trade-offs between the two illustrative reductions.

2

Striking the Balance: Tailored Tax Reform Proposals (20%):

Drawing upon the advantages and disadvantages highlighted in question 1, formulate a tax reform that aligns with the government's objectives (see Box 1: Fictive government objectives) and takes into account the information provided about the economy. Address the trade-offs of the reform and explain the reasoning behind your prioritizations. Your explanation should comment on which measures are most relevant when evaluating a tax reform. You can calculate additional effects beyond those found in question 1.

3

Broadening the Horizon (15%):

Propose additional initiatives by which the government can increase structural employment. You can use the additional data in the background material or find your own online. You are allowed to think outside the box, but should consider whether your proposed initiatives are politically viable.

BOX 1: FICTIVE GOVERNMENT OBJECTIVES

In the realm of national governance, balancing different interests poses a significant challenge. In this case, you will be working for a fictive coalition government, consisting of The Progressives, The Innovation Party, and the Knowledge Party. Each group has its distinct beliefs and priorities, but they all share a commitment to effective governance.

The Progressives are focused on *societal equity*. They see the value in tax reductions but are adamant that these cuts benefit everyone, not just the wealthy. Their concern is that every individual, regardless of their background, should have access to a fair and just distribution of resources and opportunities.

The Innovation Party, known for its emphasis on economic growth, is concerned about the coming *demographic shifts*. With an ageing population,

they see an urgent need to address the balance between the labour force and the total population. They are concerned about the potential economic and social impacts if these issues remain unaddressed.

The Knowledge Party is increasingly alert to the country's economic situation. Their analysis indicates *potential risks if the economy grows too quickly*, which could lead to a wage-price spiral. They're deeply engaged in the question, "How can we foster economic growth without overburdening the system?"

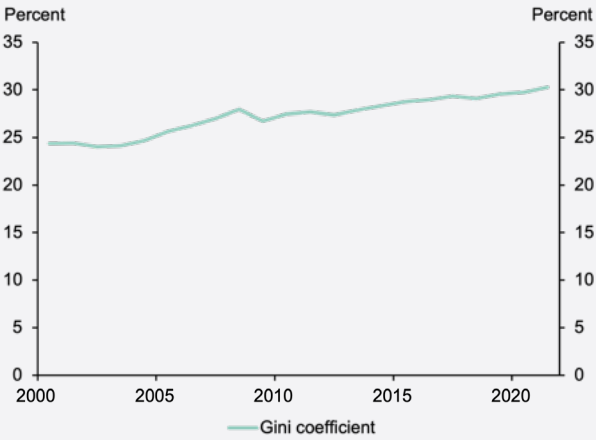
The strength of this coalition lies in their collective effort. While each party brings its unique concerns to the table, their shared goal of ensuring a prosperous future means they must find common ground and collaborate effectively.

Background Material

Inequality

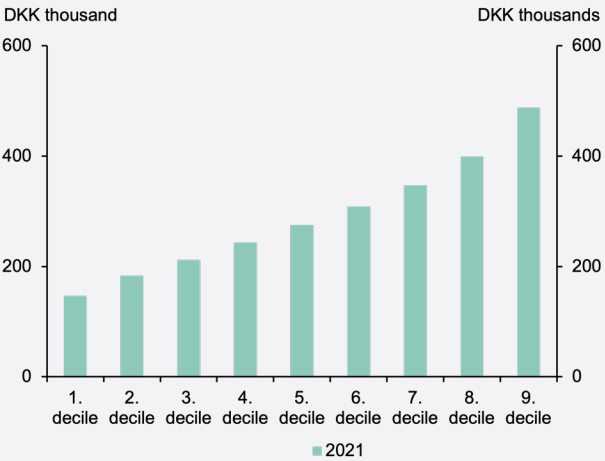
One of the key tools used to measure and assess economic inequality is the Gini coefficient. This statistical metric quantifies the extent of income disparities within a given population, offering critical insights into the overall well-being and stability of a society.

FIGURE 9: Inequality in income (by gini) slowly increasing



Source: Statistics Denmark IFOR41

FIGURE 10: Inequality measured by decile cut-offs on equivalised disposable income



Income deciles serve as a useful tool in quantifying economic inequality. By classifying the population into ten equally-sized groups based on income, we can discern the extent of disparities and identify areas where intervention is needed. This segmentation not only provides a clear snapshot of inequality but also illuminates targeted policy avenues to uplift marginalised communities, fostering a more cohesive and inclusive society.

Equivalised income takes into account differences in household size and composition, and acts as a vital gauge for measuring inequality. This adjustment enables meaningful cross-comparisons, emphasising the need of tailoring economic policies to suit various family structures. By accounting for these variations, we gain a more accurate understanding of how economic resources are distributed, paving the way for more effective policies that address inequality at its root.



The Danish Budget Act

The Danish Budget Act serves as a fundamental framework for fiscal planning and accountability in Denmark. This legislation mandates a multi-year budgeting approach, requiring the government to present four-year expenditure ceilings to the Danish Parliament. The Budget Act also establishes guidelines for responsible fiscal management, including rules for budget deficits and debt levels, ensuring transparency and sustainability in government finances.

Notably, it is based on the concept of the structural budget balance, which is the actual budget balance adjusted for economic fluctuations and temporary effects, aiming to gauge the structural health of public finances. As such, the impact of new measures on the structural balance corresponds to the structural revenue of the measure, i.e. the revenue after accounting for changes in behaviour and dynamic effects. The Budget Act sets clear deficit limits, stipulating that the structural deficit must not exceed 1% of GDP, thereby preventing excessive borrowing and safeguarding fiscal stability.

Danish fiscal policy is planned through medium term plans, which define a set path for the structural budget balance in the medium term. The current medium term plan sets a medium term target of a structural deficit of 0.5 percent of GDP in 2030. The structural budget balance path defines the fiscal space, i.e. how much money the government can spend and still adhere to their targets. As the fiscal space is calculated from the structural budget balance, the effect on the structural budget from initiatives will have an equal impact on the fiscal space¹.

The Danish Budget Act plays a pivotal role in maintaining the country's fiscal discipline and ensuring sound economic governance. Therefore, when introducing the new tax proposal, it must be founded to be in accordance with the law.

¹ In actual fiscal planning, it is also possible to propose a new path for the structural budget balance alongside a medium term plan. However, you are to disregard this option when solving this case.

Calculation Principles

Calculation principles are the methodological standards or guidelines that the ministries adhere to when making fiscal projections or assessments. In the Excel sheet provided you are given the results of the calculation principles which you can use to calculate effects.

1 Balancing budget and calculating the change in tax rate

When balancing the government budget there are two relevant revenue terms:

GOVERNMENT REVENUE DEFINITIONS:

- ▶ **Rev_{Direct}:** Direct revenue
The effect on the government budget without accounting for changes in behaviour and dynamic effects.
- ▶ **Rev_{Structural}:** Structural revenue
The effect on the government budget after accounting for changes in behaviour and dynamic effects.

Danish fiscal policy is planned with regard to the structural budget balance. For this reason, it is the structural cost of a political initiative (e.g. a tax reduction) that is relevant when calculating the budgetary impact of the initiative. In this case, we will assume that there has been allocated funds totalling DKK 4b for tax reductions. That is, a decrease in the Rev_{Structural} of DKK 4b. The DKK 4b will be deducted from the fiscal space for the budget to balance.



Calculating the revenue:

Sheet 1. Revenue conversion in the Excel sheet shows the relationship between structural and direct revenue and can therefore be used to calculate the change in direct revenue associated with the tax proposal and the corresponding change in the tax rate.

Notes on calculations: The table shows the effect following hypothetical tax reductions corresponding to DKK 1b in direct revenue. Assume a linear relationship when extending your calculations².

The relationship can be seen as:

$$\Delta \text{Rev}_{\text{Direct}} \cdot \alpha = \Delta \text{Rev}_{\text{Structural}}$$

Where alpha is the scaling between the two terms, and describes the budgetary impact of dynamic and behavioural effects. If a measure increases labour supply, alpha will typically be less than one.

2 Calculations using the Tax Economic Survey data

Once the decrease in direct revenue is calculated, you can use Sheet 2.a Labour supply and Sheet 2.b Income and inequality, which show the economic effects of marginal changes in taxes and other initiatives. The data comes from the *Tax Economic Survey*, which is a report by The Danish Ministry of Taxation. The tables show the effect of spending DKK 1b in direct revenue on different initiatives.

As in the previous calculations, assume that the relationship between revenue and the economic effects is linear.

Calculate the effect the tax reform has on:

- i. Total labour structural supply
- ii. Tax rates
- iii. Gini coefficient

When considering the effects of tax changes on labour supply, a distinction can be made between substitution and income effects based on microeconomic theory as well as empirical evidence. Substitution effects occur when individuals alter their consumption or work behaviour in response to changes in relative prices such as tax rate adjustments. In relation to income tax, a tradeoff exists on the margin between consumption (i.e., working more) and free time. Income effects, on the other hand, stem from changes in overall income resulting from tax modifications. If the overall level of taxation is lowered, and marginal rates are unaffected, individuals will increase both consumption and free time.



Structural labour supply effects are also divided into labour hour effect and participation effect. The labour hour effect is the reaction of employed persons that increase their working hours. The participation effects are people not in employment that become employed as a result of the tax reform. Both effects are measured in Full Time Equivalents (FTE), i.e. 1 person is equal to 1642.8 hours.

The tables include more information than needed. You are not required to calculate these effects but you may want to explore some of them based on what you deem relevant, when proposing your specific tax reform.

² This simplification is justified in that there may be a local linear relationship.

3

Fiscal Effect

It is not desirable for the government to overheat the economy. Therefore, they are interested in calculations regarding the effects on the business cycle. The one-year fiscal effect is a measure of the contribution of the fiscal policy to changes in output gap in a single year.

Danish fiscal policy is planned according to the structural budget balance path determined in the medium term plans. Unallocated funds in the medium term plans are part of the fiscal space, and are technically assumed to be spent on public consumption unless otherwise specified. Consequently, a tax reform funded by the fiscal space will technically result in a decrease in public consumption relative to the baseline.

Sheet 3. First year multipliers show the demand effect on the output gap of spending 0.1% of GDP in Rev_{Direct} on different initiatives, calculated in MAKRO³, including the effects of increasing structural labour supply.

4

Effect on Income for Illustrate Individuals

An important calculation to consider when changing tax rates is the actual effect on individuals' income after tax. This is a complicated calculation, due to the intricacies of the tax system. Sheet 4. Familietype is based on the ministry of finance's model calculations.

It calculates the income after tax for the 2 illustrative individuals; a worker and a manager. The calculations are tedious and therefore you are merely asked to change the tax rates in the sheet and compute the effects.

The table below shows key assumptions regarding the current planning of fiscal policy

	2022	2023	2024
Structural budget balance, percent of structural GDP	1,8	0,5	0,4
Actual budget balance, percent of GDP	3,4	2	1
Public consumption growth, per cent 1)	-3,6	1,5	2,1
Multi-year fiscal effect, level, percentage points 2)	0,9	-0,3	-0,4
One-year financial effect, percentage points 3)	-1,5	-1,1	0
Output gap, ... 4)	3	2,1	1,6
Employment gap, percent 4)	3,4	3,3	2,7
EMU debt, percent of GDP 5)	29,5	30,8	29,6
Net wealth, percent of GDP	16,4	18,6	18,9

Notes:

- 1) The estimated growth in public consumption is assumed to be the same using the input and output methods, respectively. For 2022, the growth in public consumption is shown by the input method.

2) The multi-year fiscal effect is a measure of how much changes in fiscal and structural policy affect the output gap (level effect relative to 2019).

3) The one-year fiscal effect is a measure of how much the planned fiscal and structural policies contribute to changes in the output gap in a given year.
- 4) Calculated measure of how far output and employment are from their structural levels. When the gaps are positive, it indicates that there are scarce resources in the economy relative to a normal

5) EMU debt as a percentage of GDP is estimated to increase from 2022 to 2023 despite an estimated actual government surplus in 2023. This reflects - in addition to an estimated decline in the GDP deflator and thus nominal GDP in 2023 - the size of government bond issuance in 2023, which is affected by, among other things, a political agreement to postpone corporate tax payments from 2023 to 2024.

³ MAKRO is the model used by the Ministry of Finance for impact assessments of economic policy measures and other shocks to the economy.

Source: Economic Survey, August 2023



Rules and regulations

- 1. Evaluation Criteria:** In the Polit Case Competition 2023, your performance will be assessed exclusively by the panels of semi-finale and finale judges. They will base their judgement on your oral presentation, accompanying slide deck, and the ensuing Q&A session. Your analysis and solution, including the decisions made and how they are substantiated, will be considered in the evaluation.
- 2. Submission Deadline:** Your presentation slide deck, formatted in 16:9 aspect ratio, must be submitted as a single PDF file through pcc-impact2023.innoflow.io no later than 18:30. Late submissions will not be taken into consideration.
- 3. Slide Deck Limitations:** Your presentation slide deck must not exceed 10 slides, inclusive of the front page. Any supplementary documents are neither obligatory nor considered in the assessment.
- 4. Original Work Requirement:** All content presented must be the original work of the group. In addition to the case information and expert interviews, you may utilise any publicly available information. However, external assistance or communication with other teams between 10:00 AM and 18:30 PM is strictly prohibited.
- 5. Presentation Duration:** The oral presentation should not surpass 10 minutes.
- 6. Organisational Inquiries:** For any organisational questions, please contact any member of the Polit Case Competition staff either in person or via email at info@politicasecompetition.com. Please note that we are unable to provide input on the case contents.
- 7. On-Site Case Resolution:** The case must be addressed on the premises provided as part of Polit Case Competition 2023.



Acknowledgements

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GOOD LUCK