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INTRODUCING A PERSONAL INCOME TAX IN A SMALL OIL-RICH GULF ECONOMY: INCIDENCE, EFFICIENCY AND EQUITY

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Abstract

Oman has a growing population and a heavy reliance on the oil and gas sectors that has witnessed low oil prices in recent years. This has contributed to a fall in government revenue per person and a deterioration in the government's fiscal position. A personal income tax (PIT) may provide the government with a mechanism to raise revenue and address the budget deficit. However, the introduction of a PIT will also change the post-tax return to factor income and saving and thereby create distortions in economic activity. Furthermore, depending on the design aspects, e.g., progressive versus flat tax rates, the effects will vary on households located in different parts of the income distribution. We assess these effects using a dynamic computable general equilibrium model that reflects the current structure of the economy and captures the heterogeneity of household income and expenditure. The analysis considers a number of design criteria. The results show that the introduction of a PIT system lowers the post-tax return to labour relative to capital and thus makes the economy more capital intensive; there is a modest long-run impact on GDP of less than 0.2%. Distributional effects are highly dependent on the size of the tax-free threshold. The results also show that a PIT has good revenue-raising ability even with a high-income threshold (>OMR 30,000) and low tax rate (10%).

Keywords: computable general equilibrium analysis, personal income tax, tax efficiency, tax incidence, tax policy, tax equity.

JEL codes: C68, D31, H24.

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1. Introduction

Oil and gas are the most important commodities in Oman like most Middle East countries. They account for more than a third of gross value added. Most of the oil and gas reserves are owned and managed by the Omani government. Their production contributes more than 70% of total government revenue. The declining oil and gas reserves, low recent oil prices and the impacts of the COVID-19 pandemic have put pressure on the economy and the government's fiscal position. The Omani government has outlined several key measures in its 2020-2024 Medium-Term Fiscal Plan to regain fiscal sustainability in the years to come. These policy measures include the introduction of a value-added tax (VAT), a roll-back of electricity subsidies and a personal income tax (PIT) for high-income earners (IMF, 2021). The government began implementing the first two polices in 2021 while the introduction of a PIT system is currently being studied (Al-Monitor, 2022). An interesting matter for policy evaluation therefore is the quantification of the economic costs and benefits of implementing a new PIT system and its socioeconomic impacts. We address this matter in this paper.

A PIT would provide the government with an additional mechanism to raise revenue and address the budget deficit, thus enabling the continued provision of goods and services, and an enhanced ability to redistribute income. However, the introduction of a PIT will create changes in behaviour on how much one chooses to work and invest subsequently altering the level of employment and industry activity in the economy. Such behavioural changes create inefficiencies that can reduce economic welfare. Moreover, individual and households can be impacted through the following channels: (1) a direct impact on incomes depending on the policy design (e.g., tax-free thresholds, taxable income types, exemptions and taxation rates); (2) an impact on the prices of goods and services that consumers purchase, as businesses incur additional costs if they adjust salaries to continue to attract workers; and (3) an impact on workers in industries that supply consumer goods and services, as individuals receive reduced after-tax income and choose to consume less as a result.

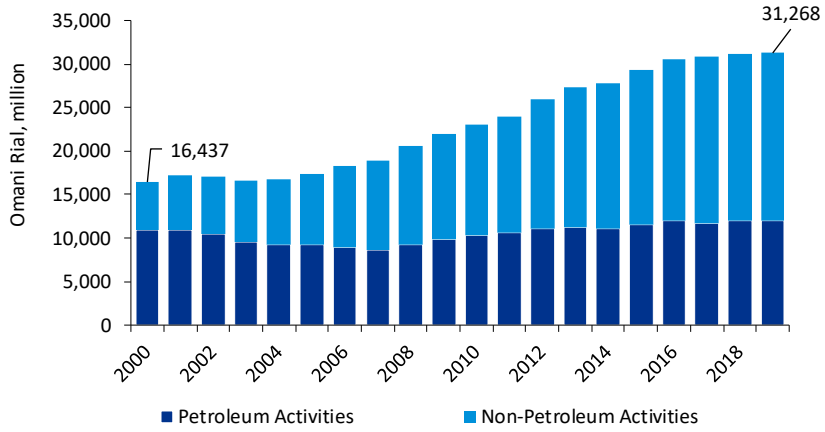
This paper provides insights on the potential economic impacts relating to incidence, efficiency and equity of the introduction of a PIT system in Oman. Applying a dynamic computable general equilibrium (CGE) model of the Oman economy, the analysis provides detailed estimates of the impact of a PIT on industries, on households, and on the government budget. While our paper focusses on Oman, these impacts are of much wider relevance as such tax policy reforms are being considered in many Gulf oil-exporting countries.

The results show that, in general, the introduction of a PIT system lowers the post-tax return to labour relative to capital and makes the economy more capital intensive; there is a modest long-run impact on GDP of less than 0.2%. Distributional effects are highly dependent on the size of the tax-free threshold. As expected, the magnitude of socioeconomic impact increases modestly as the scope of the PIT system increases. Our results also show that a PIT has good revenue-raising ability even with a high-income threshold (>OMR 30,000) and low tax rate (10%).

2. The Oman economy

Oman has experienced strong economic growth in the past two decades (Figure 1). With annual average growth of 3.5% over this period, Oman's GDP was approximately OMR 31 billion in 2019. Although the Oman economy is still quite reliant on the oil and gas sector, relatively low oil prices since 2015 have restrained economic growth. To reduce the country's economic dependence on oil- and gas-based revenue the government launched the Tanfeedh initiative in 2016 geared towards diversifying revenue streams into the manufacturing, tourism, transport, logistics, fisheries and non-oil and gas mining sectors. Figure 1 shows that non-petroleum activities have become a larger share of GDP in recent years. In 2019, more than a third of GVA derived from petroleum activities (33%) while the remainder derived from services (47%), manufacturing (18%) and agriculture and fishing activities (2%).

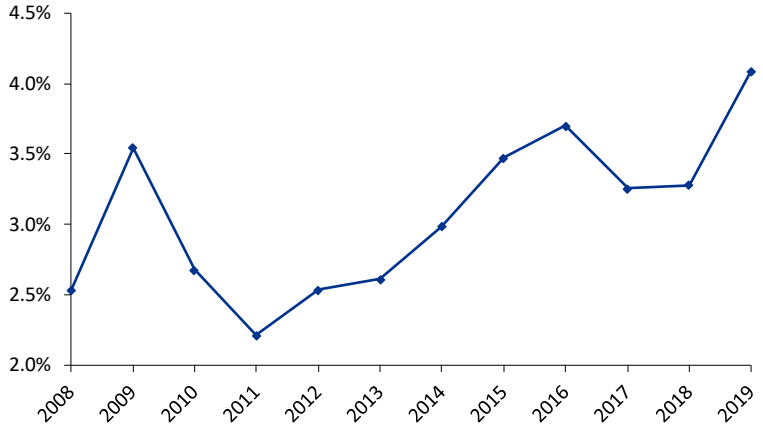
Figure 1 Gross domestic product (constant prices)



Source: National Centre for Statistics and Information (NCSI)

Tax revenue as a share of GDP has been rising steadily over the past decade. Figure 2 shows that this share was approximately 2.5% prior to 2012 increasing to 4.1% in 2019. Corporate taxes and consumption taxes are the main sources of government tax revenue. In 2019, taxes on corporate income contributed 52% to total tax revenue while taxes on goods and services contributed about 17%. Oman does not currently tax the personal income of individuals except for withholding taxes on non-residents and income tax on proprietary establishments (both of which are covered under corporate income taxes).

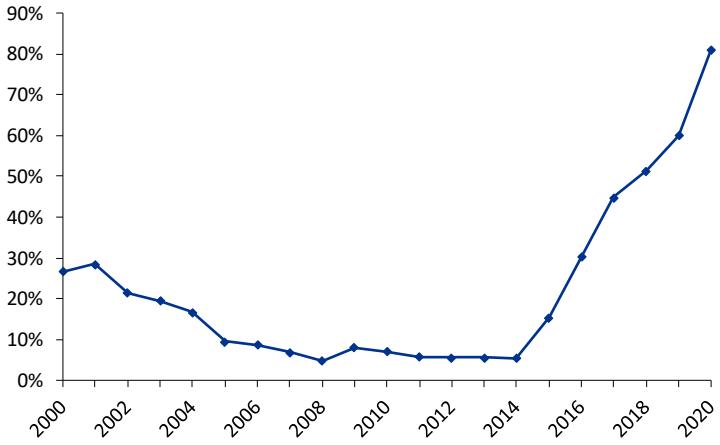
Figure 2: Tax revenue as a share of GDP



Source: NCSI

Although tax revenue has increased as a share of GDP, the budgetary deficit in Oman has also increased from 3.4% of GDP in 2014 to 8.9% of GDP in 2019. This is largely due to a dip in revenue from lower oil prices since 2015 that was not accompanied by a similar decrease in expenditure. As a result, public debt in Oman rose from 15% of GDP in 2015 to an estimated 81% of GDP in 2020 as shown in Figure 3. The rise in public debt is attributable to both the volatility of oil prices and challenges in raising revenue from non-oil sectors. The COVID-19 pandemic and the drop in oil prices placed unprecedented pressure on Oman's economy, with World Bank data indicating Oman's real GDP contracted by 3.38% in 2020. Non-oil revenues only make up about a quarter of total government revenue and inflation dropped below zero to -0.90% in 2020 (World Bank, 2021).

Figure 3: Public debt to GDP



Source: U.S. Federal Reserve Economic Data

Against a backdrop of a deteriorating budget balance and rising public debt in Oman, a VAT was introduced in April 2021. Oman has also announced that electricity subsidies will be gradually reduced from January 2021 with the aim of complete removal by 2025. From the 2020 budget, subsidies for electricity and water are estimated to be $1.95 billion and the electricity subsidy bill alone is

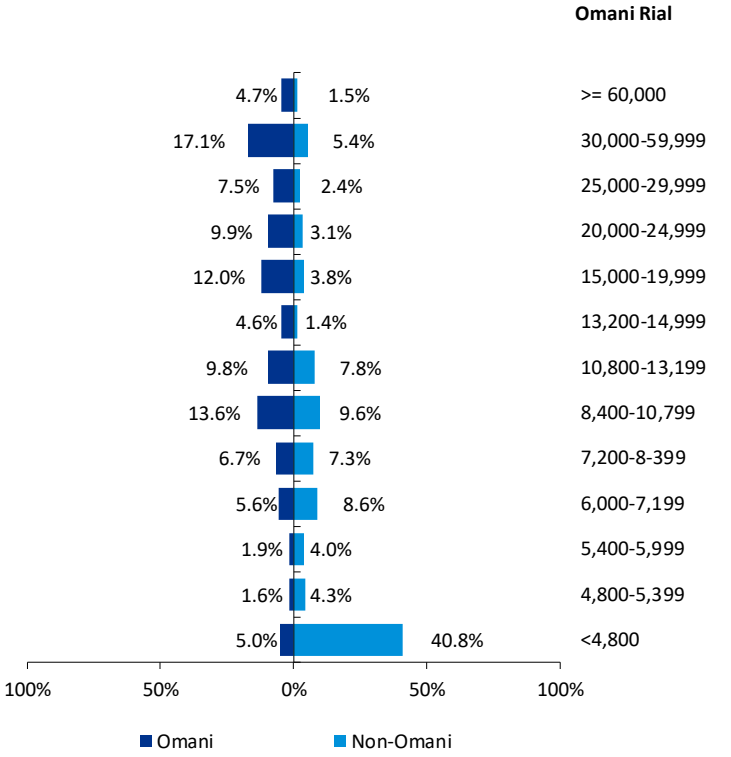
estimated to make up approximately 5% of the budget (Bloomberg, 2020). The Omani Government is now also investigating the introduction of a PIT. It is hoped that the proposed PIT might assist in addressing the budgetary deficit.

The employment rate in Oman is high with around 62% of the population employed in 2019. This provides a relatively stable base upon which to implement a tax. However, there are variations in income types, industries and levels of employment within the different households in Oman, which means that different PIT designs will likely have different impacts on different household groups. For example, a large proportion of Omani workers are employed in the public sector. In contrast, almost a third of all non-Omani workers are employed in the construction sector, with another 40% almost evenly shared across manufacturing, wholesale and retail trade, and private households employing staff. This difference in industry employment across nationalities is one of the factors likely contributing to differences in household incomes across nationalities.[1]

Figure 4 indicates that around 22% of Omani households and 7% of non-Omani households are in the two highest income brackets (earning 30,000 or more Omani rials (OMR) per year). Another 17.4% and 5.5% of the Omani and non-Omani households are in the next two income brackets earning OMR 20,000 to OMR 29,999. Moreover, Figure 5 shows that almost 45% of household income in Oman is wages. Among non-Omanis, it appears that income is almost exclusively derives from wages. While Omanis are also eligible for pensions, income from these payments only make up around 13% of aggregate household income. Rental income accounts for a similar proportion of household income. Dividends are significant, contributing around 17% of household income. Other types of income including capital gains, foreign income and interest earnings, make up only a very small share of aggregate household income. This indicates that the biggest contributor to a PIT would likely be through its application to wage income, pensions, rentals and dividends.

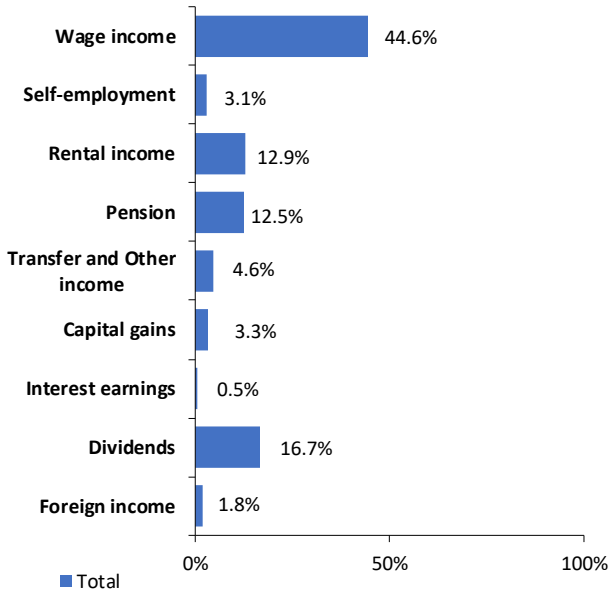
[1] The workforce in Oman contains a substantial non-Omani cohort representing around 70% of all employees in 2022 (Oman National Centre for Statistics and Information). Non-Omani workers mainly originate from India, Bangladesh, Pakistan, and Sri Lanka.

Figure 4: Household annual income by nationality, 2018-19



Source: Authors' estimates based on the Household Income Survey and Census data

Figure 5: Share of aggregate income by income source



Source: Authors' estimates based on National Accounts, Household Income Survey, Census, and Balance of Payments data. Note that foreign income only captures the foreign earnings that are repatriated to Oman.

3. PIT design options

As part of the introduction of a new tax system, decisions will need to be made regarding the particular tax design. For example, these include whether to apply PIT at the individual or household

level, how broad the tax base should be, what types of deductions are allowed, and whether to have a progressive or flat tax rate with or without a tax-free threshold. This section looks at two PIT design options for Oman, discussing them in terms of the design features.

3.1. Income tax base

There are two PIT policy options considered in this analysis and these are summarised in Table 1. A key difference between these two options is the scope of the tax base.

Option 1 is a PIT system with limited territorial scope. The tax is imposed on individual income from Oman-source employment, self-employment, and property rentals. Having income tax related only to Oman-sourced income under this option will assist in retaining Omanis working in foreign jurisdictions. Such a PIT system is also simpler to implement and thus incurs lower administration costs. Note that this PIT option includes rental income as part of the tax base, which leads to a lower post-tax return on capital invested in real estate. A disadvantage of this option is the possibility of tax avoidance by redirecting earned income into investment income (other than property income) and capital gains. This is done through 'vesting' of income that is then paid as company shares. When people have shares or company ownership, profits are retained rather than paid as wages and employees sell their shares or ownership interest at a later date for a capital gain or dividend payments.

Option 2 has a full territorial and worldwide scope. The tax base includes those income sources in Option 1 but with an additional scope of taxing income earned from Oman-source interest, dividends and capital gains as well as overseas earnings. This option corrects some of the potential methods of tax avoidance as discussed above, i.e., the ability for companies to retain profits and pay out wages to employees indirectly through capital gains or dividends. This also reduces the incentive to become self-employed to take advantage of tax incentives via capital gains. Moreover, an Omani PIT with a worldwide scope like Option 2 aligns with many other countries' tax policies, i.e., it includes both labour and capital income earned by tax residents within, as well as outside of, Oman in the PIT tax base). Shum et al. (2017) examined the taxation system of 134 countries and found that 104 of these countries opted for a worldwide income tax system over a territorial one.

As noted by Wade (2006), existing tax systems like Option 2 tend to be hybrid systems rather than pure worldwide systems, as most allow for exemptions and credits. A worldwide income taxation system is more appealing from an equity perspective as it requires all taxpayers in a jurisdiction to pay taxes based on their 'ability-to-earn' (McLaren, 2009). There are two inequitable consequences as a result of excluding foreign-sourced income. First, the tax burden falls on those who are unable to move capital offshore. Second, it creates an even greater incentive to earn foreign-sourced income.

Table 1. Tax policy options

Options	Tax base	Advantages	Disadvantages
Option 1: Limited territorial scope	▪ Income earned through Oman-source employment, self-employment, rentals (real estate and other rentals), pensions, transfers and other income.	▪ Tax-free threshold reduces administrative costs and exempts individuals who receive welfare payments ▪ Tax deductions allowed are capped for self-employed and rental income, minimising the impact on the tax base ▪ Simple to administer and requires fewer resources	▪ Relatively narrow tax base ▪ Changes behaviour (and creates deadweight loss (DWL)) in labour market ▪ Incentives to relocate or to redirect income into capital gains ▪ Tax may push up cost of rent in future
Option 2: Full territorial scope	▪ Income earned through Oman-source employment, self-employment, rentals (real estate and other rentals), pensions, and transfers and other income. ▪ Income earned on Oman-source interest, dividends and capital gains. ▪ Income earned and capital gains derived from outside Oman. Non-residents are taxed solely on Oman-sourced income.	▪ Tax-free threshold reduces administrative costs and exempts individuals who may be receiving welfare payments ▪ Tax deductions allowed are capped for self-employed and rental income, minimising the impact on the tax base ▪ Has a broader tax base, reducing avenues for tax avoidance ▪ Requires a lower tax rate to raise the same revenue as Option 1 ▪ Vertical equity	▪ Tax may push up cost of rent in future ▪ Changes behaviour (and creates DWL) in both labour and capital markets ▪ Incentive for labour to relocate to lower tax jurisdiction ▪ Higher compliance and administration cost

3.2. Flat and progressive tax rates

Taxes can be applied on income at a flat rate or at progressive rates. Under a flat rate, a single tax rate is applied on all income while a progressive tax rate applies graduated rates across income tax brackets; as income rises, the rate of tax paid increases as well. A flat tax rate applies a constant proportional rate of income taxation. In contrast, progressive tax rates apply an increasing rate to higher income, such that high-income earners pay a larger share of their income in taxation. Decisions as to which of these tax structures are optimal relies on how society views vertical equity, which will differ across jurisdictions. Both types of tax systems have their advantages.

Flat tax systems are often favoured as they are simpler, are more likely to see higher compliance and have smaller distortionary effects. Whenever there is a non-linear element to taxation policy, there will be an incentive to 'shift income' to another category. Progressive rates provide an incentive for

high income earners to move income to other parts of the taxation system, which offer lower tax rates. Progressivity is only one element that adds to the complexity of a tax system. The existence of deductions, allowances and credits are less transparent and would add to compliance costs.

However, there is some evidence that progressive tax rates are able to reduce income inequality in an economy. Several studies have found evidence of this in the context of low-income Eastern European countries (see Popescu et al., 2019, Barrios et al., 2019, World Bank, 2017). Popescu et al. (2019) find that the introduction of a progressive PIT in Romania reduces the Gini coefficient by 0.53% and reduces employee poverty rates by 1.6%. In contrast, Benczúr et al. (2018) find that inequality rose by four times in Hungary as a result of tax reforms under a flat tax system, although changes to unemployment assistance and employer contributions may have also contributed to this result.

For each PIT design option analysed in this paper, sensitivity with respect to a flat or a progressive tax system is included in the analysis to assist in understanding the implications in Oman.

3.3. Complexity, compliance and revenue

The PIT design options considered in this paper allow for a tax-free threshold, and this is expected to help to remove complexity in the system and reduce tax compliance costs. It assists many low-income individuals from having to incur additional costs of complying with the taxation system. A higher tax-free threshold also helps to exclude many people receiving welfare payments from having to submit returns and pay tax. However, if there is a revenue target in mind, the narrowing of the tax base, whether from the introduction of a tax-free threshold or tax offsets, translates into a higher tax rate required to achieve the revenue target. A sensitivity test is also conducted with respect to changing the taxable income threshold level.

4. Methodology

Almost all taxes distort economic behaviour and thus lead to welfare or deadweight losses, also known as the excess burden; this is an efficiency measure of a tax. The losses relate to the quantity and price changes due to the tax: with a downward-sloping demand curve and perfectly elastic supply curve a tax will reduce the quantity (Q) and increase the user price (P) of a good. In a simple model the deadweight loss (DWL) will equal $\frac{1}{2}\Delta Q \Delta P$, a result first derived by Harberger (1962). Harberger (1962) also showed that a general equilibrium framework is the preferred approach to analysing tax changes. Partial equilibrium analysis of tax changes can only capture first-round effects whereas a general equilibrium framework also captures second-round effects and the interactions across different taxes that are a feature of modern economies. Goulder and Williams (2003) investigate the degree of interaction between first-round and later-round effects and find that ignoring general equilibrium effects can underestimate the marginal excess burden of commodity taxes by a factor of 10. Consistent with the tax efficiency literature, the economic effects estimated here are derived by applying a dynamic

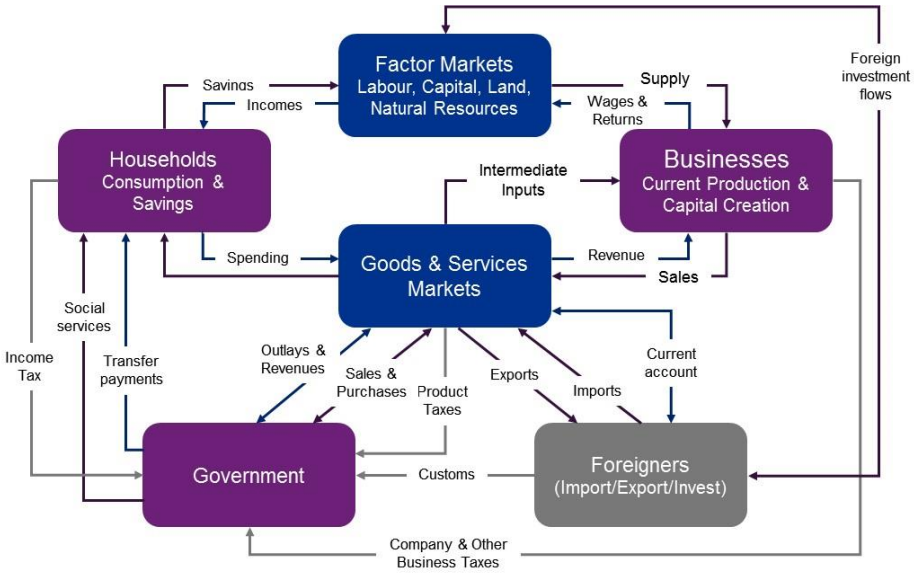
CGE model with a high degree of sectoral detail and a comprehensive representation of the current Oman tax system.

4.1. Model features

The model represents the economy as a system of interdependent economic agents operating in competitive markets. Thus it represents the supply and demand side of commodity and factor markets in which five broad categories of representative agents operate – producers, investors, households, governments and foreigners. Figure 6 is a stylised illustration of the interrelationships represented in the model; a formal description of the model theory is presented in Verikios et al. (2021).

Economic theory is used to specify the behavioural and market interactions of economic agents operating in domestic and foreign goods, capital and labour markets. An important feature of the model is the representation of households in different income groups, which is crucial in representing a threshold level of income tax rates.

Figure 6. System of relationships between economic agents in the CGE model.



Key theoretical features of the model include:

- optimising behaviour by households and firms in the context of competitive markets with explicit resource constraints and budget constraints;
- the price mechanism operates to balance markets for goods and capital;
- the labour market operates with a degree of friction so that some labour is always unemployed, but the rate of unemployment is held constant in the long run;
- marginal costs are equal to marginal revenues in all activities; and
- input substitution possibilities are allowed for in production.

The model combines data (from input-output tables, national accounts, household surveys and other sources) with underlying microeconomic theory to quantify complex outcomes such as price and

wage adjustments driven by resource constraints, household spending, government spending, and taxing adjustments that are driven by budget constraints.[2]

The model is dynamic, which means it can generate results that show the time path of economic effects. Dynamic CGE models can accommodate the temporal adjustments of economic variables, such as the accumulation of capital stocks and net foreign liabilities over time, and lagged adjustment mechanisms in the labour market.

4.2. Simulation design

In simulating the effects of introducing a PIT system involves running the model twice to first run a baseline (or business-as-usual) scenario and second to run a tax policy scenario. In assessing the economic impacts, the results of the counterfactual scenario (tax policy scenario) are compared against those of the baseline scenario. These two scenarios are implemented as follows.

Baseline scenario. The baseline represents an estimate of how the size and structure of the Oman economy will evolve in the absence of a PIT system. In this baseline, the paths of most macroeconomic variables are exogenous and set in accordance with available forecasts or based on historical growth rates. Using time-series data, we project forward the long-run trend of economic variables from 2022 to 2051. The economy converges to a balanced growth path where all quantities and prices grow by the 20-year average growth rate of GDP (3.5%) and consumer prices (2.4%). Population is projected to grow at 2.2% per annum (p.a.) with labour productivity growth forecast to be 0.9% p.a.

Policy scenarios. The alternative PIT options are implemented in the policy simulation by imposing a positive PIT. Two policy scenarios are modelled that differ in scope as summarised in Table 2. In each of these policy options, the central case is a 10% tax rate. This tax rate applies to all income groups whose earnings are above the tax-free threshold level of over OMR 30,000 a year. So, the central case for all both policy options is a flat tax rate of 10% for all earnings >OMR 30,000 p.a.. Sensitivity tests are conducted on this central case with respect to the level of tax rate and taxable income threshold.

Table 2. Policy scenarios simulated

Tax base	PIT Option 1	PIT Option 2
Wage income	✓	✓
Self-employment income	✓	✓
Rental income	✓	✓
Pension	✓	✓
Transfer and other income	✓	✓
Interest	✗	✓
Dividends	✗	✓
Capital gains	✗	✓
Foreign-sourced income	✗	✓

[2] More details on the model theory and database are provided in Appendix A and B.

The income tax bases are described as follows.

- *Wage income.* Wage income refers to the compensation of employees published in the National Accounts equal to approximately OMR 10 billion in 2018. This has been projected forward to about OMR 12 billion in 2022 using the CGE model and data on the employment, GDP and industry growth.
- *Self-employment income*. Self-employment refers to sole proprietors who conduct income earning activities without a registered commercial establishment. Income raised from self-employment in Oman is estimated to be OMR 849 billion in 2022.
- *Rental income*. In 2022, Gross Operating Surplus (GOS) has been estimated from the National Accounts equal to OMR 18 billion. This refers to profit and other returns to capital in the economy. To identify the rental income associated with GOS, the following adjustments have been made: (i) Income to Government Industries has been excluded (removing OMR 10.8 billion or approximately 60%, leaving OMR 7.2 billion); and (ii) 50% is assumed to be related to personal ownership (not corporations) giving an estimated amount of rental income for households of around OMR 3.6 billion.
- *Pension income.* Pensions in Oman refer to social security contributions from individuals and employers and the government. Pension income was around 3 billion in 2022, based on the ratio of pension income to salary income from the Salary and Pension data for Oman.
- *Transfer and other income*. Transfer and Other income refers to gifts, donations, family support, etc. and includes transfers from the government, grants or aids from other private entities that a household receives. This is estimated to be OMR 1.3 billion in 2022.
- *Capital gains*. The capital stock in 2022 is estimated to be equal to OMR 926 billion. The model calculates the change in the value of capital for each year. This annual change represents the capital gain in that year.
- *Interest.* Interest earnings refer to the income from savings through financial institutions. Data from the Central Bank of Oman shows that interest earnings in 2018 was approximately OMR 562 million. This is projected to be OMR 742 million in 2022. We assume 20% of this is received by individuals and taxed under the PIT.
- *Dividends*. To calculate dividends, we start with GOS from the National Accounts (OMR 18 billion), and make the following adjustments: (i) The Government Industries are excluded (removing OMR 10.8 billion or approximately 60%, leaving OMR 7.2 billion); (ii) the foreign share of the remainder has been excluded (removing OMR 1.4 billion, leaving approximately OMR 5.8 billion); and (iii) there is an assumed payout ratio of 80% for dividends, giving an estimated dividend income for households of around OMR 4.6 billion.

- *Foreign income*. Foreign income refers to the income raised from offshore wages and investments. The Balance of Payments data shows foreign income in 2018 to be OMR 442 million. This grows is project to be almost OMR 500 million in 2022.

4.3. Limitations and assumptions

As with any analysis based upon modelling, the results are necessarily affected by data assumptions and availability. These limitations and assumptions should be noted when interpreting the results.

One of the key inputs for the construction of a CGE model, which is the basis for this analysis, is an input-output (IO) table. No such table exists for Oman, so we adopted an IO table from a country with a similar economic structure (in this case Kuwait) and we adjusted this table to match the latest national accounts data of Oman.

There is no comprehensive individual income data available for Oman, which is the tax head upon which the proposed PIT will be applied. The only available data with appropriate socio-demographic detail is household-level data. It is assumed that the available household survey data is indicative, to a large extent, of the patterns that we would expect if individual income data was available.

Individual income has been proxied by household income. This effectively assumes that there is only one main income earner per household. It is likely that some of the income earned by high-income household income will be earned by household members who fall below the taxable threshold. Without adjusting for this, the estimated tax base for PIT will likely be overstated along with the estimated tax revenue raised. We can mitigate this overestimation by adjusting the tax base so that it assumes a proportion of this income is untaxed. Thus, we assumed that 80% of the household income represents the tax base for individual PIT.

To account for non-compliance by taxpayers and challenges in tax collection we also assume an 85% PIT compliance rate. Combining the adjustment of the tax base (80%) and the compliance rate (85%) means that the estimated effective tax rate is 68% of the applied rate before thresholds, deductions and exemptions are applied.

We assumed that the PIT is introduced in 2022. We run our policy simulations for 30 years to ensure that we achieve a new long-run equilibrium in the economy. In the first 5 years of the simulation we assumed that the ratio of the government budget to GDP can vary. This allows the additional government revenue from PIT to be used for achieving a stronger government financial position. From year 6 onwards, we assume that ratio of the government budget to GDP returns to its baseline value. This is facilitated by the government returning some of the tax revenue back to households through increased government benefit payments.

Labour supply is not fixed but responds to the introduction of the PIT system.

4.4. Estimating the effective tax rates

While the legislated personal income tax rate is 10% under the central case, the effective rate will be lower. This is because the tax is collected on income above the OMR 30,000 threshold, accounting for the individuals' share of household income, any deductions and exemptions and an average compliance rate. This means the highest effective tax rate falls on those in the highest income bracket, making it effectively a progressive tax system.

To estimate the effective tax rate applied to each income source, the household income survey, the census data and Australian household unit record data is used to help understand the allocation of the income sources across the different household income levels. This is important, as to calculate the effective tax rate, we need to apply different tax parameters across the different household income groups. Specifically, the proportion of income earned by a particular household income group that is taxable will vary according to the tax-free threshold that is applied. In addition, the tax deductions vary according to income source.

The effective tax rate is also influenced by assumptions around the rate applied to convert household income into individual income (80%) and the potential tax compliance rate (85%), both of which do not vary across household income groups.

Combining all of these, along with the legislated tax rate of 10%, gives us an effective tax collection rate by income group and income source, as illustrated in Table 3. These effective tax rates by income source are then applied to represent the PIT system in the model.

Table 3. Effective PIT rate parameters and estimation

<30000	Tax-free income	Tax deductions/ exemptions	Individualised household adjustment	Tax compliance rate	Tax rate	*Effective Tax rate*
Wage income	1.00	0.07	0.80	0.85	0.10	*0.0%*
Self-employment	1.00	0.05	0.80	0.85	0.10	*0.0%*
Rental income	1.00	0.10	0.80	0.85	0.10	*0.0%*
Pension	1.00	0.00	0.80	0.85	0.10	*0.0%*
Transfer & Other income	1.00	0.50	0.80	0.85	0.10	*0.0%*
Capital gains	1.00	0.00	0.80	0.85	0.10	*0.0%*
Interest earnings	1.00	0.00	0.80	0.85	0.10	*0.0%*
Dividends	1.00	0.00	0.80	0.85	0.10	*0.0%*
Foreign income	1.00	0.00	0.80	0.85	0.10	*0.0%*
TOTAL	**0.00**	0.00	**0.00**	**0**	**0.00**	***0.0%***
30000 -59999						*0.0%*
Wage income	0.70	0.07	0.80	0.85	0.10	*1.9%*
Self-employment	0.70	0.05	0.80	0.85	0.10	*2.0%*
Rental income	0.70	0.10	0.80	0.85	0.10	*1.8%*
Pension	0.70	0.00	0.80	0.85	0.10	*2.1%*
Transfer & Other income	0.70	0.50	0.80	0.85	0.10	*1.0%*
Capital gains	0.70	0.00	0.80	0.85	0.10	*2.1%*
Interest earnings	0.70	0.00	0.80	0.85	0.10	*2.1%*
Dividends	0.70	0.00	0.80	0.85	0.10	*2.1%*
Foreign income	0.70	0.00	0.80	0.85	0.10	*2.1%*
TOTAL	**0**	**0.00**	**0.00**	**0**	**0.00**	***1.9%***
60,000 or more						*0.0%*
Wage income	0.20	0.07	0.80	0.85	0.10	*5.1%*
Self-employment	0.20	0.05	0.80	0.85	0.10	*5.2%*
Rental income	0.20	0.10	0.80	0.85	0.10	*4.9%*
Pension	0.20	0.00	0.80	0.85	0.10	*5.5%*
Transfer & Other income	0.20	0.50	0.80	0.85	0.10	*2.7%*
Capital gains	0.20	0.00	0.80	0.85	0.10	*5.5%*
Interest earnings	0.20	0.00	0.80	0.85	0.10	*5.5%*
Dividends	0.20	0.00	0.80	0.85	0.10	*5.5%*
Foreign income	0.20	0.00	0.80	0.85	0.10	*5.5%*
TOTAL						***5.1%***
TOTAL >30,000						***2.6%***
TOTAL all						***0.6%***

(1) Transfer and Other income includes a number of different transfers such as gifts and donations. Without more information on this income sources, it has been assumed that 50% of this income is exempt.
(2) Totals are weighted averages

5. Results

This section presents the economywide impacts of the PIT options. We first explain the causality of economic, social and revenue effects arising from the PIT system. Then, we compare the magnitude of results between Option 1 and 2.

5.1. PIT incidence: economic effects

Figure 7 present the macroeconomic effects of Option 1 and 2 under the central case, i.e. imposing a flat tax rate of 10% with an annual income threshold of >30,000 OMR. In general, it is

observed that the economic impacts of each option follow the same dynamics, i.e., the time trend of most variables follows a similar pattern for each of the policy options.

Figure 7 Macroeconomic effects of PIT Options 1 and 2 (% change)

OPTION 1

Figure 7.1A

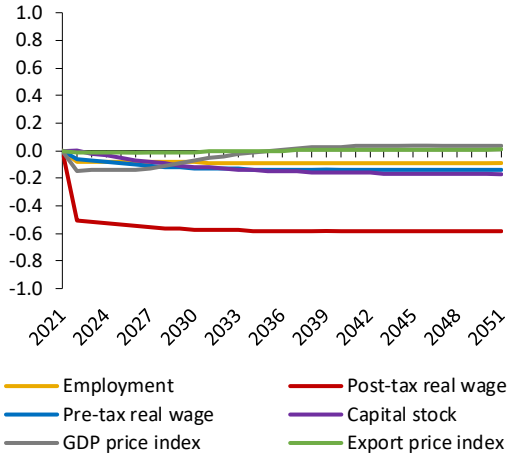
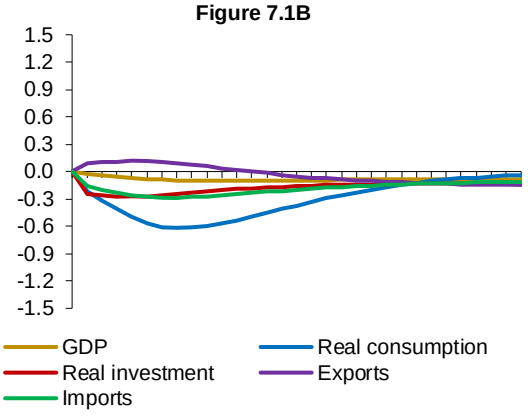


Figure 7.1B



OPTION 2

Figure 7.2A

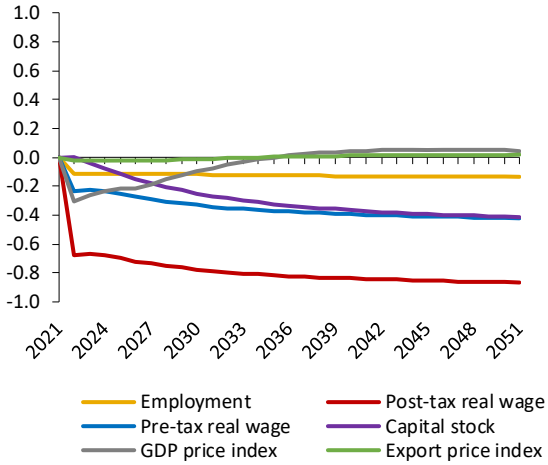
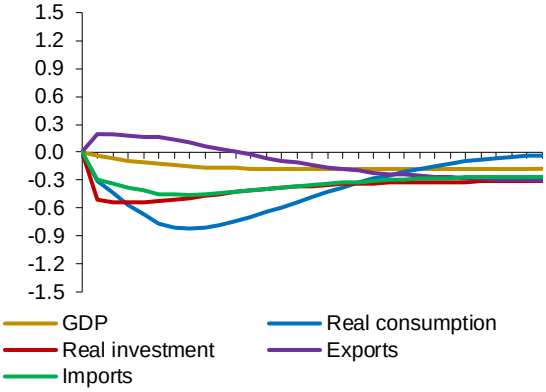


Figure 7.2B

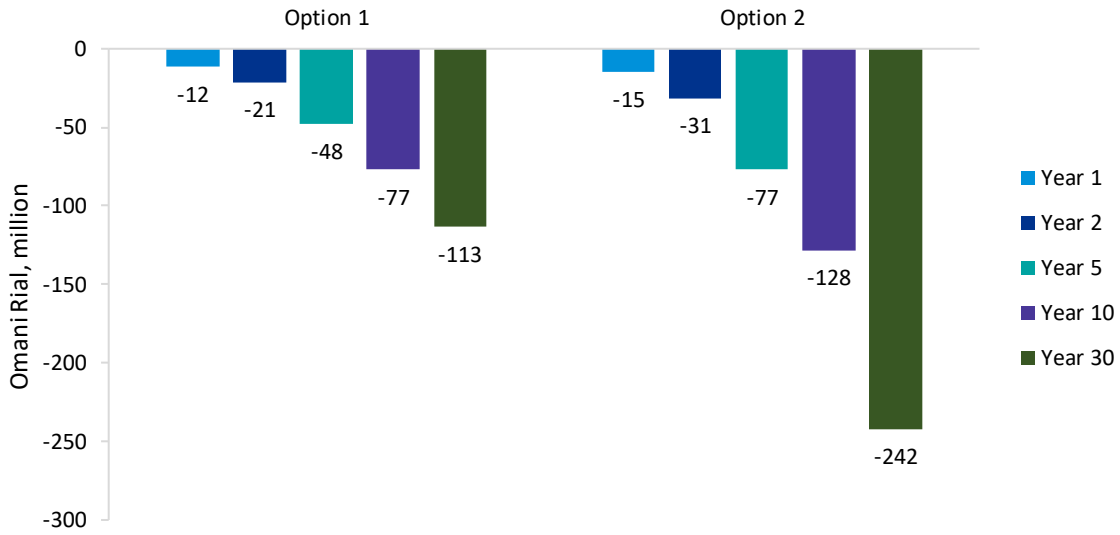


The initial effect of applying a PIT is a reduction in the post-tax real wage rate of taxed residents. That is, by taxing an individual's wage, they receive less "take-home" wages or income. This lower post-tax wage rate reduces the willingness of taxed individuals to work as much as before, leading to a fall in the supply of labour. Assuming no change in the unemployment rate, this fall in labour supply leads to a slight reduction in employment, as shown in Figure 7.1A and 7.2A.

In addition, applying the PIT to income sources other than wages (such as rental income) will affect the returns to non-labour factors of production, particularly capital. That is, the PIT causes the post-tax rate of return on capital to fall and this will discourage investment. As can be seen in Figure 7.1B and 7.2B, real investment falls below the baseline and, in turn, causes the capital stock to contract slowly over time. Given a smaller capital stock, each worker has less capital to work with causing their marginal product to fall (i.e., less output per worker). As shown in Figure 7.1A and 7.2A, the lower

marginal productivity of labour means a lower post-tax average real wage rate. Consequently, with a small reduction in employment and smaller capital stock, there will be a contraction in economic activity, as indicated by the fall in GDP. This distortionary effect on the economy is modest, with GDP falling by less than 0.1% under Option 1 (see Figure 7.1B) and less than 0.2% under Option 2 (see Figure 7.2B). In year 30, this fall in GDP is equivalent to approximately OMR 113 million for Option 1 and OMR 242 million for Option 2 (see Figure 8).

Figure 8 Effects of real GDP (OMR million)



The GDP impact is distributed across expenditure components as follows:

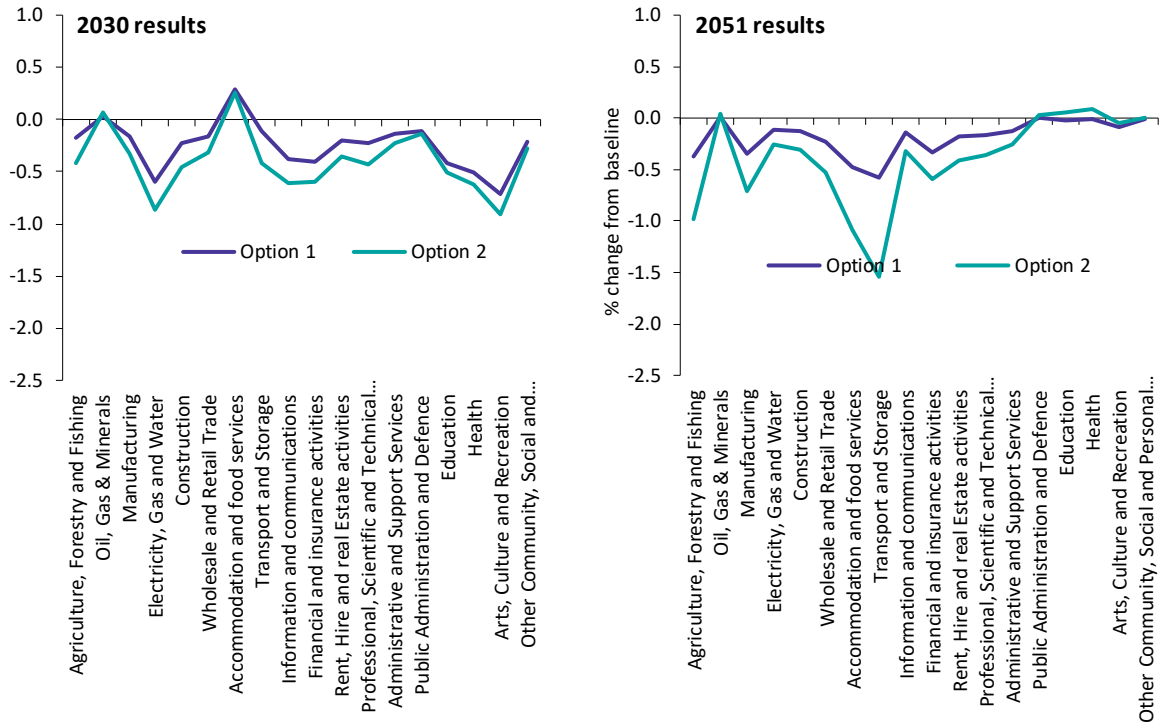
- Figure 7.1B and 7.2B indicate that the main impact of the PIT system is a significant reduction in real consumption. This is expected as the introduction of the PIT system reduces household disposable (or post-tax) income. Lower income reflects lower purchasing power of households and thus they consume less goods and services.
- Investment is positively related to the rates of return on capital. That is, firms will invest more with higher rates of return. As discussed above, real investment also falls due to the fall in the post-tax rate of return on capital.
- Consistent with these effects, the demand for imports will also be lower as household consumption and investment is composed of domestic and imported goods.
- In contrast, there is an initial increase in the exports of Oman. The contraction in GDP reduces the use of capital inputs in the economy. This lower demand for capital reduces the price of capital, which in turn, reduces the cost of production in the domestic economy (see the fall in the GDP price index in Figure 7.1A and 7.2A). The lower production cost in the domestic economy makes Oman's exports more competitive relative to the rest of the world

(see the fall in the export price index in Figure 7.1A and 7.2A) and so exports expand slightly as shown in Figure 7.1B and 7.2B.

These macro effects continue until 2026 and we then observe a reversal in some of these results in the long run. From 2027 onwards, disposable income starts to recover back to baseline as the government returns additional PIT collections to households through increased government benefit payments. This leads to a recovery of household consumption, bringing it back to its baseline level at the end of the simulation (see Figure 7.1B and 7.2B). Also, the price advantage that was there initially for Oman's exports starts to dissipate after the sixth year, driving Oman exports below the baseline.

At the sectoral level Figure 9 shows the percentage changes in output in the short-run (the year 2030) and long-run (the year 2051). In general, the industry effects are consistent with the patterns already discussed in the macroeconomic results. For instance, real consumption falls, and exports rise in the short run. This is reflected in the 2030 sectoral results, with the output of goods that are largely consumed by households (e.g., necessities like utilities - electricity, gas and water, information and telecommunication services, financial services, arts and recreation and other services) contracting in the short run while the output of export-oriented sectors (e.g., oil and gas, and accommodation and food - i.e., tourism-related sectors) expands over the same period. This result reverses in the long run, where export-oriented industries contract and consumption-related industries recover and eventually expand. There is also a contraction in the output of investment-related sectors such as transport and storage, construction, and professional, technical and scientific services, and this is related to the fall in investment.

Figure 9. Percentage change in sectoral GVA by policy option



Overall, the impacts at the industry-level are modest. By 2051, the biggest industry-level change is a 0.6% (1.5%) contraction for Option 1 (Option 2) in the transport and storage industry, as this capital-intensive sector is affected by the permanent fall in long-run real investment.

5.2. PIT equity: household income effects

Figure 10 presents the effect on household income over the 30-year simulation period. Overall, real household disposable income is estimated to fall for both Omani and non-Omani households under PIT. While those earning less than OMR 30,000 will not be directly impacted by the PIT, they will be indirectly affected by changes in pre-tax wages, labour composition of contracting/expanding sectors, and prices of commodities after the introduction of the PIT system. The fall is much larger for Omani households (-0.9% p.a. on average for Option 1 and -1.1% for Option 2) as compared to non-Omanis (-0.4% p.a. on average for Option 1 and 0.8% for Option 2). This is expected because PIT is applied to the highest income groups, and Omanis are highly represented at the top of the income distribution.

Figure 10 Effects on real household disposable income by resident

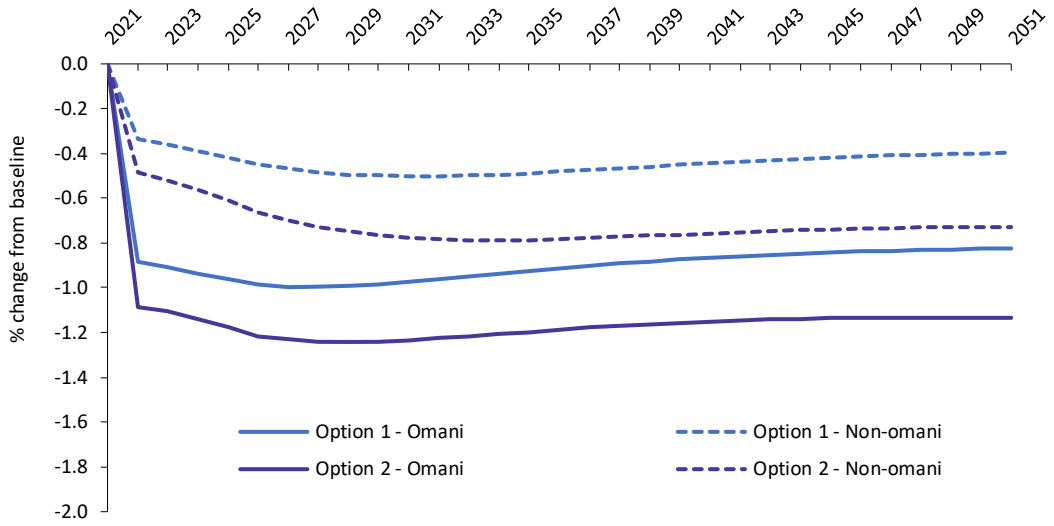


Figure 11 Effects on real household disposable income by income group (OMR), 2051

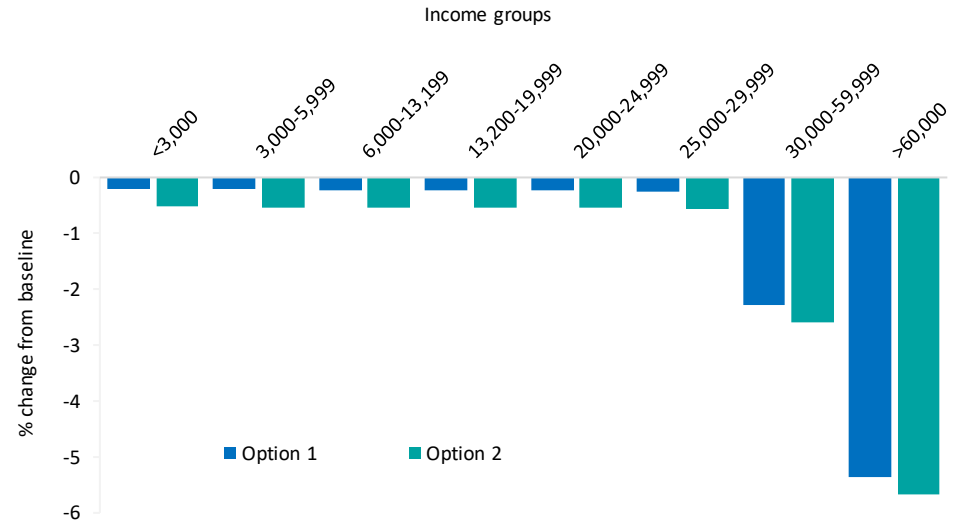


Figure 11 shows the impact of the PIT system across income groups. As expected, the tax burden falls mostly on the top two income brackets as they are directly affected by PIT. There is a slight fall in the income of households in all other income groups. This indirect effect is attributed to the reduction in the overall average real wage rate as the economy slightly contracts after the introduction of the tax system. Between the two options, the magnitude of social effects is much higher in policy Option 2 compared to Option 1. This is because a bigger share of non-wage income accrues to richer individuals in the income distribution. Hence, the inclusion of capital gains, interest earnings, dividends and foreign income under Options 2 means that higher income earners will have to pay more taxes, which in turn reduces their disposable income by more.

5.3. Budgetary impacts

Table 4 shows the effects of the PIT system on government revenue. Under Option 1, PIT collections will increase government tax revenue in the first year by OMR 126 million. In Year 5, tax revenue will be approximately 23% higher (or OMR 155 million) relative to year 1. This reflects the growth in the nominal tax base over time. As the economy grows over time, the sources of household income will also grow, and, in line with this, PIT revenue will also grow. After 30 years, PIT revenue is expected to be around OMR 533 million. Income taxes on wages is expected to contribute the most to this revenue (45%), followed by taxes on rental income (22%).

Across policy options, results show that the revenue generated increases as the scope of the PIT system expands. That is, Option 2 will generate more tax revenue as this option has a wider taxation coverage as compared to Option 1. In the first year, the inclusion of capital gains, interest earnings, dividend taxes and foreign income in the PIT system generates about 39% more revenue under Option 2 relative to the revenue collected in Option 1.

Table 4 Changes in income tax revenue by source and by policy option (OMR million)

	Year 1	Year 2	Year 5	Year 10	Year 30
Option 1	**126**	**132**	**155**	**200**	**533**
Wage income	57	60	70	90	242
Self-employment	7	7	8	11	27
Rental income	31	33	38	47	118
Pension	24	26	30	39	105
Transfer and Other income	6	6	9	13	42
Option 2	**175**	**184**	**213**	**276**	**744**
Wage income	57	60	70	90	241
Self-employment	7	7	8	11	27
Rental income	31	33	38	47	118
Pension	24	26	30	39	105
Transfer and Other income	6	6	8	13	42
Capital gains	8	8	8	9	24
Interest earnings	2	2	3	3	9
Dividends	34	36	43	56	158
Foreign income	5	5	6	7	20
Ratio of Option 2 to Option 1	**1.39**	**1.39**	**1.38**	**1.38**	**1.40**

5.4. Sensitivity tests

Given that there is always uncertainty around economic data and modelling assumptions, it is important to understand how the results might change under different assumptions. In this subsection, we test the sensitivity of the PIT revenue estimates under the following scenarios and present the results under Option 2:

- Sensitivity 1: Comparing a flat rate to a progressive rate.
- Sensitivity 2: Changing the taxable income threshold.

The first sensitivity compares the change in estimated revenue if a progressive rate PIT was introduced instead of a flat rate system, i.e., the tax rates are higher for the higher income brackets. The tax rates are summarised in Table 5.

Table 5 Comparing a flat rate to a progressive rate

Income group	Flat rate	Progressive rate
Households earning OMR 30,000 – 60,000	10%	10%
Households earning >OMR 60,000		20%

Table 6 shows the compares the sensitivity of income tax revenue from a flat tax rate to a progressive rate. It is estimated that the government could generate 42% more revenue under these progressive tax system scenarios, compared to the flat-rate system. This is because the average tax rate is effectively higher under these progressive rate scenarios, with the top income group facing a 10 percentage-point higher tax on their earnings above OMR 60,000 compared to the flat rate scenario.

Table 6 Sensitivity of income tax revenue (OMR million) from a flat rate to a progressive rate

	Year 1	Year 2	Year 5	Year 10	Year 30
Flat rate	175	184	213	276	744
Progressive rate	248	260	302	392	1,058
Ratio = Progressive/Flat	1.42	1.42	1.42	1.42	1.42

The second sensitivity test lowers the taxable income threshold from >OMR 30,000 per annum (p.a.) to (i) >OMR 25,000 p.a. and (ii) >OMR 20,000 p.a. A lower income threshold reflects a higher coverage of the PIT system as more individuals will be taxed. Therefore, more tax revenue will be raised, as indicated in Table 7. Relative to the standard threshold level of >OMR 30,000, tax revenue is estimated to be around 30% higher for the >OMR 25,000 threshold and 77% higher for the >OMR 20,000 threshold.

Table 7 Sensitivity of income tax revenue (OMR million) with a lower income tax threshold

Income tax threshold	Year 1	Year 2	Year 5	Year 10	Year 30
>OMR 30,000 p.a. (Central Case)	175	184	213	276	744
>OMR 25,000 p.a.	228	239	278	360	972
>OMR 20,000 p.a.	307	323	375	487	1,318
RATIO (25k/30k)	1.30	1.30	1.30	1.31	1.31
RATIO (20k/30k)	1.76	1.76	1.76	1.76	1.77

6. Conclusion

This paper provides valuable insights on the economywide impacts of introducing a PIT system in Oman. We explored two tax policy options that differ in the coverage of the tax base. Option 1 has a limited tax scope in which the PIT is imposed on income earned in Oman from employment, self-employment, property rentals, pensions, and transfers and other income. Option 2 has a wider tax scope as it includes those components in Option1 plus taxation on capital gains, dividends, interest earnings and foreign-sourced income.

Results from the CGE simulations indicate that a PIT in Oman has good revenue-raising ability despite having a high threshold and low tax rate. Any resulting adverse socio-economic impacts are also limited, mainly affecting high-income individuals. Option 2 has a bigger impact on real GDP, tax revenue and household income due to its wider taxation coverage. The sensitivity tests conducted in this study provide alternatives for increasing PIT revenues under certain scenarios. Our sensitivity results showed that a progressive tax rate with higher rates applied to high income earners (Sensitivity 1) and a lower taxable income threshold (Sensitivity 2) increase the average effective rates of personal income tax and thus will result in more PIT revenue being generated by the government.

Aside from the economic costs associated with any tax, there are operational costs that will arise with the introduction of the PIT. First, there is the cost of implementation. Second, ongoing administration and compliance costs will fall on individuals, businesses and the tax authority. From previous tax system implementations in Oman, sources indicate that the set-up costs for the taxation authority would likely be recovered in the first year of implementation. Based on research conducted on ongoing costs (presented in the full technical report), a reasonable overall estimate of ongoing compliance and administration is anticipated to range between 2% and 3%.

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Appendix A. Theoretical features of the CGE model

Labour market

Employed workers. The supply of labour for each occupation is determined by an infinitely-lived household[3] based on a labour-leisure trade-off. The hours of work supplied by workers across different occupations to the labour market are influenced by the CPI-deflated real post-tax wage rates. The labour-leisure trade off recognises the disutility to work that gives an upward-sloping labour supply curve for each occupation.

Owner-operators. The supply of owner-operator labour is determined at the industry level, recognising that the return to such labour varies by industry and depends on many factors. Owner-operator labour supply is positively related to population and the CPI-deflated real after-tax rental rate. The elasticity of owner-operator labour supply is defined as the average of the uncompensated labour supply elasticity of occupations, while the rental rate on owner-operator labour is defined as the average of the rental rate on all non-labour factors of production. This ensures that owner-operator labour has a similar supply elasticity as regular labour, recognising that the rental rates for these two labour types vary.

Investment behaviour

Capital is assumed to be specific to each industry. Consistent with this, investment (or capital creation) is also specific to each industry and positively related to the expected rate of return (ROR) on capital. The definition of ROR is equivalent to Tobin's Q, adjusted for taxes and depreciation.

In a simulation, the ROR is able to fluctuate in the short run but will return to its initial value in the long run. This occurs as investment is positively related to the ROR in the same year. A higher ROR will lead to higher investment and higher proportionate growth in an industry's capital stock.

Investment is modelled in two stages:

(1) The capital creator determines the cost-minimising mix of effective composite inputs to capital creation subject to constant elasticity of substitution (CES) production technology.
(2) In the second stage, capital creators in each industry choose the optimal mix of domestic and foreign inputs to minimise the cost of producing units of capital subject to CES technology.

Foreign sector

The model explicitly models foreign income flows on imports and exports of goods and services, payments to foreigners investing in Oman and receipts from Oman investment abroad as well as unrequited foreign transfers and overseas worker remittances.

[3] That is, there is a single household that represents all cohorts in society and their preferences. These preferences are constant over time.

The current account is defined as the value of net exports (exports minus imports) plus the value of net foreign income, where net foreign income is the sum of income earned on foreign assets minus income paid on foreign liabilities.

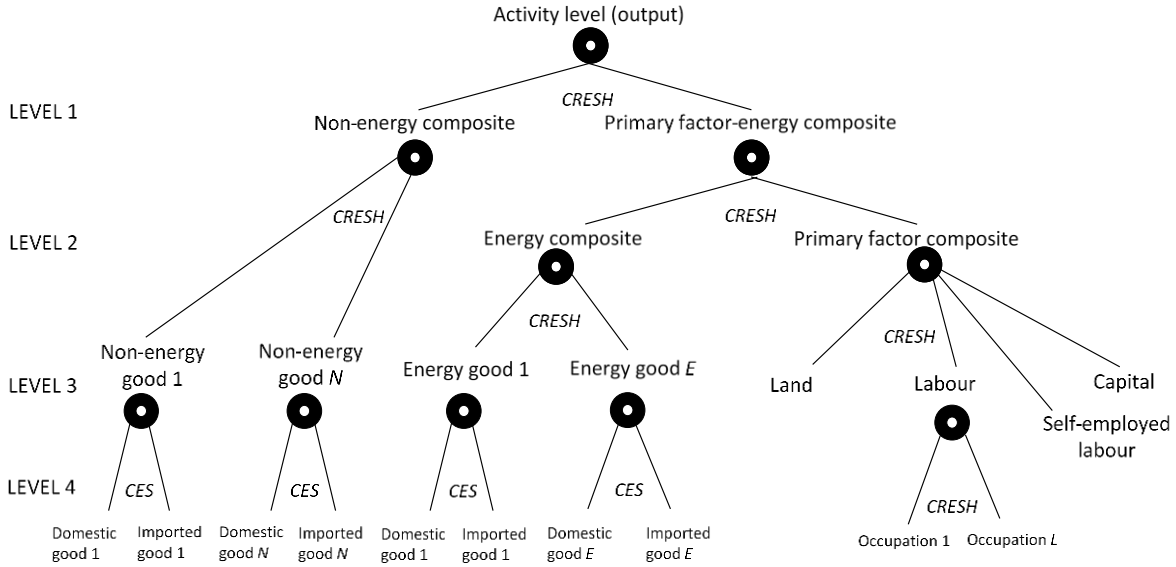
The model specifies foreign assets and liabilities held by the representative household. Foreign assets comprise equity and credit instruments; foreign liabilities comprise foreign direct investment and debt instruments. As foreign credit and debt is only issued in foreign currency, revaluation effects from changes in the exchange rate will influence the accumulation of net foreign liabilities, and flow-on real effects.

In a typical baseline simulation foreign equity and foreign credit will grow at the same rate as nominal GDP. Foreign debt will grow as the same rate as foreign direct investment, and the composition of foreign assets and liabilities will be constant over time. These assumptions mean the accumulation of foreign direct investment drives the accumulation of net foreign liabilities.

Producer Behaviour

Producers exhibit optimising behaviour, operate in a competitive market and are constrained by a limited supply of resources. A representative firm in each sector purchases intermediate inputs and employs primary factors to produce a commodity or create capital at the least possible cost.

There are two broad categories of inputs: intermediate inputs and primary factors. Representative firms choose inputs of primary factors and intermediate inputs to minimise costs subject to a given production technology and given factor and commodity prices. Primary factors include land, eight types of labour (occupations), owner-operator labour and physical capital. Intermediate inputs consist of 70 domestically-produced goods and services and 70 foreign substitutes. Demands for primary factors and intermediate inputs are modelled using nested production functions. There are four stages to modelling the producer behaviour illustrated below.



(1) At the highest tier, firms determine optimal quantities of the non-energy composite (i.e., an aggregate of non-energy intermediate inputs) and the primary factor-energy composite (i.e., an aggregate of primary factors and energy intermediate inputs).

(2) At the second level of the production nest, firms choose the optimal mix of the energy and primary factor composites. The energy composite is an aggregation of energy intermediate inputs; the primary factor composite is an aggregation of all primary factors.

(3) At the third level of the production nest, firms choose cost-minimising combinations of constituents in each of the non-energy intermediate inputs composite, energy intermediate inputs composite and primary factor composite.

(4) At the lowest level of the production nest, firms decide on the optimal mix of domestic and foreign intermediate inputs subject to CES technology.

Firms determine optimal input quantities subject to constant ratios of elasticities of substitution, homothetic (CRESH) production technology.[4] Profit-maximising producers are capable of choosing the optimal combination of primary factors independently of the prices of intermediate inputs. Nested CRESH functions allow different elasticities of substitution to exist between primary factors of production and goods.

[4] This formulation relaxes the assumption implied by CES functions that the elasticity of substitution across all pairs of inputs must be the same. CRESH production functions were introduced as a generalisation of CES by Hanoch (1974). The nested CRESH functional form is more desirable than alternative techniques such as fixed coefficients (Leontief) production technology since it allows us to take advantage of differences in econometrically-estimated values of the elasticities of substitution across individual factors.

Household behaviour

Households receive income as owners of primary factors and maximise utility subject to their budget constraint or income. The model assumes that there is an infinitely-lived representative household that maximises nested utility functions subject to a budget constraint.

Household consumption spending is modelled in two stages:

(1) Households allocate their income into subsistence and luxury consumption (modelled via a linear expenditure system (LES) or Stone-Geary utility function)
(2) Households choose the minimum cost combination of imported and domestic commodities based on relative prices and tastes (modelled via a constant elasticity of substitution (CES) demand function)

Government sector

Detailed modelling of government revenue flows from direct and indirect taxes and income from government enterprises, is included.

Government spending on commodities and investment, and transfer payments (e.g., old-age pension) are also explicitly modelled. A range of other government expenditures are represented including other operating expenses, government investment expenditure and capital expenditure on existing assets. Other operating expenses are linked to aggregate government consumption. Government investment expenditure is determined as the product of the government investment demands by industry and the industry-specific investment price index. Government investment demands are typically held exogenous or imposed. Capital expenditure on existing assets typically moves with government consumption expenditure.

The budget balance of all governments is typically exogenous (relative to GDP) in the baseline and project simulations. This is accommodated by allowing a variable that would usually be exogenous, such as a tax rate, to vary.

Appendix B: Creating the CGE database

Figure A1 illustrates the model development procedure and Table A1 summarises the key data inputs and sources for developing the model database.

Figure A1 Process of constructing the CGE database and model

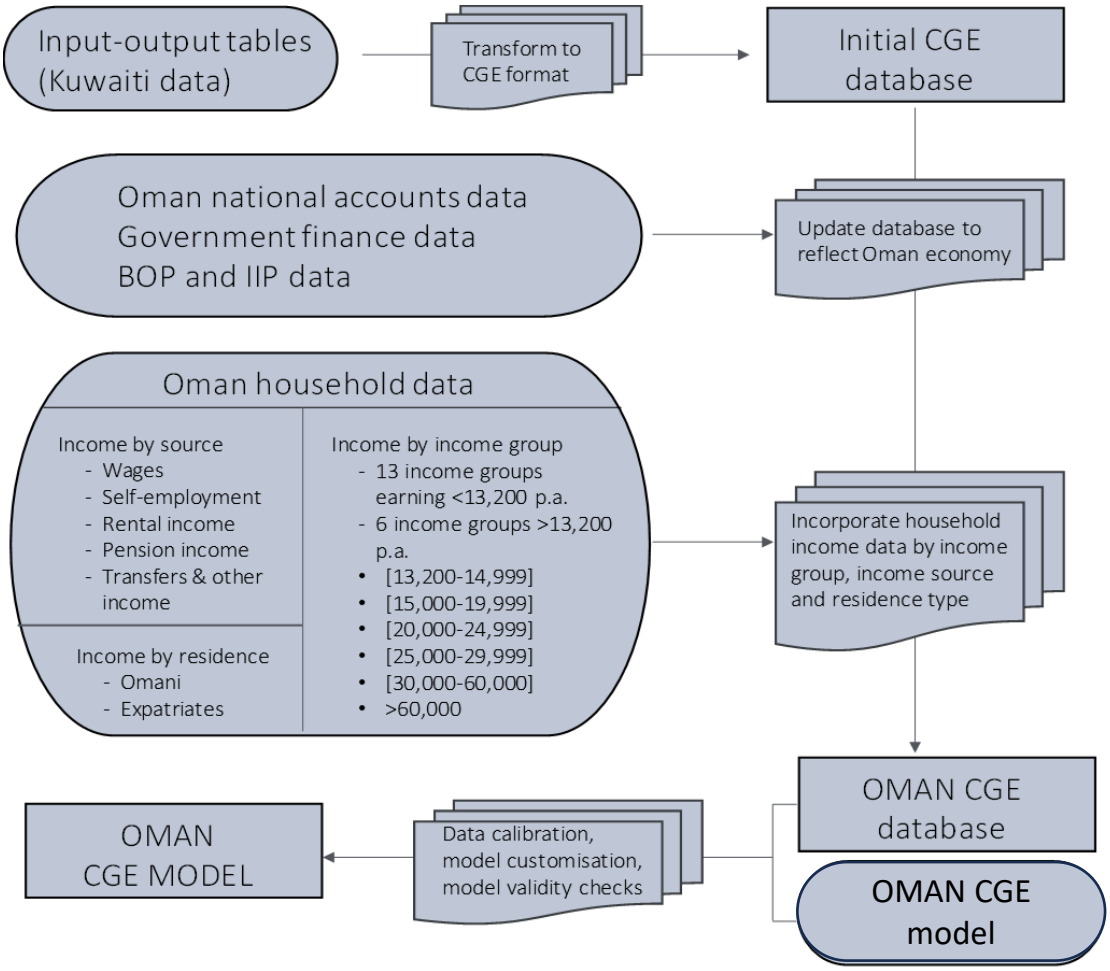


Table A1 Data Sources

Data	Description	Source
Kuwaiti input-output table, 2005	A 79 -sector data that describe the flow of commodities across industries and final users.	Central Statistical Office https://www.csb.gov.kw/Pages/Statistics_en?ID=26&ParentCatID=%203=
Oman national accounts data	Macroeconomic data such as GDP data broken down into its expenditure and income components, industry gross value added, and employment in Oman.	Oman statistical yearbook 2020
Government finance data, 2010 - 2019	Data on government revenues by type of tax collections, public sector debt and net interest, capital expenditure, other expenditure items, and current transfers.	National Centre for Statistics & Information (NCSI)
Balance of payment (BOP) data, 1996 – 2019 International investment position (IIP) data, 2006 - 2019	Record of international financial transactions made by Omani residents. This includes data on the foreign assets, credits, debts, equity, liability and interests, foreign payments to Omani workers and payments to foreign workers in Oman.	Central Bank of Oman, Ministry of Finance and National Centre for Statistics & Information
Household income and expenditure data, 2018-19	Data on household income and expenditure aggregated into income groups, income types and sociodemographic groups.	NCSI Census

Core database procedure

To develop the CGE model database, the first step is to process the input-output (IO) table. There is no IO table in Oman, so we adopted an IO table from a country with a similar economic structure (in this case Kuwait). The Kuwaiti IO table was transformed into a format consistent with the CGE model's theoretical structure. This gives the first form of the initial CGE database. We then update this initial database using the latest national accounts data of Oman. This updated CGE database reflects the current structure of the Omani economy. Other supplementary data are also incorporated in the database, such as the value of the government account's expenditure and revenue items, the balance of payments and international investment position. This makes up the CGE database at the macro level.

Moreover, a bespoke model for PIT analysis requires individual-level data as the income tax rates are applied to a specific cohort of the Omani population (e.g., individuals earning >30,000 per year). However, there is no available income data on individuals, only household-level data. This household data has significant sociodemographic characteristic detail; however, it is not possible to identify individuals within that household income data. This means that one of the assumptions that needs to be made is that the data as represented at the household level is indicative to a large extent of

the patterns that we would expect if we had individual income data. We combine different slices of the household data (mostly two-dimensional: income by income group and residence type, income by income source and residence type) to form a three-dimensional income dataset (i.e. income across income sources by income group and resident type). This household data is combined with the macro database to form the final Omani CGE database.

In developing the CGE model, we started with the comprehensive CGE model developed by Verikios et. al. (2021) for the Australian economy. This model contains the theoretical underpinnings of a CGE model, such as consumption and production behaviour, investment theory, and labour supply function. Additional features relating to the PIT system are also added to the CGE model. These PIT elements of the model facilitate the imposition of income tax shocks in running the policy simulations. The last step of the model development procedure is to run some simulation tests that check the validity of model results and any anomalies in the database.

Two key data inputs for the model are (1) Omani household income and (2) the effective tax rates under each policy scenario. The following subsections provide an explanation of these data sets.

Estimating Household Income

A key data input into the model is Omani household income. As such, this subsection provides additional detail on how the Omani baseline income data was estimated. The table below shows the National Income used in the analysis.

Table A2. Summary statistics of household income across sources

Income source	Household Income in 2022 (OMR million)
Wage income	12,386
Self-employment	849
Rental income	3,591
Pension	3,473
Transfer and Other income	1,279
Capital gains	926
Interest earnings	148
Dividends	4,629
Foreign income	497

Wage Income

Wage income refers to the compensation of employees published in the National Accounts in 2018 of approximately OMR 10 billion. This has been grown to about OMR 12 billion in 2022 using the CGE model and data on employment, GDP and industry growth.

Self-employment income

Self-employment refers to sole proprietors or partners in a partnership. Income raised from self-employment in Oman is estimated to be OMR 849 billion in 2022.

Rental income

In 2022, Gross Operating Surplus ("GOS") has been estimated from the National Accounts as OMR 18 billion. This refers to profit and other returns to capital in the economy. To identify the rental income associated with GOS, the following adjustments have been made:

(1) Income to Government Industries has been excluded (removing OMR 10.8 billion or approx. 60%, leaving OMR 7.2 billion);
(2) 50% is assumed to be related to personal ownership (not corporations) giving an estimated amount of rental income for households of around OMR 3.6 billion.

Pensions

Pensions in Oman refer to social security contributions from individuals and employers and the government. Pension income was around 3 billion in 2022, based on the ratio of pension income to salary income from the Salary & Pension data for Oman.

Transfer and other income

Transfer and Other income refers to gifts, donations, family support, etc. and includes transfers from the government, grants or aids from other private entities that a household receives. This is estimated to be OMR 1.3 billion in 2022.

Capital gains

The Capital Stock in 2022 is estimated to be OMR 926 billion. The model calculates the change in the value of capital for each year. This change in the year represents the capital gain in that year.

Interest

Interest earnings refer to the income from savings through financial institutions. Data from the Central Bank of Oman shows that interest earnings in 2018 were approximately OMR 562 million. This has grown to OMR 742 million in 2022. We assume 20% of this is received by individuals and taxed under the PIT.

Dividends

Starting with the OMR 18 billion in GOS from the National Accounts, the following adjustments have been made:

- The Government Industries have been excluded (removing OMR 10.8 billion or approx. 60%, leaving OMR 7.2 billion);
- The foreign share of the remainder has been excluded (removing OMR 1.4 billion, leaving approx. OMR 5.8 billion); and
- There is an 80% assumed pay-out ratio for dividends, giving an estimated dividend income for households of around OMR 4.6 billion.

Foreign income

Foreign income refers to the income raised from offshore wages and investments. The Balance of Payments data in 2018 is OMR 442 billion. This grows to be almost OMR 500 million in 2022.

Estimating the effective tax rate

To estimate the effective tax rate applied to each income source, the household income survey, the census data and Australian household unit record data is used to help spread the income sources identified above across the different household income levels. This is important, as to calculate the effective tax rate, we need to apply different tax parameters across the different household income groups. Specifically, the proportion of income earned by a particular household income group that is taxable will vary according to the tax-free threshold that is applied. In addition, the tax deductions vary according to income source.

The effective tax rate is also influenced by assumptions around the rate applied to convert household income into individual income (80%) and the potential tax compliance rate (85%), which don't vary across household income groups.

Combining these, along with the legislated tax rate, gives us an effective tax collection rate by income group and income source, as illustrated below.

Table A3. Effective PIT rate parameters and estimation

<30000	Tax-free income	Tax deductions/ exemptions	Individualised household adjustment	Tax compliance rate	Tax rate	*Effective Tax rate*
Wage income	1.00	0.07	0.80	0.85	0.10	*0.0%*
Self-employment	1.00	0.05	0.80	0.85	0.10	*0.0%*
Rental income	1.00	0.10	0.80	0.85	0.10	*0.0%*
Pension	1.00	0.00	0.80	0.85	0.10	*0.0%*
Transfer & Other income	1.00	0.50	0.80	0.85	0.10	*0.0%*
Capital gains	1.00	0.00	0.80	0.85	0.10	*0.0%*
Interest earnings	1.00	0.00	0.80	0.85	0.10	*0.0%*
Dividends	1.00	0.00	0.80	0.85	0.10	*0.0%*
Foreign income	1.00	0.00	0.80	0.85	0.10	*0.0%*
TOTAL	**0.00**	0.00	**0.00**	**0**	**0.00**	***0.0%***
30000 -59999						*0.0%*
Wage income	0.70	0.07	0.80	0.85	0.10	*1.9%*
Self-employment	0.70	0.05	0.80	0.85	0.10	*2.0%*
Rental income	0.70	0.10	0.80	0.85	0.10	*1.8%*
Pension	0.70	0.00	0.80	0.85	0.10	*2.1%*
Transfer & Other income	0.70	0.50	0.80	0.85	0.10	*1.0%*
Capital gains	0.70	0.00	0.80	0.85	0.10	*2.1%*
Interest earnings	0.70	0.00	0.80	0.85	0.10	*2.1%*
Dividends	0.70	0.00	0.80	0.85	0.10	*2.1%*
Foreign income	0.70	0.00	0.80	0.85	0.10	*2.1%*
TOTAL	**0**	**0.00**	**0.00**	**0**	**0.00**	***1.9%***
60,000 or more						*0.0%*
Wage income	0.20	0.07	0.80	0.85	0.10	*5.1%*
Self-employment	0.20	0.05	0.80	0.85	0.10	*5.2%*
Rental income	0.20	0.10	0.80	0.85	0.10	*4.9%*
Pension	0.20	0.00	0.80	0.85	0.10	*5.5%*
Transfer & Other income	0.20	0.50	0.80	0.85	0.10	*2.7%*
Capital gains	0.20	0.00	0.80	0.85	0.10	*5.5%*
Interest earnings	0.20	0.00	0.80	0.85	0.10	*5.5%*
Dividends	0.20	0.00	0.80	0.85	0.10	*5.5%*
Foreign income	0.20	0.00	0.80	0.85	0.10	*5.5%*
TOTAL						***5.1%***
TOTAL >30,000						***2.6%***
TOTAL all						***0.6%***

(1) Transfer and Other income includes a number of different transfers such as gifts and donations. Without more information on this income sources, it has been assumed that 50% of this income is exempt.
(2) Totals are weighted averages. (3) For the derivation of the tax-free income parameters, see Limitation and Assumption no. 10 in section 4.1.

The effective tax rates are then applied to the incomes by source to estimate the tax revenue likely to be collected under each policy option.

It should be noted that the economic model also estimates the impact of applying a tax on the prices and levels of activity in the economy (as discussed in the results section of the report). This means that the final results will be somewhat different to the simple application of the effective rates to the initial National Household incomes.

A formulaic description of the calibration and steps to the application in the model is shown below.

Calibrating the effective tax rates

Coefficient	Description	Unit	Dimensions	Source
$HOUINC_{g,i,r}$	Household gross income of income group g with resident type r from income source i	OMR	$g = \{19\ income\ groups\}$ $i = \begin{Bmatrix} wages, \\ selfemp, \\ rental, \\ pension, \\ othinc \end{Bmatrix}$ $r = \begin{Bmatrix} Omani, \\ Expat \end{Bmatrix}$	Household survey data
$NATINC_i$	National income from source i	OMR	$i = \begin{Bmatrix} wages, \\ selfemp, \\ rental, \\ pension, \\ othinc, \\ capGain, \\ interest, \\ dividend, \\ forInc \end{Bmatrix}$	National accounts data and other supplementary data at the macro level
$TaxFree_g$	Parameter 1 – proportion of income that is tax free by income group ▪ 70% for 30k-60k income group ▪ 20% for >60k income group	% of income	$g = \{19\ income\ groups\}$	Calibrated using Australian household data
$TaxDeduct_i$	Parameter 2 – tax deductions/exemptions by income source i. Not all income sources have tax deductions or exemptions.	% of income	$i = \begin{Bmatrix} wages, \\ selfemp, \\ rental, \\ pension, \\ othinc, \\ capGain, \\ interest, \\ dividend, \\ forgnInc \end{Bmatrix}$	Policy design document
$DataAdj$	Parameter 3 – conversion factor to adjust household income to individual income. 80% of household income represents individual income.	%		Expert opinion
$TCrate$	Parameter 4 – tax compliance rate 85% of total income is taxed.	%		Expert opinion
$TaxRate_g$	Parameter 5 – income tax rate		$g = \{19\ income\ groups\}$	Policy design document

Step 1. Create household data for income sources without household split, e.g. capital gains, interest earnings, dividends and foreign income.

$$HOUINC1_{g,i,r} = HOUINC_{g,i,r} \quad \text{for} \quad i = \begin{Bmatrix} wages, \\ selfemp, \\ rental, \\ pension, \\ othinc \end{Bmatrix}$$

$$HOUINC2_{g,i,r} = NATINC_i \cdot \frac{HOUINC_{g,i,r}}{\sum_{g,r} HOUINC_{g,"rental;",r}} \quad \text{for} \quad i = \begin{Bmatrix} capgain, \\ interest, \\ dividend, \\ forgnInc \end{Bmatrix}$$

$$HOUINCBASE_{g,i,r} = HOUINC1_{g,i,r} \cup HOUINC2_{g,i,r} \quad \text{such that} \quad i = \begin{Bmatrix} wages, \\ selfemp, \\ rental, \\ pension, \\ othinc, \\ capGain, \\ interest, \\ dividend, \\ forgnInc \end{Bmatrix}$$

Step 2. Calculate the taxable income by taking into account parameter 1 and 2: proportion of income that is tax-free and the tax deductions/exemptions.

$$TaxableINC_{g,i,r} = HOUINCBASE_{g,i,r} \cdot \left(1 - TaxFree_g\right) \cdot (1 - TaxDeduct_i)$$

Step 3. Calculate the value of the personal income tax at the household level by taking into account the following parameters: (a) the household income conversion factor to individual income, (b) tax compliance rate, and (c) statutory tax rate.

$$PIT\_HOU_{g,i,r} = TaxableINC_{g,i,r} \cdot DataAdj \cdot TCrate \cdot TaxRate_g$$

Step 4. Calculate the national effective tax rate (ETR) at the household level.

$$ETR\_NAT_i = \frac{\sum_{g,r} PIT\_HOU_{g,i,r}}{\sum_{g,r} HOUINCBASE_{g,i,r}}$$

Step 5. Calculate the government tax revenues by applying the effective tax rate to the national income bases.

$$PIT\_NAT_i = ETR\_NAT_i \cdot NATINC_i$$