



The Economic Effects of an International Student Levy

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The economic effects of an international student levy

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Abstract

We investigate the economic impacts and tax efficiency of an international student levy (ISL) levied at a rate of 5%. Like many other taxes, an ISL has adverse economic impacts. At the regional level, the adverse impacts are largest for regions that have relatively large export education sectors. At the industry level, the adverse impacts are largest for sectors involved in the export of education services. To compare the tax efficiency of an ISL to other Australian taxes, we calculate its marginal excess burden (MEB). We find that an ISL levied at a rate of 5% on international student fees has an MEB of 15, i.e. it generates economic damage of 15 cents per dollar of ISL revenue raised. This compares favourably with a number of major federal and state taxes, like personal income tax, GST, payroll tax, stamp duty and insurance duty, all of which have higher MEBs. When assessing tax mix change, comparative efficiency arguments should be balanced against broader economic implications and clear policy objectives.

JEL Codes: C68; H2; H5; H72

Keywords: Taxation; International Student; CGE modelling; Excess Burden

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Executive Summary

- The recent Australian Universities Accord Interim Report raised the possibility of a levy on international student fee income. We refer to this as an international student levy, or ISL.
- From an economic perspective, an ISL is a federal indirect tax on purchases of Australian education services by international students.
- Viewed simply as a tax, the economic effects of an ISL can be evaluated using the type of multi-sectoral economic model that is typically used in evaluation of tax policy reform proposals.
- We undertake a preliminary investigation of an ISL using VURMTAX, a dynamic multi-regional multi-sectoral model of the Australian economy with tax detail. VURMTAX has been used in previous studies to investigate the economic effects and efficiency characteristics of over 30 state and federal taxes.
- Using VURMTAX, we evaluate the effects of an ISL on national and regional macroeconomic variables, and evaluate and compare its economic efficiency.
- An ISL, like most other taxes, has adverse macroeconomic consequences. Depending on how ISL revenue is recycled, these consequences are potentially larger for regions (like Victoria) that have relatively large export education sectors.
- Compared with personal income tax and GST, two large federal taxes, our preliminary findings suggest that an ISL compares favourably on tax efficiency grounds. We estimate the ISL's "marginal excess burden", a measure of tax efficiency, to be 15c per dollar of tax revenue. For comparison, in previous work we have estimated the MEB of the personal income tax at 24c and the MEB of the GST at between 24c and 34c.
- Our study represents an initial exploration of an ISL using an existing tax analysis framework. Avenues for future work include: (i) incorporating collection costs; (ii) exploring alternative assumptions for the price sensitivity of international student demand for Australian education; (iii) exploring alternative assumptions for how ISL revenue will be used; (iv) modelling the ISL with higher levels of regional detail; (v) disaggregating the export education sector; and (vi) identifying the sources of ISL's comparatively low measured MEB.

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1 Introduction

The recent Australian Universities Accord Interim Report raised the possibility of a levy on international student fee income (hereafter, international student levy, or ISL). The interim report notes that an ISL: “*could provide insurance against future economic, policy or other shocks, or fund national and sector priorities such as infrastructure and research*” (Universities Accord Interim Report, p.23). Elsewhere, the report notes “*various submissions support establishing a specific fund that could be used for future infrastructure needs, as well other national priorities. This could include consideration of a levy on international student fee income. The use of this revenue for sectoral-wide priorities could reflect the collaborative nature of the sector in building a strong and enduring system.*” (p. 143).

Funding for these aims could be provided from public revenue generated from any number of sources, including redirecting other expenditures or raising an existing or new tax. In this regard, the ISL can be viewed as a policy proposal for a new tax.

An ISL is a tax on purchases of Australian education services by international students. Hence, the economic effects of an ISL can be evaluated using the type of economic model that has traditionally been used to assess other taxes, like the GST. Similarly, the economic effects of an ISL can be evaluated against the same criteria used for other taxes, like impacts on macroeconomic variables and measures of tax efficiency.

In this paper, we undertake a preliminary investigation of the effects of an ISL using a multi-regional dynamic computable general equilibrium (CGE) model designed for tax policy analysis. We implement a permanent 5% ISL on fees paid by international students for tertiary, technical and vocational education.

2 Methodology

We investigate the economic effects of an ISL using VURMTAX (Victoria University Regional Model with Tax detail). VURMTAX is a comprehensive economic model of Australia with 220 industries and 8 regions, based on VURM [Adams et al. (2015)]. Herein, we utilise a 91-industry and 2 region (Victoria and rest-of-Australia) aggregation of the core 220-industry database, with an emphasis on education sector detail. The model is designed for detailed taxation analysis, containing individual treatment of 34 state and federal taxes.⁴ For further details on VURMTAX, see Nassios et al. (2019a).

VURMTAX’s theory follows standard neoclassical economic principles, in which industries operate in competitive markets and behave in a cost minimising fashion, investors allocate capital to

⁴ When represented in its full multi-regional detail, VURMTAX models approximately 200 taxes. For example, payroll tax (one of the 34 taxes modelled in VURMTAX) is implemented by each of the 8 Australian states and territories, but state-specific implementations differ considerably in terms of tax rates, thresholds and concessions. We model these region-specific differences in the implementation of all state and territory taxes. Hence, given that 11 of the tax instruments in VURMTAX are federal, VURMTAX effectively contains modelling of approximately 200 different taxes ($\approx (34 - 11) * 8 + 11$)

industries on the basis of expected rates of return, households make budget and labour supply decisions in a utility maximising fashion, and export demands are price sensitive. The model incorporates a detailed representation of government taxing, spending, and transferring activities within a fiscal federal framework. VURMTAX's solutions involve annual equilibria linked through stock-flow dynamics, with capital stocks, net debt, and regional populations connected to past and present data.

The model has been used for various tax policy analyses, including the goods and services tax [GST, see Giesecke and Tran (2018) and Giesecke et al. (2021)], company tax [Dixon and Nassios (2018)], efficiency of the NSW tax system [Nassios et al. (2019a)], state land tax [Nassios et al. (2019b)], stamp duty and other property taxes [Adams et al. (2020); Nassios and Giesecke (2022a)], personal income tax [Nassios and Giesecke (2022b)], and fuel tax excises [Liu et al. (2022)].

The model's initial solution for the year 2018/19 is calibrated using data from various ABS sources including: 2018/19 national input-output data, census data, agricultural census data, state accounts data, government financial statistics data, international trade data, and tourism satellite account data. The model's initial solution is updated via simulation to 2022/23.

Exports of education are modelled in VURMTAX via an export education sector, with data for this sector sourced from the ABS cat. No 5249.0 tourism satellite account. Sales of education exports by five education sectors are identified in the model: pre-school, primary, secondary, technical and vocational, and tertiary. In modelling terms, these sectors do not sell directly to international markets, but rather, sell to a mixing industry (hereafter, the export education sector) which also purchases accommodation, food, transport and all the other commodities that international students purchase while on-shore. The export education sector sells its output (comprising a combination of education fees and the cost of accommodation, food, transport, entertainment and other student living expenses) to the foreign market. We model the ISL as a federal indirect tax on purchases by the export education sector of tertiary and technical and vocational education. Purchases of these types of education services by the export education sector represent 94% of its purchases of all education services (the other 6% are purchases of pre-school, primary and secondary education), but only 44% of its purchases of all commodities. The remaining 56% of the input costs of the export education sector covers spending by international students on accommodation, food, transport, energy, entertainment and other living expenses.

This treatment of export education recognises that when an ISL is imposed on tuition fees it affects only one (albeit large) element of all the costs that international students face when considering whether to study in Australia. As noted earlier, in our model purchases of tertiary, technical and vocational education by international students represent 44% of the total cost of export education. Hence, the direct effect of a 5% ISL is to raise the cost of Australian export education by 2.2% ($=5\%*0.44$).

Our simulation involves two runs: a baseline forecast from 2018/19 to 2039/40, and a policy simulation introducing in 2024 a permanent 5% ISL on fees paid by international students for tertiary, technical and vocational education. Results are reported as cumulative deviations from the baseline in each year of the policy simulation. The main economic assumptions in our baseline simulation are:

- [1] Regional labour supply and employment are determined via the following assumptions:
- (i) the working age population grows in each region at exogenously determined rates, which are a function of natural population growth rates and international net immigration rates;
 - (ii) inter-regional population mobility is determined by maintenance of initial inter-regional relativities in post-tax income per household;
 - (iii) regional unemployment rates are exogenously determined;
 - (iv) regional wage flexibility ensures labour supply and employment are equated.
- [2] Regional investment is endogenous, and responds to movements in expected rates of return on regional industry capital relative to normal rates of return. This determines capital supply through the baseline forecast.
- [3] Real GDP growth is exogenously determined, with the rate of labour-augmenting technical change endogenous.
- [4] The supply of agricultural, commercial, industrial and residential land grows at the population growth rate. This ensures that the rental rates for these natural resources grow at rates commensurate with those of labour and capital.
- [5] The ratio of the federal government deficit to GDP is determined exogenously via endogenous determination of a nation-wide lump sum tax. Similarly, the ratio of each state's government deficit to the state's gross state product is determined exogenously via an endogenous lump sum tax in each state.
- [6] We set the elasticity of demand in international markets for export education at -3.5. This means that a 1 per cent increase in the foreign currency price of export education will generate a 3.5 per cent reduction in the volume of international sales of export education.⁵
- [7] Global demand for Australian exports expands at a rate that is consistent with an exogenous status for the national terms of trade.
- [8] National consumption (private and public) is a fixed proportion of national income. At the same time, we assume that the ratio of real private to real public consumption is given. Together, these two assumptions determine aggregate consumption and its division between private and public consumption.

In the policy simulation, we continue to adopt assumptions [1] (i), [1] (ii), [2], [4], [5] and [6]. In place of [1] (iii) and [1] (iv), we assume that regional labour markets are characterised by short-run wage stickiness and short-run endogenous unemployment rates, with a gradual transition to long-run regional labour market environments that are characterised by [1] (iii) and [1] (iv). In place of assumption [3], real GDP is endogenous, and labour-augmenting technical change is exogenous and equal to its baseline forecast values. In place of assumption [7], the national terms of trade is endogenous, and foreign willingness to pay for Australian exports is exogenous and equal to its baseline forecast values. This allows export volumes and prices in the policy simulation to respond

⁵ We base this on inspection of the latest version of the GTAP (Global Trade Analysis Project) database, GTAP v.11 (Aguiar et al. 2022).

endogenously to policy shocks, holding foreign export demand schedules for all Australian exports at their baseline positions throughout the policy simulation. Regarding assumption [8], we continue to hold the propensity to consume out of national income at its baseline forecast level. However, we hold the paths of real public consumption spending in each state and at the federal level at their baseline values. This means that deviations in real consumption in the policy simulation are expressed as deviations in private consumption spending.

In 2024 of the policy simulation, we implement a permanent 5% ISL on fees paid by international students for tertiary, technical and vocational education. We assume that the ISL is revenue neutral. Revenue neutrality is achieved by recycling the revenue back to Australian households as increases in lump-sum transfer payments. Note that our assumption of revenue recycling via lump sum payments to households has implications for the net regional impacts of the ISL. Under this assumption, some states (like Victoria) pay more in ISL than they receive back from the lump sum payments. As we shall find, this depresses economic activity in Victoria relative to the national average. Recycling under a different assumption (e.g., in proportion to ISL collections) would lead to a different distribution of regional outcomes than that reported here.

3 Results

3.1 Impacts of the ISL on national and regional macroeconomic variables

Figure 1 reports the impact of the ISL on export education and the tertiary, vocational and technical education sectors. The 5 per cent ISL on tertiary, technical and vocational education raises the foreign currency price of export education by approximately 2.0% (Figure 1). This is a little less than the direct effect predicted earlier (2.2%) because part of the ISL is not passed on to students but is instead borne by the tertiary, technical and vocational education sectors via lower tuition prices. The increase in the foreign currency price of export education causes a reduction in international student demand of approximately 6.6% (Figure 1). This reduces activity in the tertiary and technical and vocational education sectors by approximately 1.1% and 0.7% respectively.⁶

Figure 2 reports impacts of the ISL on macroeconomic price measures that are relevant to understanding the levy's macroeconomic effects. The ISL is an indirect tax. Hence, it drives a wedge between the GDP deflator at market prices (which includes indirect taxes) and the GDP deflator at factor cost (which does not include indirect taxes). This accounts for the gap in the deviations between these two deflators. The ISL is a tax on exports. Hence, it reduces export volumes and raises the average price Australia receives for its exports. This accounts for the positive deviation in the terms of trade (the ratio of export prices to import prices) in Figure 2. Other things being equal, a rise in the

⁶ This is close to the direct effect on output of these sectors via the contraction in the export education sector. In the VURMTAX database, international student fees represent approximately 14.8% and 9.5% of the output of the tertiary sector and the technical and vocational sector respectively. The direct effect on the output of these sectors of a 6.6% contraction in the export education sector is thus 0.98% and 0.63% respectively.

terms of trade improves national income because it increases the volume of imports that the nation can purchase in international markets in exchange for a given volume of exports.

Figure 3 reports the impacts of the ISL on the national labour market. As reported in Figure 1, the ISL raises the national terms of trade. In isolation, a rise in the terms of trade imparts a positive influence on the national real wage. However, as reported in Figure 3, the deviation in the national real wage is negative, at -0.05%. This reflects compositional differences in labour / capital ratios across sectors of the Australian economy. The tertiary, technical and vocational education sectors are among the most labour intensive sectors in the economy.⁷ When these sectors contract (see Figure 1) they release labour that, for the most part, finds re-employment elsewhere in the economy. For other sectors to expand to absorb the labour leaving the tertiary and vocational education sectors, the national real wage must fall.

The ISL causes a long-run negative deviation in national labour supply (Figure 3). This is caused by two factors. First, the fall in the real wage reduces the return to households from supplying labour to the job market. Second, we model the implementation of the ISL in a revenue-neutral fashion. Revenue neutrality is achieved via the federal government distributing the ISL revenue to households as a lump-sum transfer. The receipt by households of these transfers raises their demand for leisure via a positive income effect. This adds to the reduction in labour supply. Note that in the short-run, the employment deviation lies below the labour supply deviation. This represents a positive deviation in the unemployment rate during the short-run transition of labour out of the education sector and into other sectors. Over time, the deviations in labour supply and employment converge as real wage adjustment leads to a return of the unemployment rate to its long-run natural level.

The gradual absorption of the labour displaced from the education sector by other sectors of the economy with comparatively higher capital / labour ratios generates a positive deviation in the national capital stock (Figure 4). In the short-run, the negative deviation in employment causes a negative deviation in real GDP. Over time, as the positive capital stock deviation grows, and the labour market recovers, the GDP deviation attenuates. Nevertheless, by the end of the simulation period, a small negative deviation in real GDP remains. This reflects the enduring negative deviation in wagebill weighted employment (Figure 4). This is caused by two factors: (i) the decrease in overall labour supply; and (ii) the contraction in the share of total employment accounted for by employment in the high wage education sector.

Export education has differing degrees of economic importance across Australia's states. For states where export education represents a relatively high share of economic activity, we might expect the ISL to have an economic impact that is larger than the national average. Figure 5 supports this, showing that Victoria's macro-economy is relatively adversely affected by the ISL. This reflects the relatively larger sizes of both the export education sector, and the underlying tertiary, and technical and vocational education sectors, in Victoria compared to the country as a whole.⁸ It also reflects our

⁷ Taken together, these two sectors have a labour / capital ratio (i.e. a ratio of payments to labour relative to payments to capital and land owners) of 12:1. The economy-wide average labour/capital ratio is 1.4:1. Put another way, wages represent approximately 92% of primary factor payments in the tertiary, technical and vocational education sector. In comparison, for the economy as a whole, wages represent just under 60% of total primary factor payments.

⁸ In VURMTAX, export education represents 10.7% of Victorian international exports, but only 4.2% of national exports. Similarly, the value added of the tertiary, and vocational and technical education sectors, represents 2.6% of Victorian GDP at factor cost, but only 2.2% of national GDP at factor cost.

revenue recycling assumption. Each region receives an equal per-capita distribution of the ISL. If instead each region received ISL revenue in proportion to its contribution to total ISL collections, or in proportion to the scale of tertiary and vocational and technical education within its borders, then the regional dispersion in economic outcomes would be attenuated relative to that reported in Figure 5.

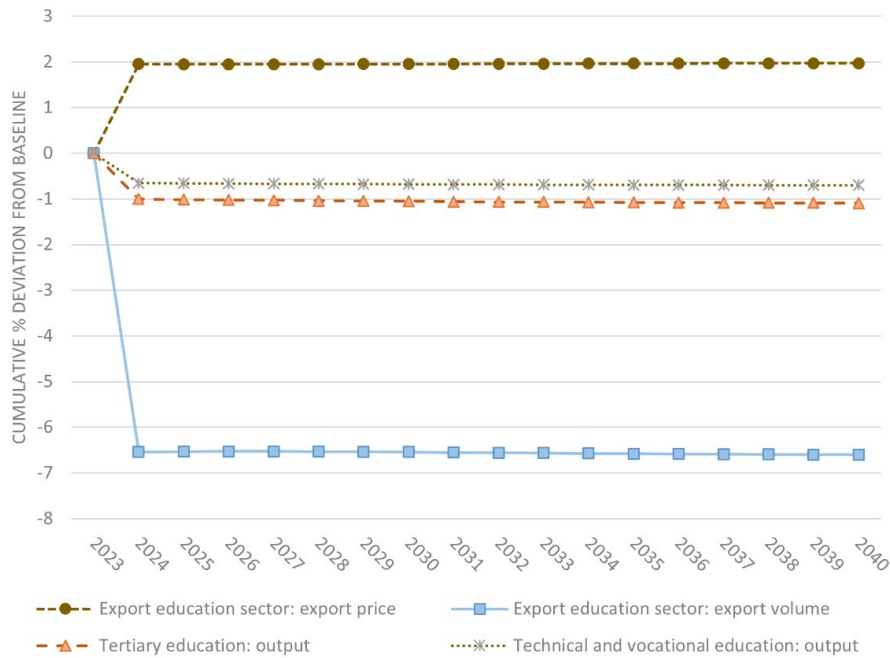


Figure 1. The export education, tertiary education, and vocational and technical education sectors

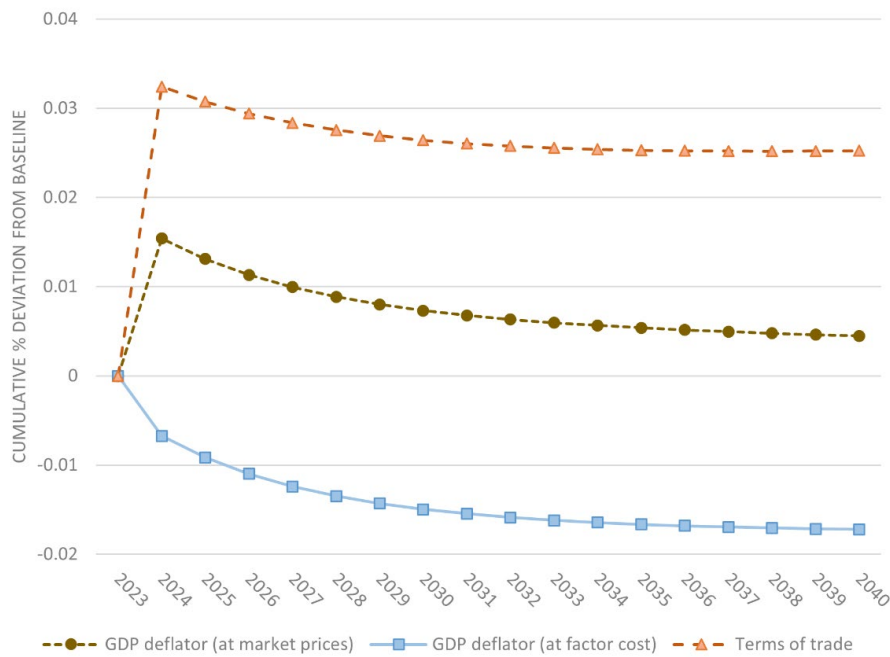


Figure 2. Macroeconomic price measures

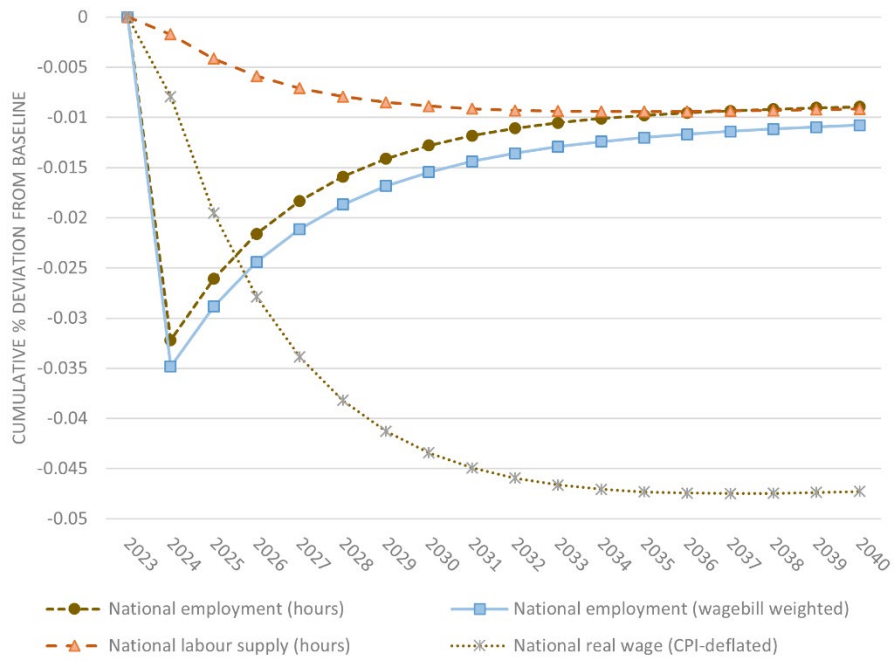


Figure 3. National labour market

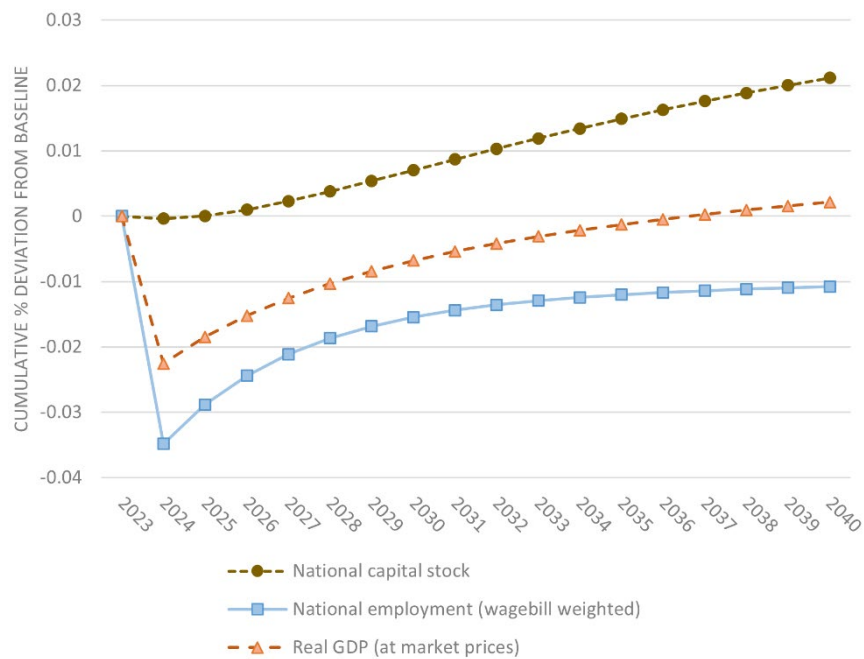


Figure 4. Real GDP, capital stock, and employment

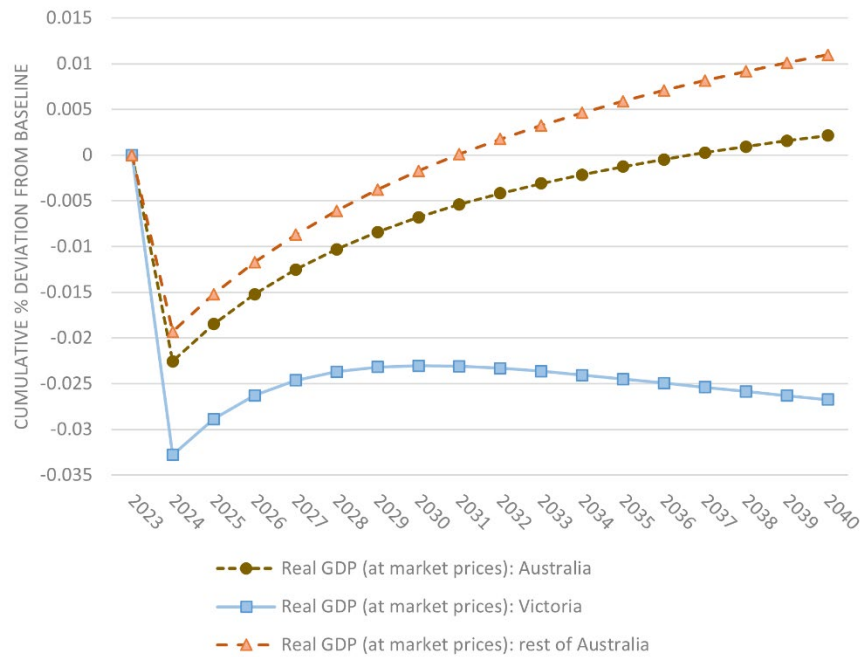


Figure 5. State and national real GDP

3.2 The tax efficiency of an ISL

Taxes generate economic costs, by changing incentives to supply valuable resources (like labour), and by changing incentives to use commodities that are valued more highly than their before-tax costs. Economists compare the economic costs of different tax instruments by calculating their “marginal excess burdens” (MEBs). The MEB is a measure of the economic damage of a tax expressed in terms of cents of damage per dollar of revenue raised. For example, if we were to raise an extra \$1 of revenue from a tax with an MEB of 20c, then we would expect that extra dollar of revenue to generate economic costs valued at 20c. These economic costs would come in the form of allocative efficiency losses (caused by tax wedges between production costs and market prices) and lost resource inputs (as households reduce labour supply and investors cut back on investment).

Following the approach of Nassios et al. (2019a; 2019b) and Adams et al. (2020), we use VURMTAX to evaluate the MEB of a 5% ISL. The VURMTAX estimate of the MEB of the ISL is 15 cents per dollar. For comparison, in previous work, CoPS has estimated the MEB of the PIT at 24 cents per dollar, which is similar to recent estimates for the GST [34 cents per dollar in Giesecke et al. (2021), 24 cents per dollar in Nassios and Giesecke (2022b)]. This suggests that an ISL, at least at the revenue raising effort implied by the 5% rate studied herein, is more efficient than other major federal taxes at their current revenue raising levels. It also compares favourably with existing state taxes, which are, in general, more distortionary than federal taxes. For example, previous work at the Centre of Policy Studies has estimated the MEBs of state payroll tax, insurance duties, and stamp duties at 22c, 38c and 76c per dollar of revenue [Nassios et al. (2019b), Nassios and Giesecke (2022b)]. Relative to existing taxes, the comparatively low MEB of the ISL likely has two sources. First, as a tax on exports, it raises the terms of trade. This is a positive contributor to national income, offsetting some

of the tax's adverse allocative efficiency and resource supply impacts. Second, the tax is levied at a low rate. A tax's MEB rises as its rate rises. At higher ISL revenue raising efforts than those modelled herein, the ISL's measured MEB would be correspondingly higher.

4 Conclusions

Using an existing economic modelling framework (VURMTAX) designed for tax policy analysis, we have undertaken an investigation of the economic impacts and tax efficiency of an international student levy (ISL) levied at a rate of 5%. From a tax efficiency perspective, we find that such a tax would generate economic damage of 15 cents per dollar raised. This compares favourably with two major federal taxes (personal income tax and GST) and a range of major state taxes, including payroll tax, stamp duty and insurance duties.

The modelling reported in this paper represents a preliminary exploration of an ISL. Hence there are a number of areas to be investigated further in future work:

ISL revenue collection costs. Our current MEB estimate does not include collection and administrative costs. The ISL proposal does not yet contain details of how an ISL would be implemented and administered. If an ISL is implemented in a way that imposes a heavy administrative burden on educational institutions, this should be included in the modelling, as it will have consequences for educational costs, international student numbers, and the measured economic characteristics of an ISL.

The sensitivity of international student demand to price. In the modelling reported in this paper, we use an estimate of the elasticity of foreign student demand of -3.5, which we base on investigation of the latest GTAP database. Future work should explore the ISL under a range of plausible alternative demand elasticity estimates.

Budget-neutral recycling of ISL revenue. In the modelling reported in this paper, the revenue raised from the ISL is distributed in a budget neutral fashion to each state on an equal per-capita basis. This is an unfavourable recycling assumption for export education intensive states like Victoria. The Universities Accord Interim Report hints at uses for ISL revenue (e.g. education infrastructure needs) that would possibly produce a regional ISL revenue disbursement profile that aligns more closely with the ISL's regional revenue raising profile. Future work should expand the investigation of the ISL to encompass how ISL revenue will be used.

ISL impacts for states and regions beyond Victoria and the rest of Australia. We have used a two-region (Victoria, rest of Australia) implementation of VURMTAX. However, Australia has over 40 universities, and hundreds of VET and TAFE providers, distributed across diverse regions of the country. Future work should explore the consequences of an ISL taking into account institutional and regional detail. For example, the un-aggregated VURMTAX database covers Australia's eight states and territories. The master database for CoPS' TERM model contains over 300 regions. Examining the ISL using such models will provide greater insight into the regional economic effects of an ISL.

Disaggregating the export education sector. Export education within VURMTAX is currently modelled as a single sector. Together with living costs, this sector bundles fees associated with tertiary, vocational, technical, secondary, primary and pre-school education. This treatment is suitable for an ISL that does not distinguish between student types. However, if the ISL is to fall on one type of student only (e.g. tertiary) then as a minimum VURMTAX's treatment of export education should be divided in two (tertiary education, and other education). This would also allow exploration of substitution possibilities by foreign students between types of education. This would be relevant if Australian education is valued by international students not only for the qualifications and experiences it provides, but also as a potential pathway to permanent residency.

Benchmarking the ISL's MEB against other tax instruments. Our initial investigation finds that an ISL is a relatively efficient tax, in that its MEB compares favourably with those of other federal and state taxes. In future work we would like to investigate the characteristics of the ISL that generate this outcome.

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