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New Insights into the Relationship Between Taxation and International Trade

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Abstract

This policy note summarises the main findings of our recent research on the effects of labour and corporate taxation on international trade, and discusses their policy implications. The first major finding is that labour taxes do not seem to affect imports, while their effect on exports is likely to depend on how much domestic labour contributes to total value added. If the contribution of domestic labour is low, as has often been the case recently, changes in labour taxes are unlikely to have a major impact on exports. This is an important finding, because it challenges the established view in the literature and policy making, that by lowering labour taxes, authorities can improve the trade balance. The second major finding is that the effect of corporate tax on exports and imports depends on the stock of FDI. Corporate taxes are unlikely to affect international trade in general, but only when the stock of FDI is large. This means that corporate taxes affect international trade through multinational enterprises, which reduce their activity in countries with higher taxes and increase it in countries with lower taxes. Both labour and corporate taxes have seen a downward trend in recent decades, but we find that the contribution of this to the expansion of international trade has been small.

Keywords: labour taxes, corporate taxes, international trade, exports, imports

JEL classification: F14, F16, F23, H24, H25, J32

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New insights into the relationship between taxation and international trade

1. INTRODUCTION

This policy note summarises the main findings from our recent work on the relationship between taxation and international trade, presented in detail in two recent wiiw working papers – 'Labour Taxes and International Trade: The Role of Domestic Labour Value Added' and 'How do Corporate Taxes affect International Trade?'.

The first paper, 'Labour Taxes and International Trade: The Role of Domestic Labour Value Added', revisits the relationship between labour taxation and international trade, focusing on the role of domestic labour value added. The relationship between labour taxes and international trade has received attention in the literature, and the conventional wisdom argues that higher labour taxes may reduce exports and increase imports because they make domestic products more expensive and less competitive than foreign products. This argument has been further interpreted in the sense that policy makers can improve their trade balance by reducing labour taxes. Recently, in the aftermath of the European debt crisis, some authors have even used this as a background for proposing fiscal devaluation, whereby governments can improve their external position, without damaging their public finances, by reducing labour taxes by a certain amount and increasing value-added tax (VAT) by a comparable amount.

We have thus reinvestigated the relationship between labour taxes and international trade, focusing on the role of domestic labour value added. Specifically, the mechanism that has been elaborated in the literature, described above, works through domestic labour costs. This means that domestic labour costs have to constitute a sizeable share of the final price of a product to make the mechanism effective. If domestic labour costs are not sizeable, changes in labour taxes will have only a small impact on the final price of the product, and the corresponding changes in exports and imports will be small. We have then assessed how labour taxes affect exports and imports, and whether the effect depends on domestic labour value added.

The second paper, 'How do Corporate Taxes affect International Trade?', investigates how corporate income taxes affect international trade, and what is the underlying channel. Corporate income taxes are important for companies because they affect their net profits, and through this, their business decisions, such as investment, production and employment. This implies that when corporate taxes are raised, companies may have fewer funds for new investment and employment. This can then affect aggregate demand in the economy, and through this, reduce imports, and after some time maybe also exports. But higher taxes may also make companies think about ways to reduce their tax bill, which they can do by shifting profits to places with lower taxes, or by relocating activity there. This is easier for multinational enterprises to do as they operate in many different places around the world.

Our paper has explored how corporate taxes affect imports and exports, and whether the relationship depends on the presence of multinational enterprises, measured by the stock of FDI. If corporate taxes are found to reduce imports and exports in general, we interpret this as an indication that the aggregate-demand channel is at play. If they are found to affect international trade only when FDI stocks are high, our interpretation is that the underlying channels are multinational enterprises. We then distinguish between the two ways in which multinational enterprises can reduce their tax bill - by profit-shifting through transfer prices, or by relocating activity - by observing how taxes affect imports. If corporate taxes are found to increase imports, we interpret this as evidence that the profit-shifting mechanism is at play, because multinationals shift profits outside by presenting bigger imports in the high-tax country. If corporate taxes are found to lower imports, we interpret this as a signal that the activity-shifting mechanism is working, because multinationals decide to reduce the volume of their operations in the high-tax country.

The rest of this note is organised as follows. Section 2 briefly presents the methodological approach, section 3 presents the main findings, first for labour taxes and then for corporate taxes, section 4 discusses the relevance of the findings for policy makers, and section 5 summarises the main take-aways.

2. HOW DO WE INVESTIGATE WHETHER TAXES AFFECT INTERNATIONAL TRADE?

Our research approach is similar for both pieces of research and is based on estimating the following type of regressions:

$$trade_{s,c,t} = \alpha_1 + \alpha_2 * tax_{s,c,t} + \alpha_3 * factor_{s,c,t} * tax_{s,c,t} + \alpha_4 * controls_{s,c,t} + x_s + y_c + z_t + \varepsilon_{s,c,t} \quad (1)$$

where *trade* is either exports or imports, *tax* is either labour income tax or corporate income tax, and *factor* is the variable we want to investigate in terms of whether it shapes how tax affects trade. Concretely, in the labour tax regressions, *factor* is the contribution of domestic labour to value added in the respective industry's exports and imports, while in the corporate tax regressions, *factor* is the stock of FDI in the respective industry.

Controls are standard macroeconomic factors that might affect exports and imports, such as the exchange rate, foreign and domestic demand, other taxes, wages, unemployment rate, government budget balance, as well as variables for euro and EU membership. *s* is an index that denotes sector, *c* is an index for country, *t* is an index for the year, x_s indicates sector fixed effects, y_c country fixed effects, z_t time fixed effects, ε and η are error terms, and α*'s* and β*'s* are coefficients to be estimated.

If the coefficient on the tax variable (α_2) is found to be significant, it means that the respective tax is affecting trade in general. If the coefficient on the interaction term (α_3) is found to be significant, it means that the factor of interest is shaping how taxes affect trade.

We estimate these regressions using industry-level data, which is an improvement over most of the existing literature which usually uses country-level data. Concretely, we use data on 33 NACE sectors for 41 EU and OECD countries, over the period 2005-2014. We apply two-stage least squares (2SLS)

estimations to account for potential endogeneity (i.e. that trade may also affect taxes), using past values of public debt and past values of taxes as instruments for current values of taxes.

3. WHAT DO WE GET?

Table 1 presents the main results for the effect of labour taxes on exports and imports. We can see that the coefficient on the labour tax wedge is insignificant in both cases, meaning that labour taxes do not seem to affect exports or imports in general. The interaction terms of labour tax with domestic labour value added, on the other hand, is significant and negative for exports. This implies that domestic labour value added shapes the effect of labour taxes on exports – as the share of domestic labour in value added gets bigger, the effect of labour taxes on exports will become more negative. The interaction term is found to be insignificant in the imports regression, implying that for imports, labour taxes are always insignificant.

Figure 1 shows the impact of the share of domestic labour value added on the semi-elasticity of exports to labour tax changes. When domestic labour value added is 20%, which is a relatively low value, semi-elasticity is around -1. When domestic labour value added is 80%, which is a relatively high share, semi-elasticity grows to -4. These are sizeable changes. For example, a semi-elasticity of -1 implies that a 1 pp increase in the labour tax (as a percent of the total labour cost) is associated with a decline in exports of 1%. When semi-elasticity is -4, the same increase in the labour tax leads to a decline in exports of 4%.

Table 2 shows the main results for the effect of corporate taxes on international trade. As can be seen, corporate taxes are insignificant for both exports and imports, when they are alone. But when they interact with the stock of FDI in the industry, they become negative and significant. This means that corporate taxes do not seem to affect trade in general, but only in combination with FDI stock, i.e. only through the presence of multinational enterprises. Their effect is negative both for imports and exports, implying that when corporate taxes grow and the stock of FDI is high, both imports and exports decline. This finding is in accordance with the hypothesis that multinational enterprises decide to reduce their activity in a country with high (or rising) corporate taxes, which makes both imports and exports decline.

Figures 2 and 3 show the magnitude of the effect of corporate income tax on exports and imports, for different values of FDI stock in the industry (measured as logarithms). When the stock of FDI is zero, the effect of corporate taxes on trade is also zero. As FDI stock grows, so does the effect (in absolute terms). When FDI stock is around 12 (in log terms), which is among the highest values in the sample and corresponds to the stocks of FDI in the financial sector in Ireland, the Netherlands and Switzerland, the partial effect becomes around -0.7. This means that an increase of 5 pp in the effective average corporate income tax (CIT) rate (from 20% to 25%, for instance) is associated with a decline in exports and imports of around 3.5 pp of GDP, which is close to the average value for industry exports and imports in the sample. In other words, a big increase in the corporate income tax, in industries with a large presence of multinationals, leads to just an average decline in exports and imports, meaning that the effect of corporate taxes on international trade is small.

Table 1 / Results for the effect of labour taxes on exports and imports

VARIABLES	(1) Exports	(2) Imports
Labour tax wedge	**0.392**	**1.442**
	(4.246)	**(2.441)**
Labour tax wedge * Domestic labour value added	**-5.260****	**-0.00697**
	(2.050)	**(1.113)**
Nominal effective exchange rate	-0.481	0.0976
	(0.330)	(0.227)
Foreign demand	0.0731	0.256
	(0.231)	(0.188)
Other taxes	-0.528	-0.651
	(1.728)	(1.009)
Euro	-0.0265	0.0770
	(0.0928)	(0.0508)
FDI stock	-0.0110	0.0957
	(0.128)	(0.0728)
Old age dependency	-1.439	-1.523
	(3.972)	(2.091)
Government budget balance	1.21e-05	0.00320
	(0.00665)	(0.00405)
Unemployment	0.875	-1.145*
	(0.971)	(0.588)
Wages	0.835***	-0.180***
	(0.107)	(0.0500)
Domestic labour value added	-1.312*	0.158
	(0.771)	(0.413)
Exports		0.236***
		(0.0147)
Constant	2.954	-2.143
	(7.144)	(5.307)
Observations	7,297	7,303
R-squared	0.786	0.930
Underidentification test p-value	0	0
Hansen J test	0.696	0.410

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
All regressions include industry, country and year fixed effects.

Figure 1 / Semi-elasticity of log (exports) to 1 pp increase in the labour tax wedge

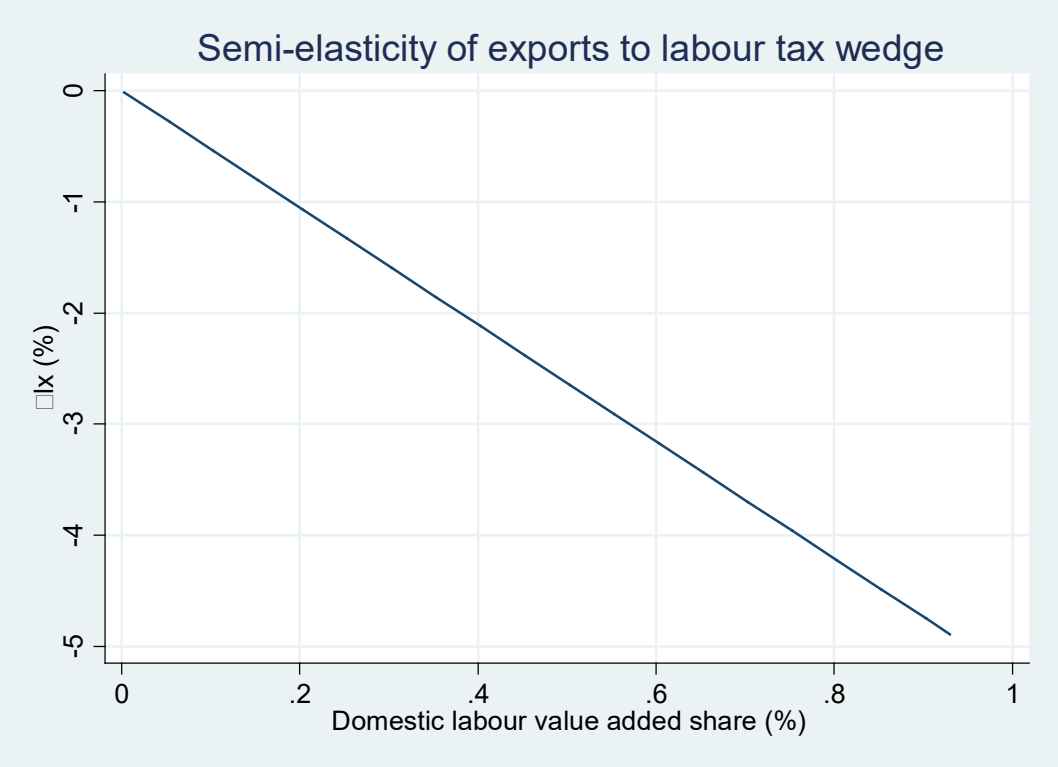


Table 2 / Results for the effect of corporate taxes on exports and imports

VARIABLES	(1) Export	(1) Imports
Effective average CIT	**1.234**	**0.545**
	(1.125)	**(0.804)**
Effective average CIT * FDI stock	**-0.0523*** **	**-0.0600*** **
	(0.0141)	**(0.0141)**
Nominal effective exchange rate	0.131	0.0371
	(0.105)	(0.0806)
Foreign demand	0.00724	0.00435
	(0.0274)	(0.0239)
Euro	-0.00276	0.000159
	(0.0133)	(0.00968)
Government budget balance	-0.00469	-0.000900
	(0.00803)	(0.00571)
Unemployment	-0.196	-0.0639
	(0.204)	(0.160)
Wages	0.00477	-0.00556
	(0.00689)	(0.00388)
FDI stocks	0.0163***	0.0133***
	(0.00393)	(0.00312)
Domestic GDP	-0.232	-0.0598
	(0.153)	(0.120)
Other taxes	-0.304	-0.00886
	(0.897)	(0.613)
Constant	5.937	1.499
	(4.012)	(3.208)
Observations	2,823	2,823
R-squared	0.601	0.475
Underidentification test p value	0	0
Hansen J test	0.714	0.727

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
All regressions include industry, country and year fixed effects.

Figure 2 / Partial effect of average effective CIT rate on exports

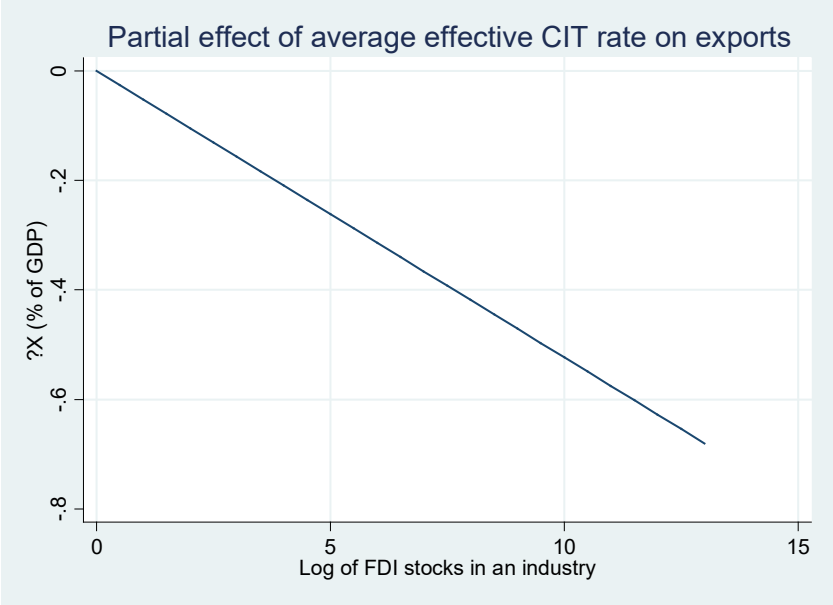
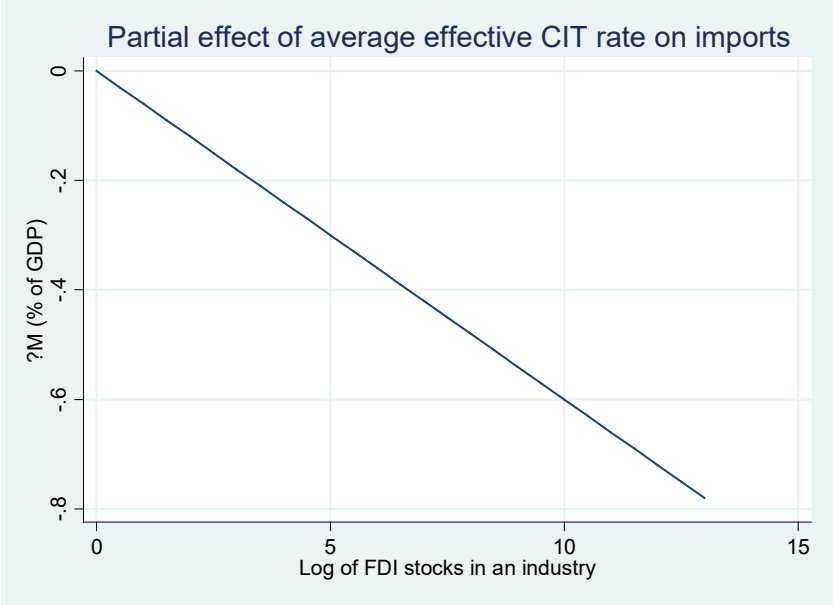


Figure 3 / Partial effect of average effective CIT rate on imports



4. WHAT ARE THE IMPLICATIONS OF THESE RESULTS?

The first important implication of these findings is that the effect of labour and corporate taxes on international trade will differ for different industries, countries and time periods. For labour tax this will depend on the contribution of domestic labour to value added, while for corporate tax, on the stock of FDI. To illustrate this, we present in Tables 3 and 4 the partial effects of changes in labour and corporate taxes on trade, for different industries and countries.

Concretely, Table 3 shows the semi-elasticity of exports to changes in labour tax for Austria, Germany and the US, for 33 industries in 2014. In all three countries the semi-elasticities vary considerably: in Austria, from 0.4 to 4.3, in Germany, from 0.2 to 4.5, and in the US, from 0.3 to 4.7. For example, in Austria, in the mining and quarrying sector an increase in the labour tax of 1 pp is likely to reduce exports by 1.2%, whereas in agriculture the same increase would reduce exports by 4.1%. One can also note that certain industries have very different semi-elasticities in different countries. For instance, agriculture in the US has a semi-elasticity of 1.8, while in Austria the semi-elasticity is 4.1.

Table 4 presents the partial effect on imports of changes in the average effective corporate income tax rate for Austria, the Netherlands and Croatia, in the same industries, in 2012. Austria is taken as a country with a moderate presence of multinational enterprises, the Netherlands as a country with a strong presence and Croatia as a country with a minor presence (in the analysed sample). Again, it can be seen that there is a sizeable variation in the partial effect, both between and within countries. In Austria for example, an increase in the effective average corporate income tax of 1 pp would reduce imports of chemical and pharmaceutical products by 0.45 pp of GDP, while for agricultural products, the decline in imports would be 0.15 pp of GDP. It can also be seen that the Netherlands, a country with a strong presence of multinationals, has sizeably bigger partial effects than Austria or Croatia. For example, in the chemical and pharmaceutical industry the partial effect in the Netherlands is -0.66, which is more than double that of Croatia (-0.29).

The second important implication of the findings is that the overall effects of changes in labour and corporate taxes on international trade are likely to be small. Recent decades have seen a decline in corporate taxes mostly everywhere in the world, which some have termed the ‘race to the bottom’. The same can be said for labour taxes, though perhaps not to the same extent as for corporate taxes. Figures 4 and 5 show the dynamics of labour and corporate taxes in the sample that we cover, where it is clear that taxes have indeed declined in most of the countries. The contribution of this decline to the expansion of international trade turns out to be small, however. Let us illustrate the effect of labour taxes on the case of the UK, where labour taxes have declined during this period by 3 pp (from 34% of labour costs to 31%). This decline has made exports grow by 8.8% during the analysed period. The total growth in exports in that period in the UK was 44%, which means that lower labour taxes have contributed only marginally to export expansion. As for corporate taxes, we take the case of Canada, which had one of the biggest declines in the effective average corporate income tax rate in the analysed sample - from 33% to 24%. Taking an industry with a high stock of FDI (i.e. in the 90th percentile of the distribution), this decline in the tax means that imports and exports in that industry have increased by approximately 4.6 percentage points of GDP. This is 4 times smaller than the standard deviation of exports, and 3 times smaller than the standard deviation of imports, implying that the contribution of the CIT to the increase in exports and imports in the observed period is not very large.

Since the contribution of the recent decline in labour and corporate taxes to international trade has been found to be small, this implies that governments can consider raising labour or corporate taxes as a means to improve their revenues, without the fear that this will severely damage their external trade. Furthermore, some past initiatives for lowering labour taxes such as the fiscal devaluation proposals whereby labour taxes are reduced and the reduction is compensated by an increase in VAT, are unlikely to hold in general, and only under certain conditions. Finally, a possible increase in corporate tax in the coming period, due to the adoption of the global minimum tax, is unlikely to significantly damage international trade.

Table 3 / Semi-elasticities of exports to changes in labour tax wedge for 33 industries in Austria, Germany and the US, in 2014

Industry name	Austria	Germany	US
Paper products and printing	-2.11	-2.55	-2.79
Other social and personal services	-3.48	-3.30	-3.94
Agriculture, hunting, forestry and fishing [A]	-4.07	-3.25	-1.78
Mining and quarrying [B]	-1.17	-3.75	-1.14
Food products, beverages and tobacco [CA]	-1.96	-2.98	-1.93
Textiles, wearing apparel, leather and related products [CB]	-2.28	-3.00	-3.39
Wood and products of wood and cork, except furniture	-2.40	-3.22	-3.06
Coke and refined petroleum products [CD]	-1.12	-0.58	-0.38
Chemical and pharmaceutical products	-1.41	-1.91	-1.26
Rubber and plastics products	-2.03	-2.57	-2.49
Other non-metallic mineral products	-2.41	-2.78	-2.60
Basic metals	-1.82	-2.37	-2.30
Fabricated metal products, except machinery and equipment	-2.25	-3.09	-2.89
Computer, electronic and optical products [CI]	-1.63	-2.48	-2.38
Electrical equipment [CJ]	-1.94	-2.65	-2.69
Machinery and equipment n.e.c. [CK]	-1.95	-2.80	-2.58
Motor vehicles, trailers and semi-trailers	-1.25	-2.14	-1.80
Other transport equipment	-1.61	-2.44	-2.66
Furniture; other manufacturing; repair and installation of machinery and equipment [CM]	-2.66	-3.43	-3.10
Electricity, gas and water supply; sewerage, waste management and remediation activities [D-E]	-1.68	-1.53	-1.50
Construction [F]	-2.64	-3.41	-3.74
Wholesale and retail trade, repair of motor vehicles and motorcycles [G]	-2.95	-3.64	-2.69
Transportation and storage [H]	-2.40	-2.59	-2.94
Accommodation and food service activities [I]	-2.53	-3.71	-3.21
Publishing, audiovisual and broadcasting activities [JA]	-3.25	-2.50	-2.13
Telecommunications [JB]	-1.92	-1.52	-1.39
IT and other information services [JC]	-3.43	-3.31	-4.09
Financial and insurance activities [K]	-2.98	-3.40	-2.93
Real estate activities [L]	-0.42	-0.24	-0.28
Professional, scientific and technical activities; administrative and support service activities [M-N]	-3.28	-3.14	-3.68
Public administration and defence; compulsory social security [O]	-3.81	-3.89	N/A
Education [P]	-4.27	-4.48	-4.74
Human health and social work activities [Q]	-3.93	-3.91	-4.40

Table 4 / Partial effects on imports of changes in average effective CIT, for 33 industries in Austria, the Netherlands and Croatia, in 2012

Industry name	Austria	Netherlands	Croatia
Agriculture, hunting, forestry and fishing [A]	-0.15		-0.31
Wood and products of wood and cork, except furniture	-0.40	-0.43	-0.30
Paper products and printing			
Coke and refined petroleum products [CD]		-0.63	-0.47
Chemical and pharmaceutical products	-0.45	-0.66	-0.29
Rubber and plastics products	-0.33	-0.48	-0.23
Other non-metallic mineral products			
Basic metals	-0.42	-0.54	-0.32
Fabricated metal products, except machinery and equipment			
Computer, electronic and optical products [CI]	-0.39	-0.53	-0.29
Electrical equipment [CJ]			
Machinery and equipment n.e.c. [CK]	-0.44	-0.60	-0.28
Motor vehicles, trailers and semi-trailers	-0.42	-0.46	-0.21
Other transport equipment	-0.31	-0.49	-0.19
Furniture; other manufacturing; repair and installation of machinery and equipment [CM]			
Electricity, gas and water supply; sewerage, waste management and remediation activities [D-E]	-0.41	-0.58	-0.27
Mining and quarrying [B]	-0.34	-0.48	-0.31
Construction [F]	-0.30	-0.44	-0.40
Wholesale and retail trade, repair of motor vehicles and motorcycles [G]	-0.59	-0.68	-0.46
Transportation and storage [H]	-0.41	-0.62	-0.31
Accommodation and food service activities [I]	-0.34	-0.42	-0.39
Publishing, audiovisual and broadcasting activities [JA]	-0.21	-0.56	-0.31
Telecommunications [JB]	-0.44	-0.57	-0.44
IT and other information services [JC]	-0.39	-0.35	-0.26
Financial and insurance activities [K]	-0.64	-0.65	-0.54
Real estate activities [L]	-0.48	-0.62	-0.42
Professional, scientific and technical activities; administrative and support service activities [M-N]	-0.64	-0.50	-0.43
Public administration and defence; compulsory social security [O]			
Education [P]	-0.18		
Human health and social work activities [Q]	-0.14		-0.08
Other social and personal services	-0.19	-0.41	-0.21
Food products, beverages and tobacco [CA]	-0.42	-0.67	-0.38
Textiles, wearing apparel, leather and related products [CB]	-0.30		-0.32

Figure 4 / Labour tax wedge in the analysed countries during the analysed period (% of total labour costs)

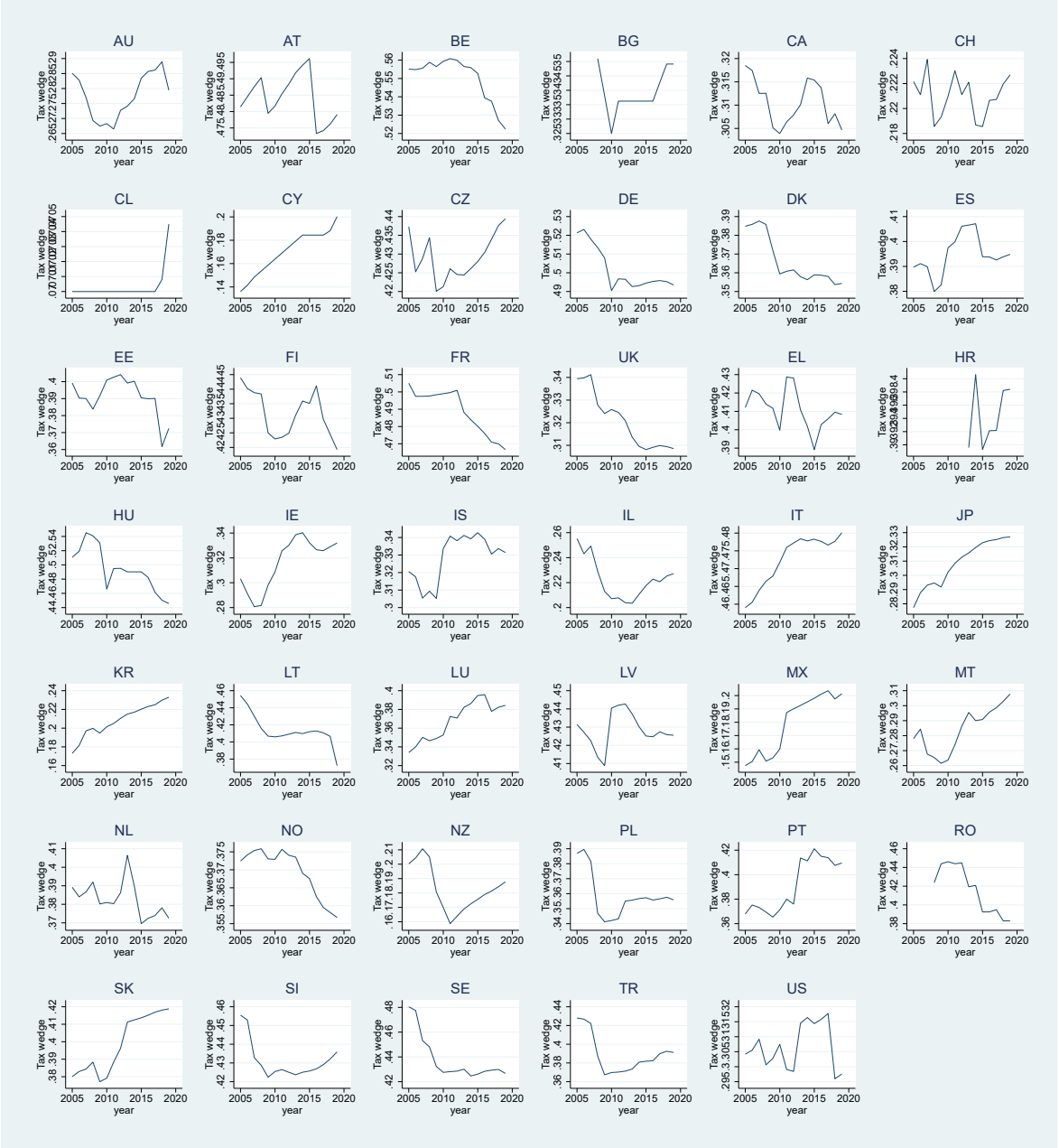
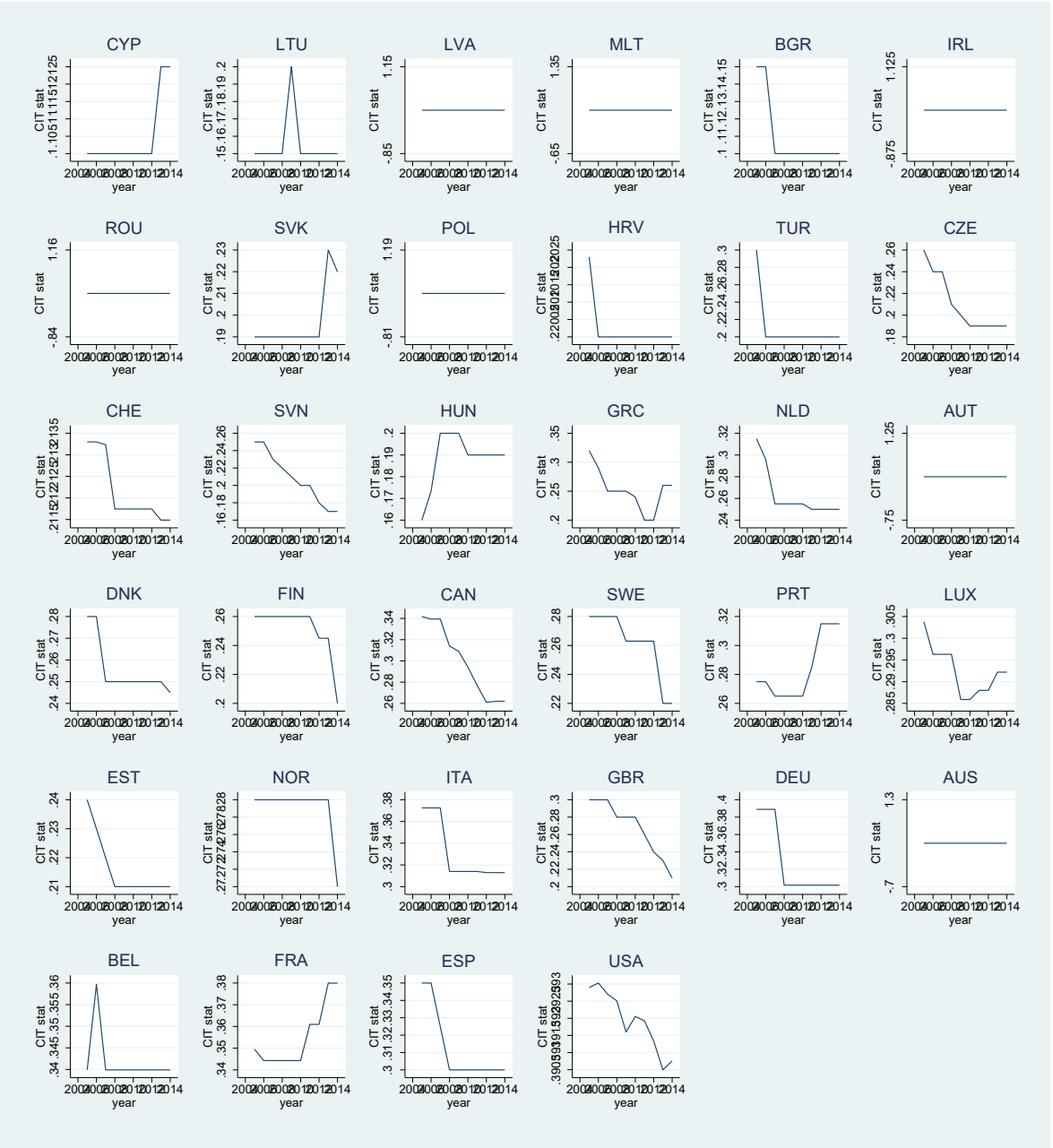


Figure 5 / Top statutory corporate income tax rates in the analysed countries during the analysed period



5. KEY TAKE-AWAYS

› The effect of labour taxes on exports depends on how much domestic labour contributes to the value added in exports. If the contribution is low, the effect of labour taxation on exports will be small.

› The effect of labour taxes on imports is found to be insignificant.

› The effects of corporate taxes on exports and imports depend on the stock of FDI in the industry. If there is no FDI in the sector, corporate taxes will have no effect on imports and exports in that sector. If the stock of FDI is large, corporate taxes will have larger negative effects on exports and imports.

› This implies that corporate taxes affect international trade through the operations of multinational enterprises, which can easily shift production between countries, and decide to reduce activity in countries which raise their taxes.

› The effects of certain changes in labour or corporate taxes on international trade will depend on the underlying conditions, and will be different in different countries, industries and time periods.

› Recent decades have seen a decline in both labour and corporate taxes, but the contribution of this decline to the growth of international trade has been small.

› Fiscal devaluation proposals are unlikely to be valid in general, but only in very specific cases.

› Recent initiatives to increase taxes, such as the global minimum tax initiative, are unlikely to harm international trade.

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