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Comment on: "International tax competition with rising intangible capital and financial globalization" by Vincenzo Quadrini and José-Victor Ríos-Rull☆

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1. Introduction

The objective of Quadrini and Ríos-Rull (2024), (QR henceforth) is to study how equilibrium capital taxation in an open economy depends on structural features of the economy, such as the degree of international integration, or the share of intangible capital. The framework of the analysis is a standard dynamic open macro model with two symmetric countries, where firms headquartered in each country can produce a single good in both countries using labor, standard capital and intangible capital. The key feature of intangible capital (think of R&D) is that firms can use the same stock of intangible capital to produce in both locations. This feature allows firms to book the profits from intangible capital in the location with the more favorable tax regime. Households supply labor and hold a portfolio of stocks of foreign and domestic firms. In this set-up globalization/integration is captured both as a higher share of foreign production by firms (multinational production) and as a higher share of cross-country holdings of stocks by households. Capital and labor taxation are chosen by benevolent national governments in a non-cooperative fashion. Moreover governments cannot commit to future tax policies. This implies that the current domestic government chooses taxes to maximize utility of domestic residents, taking as given the tax choices of foreign governments and of domestic future governments. An equilibrium tax function is a fixed point of the operator that maps foreign tax choices and domestic future tax choices into current domestic tax choices. The most notable methodological contribution of QR is to solve for and characterize these equilbrium tax functions. Its main substantial results, as stated in the abstract, are that "*increased cross-country ownership of assets has resulted in higher taxation of profits*" and that "*higher share of intangible capital has led to lower profit tax rates.*" The intuition for the results is clear. Regarding the first result, the higher the cross-country holdings of assets are, the higher the fraction of capital taxes paid by foreign owners. Since the local government does not care about their welfare, when foreigners own more capital, capital will be taxed more. It is important to notice that the share of foreign owners here is fixed exogenously and cannot respond to taxes. Regarding the second result, when there is more intangible capital, it is easier for firms to avoid domestic taxation by booking profits abroad, which reduces the ability of domestic governments to raise revenues through capital taxation. In this comment I will first

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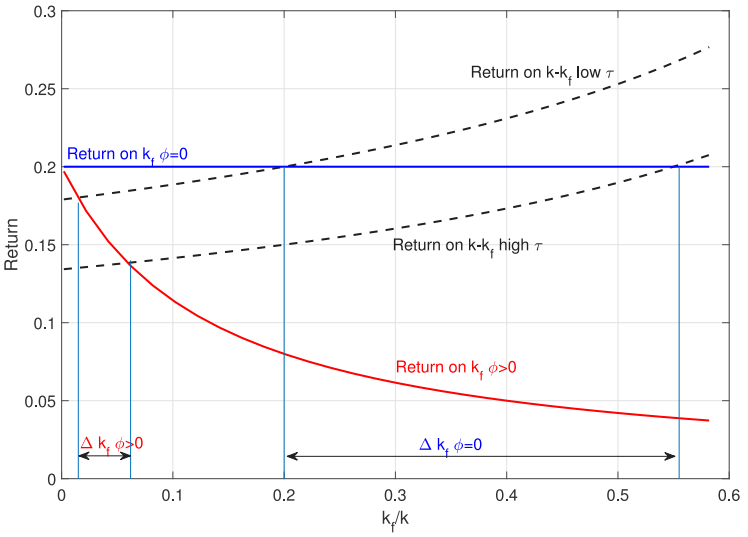

Fig. 1. Equilibrium choices of foreign capital.

discuss in more detail the first result, that is the relation between higher degree of cross-country ownership of assets, and capital taxation. Second, I will discuss some recent empirical evidence on tax rates on capital and intangible capital which supports some of the main insights of this paper.

2. Does globalization lead to higher capital taxes?

Whether globalization leads to higher or lower capital taxes is a question that came up since the early days of globalization. The literature has highlighted two key effects of globalization on capital tax rates.[1] The first is that globalization increases the elasticity of capital to domestic taxes, thereby lowering the ability of the domestic tax authority to tax capital. The second is that globalization typically increases the amount of foreign capital in a country, and that increases the incentives for the tax authority to tax capital, as the cost of higher taxation are not borne by domestic residents (this effect is also labeled as "tax exportation"). This paper pushes the view that globalization, measured as the share of foreign holdings of domestic assets, increases capital taxation, because of "tax exportation". The result is best seen in Figure 5e in QR, which shows that when foreign ownership of domestic capital (λ) increases, so does the taxation of capital. This result captures an important aspect of the impact of globalization on capital taxation. However I want to argue that there are other aspects of globalization that are also potentially important and that can push capital taxation in a different direction. In particular I want to stress features of globalization that can change the elasticity of capital to domestic taxation and therefore change optimal capital taxation, in a direction different than what is highlighted in this paper.

2.1. Globalization as a reduction of costs of investing abroad

Here, I am going to consider a very stylized set-up that shows how globalization can actually lower capital taxes. The set-up is a simplified version of the one in Quadrini (2005). Consider a small open economy inhabited by measure μ of workers and $1-\mu$ of capitalists. Workers are endowed with a unit of labor which they supply inelastically to the market. Capitalists are endowed with capital k, which they can invest either at home or abroad. Let k_f be the amount of capital invested abroad. Capital invested at home $k-k_f$, is used in a standard Cobb–Douglas production function that uses capital and labor, so that the return of capital invested at home is given by $(1-\tau)\alpha(k-k_f)^{\alpha-1}$, where α is the share of capital in domestic production and τ is the tax rate on domestic capital income. The key assumption of this set-up is that after-tax returns earned by capital abroad are equal to $\frac{r^*}{1+\phi k_f}$. The parameter ϕ here captures the extent of globalization. When $\phi=0$, the economy is a standard small open economy with perfect capital mobility, where capital invested abroad earns a return r^*. When $\phi>0$, the economy features returns to foreign capital that are decreasing in the amount of capital invested abroad, owing possibly to restrictions or capital controls. As ϕ goes to ∞ the economy converges to a standard closed economy. In equilibrium, returns to capital invested domestically are equalized to returns to capital invested abroad, that is

$$(1-\tau)\alpha(k-k_f)^{\alpha-1}=\frac{r^*}{1+\phi k_f} \tag{1}$$

Fig. 1 illustrates how solutions to Eq. (1) provide intuition on how taxes respond to globalization.

[1] See Mintz (1992) for an early survey of these effects.

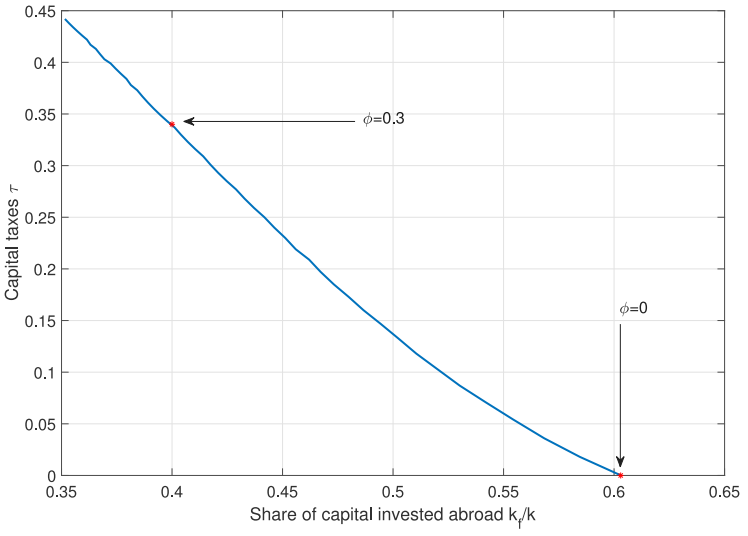

Fig. 2. Globalization and capital taxes.

The solid lines represent how returns to foreign capital change with k_f in a fully globalized economy ($\phi = 0$, the horizontal line) and in an economy with restrictions to capital mobility ($\phi > 0$, the downward sloping line). The dashed, upward sloping lines represent the left hand side of Eq. (1) for high (the bottom curve) and low (the top curve) capital taxes. The intersections of these curves identify equilibrium foreign capital with high and low capital taxes, in the globalized and the restricted economy. The figure shows how in a globalized economy, an increase in taxes (i.e., a shift from the top to the bottom dashed curve), increases foreign investment by a much larger amount ($\Delta k_f, \phi = 0$) than the increase under the economy with restriction to capital flows ($\Delta k_f, \phi > 0$). This implies that capital invested domestically is less elastic to tax rates in the more restricted economy, and thus in equilibrium, the more restricted the capital flows are, the more the tax authority will tax domestic capital. To make this point more concrete, assume that the tax authority can raise taxes on capital income and rebate the proceeds to workers. The tax authority values output accruing to workers $(1-\alpha)(k-k_f)^\alpha + \tau\alpha(k-k_f)^\alpha$ with weight μ and output accruing to capitalists $(1-\tau)\alpha(k-k_f)^\alpha + k_f \frac{r^*}{1+\phi k_f}$ with weight $1-\mu$, and chooses τ to maximize its value. As long as $\mu > 0.5$, the tax authority will want to use capital tax to redistribute from capitalists to workers.[2] However, when the economy is fully open, even a small capital tax results in a large capital flight which lowers domestic wages so much that workers are actually worse off; as a consequence, in a fully open economy, the optimal capital tax is set to 0. By contrast, when the economy is more closed it is costly for domestic capital to leave, and the tax authority will use some capital tax to achieve its redistributive goals. Fig. 2 plots, for several values of ϕ ranging from 0 to 0.5, the optimal tax chosen by the tax authority (on the y axis), against the resulting level of openness of the economy (measured as the share of k_f over k).[3] The figure shows that in a more open economy the government will choose lower level of capital taxes. Note that the relation between globalization and capital taxes depicted in Fig. 2 goes in exactly the opposite direction as the relation in Figure 5e in QR. Why is that? The reason lies in the different way QR and this simple set-up model globalization. QR models globalization as an exogenous increase in cross-country ownership of assets, here I have modeled globalization as a reduction of costs of investing abroad. The increase in cross country ownership naturally leads to higher capital tax, because of tax exportation logic; the reduction of costs naturally leads to lower tax because of high elasticity logic. Ideally a more complete model of globalization would entail both features and, more importantly, would make the share of cross country ownership itself endogenous and responding to capital taxes. Next I will briefly sketch how such a set-up could look like.

2.2. Globalization as a reduction of barriers to entry of foreign firms

There is a large literature in international economics studying the entry of firms in a given foreign market.[4] One important insight of this literature is that the elasticity of firms' entry in a market to entry costs can be a function of the costs of entry. The idea can be illustrated with the graph in Fig. 3. The curve represents the mass of potential foreign entrants in a domestic market, as a function of their productivity/net revenues in that market. The vertical line to the right (labeled by C_0) represents the entry costs

[2] In this simple set-up redistribution captures the motive for capital taxation. In the fully dynamic set-up of QR the justification for capital taxation is that it is, in the short run, less distortionary.

[3] This is just a numerical illustration and the exact shape of the line in Fig. 2 depends on parameter values. However it is easy to show that when $\phi = 0$ the optimal capital tax is 0 and that when $\phi > 0$ the optimal capital tax is positive as long as $\mu > 0.5$. The parameters used to produce Fig. 2 are $\alpha = 0.4$, $k = 8$, $r^* = 0.2$, $\mu = 0.8$.

[4] See, for example, the seminal paper by Melitz (2003).

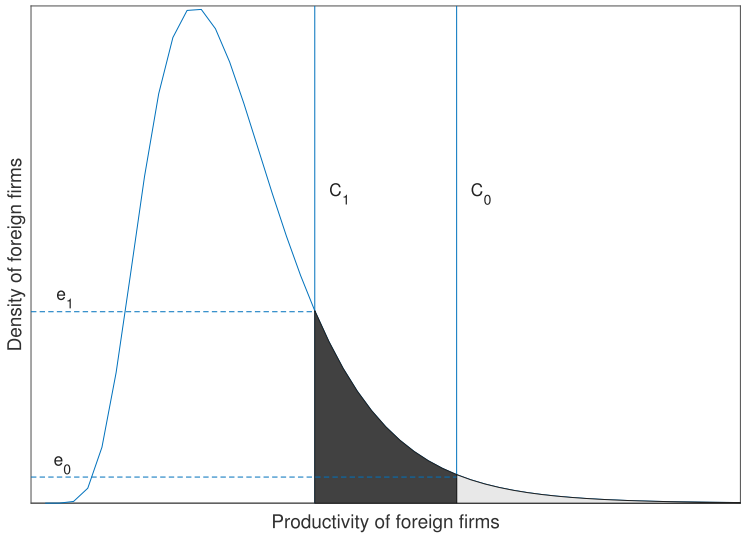

Fig. 3. Entry of foreign firms.

and the light shaded area represents the mass of foreign firms that will enter the market, as their net revenues are higher than the entry costs. Since the entry costs C_0 are high, only few firms will enter the domestic market, and the economy will display a low level of cross-country ownership of assets. Note that in this set-up, the costs of entry (or the extent of globalization), together with the distribution of potential entrants, simultaneously pin down the mass of foreign firms that will enter (the light shaded area) and the elasticity of entrants to a change in taxes (the density of firms at the threshold, denoted by e_0). This is because a local increase in capital tax will reduce the entry of foreign firms (and thus foreign tax base) by an amount that is proportional to the mass of firms that are indifferent between entering and not entering. In other words, the level of globalization determines both the benefits and the costs of capital taxation. The benefits are increasing in globalization, as the mass of entering firms, which constitutes the foreign tax base, increase as the threshold moves to the left. The costs of capital taxation, given by the elasticity of entry of foreign firms, can also be increasing (at least for the initial phase of globalization) as the density of indifferent firms increases as globalization increases. This can all be seen in the figure when the cost of entry falls from C_0 to C_1. At C_1 the mass of entering firms increases by the amount represented by the dark shaded area, and the elasticity also increases from e_0 to e_1. The tax authority will take all these factors into consideration when choosing the optimal capital tax, and, crucially, firms will change their entry decision in response to the capital tax. So the key property of this set-up is that the degree of cross-country ownership is endogenous, and can react to capital taxation, while in QR, it is determined by fixed parameters (λ and θ). So for QR more globalization always leads to more capital taxation, while in this set-up globalization can, by increasing the elasticity of cross-country ownership, lead to lower capital taxation.

The endogenous elasticity of cross country ownership could explain the issue QR raise: Why has the discussion of coordinating taxes on capital gained momentum only recently and not during the early phases of globalization? In the early phases of globalization the additional benefits from taxing capital are small, as the foreign tax base is small. As globalization progresses, the benefits from capital taxation increase but costs also increase, as more foreign firms will leave the country in response to an increase in taxes (higher elasticity); this implies that from the point of view of the tax authority, the establishment of mechanisms for international tax cooperation becomes more desirable. Certainly, it is very plausible that the increasing importance of intangible capital has played a role in increasing the elasticity of capital to taxation; however, this simple set-up suggests that the progressive reduction of costs of entry in foreign markets might have lead to an increased mass of firms which are close to indifference on where to locate their activity, and thus provides another reason for why the elasticity of capital to taxes might have increased over time.

3. Some supporting evidence

In this section, I explore the connections between the quantitative/theoretical predictions of the model and some recent cross country data on capital taxation and intangible capital. There is a recent literature stressing the growing importance of intangible capital in a number of contexts, from macro, to finance and taxation.[5] The dataset assembled by Bontadini et al. (2023) provides panel data on tangible and intangible capital for a number of European countries plus the United States and the United Kingdom. Recent work by Bachas et al. (2022) has collected long time series for capital taxes for a large set of countries, using the methodology of Mendoza et al. (1994). Fig. 4 plots the relation between the change in the share of intangible capital and change in capital taxes for

[5] See, for example, Guvenen et al. (2022), Corrado et al. (2022), Crouzet et al. (2022), or Dyrda et al. (2023).

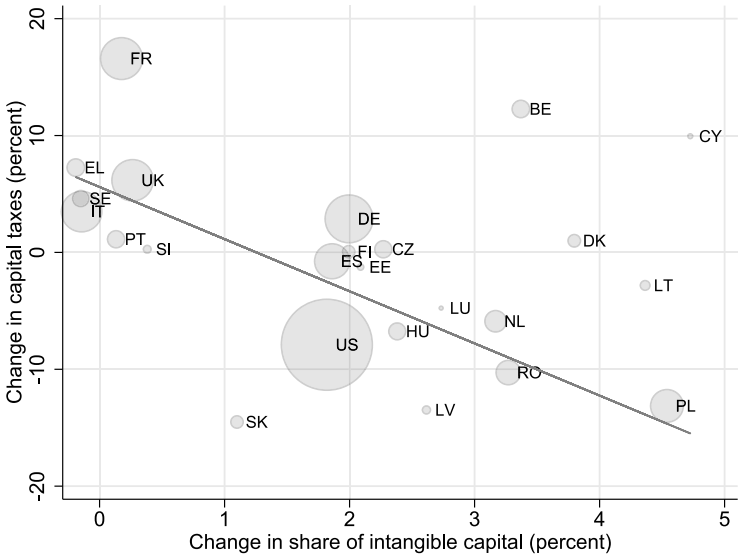

Fig. 4. Changes in capital taxes and changes in share of intangible capital. Note: The regression line is computed weighting each country observation by its average population over the period 1990–2020. Regression coefficient is −4.46 with a robust standard error of 1.24. R^2 of the regression is 0.41.

all the countries for which there are data on both tangible and intangible capital. The change is computed averaging each variable over the period 2015–2020 and subtracting the average for the period 1990–1995. The figure shows that there is a significant negative association between the change in the share of intangible capital and the change in capital taxes.[6] On average, the countries that have experienced the largest increase in the share of intangible capital have also experienced the largest reduction in capital taxes. The economic magnitude of this association is quite large, as an increase in the share of intangible capital of 1 percentage point is associated with a reduction in capital taxes of over 4 percentage points. There are two main caveats to this finding. First, it is based on a small number of observations and might not prove true for a larger sample of countries, and second, it is just an association and does not represent evidence of causality going from intangible capital to taxation (as in QR). Indeed the association could be driven by reverse causation or by a third factor (for example, the adoption of structural reforms) driving, at the same time, capital taxes and the share of intangible capital. Nevertheless I found this relation suggestive and broadly consistent with the main thesis of QR.

A second empirical question concerns the relation between capital taxes and globalization. QR's results suggest a negative relation, but the discussion in Section 2 above suggests that the relation could go in both directions. Bachas et al. (2022) provide some very interesting evidence regarding this relation. They identify changes in globalization as changes in trade, and they measure the association between trade and capital taxes, controlling for country and time fixed effects. They find that for developed economies, periods/countries with higher trade are associated with lower capital taxes, while in developing economies the reverse is true; that is, more trade is associated with higher capital taxes. (see figure 6 in their paper) To explain this second finding, Bachas et al. (2022) hypothesize that more globalization increases the ability of less developed countries to tax capital "*by increasing the concentration of economic activity in formal corporate structures at the expense of smaller informal businesses*". I believe that their explanation is very complementary to the explanation by QR, which focus not on the ability to tax, but rather on the idea that more globalization actually increases the willingness of economies to tax capital, because some of the capital is owned by foreigners. The next natural question is why for developed economies we see that more integration is actually associated with lower capital tax. One possibility is that globalization for developed and developing economies is actually a quite different feature. For developing economies, like China, India or Mexico, globalization means a large influx of foreign corporations establishing production plants in their countries. The presence of these plants increases both the ability and the willingness of local governments to tax foreign capital. For developed economies, globalization means an increasing ability of domestic corporations of booking their profits in locations with more favorable tax regimes (maybe taking advantage of intangible capital), and that naturally would lead to lower capital taxes.

[6] The share of intangible capital is computed as K_INTANG/(K_TANG+K_INTANG), where K_INTANG and K_TANG are from Bontadini et al. (2023). Capital tax is the variable ETR_K in Bachas et al. (2022). The 24 countries in the sample are (codes in parenthesis): Belgium (BE), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), United Kingdom (UK), United States (US).

4. Conclusion

I have truly enjoyed reading the paper by QR. It very clearly elucidates and quantifies how globalization and the presence of intangible capital affect the incentives for government to tax capital and how, in turn, these incentives materialize in actual tax policies. The main result that more intangible capital results in lower capital taxation is very plausible and I have provided some cursory evidence consistent with this hypothesis. The result that more globalization leads to higher capital taxes is a bit more delicate, and more dependent on how exactly one models globalization. Indeed, in the paper itself (see section 8.2) there is a case in which globalization leads to lower capital tax. This can happen when intangible capital and globalization are complementary in reducing the costs of shifting profits toward more favorable tax regimes. Looking forward, I think QR point to interesting research directions on the relation between taxes and globalization. I believe one very promising approach is to make globalization (i.e. the fraction of foreign firms in a given market) endogenous and dependent on capital taxes. It would be very interesting to use models of dynamic firm entry (as, for example, Baldwin and Krugman, 1989 or Alessandria and Choi, 2014) to study the short and long run effect of capital taxation on welfare and globalization. Initially, globalization can make it easier for firms to cross borders, inducing lower capital taxes, which in turn fuel more globalization. But in a dynamic entry set-up, once firms have paid the fixed costs to enter a given market, they are reluctant to exit, and this in turn generates stronger incentives for the governments to tax capital (which Bachas et al., 2022 document is happening in emerging economies). Higher taxes then will lower the incentives for new firms to enter the domestic market, causing a slowdown in globalization. So overall, I believe that political economy models of taxation like the one presented by QR, coupled with dynamic entry models of firm entry, could potentially help us understand the causes and consequences of the waves of globalization and retrenchment that many economies have experienced in modern times.

Data availability

Data will be made available on request.

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