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How do the Tax Burden and the Fiscal Space in Latin America look like? Evidence through Laffer Curves

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Abstract

How much fiscal space do Latin American countries have to increase their tax burdens in the long term? This paper provides an answer through Laffer curves estimates for taxes on labor, capital, and consumption for the six largest emerging economies of the region: Argentina, Brazil, Chile, Colombia, Mexico, and Peru. Estimates are made using a neoclassical growth model with second-generation human capital and employing data from the national accounts system for the period from 1994 to 2017. Our findings allow us to compare the recent effective tax rates on factor returns against those which would maximize the government's revenues, and therefore to derive the potential tax-related fiscal space. Results suggest that joint fiscal space on labor and capital taxes would reach 6.5% of GDP for the region, on average, although there are important differences among the countries.

Classification JEL: E13, E62, H20, H30, H60

Key Words: Laffer curves; fiscal policy; taxes on consumption, taxes on labor and capital income.

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Introduction

Professor Arthur Laffer from the University of Southern California made the following assertion in 1974: "...there are always two tax rates that yield the same revenues…" (Wanniski, 1978). To explain his statement, he drew an inverted u-shaped curve with the government revenue (on the vertical axis) increasing with the tax rate (on the horizontal axis) until a maximum point, where it begins to decrease. Since then, the simple design of the Laffer Curves has crucial implications, given that an increase in taxes could have two opposite effects regarding fiscal revenues: On the one hand, an increase; on the other, a reduction, because a higher tax could disincentivize the labor supply and the desire to invest.

One of the two effects will predominate in an economy depending on the tax burden level with respect to its maximum point. If it stands below, increasing taxes could generate more revenues. However, if it stands above, increasing taxes could end up reducing government revenues. Therefore, each curve shows how government revenues at steady state vary when there are changes on the effective labor tax rate, while keeping the other tax rates and the remaining parameters constant. Hence, policymakers are usually concerned with knowing the rates that maximize their country's fiscal revenues and therefore how close/far the current tax burden is with respect to such maximizing rates.

In this paper, we estimate the Laffer Curves for taxes on labor, capital, and consumption expenditures for the six largest Latin American emerging economies: Argentina, Brazil, Chile, Colombia, Mexico, and Peru. Estimates are made employing a neoclassical growth model with human capital accumulation, where growth rates are defined both exogenously and endogenously, as suggested by the literature (Trabandt and Uhlig, 2011; Lucas 1988; Uzawa, 1965). The model is calibrated with annual data coming from the national accounts of each country (United Nations system) for the period from 1994 to 2017.

The effective tax rates—one of the most important parameters—are calculated following the procedure applied by Mendoza et al. (1994) to G7 countries, although we include some extensions considered by Prescott (2004) and Trabandt and Uhlig (2012). The long-term government's potential tax-related fiscal space is the result of contrasting effective tax rates on labor and capital income (tax burden) against those that would maximize the government's revenues (obtained from the model).

By comparing the effective tax rate that maximizes labor income versus the most recent rate, results suggest that governments in Latin American Countries (LAC) would have an important labor tax-related fiscal space. It reaches 13.7%, on average, for the region, meaning that for every 100 bp (basic points) of increase in the effective tax rate on labor, the tax collection on labor income would increase 44 bp. Regarding the Laffer curves associated to capital taxes, figures suggest that fiscal space is smaller. Thus, on average, the regional space would reach 10% of capital income, meaning that for every 100 bp of increase in the effective tax rate, the capital tax collection would increase only by 25 bp. As a share of potential GDP, fiscal space on labor and capital incomes achieves 3.7% and 2.7%, respectively.

Adding up the figures on labor and capital Laffer Curves, results suggest that fiscal space could achieve nearly 6.5% of potential GDP, on average for the region, which gives an important margin to adjust the tax burden in the long term. This percentage would be larger if we add the potential space from the consumption taxes. Of course, there are important differences in fiscal space for both factors when they are assessed and compared between countries. Mexico and Chile seem to have the highest fiscal space, while Brazil and Argentina the lowest. To the best of our knowledge, this is the first time that a human capital growth model has been considered to estimate Laffer curves and the fiscal space for the main Latin American emerging economies

The paper contains six sections in addition to this brief introduction. Section 2 presents the theoretical model of human capital with exogenous accumulation, which we use as baseline and is labeled as 2nd generation. In section 3 we describe the calibration and parameterization of the model, with special mention to the computation of effective tax rates. Section 4 presents the main results, and in section 5 we compare our results with respect to those coming from an endogenous human capital model. Section 6 contrasts the findings for Latin America on tax burden and fiscal space with respect to developed countries (USA and the 14 main European Union economies, or 14-EU). Finally, Section 7 presents some final remarks. We include five appendices with methodological details on the effective tax rates calculation and with supplementary country specific as well as aggregated results that help us in explaining what we find on section 4.

The Theoretical Approach

Agents

There are three agents: a representative household, a representative firm, and a government financed with distortionary taxes and debt to provide public goods and transferences to households. At the beginning of each period, the household has assets represented by the stock of physical capital, k_{t-1}, human capital, h_{t-1}, and government bonds, b_{t-1}. The household rents capital to the firm which is used to produce final goods and receive a rental rate given by $(d_t - \delta_k)$, where δ_k is the depreciation rate of physical capital. The household also obtains interest payments, r_t^b, for holding government bonds. Additionally, households obtain a wage, w_t, for the hours hired in the labor market, profits from firms, π_t, since they are their owners, transferences from the government, s_t, and other exogenous resources denoted by m_t. The latter could be associated to transferences from abroad. Consequently, this economy could be modeled as an open economy without further complications.[1]

The model used in this paper includes human capital both exogenously and endogenously accumulated. Thus, the hours offered by the households to the market depend on their desire to increase their human capital (in the form of studies and/or learning-by-doing). This is a key feature that makes our theoretical approach different from the standard neoclassical model of exogenous growth used as benchmark by Trabandt and Uhlig (2011) and Nutahara (2015) in previous papers on this matter. The labor tax rate charged by the government, τ^n, implies, therefore, that it could affect not only labor-leisure household decisions, but also the decisions between learning hours and those effectively worked for the firm. Households also pay a tax, τ^k, on capital returns. From the perspective of disposable income, households choose how much to spend in consumption and how much to accumulate in assets. Furthermore, the government imposes a tax rate to consumption given by τ^c.

The representative household maximizes the discounted value of its utility (equation 1) subject to a budget constraint (equation 2), and to the equations representing the law of motion for physical and human capital (equations 3 and 4):

$$\max_{c_t, b_t, x_t, k_t, n_t, h_t} E_0 \sum_{t=0}^{\infty} \beta^t \left[u(c_t, n_t) + v(g_t)\right] \qquad (1)$$

Subject to:

1 Although it is a very simple form of modelling an open economy.

$$(1+\tau_t^c)c_t + x_t + b_t = (1-\tau_t^n)w_t h_{t-1} q_t n_t + \left(1-\tau_t^k\right)(d_t - \delta_k)k_{t-1} + \delta k_{t-1} + \left(1+r_t^b\right)b_{t-1} + s_t + \pi_t + m_t \tag{2}$$

$$k_t = (1-\delta)k_{t-1} + x_t \tag{3}$$

$$h_t = [Aq_t n_t + B(1-q_t)n_t]^{\omega} h_{t-1}^{1-\omega} + (1-\delta_h)h_{t-1} \tag{4}$$

where $c_t, n_t, x_t, b_t, g_t, s_t, k_t$ and h_t represent consumption, hours worked, investment in physical capital, government bonds, government spending, transfers, and stock of physical and human capital, respectively.

As mentioned, households increase their human capital through studying and/or learning by doing. This implies that they devote a fraction of their time, $(1-q_t)$, to increase their knowledge and the remaining portion, (q_t), to work at the firm. Human capital depreciates at a rate of δ_h each period. The motion of human capital accumulation follows the ideas developed by Levine et al. (1992).

Household preferences are represented by equation (5), where η_t is the inverse of intertemporal rate of substitution, κ measures the labor disutility, and φ represents Frisch elasticity (sensitivity of labor supply to changes in the disposable labor income) that could be affected by tax changes. The way in which the model includes preferences is standard in all the previously cited papers.

$$u(c_t, n_t) = \begin{cases} \frac{1}{1-\eta}\left\{c_t^{1-\eta}\left[1-\kappa(1-\eta)n_t^{1+\frac{1}{\varphi}}\right]^{\eta} - 1\right\}, & \eta \neq 1 \\ \log(c_t) - \kappa n_t^{1+\frac{1}{\varphi}}, & \eta = 1 \end{cases} \tag{5}$$

In turn, the representative firm operates under perfect competition and uses capital and labor as inputs to produce a homogeneous final good y_t. Firms maximize their profits, which are given by:

$$\pi_t = y_t - w_t h_{t-1} q_t n_t - d_t k_{t-1} \tag{6}$$

subject to a Cobb-Douglas production function:

$$y_t = \xi^t k_{t-1}^{\alpha}(h_{t-1} q_t n_t)^{1-\alpha} \tag{7}$$

where ξ^t represents the total factor productivity. The work effectively used by firms, $(q_t n_t)$, is affected by the workers' training, $(h_{t-1} q_t n_t)$. The government faces the following budget constraint:

$$g_t + s_t + \left(1+r_t^b\right)b_{t-1} = b_t + T_t \tag{8}$$

Equation (8) shows that in every period, public spending plus transferences to households plus the debt service must be equal to revenues from new debt issued by the government, whose maturity is equal to one period, plus taxes charged to factors and consumption. The total tax revenue, T_t, is given by $T_t = \tau_t^c c_t + \tau_t^n w_t h_{t-1} q_t n_t + \tau_t^k (d_t - \delta)k_{t-1}$. The first order conditions for both the representative household and the firm and details on the steady-state growth solution can be consulted in Lozano and Arias (2018).

Equilibrium and Characterization of Laffer Curves

The model´s equilibrium follows the insights provided in Trabandt and Uhlig (2011). All variables - except hours worked, interest rate, and tax rates - grow at a constant rate equal to:

$$\psi = \xi^{1/(1-\alpha)} \quad (9)$$

The optimal capital-output ratio consistent with the balanced growth path is given by:

$$\overline{k/y} = \left(\frac{r^b}{(1+\tau^k)\alpha} + \frac{\delta}{\alpha}\right)^{-1} \quad (10)$$

whereas the optimal work level under such specification is:

$$\frac{1}{\eta\kappa\bar{n}^{1+1/\varphi}} - \frac{1}{\eta} + 1 = \frac{(1+\tau^c)}{(1-\tau^n)}\frac{(1+\frac{1}{\varphi})}{(1-\theta)}\mathfrak{F}\frac{\bar{c}}{\bar{y}} \quad (11)$$

where

$$\mathfrak{F} = \frac{\frac{1}{\beta\psi^{1-\eta}} - 1 + \omega\delta_h}{\frac{1}{\beta\psi^{1-\eta}} - 1 + 2\omega\delta_h} \quad (12)$$

Notice that fraction of hours offered by a household depends on the consumption-output ratio multiplied by a term which, in turn, depends on taxes on consumption and labor, the Frisch elasticity and the variables related to human capital accumulation as well. This result comes essentially from if the same forces that govern growth, via physical capital accumulation, dominate long-term growth. In addition, the model assumes that human capital greatly affects the labor supply through its accumulation.

The human capital stock at the balanced growth path is defined as a working time fraction offered by a household, so that:

$$\bar{h} = \delta_h^{-\frac{1}{\omega}}(B + (A - B)\bar{q})\bar{n} \quad (13)$$

In order to characterize the Laffer Curves,[2] it is assumed that both debt and government spending are aligned with the balanced growth path, i.e., $b_{t-1} = \psi^t\bar{b}$ and $g_t = \psi^t\bar{g}$, whereas the transferences to households are equal to the residual needed to meet the government budget constraint: $s_t = \psi^t\bar{b}\left(\psi - \left(1 + r_t^b\right)\right) + T_t - \psi^t\bar{g}$. Hence, the higher tax revenues are for the government, the greater the transferences to households.

These remarks are consistent with the ideas by Levine and Renelt (1992), who argue that little evidence is found concerning a tax system affecting the long-run growth rate [also discussed by Trabandt & Uhlig 2011]. Hence, taxes in the model impact economy only through the level of human capital, and since human capital is proportional to non-leisure time along the balanced growth path, there seems to be no intertemporal effect, as is the case with physical capital. Because of this, the approach is commonly known as human-capital-exogenous-growth

2 The Laffer Curves displayed in Section 4 come from a one-dimensional nonlinear equation that depends mainly on the labor supply. It is solved numerically using values given in Table 1 and changing the corresponding tax rate across all possible values it can take.

model (our benchmark model). In section 5 we include results from the endogenous version, i.e., a model that allows for long-term growth impacts of taxation.

Calibration and Parameterization

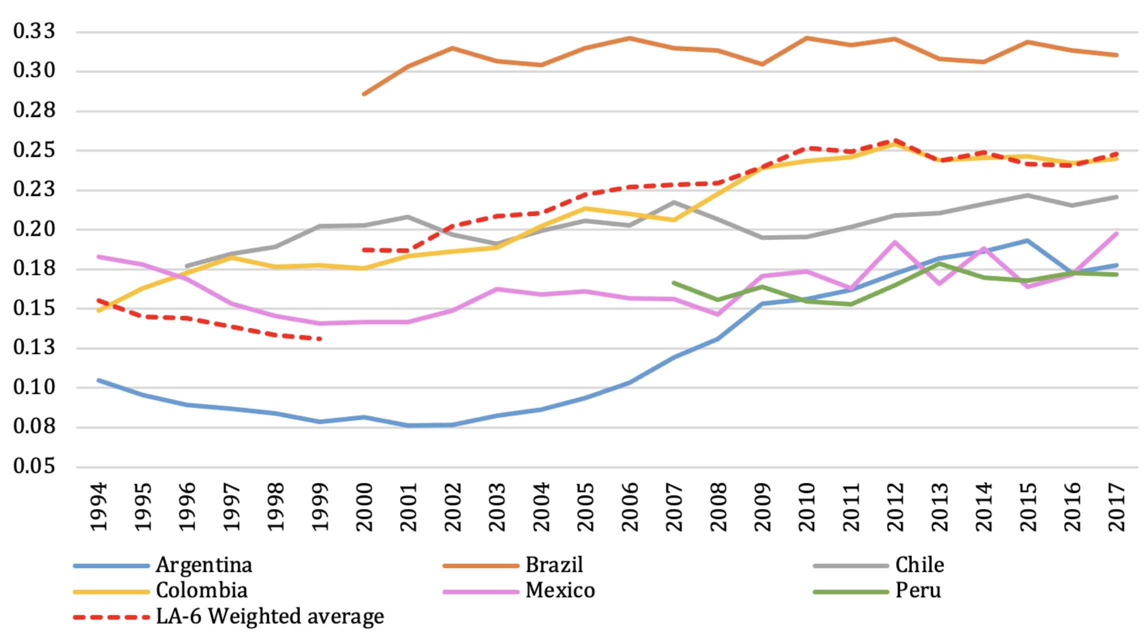
Effective Tax Rates

A key parameter to estimate Laffer Curves is the tax rates. As described in section 2, the government sets three taxes: one on labor income, τ_t^n, another on earnings from renting physical capital, τ_t^k, and the last on consumption of goods and services, τ_t^c. Empirical literature favors the use of effective tax rates instead of statutory rates, since they can better reflect the real tax burden. Effective tax rates are usually lower than statutory rates mainly due to tax evasion and tax benefits contemplated in the tax codes. Speaking broadly, an effective tax rate is defined as the tax collection as a percentage of an amount of income (or expenditure) susceptible of being taxed, known as the tax base. Methodologically, these rates are calculated in this paper following the procedure applied by Mendoza et. al. (1994) to G7 countries with some extensions considered by Prescott (2004) and Trabandt and Uhlig (2012).

Effective tax rates are calculated using annual data from the National Accounts (NA) database of each country from 1994 to 2017 (except for Brazil because the information is only available since 2000). We also use information from the OECD and Penn World Tables databases. The NA tax records include revenues from the central government as well as subnational governments. Labor taxes consider all the households' labor earnings (including the so-called mixed income) as well as social security contributions and payroll taxes. Regarding taxes set on capital gains, they include the taxes paid by corporations as well as those paid by households that hold businesses. In Appendix 1, we present further details on these tax rate estimates. Results are shown in Graph 1.

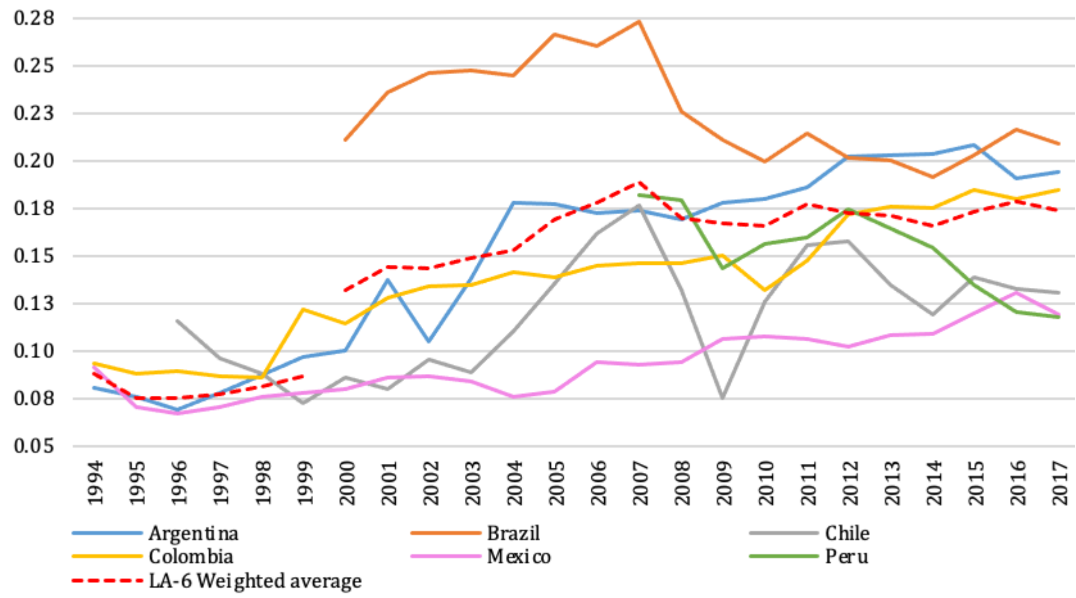
Graph 1. Effective Tax Rates in Latin American Countries

A. On Labor Income

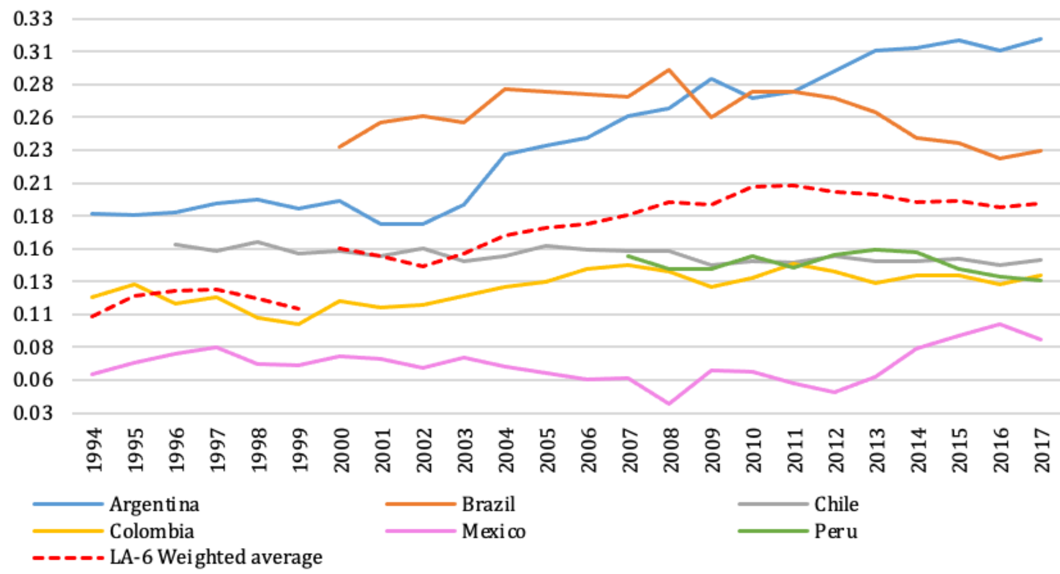


Graph 1 (continued). Effective Tax Rates in Latin American Countries.

B. On Capital Gains



C. On Consumption Expenditures



Source: Calculations by the authors based on data from the National Accounts.

Graph 1 includes the effective tax rates for the six LAC and the weighted average of the region (dotted line), using the size of the tax basis as weighting. As we can see, there is an ample difference in tax burden among these six economies. Nonetheless, when dynamics during the last twenty-five years are examined carefully, such differences have been reducing. On labor earnings, for instance (Panel A), the highest effective tax rate is Brazil's (31% for 2017), while the lowest are Peru's and Argentina's (17%). The most recent difference of 14 percentage points (pp) between these countries is lower than those at the beginning of the century (20 pp). The regional weighted average is about 25%, being Argentina, Colombia, and Chile the countries with the largest effort to increase the tax burden on labor in recent times.

Trends are not different for taxes on capital gains. The highest effective tax rate is again in Brazil (21% in 2017, close to Argentina) and the lowest is for Peru and Mexico (11.8%). The current difference in capital tax burden between these economies is only of 9 pp, while ten years ago it was close to 17 pp. On average, the region currently has a 17.5% tax burden on capital returns, while in the mid-nineties such tax burden was 7.5%, clearly denoting important advances on this matter. It is remarkable that for both labor and capital incomes, Brazil has the highest effective tax rates, although the latter has been importantly reduced in recent years (falling from 27% to 19% between 2007 and 2014). In turn, Mexico appears to have the least expensive tax system for production factors.[3]

Regarding consumption, the weighted average tax rate for the region was 19% in 2017, being the highest rate for Argentina (31.5%) and the lowest for Mexico (8.6%). Argentina's effort to increase consumption tax revenues is evident especially since the beginning of this century. The differences in tax burden on consumption are more ample among countries, and there is less convergence between them.

Other Parameters

Another set of parameters is required to estimate the Laffer curves. According to their source, we classified them into those calibrated from National Accounts and IMF statistics, other estimates by previous literature, and those calibrated into the model by finding the steady-state solutions. Table 1 summarizes these parameters for each one of the six LAC as well as the average for this group of economies. Following the model notation (Section 2), the share of capital on output (θ), the GDP growth rate (ψ), and the capital-output ratio (K/Y) are averaged values estimated from national accounts, while the current account balance, (m), government expenditures, (g), and public debt, (b), come from the IMF's World Economic Outlook. The labor supply, (h), is calculated as the average number of hours worked by a worker daily divided by fourteen hours, which are understood as the total number to be distributed between labor and leisure (Ragan, 2006). This data is sourced in the Conference Board.

On the second group we include the discount factor, (β), whose value for each country is taken from Lama (2011), the capital depreciation rate, (δ), which is set by using data from Penn World Tables (Feenstra, Inklaar, &Timmer, 2015), and the inverse elasticity of substitution, (η), which is set independently for each country according to their own studies. Finally, Frisch elasticity (φ) is set at 1 (in the benchmark model) as is done by Trabandt & Uhlig (2011), Fernandez-Villaverde et al. (2015), and Chetty et al. (2011).[4] In the last group we include government transfers to households, (s), and the steady state gap between the real interest rate and output growth. The former is calibrated by the model as the value that balances the government's budget constraint, while the latter uses the same real interest rate for all countries - measured as the weighted average of the money market for the six LAC - to avoid extremely positive high gap values, as is the case with Brazil, or negative values as those for Peru.

Table 1. Main Macroeconomic Parameters for LAC (Average, 1994-2017)

Parameters		**Argentina**	**Brazil**	**Chile**	**Colombia**	**Mexico**	**Peru**	**LAC**
Discount Factor	β	0.954	0.9317	0.921	0.925	0.947	0.936	0.938
Capital Depreciation Rate	δ	0.0346	0.0436	0.0364	0.0384	0.0353	0.0342	0.0390
Inverse of IES	η	2	2	1.5	2	2	4	2.05

3 See a more detailed estimate of effective tax rates in Brazil and Mexico with Mendoza's (1994) methodology; annual and quarterly data are provided by Freitas and Marsiglia (2015) and Antón-Sarabia (2005), respectively.

4 Our benchmark model uses this value specially following Keane (2021), who shows that papers that account for human capital or the participation margin usually find Frisch elasticities around 1.0. We acknowledge that there is a lack of consensus about the magnitude of the Frisch elasticity. The literature that employs microeconomic data (for example Park (2020), Kneip et al (2020), Chang et al (2019), Keane & Wasi (2016), and Attanasio et al. (2018)) argues that it is usually less than 1.0. With macroeconomic data, Frisch elasticity could take values from 1.0 to 4.0 (Whalen and Reichling (2016), Fiorito & Zanella (2012), Banerjee (2014), Cacciatone and Traum (2020), Gottlieb et al. (2021)).

Table 1 (continued).Main Macroeconomic Parameters for LAC (Average, 1994-2017).

Parameters		Argentina	Brazil	Chile	Colombia	Mexico	Peru	LAC
Capital Share in Production	θ	0.3750	0.3965	0.4617	0.3789	0.4876	0.4212	0.4272
Growth Rate	ψ	0.0255	0.0248	0.0427	0.0344	0.0249	0.0497	0.0268
Capital Stock/ GDP	K/Y	2.79	4.53	2.75	3.349	3.50	2.74	3.76
Current Account/ GDP	m	-0.006	-0.0196	-0.0107	-0.0272	-0.0179	-0.0286	-0.0191
Labor Supply	h	0.335	0.3375	0.41	0.38	0.43	0.367	0.372
General Government Expenditure/ GDP	g	0.2987	0.3836	0.2237	0.2733	0.2394	0.2054	0.3008
General Government Gross Debt/ GDP	b	0.5789	0.6821	0.1278	0.3803	0.4378	0.3195	0.4840
Effective Tax Rate on Consumption	τ^c	0.2385	0.2576	0.1501	0.1254	0.0667	0.1435	0.1560
Effective Tax Rate on Labor Income	τ^l	0.1228	0.3111	0.2033	0.2090	0.1638	0.1654	0.2089
Effective Tax Rate on Capital Income	τ^k	0.1493	0.2254	0.1187	0.1373	0.0931	0.1533	0.1379
Real Interest Rate	r^b	0.05128	0.05128	0.05128	0.05128	0.05128	0.05128	0.05128
Spread $(r^b - \psi)$		0.025	0.026	0.00861	0.01684	0.02634	0.0015	0.02444

Source: Authors' calculations.

Results

Laffer Curves on Labor Taxes

The Laffer curve estimates for taxes on labor income for the major LAC are presented in Graph 2. Each curve shows how government revenues of the steady state vary in the face of changes in the effective labor tax rate, while keeping the other tax rates and the remaining parameters constant. Tax revenues represented on the vertical axis are normalized so that 100 corresponds to the average tax. We present results under a double scenario of effective tax rates: one considering the average for the 1994-2017 period (of 20.7%, Panel A), and the other considering the tax rates recorded for the last year (of 24.8% in 2017, Panel B).[5] The latter is especially important to see the most current fiscal panorama to which we will be referring to in our analysis.

The baseline model considers two types of preferences. The first with a unitary Frisch elasticity of labor supply, (φ = 1), this being the most used in the literature. The second takes a more

5 In Appendix 4, we present results for the Laffer curve analysis under the same methodology but employing statutory tax rates for labor and capital income.

inelastic Frisch elasticity, (φ = 0.5), which could better reflect the behavior of the labor market in emerging economies (Airaudo et.al., 2016). For advanced economies, greater elasticities have been also employed ranging from 1.66 to 3.0 (MaCurdy, 1981; Trabandt and Uhlig 2011; Nutahara, 2015; Miyamotoy Lan Nguyen, 2016). In appendix 5, we present the results of a sensitivity analysis on the changes in our results when the Frisch elasticity takes values ranging from 0.5 to 3.0.

Notice, on the one hand, that our findings corroborate the shape of the U-inverted Laffer curves with a single maximum point, and, on the other, that revenue-maximizing tax rates are slightly higher as the labor supply is more inelastic. This result was foreseeable because as the labor supply is less sensitive to changes in taxes, the government has a greater margin to increase tax burden without generating labor disincentives.

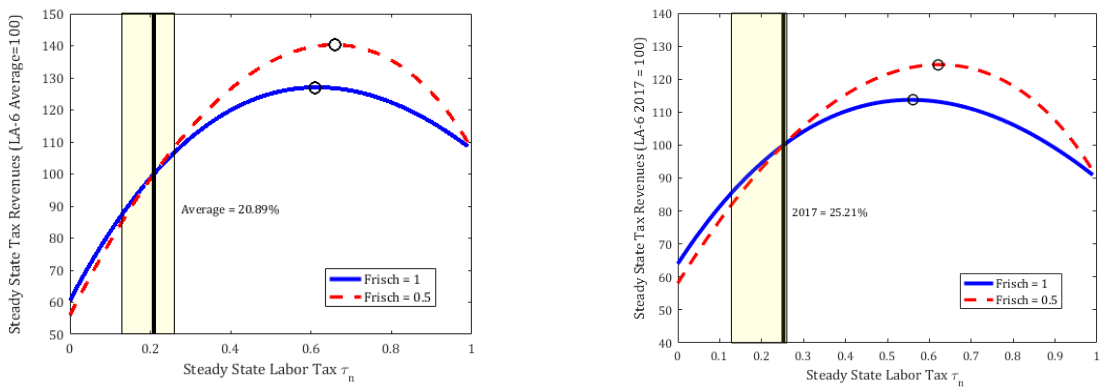
The figures suggest that the effective tax rate that maximizes government revenues coming from labor would be around 57% for the region (Panel B and Table). It is important to remember that this result is a weighted average tax rate for the six largest economies using income-labor-tax-base as the weighting. Considering that the most recent measure of tax burden on labor rents was 25.2% (for 2017), the governments in region could have an important labor tax-related fiscal space (nearly 31% resulting from the difference between the rate that maximizes revenues and the current one).

Although the fiscal space expressed in percentages of tax rates is apparently large, the space in terms of additional revenues for the government is relatively narrow. Under the hypothetical case that the effective labor tax rate would be increased to its maximizing level, government revenues would increase only by 13.7%. This means that for every 100bp of increase in the effective tax rate, the tax collection on labor income would increase by 44bp, on average. The fiscal space expressed in terms of the potential GDP achieves 3.7%. As expected, the fiscal space would be higher in as much as the labor supply elasticity is lower (see the red dotted line).

There are important differences in the results when these are assessed across countries. Regarding the effective tax-rates that could maximize revenues, the lowest are for Argentina and Peru (49%), while the highest is for Brazil (63%). Chile, Colombia, and Mexico exhibit tax rates close to the average for the region. When these tax rates are compared with the last ones recorded in 2017 to assess the potential gains in labor revenues, we conclude that Brazil could have the smaller gains (10.9%), while Mexico and Chile the largest ones (31% and 22%, respectively). In other words, potential fiscal space through labor taxes in Brazil is the smallest, especially with respect to Mexico and Chile. An important part of potential fiscal space differences between countries is explained by the concavity of the Laffer curves, which, in turn, depends on the parameters of each economy. Appendices 2 and 3 displays these curves for each of the countries in the sample.

Graph 2. Laffer Curves on Labor Income Taxes for Latin America (Weighted average for the largest six Economies)

A. Average Effective Labor Tax (1994 to 2017) **B. Effective Labor Tax of 2017**



	Argentina	Brazil	Chile	Colombia	Mexico	Peru	LAC
Tax Rate 2017	0.178	0.310	0.221	0.245	0.198	0.172	0.252
Maxim. Rate (Frisch 1)	0.49	0.63	0.57	0.55	0.59	0.49	0.57
Fiscal Space (% of labor income) (Frisch 1)	12.14	10.89	21.91	15.75	31.12	14.98	13.71
Fiscal Space (% of GDP) (Frisch 1)	3.68	3.55	4.78	3.95	5.44	2.86	3.72

Source: Authors' calculations.

Laffer Curves on Capital Taxes

The results of the Laffer curves on capital gain taxes are presented in Graph 3. The effective rate on capital, (τ_t^k), is represented on the horizontal axis and government tax revenues (normalized) on the vertical. As in the previous case, Panel A presents our estimates using the average tax rate between 1994 and 2017 (13.8%), while Panel B exhibits those with the rate recorded for the last year (16.7% in 2017). We also use two Frisch elasticities (unitary and inelastic).

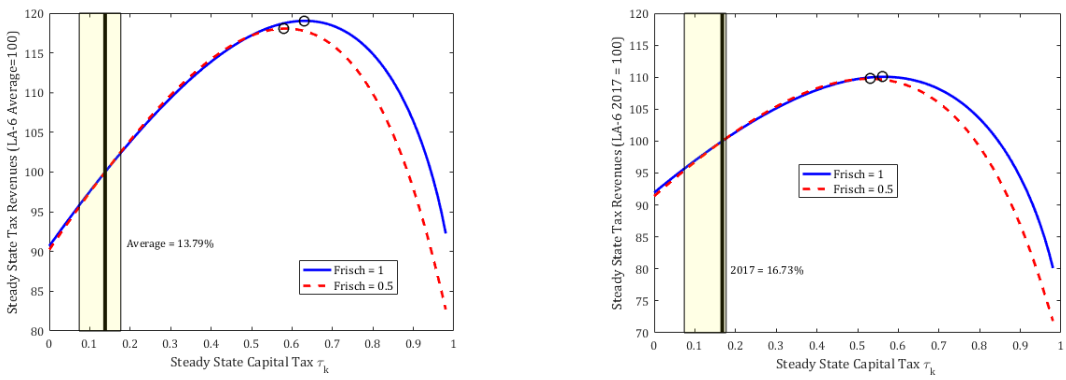
The figures show that the LAC´s capital tax burdens are located on the left side of the peak of the Laffer curves. The effective tax rate that maximizes government revenues coming from capital would be 57%, while the most recent measure of tax burden achieves 16.7% (Panel B and Table). Comparing these rates, governments in the region would have an ample potential capital tax-related fiscal space (close to 40%, on average). Nonetheless, this is different when fiscal space is expressed in potential additional revenues. Thus, under the hypothetical case that the effective capital tax rate be increased to its maximizing level, government revenues from capital returns would increase only 10%, which means that for every 100 bp of increase in the effective tax rate, the tax collection would increase by 25 bp, on average. The fiscal space on capital returns expressed in terms of the potential GDP would reach 2.7%.

When comparing these results with to Graph 2 (Panel B), we see that in Graph 3 there are practically no differences in tax rates that maximize revenue collection with the two alternatives for the Frisch elasticities. This result is expected because, by definition, Frisch elasticity measures the sensitivity of labor supply to changes in after-tax wages and, therefore, does not affect the decisions on capital allocation directly.

Regarding results of the Laffer curves across countries, significant differences are found. Mexico appears to have the greatest potential space to increase tax revenues on capital (26.4%), partly because of its current low tax burden (11.9% in 2017). Concerning such burden, Peru and Chile are located subsequently, but these two countries clearly have much less potential to increase revenues (between 8.0% and 11%). The most notorious cases of highest capital tax burden are Argentina and Brazil with effective tax rates around 20%. It is not surprising that precisely these two countries have the lowest potential space to increase this type of revenues (around 7.0%).

Graph 3. Laffer Curves on Capital Gains from Taxes for Latin America (Weighted average for the largest six economies)

A. Average Effective Capital Tax (1994 to 2017, on average)	**B. Effective Capital Tax of 2017**



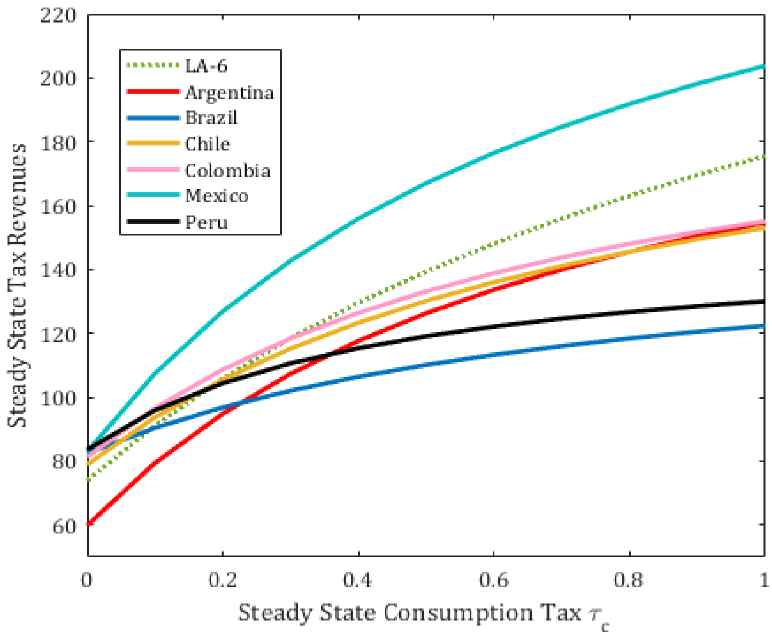
	Argentina	**Brazil**	**Chile**	**Colombia**	**Mexico**	**Peru**	**LAC**
Tax Rate 2017	0.194	0.209	0.131	0.185	0.119	0.118	0.167
Maxim. Rate (Frisch 1)	0.55	0.63	0.49	0.57	0.59	0.48	0.57
Fiscal Space (% of capital income) (Frisch 1)	6.64	7.48	10.96	8.39	26.42	7.81	10.06
Fiscal Space (% of GDP) (Frisch 1)	2.09	2.42	2.36	2.23	4.66	1.45	2.66

Source: Authors' calculations.

Laffer Curves on Consumption Taxes

Graph 4 shows the Laffer curves for consumption taxes for each one of the six Latin American countries. In contrast to the two previous cases, curves on consumption taxes do not have a maximum point within the economically reasonable range of tax rates (between 0 and 1). Mathematically, this means that government revenues grow monotonously with the effective tax rate, albeit with a slight concave trend. Hypothetically, if we could consider a tax higher than 1 (i.e., $\tau^c > 1$ in the horizontal axis), we would see that the slope of the Laffer curve would approach to zero (the maximum point of the function), to the extent that the consumption rate tends to infinity ($\tau^c \rightarrow \infty$). These findings have been established and discussed by previous papers on this matter (Trabandt and Uhlig, 2011).

Graph 4. Laffer Curves on Consumption Expenditures for Latin America (Weighted average, Frisch 1)



Source: Authors' calculations.

The atypical form of the Laffer curve for consumption taxes is associated with distortions of labor taxes versus those of consumption. To explain distortions, we deduce the intra-temporal condition of consumption that arises from the households' problem (using equations 1 to 4), that is $-\frac{u_2(c,n)}{u_1(c,n)} = \frac{(1-\tau_w)}{(1+\tau_c)} w = \zeta w$, where ζ captures the marginal distortion of each tax. Note that while the distortion on ζ of an increase in the labor tax is given by -1, those arising from an increase in consumption tax is given by $-\frac{1}{(1+\tau_c)}$, being the latter smaller than the first and decreasing in τ^c. This implies that for consumption taxes, the positive effect on government revenues coming from a marginal increase in the tax rate (income-effect that ends up benefiting households through more transfers), is greater than the negative marginal effect on household consumption caused for the larger prices. Hence, the function is monotone and increasing in the tax rate. Given all these peculiarities for this case, we can say little about the potential fiscal space through consumption taxes.

How do Results change under the Endogenous Human Capital Model?

The benchmark results of Section 4 follow the ideas by Levine and Renelt (1993) about the nil influence of taxes on long-term economic growth. Nevertheless, because there is ample literature with opposite evidence, this issue seems to remain open. In this section, we want to fathom what could happen to economic growth when we allow for impacts on the tax system through the channels suggested by Trabandt & Uhlig (2011), Lucas (1988), and Uzawa (1965). In particular, the model allows for economic growth to be influenced by what could happen with the human-capital law of motion, which is determined by the endogenous time allocation of households between work and the time used for job training (education). After some arithmetical substitutions, the balanced growth path for human capital will be given by (instead of equation 9):

$$\psi = [B + (A - B)\bar{q}]^{\omega} \bar{n}^{\omega} + 1 - \delta_h \qquad (14)$$

The major changes of the new setup are concentrated on the first-order condition of utility function with respect to labor, along the balanced growth path, that is:

$$\bar{u}_n = (1-\tau^n)\bar{w}\bar{\lambda}[1+\omega(\psi-1+\delta_h)]/(\bar{R}-\psi) \qquad (15)$$

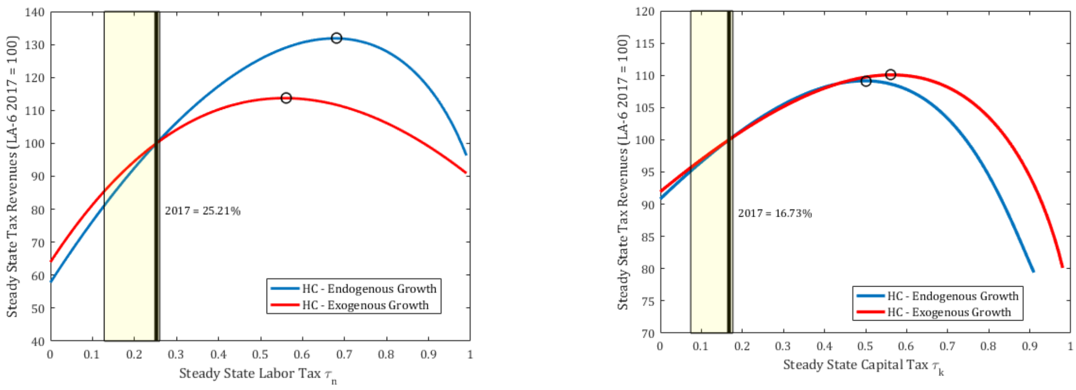
Under this setting, the labor tax rate influences the labor supply, which in turn affects economic growth, the real interest rate, $(\bar{R}=\psi^{\eta}/\beta)$, and the capital-output ratio, as well as the consumption-output ratio. Following equation (11) closely, there is another less important effect, quantitatively speaking: the right-hand term is now numerically different, since $\mathfrak{F}$ is given by:

$$\mathfrak{F}' = \frac{\bar{R}-\psi}{\bar{R}-\psi+\omega(\psi-1+\delta_h)} \qquad (16)$$

Under the new growth dynamics, changes in tax structure (particularly in labor taxes) affect a household's decisions about the time offered to the labor market (equation 15). We could infer from equation (14) that such decision affects economic growth and, ultimately, the Laffer Curves. Graph 5 present the results.

Graph 5. Laffer Curves on Labor and Capital Incomes for Latin America (Exogenous vs. Endogenous Human Capital)

A. Labor **B. Capital**



Endogenous H.C. Model		**Argentina**	**Brazil**	**Chile**	**Colombia**	**Mexico**	**Peru**	**LAC**
Labor	Tax Rate 2017	0.178	0.310	0.221	0.245	0.198	0.172	0.252
	Maxim. Rate	0.64	0.71	0.63	0.63	0.74	0.54	0.69
	Fiscal Space (% labor income)	30.49	22.58	30.78	28.32	69.92	29.27	31.84
	Fiscal Space (% GDP)	9.43	7.28	6.75	7.29	12.51	5.92	8.74
Capital	Tax Rate 2017	0.194	0.209	0.131	0.185	0.119	0.118	0.167
	Maxim. Rate	0.50	0.52	0.48	0.55	0.52	0.51	0.51
	Fiscal Space (% capital income)	6.12	5.41	10.92	9.14	24.64	7.81	9.14
	Fiscal Space (% GDP)	1.95	1.78	2.62	2.46	4.42	3.09	2.45

Source: Authors' calculations.

The Laffer Curves displayed in Graph 5 are also estimated using the effective tax rates of 2017 and the parameters from Table 1. In blue, we show curves resulting from the endogenous growth model, while the ones from the exogenous (the baseline model) are shown in red. For labor returns (Panel A), the new effective tax rate that maximizes revenue is to the right on the baseline, implying an increase in tax revenues (fiscal space) of around 18% (resulting from 32% - endogenous - minus 14% - exogenous). In the case of capital returns (Panel B), the opposite happens: the effective tax rate that maximizes revenues is to the left of the baseline. Nevertheless, the fall in tax revenues is marginal, only around 0.9% (9.1% - 10%) (see Tables from graphs 5 and 4).

To better understand these results, it is enough to analyze what happens when there is a change in labor tax, first along the Laffer Curves and second at any specific point. Thus, if the labor tax increases, the labor income falls, $(1-\tau)w$, pushing down the non-leisure time, (n), the share of non-leisure time for work, (q), and, therefore, the working time, (q*n). This, in turn, leads schooling time to grow, ((1-q)*n), since the model assumes that the households are always employed. Because the growth is driven by (q*n), there will be less economic growth and less physical capital accumulation, output level, and lower interest rates. The left-side of the capital Laffer Curve (Panel B) is just a consequence of the lower real interest rate, while the insignificant change in capital tax revenue comes from the fact that human capital is the growth source of this economy.

Nonetheless, from the second point of view, the greater labor fiscal space from the endogenous model is a consequence of having both larger interest rates and economic growth at a particular labor tax rate. For instance, using the effective tax rates of 2017, we get larger real interest rate and long-run economic growth, than those used for the baseline (6.3% vs. 5.1% and 3.2% vs. 2.7%, respectively).

Tax Burden and Fiscal Space: Latin America vs. E.U.-14 and U.S.A.

In this section, we contrast Latin America's Laffer Curves for labor and capital taxes with those corresponding to the main European Economies and the U.S.A. As described in Section 3, we consider the largest six Latin American economies (LAC) and, for the European case, we retake the main fourteen economies (EU-14), as in Trabandt and Uhlig (2011).[6] The graphs depict the weighted average for these two groups of economies. The comparison is informative because in all cases we use the same benchmark model (with unitary Frisch elasticity), the data comes from national accounts and covers the same period, and we apply a similar technique to estimate effective tax rates.[7]

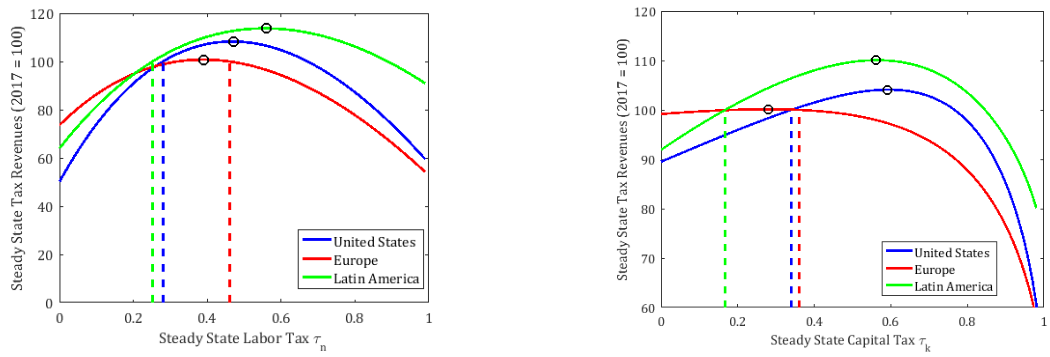
Graph 6 exhibits the results. On the left-hand side, we compare the Laffer curves for labor taxes. The fiscal revenues are standardized, so the value of 100 corresponds to the last available effective tax rate, which is 25% for LAC in 2017 (dotted green vertical line), while for the U.S.A. and the E.U.-14 they are 28% and 46%, respectively (dotted blue and red vertical lines). On the right-hand side, we display the corresponding Laffer curves for capital taxes.

6 The EU-14 group includes Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, The Netherlands, Austria, Portugal, Finland, Sweden, and the United Kingdom.

7 For U.S.A and EU-14 we update the Trabandt and Uhlig´s database for all parameters up to 2017 (using European Commission (2019), and OECD (2019). and re-estimate the models

Graph 6. Laffer Curves on Labor and Capital Incomes: LAC vs. EU-14 and & U.S (Exogenous HC and Frisch 1)

A. Labor **B. Capital**



	Labor				Capital			
	Last Tax Rate, 2017	Maxim. Rate	Fiscal Space (% labor income)	Fiscal Space (% GDP)	Last Tax Rate, 2017	Maxim. Rate	Fiscal Space (% capital income)	Fiscal Space (% GDP)
LAC	0.25	0.57	13.71	3.72	0.17	0.57	10.06	2.66
USA	0.28	0.48	8.27	2.09	0.34	0.60	4.10	1.04
EU14	0.46	0.40	-	-	0.36	0.29	-	-

Source: Authors' calculations.

Regarding labor levies, we stress that the current effective tax rate for the E.U.-14 group is over to the one that maximizes the fiscal revenues, implying that additional increments in labor taxes could create disincentives on labor supply, therefore reducing tax revenues. This finding is not surprising, since, as it is well known, European countries such as Sweden (54%), Austria (52%), and France (49%) are among those with the largest labor tax rate in the whole world. In this sense, there seems to be no fiscal space to set more labor taxes in the region. Our results also suggest a little different situation for U.S.A. and LAC. In the former, there is a significant fiscal space (due to the ample distance between the current effective labor tax rate vs. the one that maximizes revenues), which could turn into additional tax revenue close to 8.3% of the labor income. For the latter group such revenues could be around 13.7%.

With respect to capital, the right panel of Graph 6 shows that Europe possesses the highest effective tax rate (36%) compared to the U.S.A. (34%) and LAC (17%). The U.S.A.'s effective tax rate corresponds to 2017 and, therefore, does not totally capture the important tax reduction to corporate profits set at the beginning of the Trump administration. Despite this, there would be an important space to increase the U.S.A. tax burden, although with relatively small revenue gains. Thus, hypothetically, should the effective rate be increased to the level that maximizes revenues, gains in tax revenues would be only 4.1% of the capital returns.

Europe's effective tax rate on capital is beyond to the peak of the Laffer Curve, which in practice means that there is no fiscal space. Within the E.U.-14 there are economies such as France (50%), Denmark (47%), Belgium (44%), and United Kingdom (40%) with capital tax burdens that leave narrow or nil space to consider additional rises. In turn, the LAC group has the largest fiscal space due to the smaller current tax burden.

The degree of concavity for the Laffer Curves, which depends on fundamental parameters of each economy, also determines the size of the fiscal space (the biggest concavity being for the U.S.A. and the lowest for E.U.-14).

Conclusions and Final Remarks

Laffer Curves estimates are crucial for economic policy actions due to two potential opposite effects that a revenue-seeking tax reform could have: on one side, it could bring an expected increase; on the other, a reduction because higher taxes could disincentivize the labor supply and the desire to invest. The status of the tax burden with respect to the one that generates the maximum revenues determines which of the two effects ends up dominating. The main goal of this paper was to measure how close/far are the current effective tax rates in LAC with respect to those that maximize revenues and, therefore, to explore the potential tax-related fiscal space.

The Laffer curves on labor and capital taxes were estimated using a neoclassical growth model with human capital for the six largest Latin American emerging economies: Argentina, Brazil, Chile, Colombia, Mexico, and Peru. The model was calibrated with annual data from the national accounts of each country for the period 1994-2017. To the best of our knowledge, this is the first time that a human capital growth model has been considered to estimate Laffer curves and the fiscal space for the main Latin American emerging economies.

There are ample differences across the LAC concerning the recent tax burden, even though such differences have been declining. Regarding labor, Brazil has the highest effective tax rate (31% for 2017), while the lowest is for Peru and Argentina (17%). The regional weighted average is 25%, being Argentina, Colombia, and Chile the countries who have made more efforts to increase these taxes in recent times. Trends are not so different for taxes on capital returns. The highest effective tax rate is again in Brazil (21% in 2017, close to Argentina) and the lowest is for Peru and Mexico (11.8%). On average, the region has now a 17.5% tax burden on capital returns, while in the mid-nineties it was 7.5%. When these effective tax rates are contrasted against those which would maximize the government's revenues (obtained from the model), a long-term potential tax-related fiscal space is found.

Concerning labor taxes, results suggest that governments in the region have an important margin to increase their revenues. In terms of potential GDP, the long-term fiscal space on labor income would reach 3.7%. In detail, the figures suggest that for every percentage point that the effective tax rate increases, the revenues from labor taxes would increase by 0.44 points, on average, for the six countries. The lower the elasticity of the labor supply, the greater the revenue gains. Of course, results differ across countries, being Mexico and Chile those with the largest fiscal space and Brazil with the lowest one.

Fiscal space is smaller for taxes levied on capital returns. For this group of LAC, on average, it would achieve 2.7% of the potential GDP. Results also suggest that for every percentage point of increase in the effective tax rate, capital revenues increase 0.25 points. Mexico appears to have the greatest potential space to increase tax revenues on capital, while Peru, Argentina, and Brazil have the lowest. When contrasting the fiscal space for LAC with that of the main European economies (on average), we find that the latter practically do not have margin to increase taxes on neither labor nor capital incomes. By contrast, compared to the U.S.A., results suggest that this country has fiscal space particularly though labor taxes.

We conclude with three important remarks which help to understand the actual scope of this paper. First, our analysis is far from being a social welfare analysis since the effective tax rates that maximize revenues are not optimal tax rates. Second, our benchmark model is designed for a closed economy and it does not consider an informal labor market. These issues restrict our analysis because, on the one hand, it does not capture the external competitive context and the recent debates in the region about the need to reduce corporate taxes in order to attract investment and thereby strengthen the taxable bases. On the other hand, the significant degree of informality that Latin American labor markets endure is left aside.

Finally, when we use effective tax rates to take advantage of the fiscal space, we have to bear in mind that changes in these effective tax rates can be achieved through an extensive menu. For instance, by including new taxpayers into taxable bases, and/or by reducing or eliminating tax benefits usually granted through tax codes, and/or adjusting statutory tax rates, and/or through better tax management that lead to lower evasion.

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Appendix 1. Effective Tax Rates on the Labor, Capital, and Consumption Technical Details

In this section we provide details on the calculation of effective tax rates on labor, capital income and consumption. The main source of information is the National Statistics Bureau for each country, specifically the Integrated Economic Accounts. We also use complementary information from the OECD - mainly for the case of Argentina - and Penn World Tables databases. Table A1.1 includes the definitions for each effective tax rate, while Table A1.2 describes all the variables used in their calculations.

Table A1.1. Effective Tax Rates, based on Mendoza et al. (1994).

Effective Tax	Formula
Consumption	$\tau^c = \frac{INN}{C + (GC - GW) - INN}$
Personal Income	$\tau^h = \frac{ICIH}{(W + IM_L) + (ENEH + IM_K) + RNPH}$
Labor Income	$\tau^l = \frac{\tau^h (W + IM_L) + CST + ICNOM}{W + IM_L + CSE}$
Capital Income	$\tau^k = \frac{\tau^h (ENEH + IM_K + RNPH) + ICIE + ITF}{ENE}$

Source: Authors' calculations.

Table A1.2. Variable description.

Variable	Description
INN	Indirect taxes on production of goods and services.
ICIH	Income, profit, and capital gains taxes of individuals.
ICIE	Income, profit, and capital gains taxes of corporations.
CST	Social security contributions, total.
CSE	Social security contributions made by employers.
ICNOM	Payroll Taxes.
ITF	Financial transactions tax.
C	Final household expenditures.
GC	Final government expenditures.
GW	Salaries paid by the government.
W	Wage income received by households.
ENE	Gross operating surplus minus consumption of fixed capital.
IM_K	Mixed income attributable to capital.
IM_L	Mixed income attributable to labor.
RNPH	Net property income, households.
ENEH	Net operating surplus, households.

Source: Authors' calculations.

The sources of all the data used are listed by country:

- Argentina: the main sources of data are the OECD and the National Institute of Statistics and Censuses (INDEC by its Spanish acronym). The tax related data was retrieved from the OECD, and the data such as consumption and gross operating surplus was retrieved from the Integrated Economic Accounts (IEA) found on the INDEC's website. Only the wages paid by the government (GW) and the tax on payroll (ICNOM) were found elsewhere. GW was taken from the Ministry of Economy, and the ICNOM was estimated with information from the provincial tax administrations and the Observatory of Employment and Business Dynamics.

- Brazil: most of the data was retrieved from the IEA found on the Brazilian Institute of Geography and Statistics (IBGE by its Portuguese acronym). Only the ICNOM and the tax on financial transactions (ITF) were taken from other databases. The ICNOM was retrieved from the OECD and the ITF from the Inter-American Center of Tax Administrations (CIAT by its Spanish acronym).

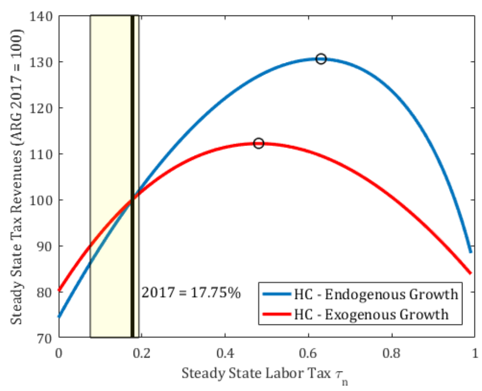
- Chile: the data was obtained from Chile's Central Bank; however, it is important to note that the ICNOM and ITF were not found, hence they are not included in the calculation of Chile's effective tax rates.

- Colombia: the main data source was the National Administrative Department of Statistics (DANE by its Spanish acronym). Only two variables were found elsewhere. The ICNOM was estimated from contributions made to family compensation funds and the ITF was retrieved from the National Tax and Customs Direction (DIAN by its Spanish acronym).

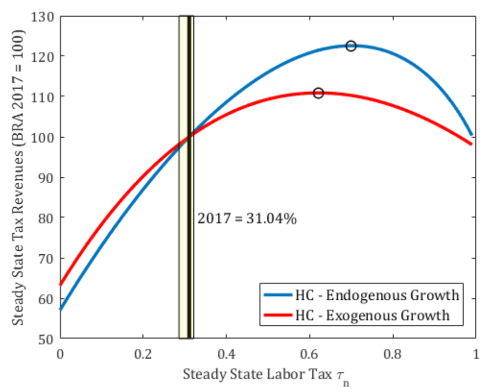
- Mexico: most of the data was retrieved from the IEA found on the National Institute of Statistics and Geography (INEGI by its Spanish acronym). Only the ICNOM and the ITF were taken from other databases. The ICNOM was retrieved from the OECD and the ITF from the CIAT.

- Peru: the main data source was the National Institute of Statistics and Informatics (INEI by its Spanish acronym). Only the ICNOM and the ITF were taken from other institutions. The ICNOM was retrieved from the OECD and the ITF from the CIAT.

Appendix 2. Laffer Curves for Labor Income Taxes in Latin America: Exogenous and Endogenous Growth Models



Argentina



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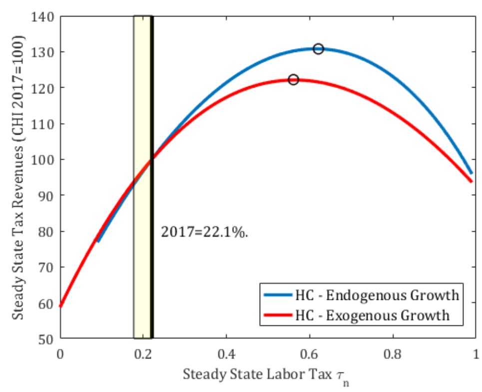

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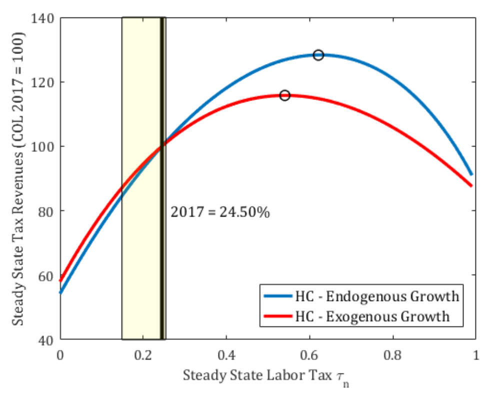

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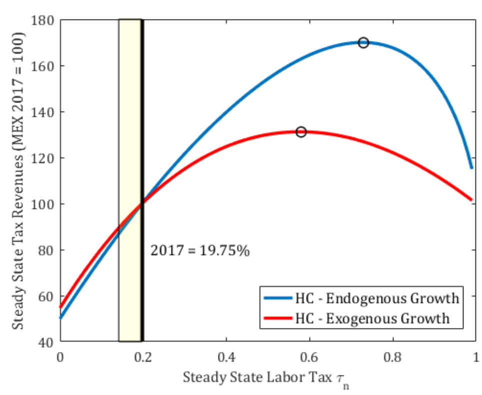
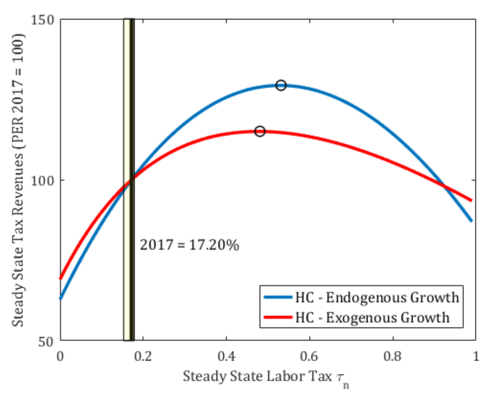


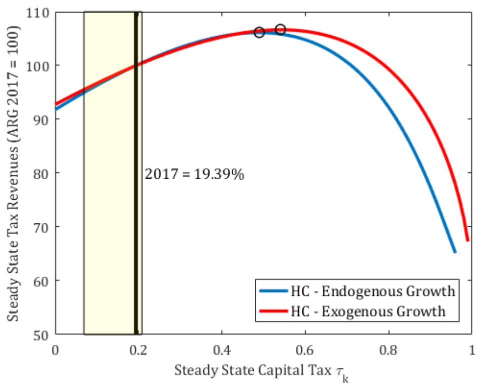
Mexico



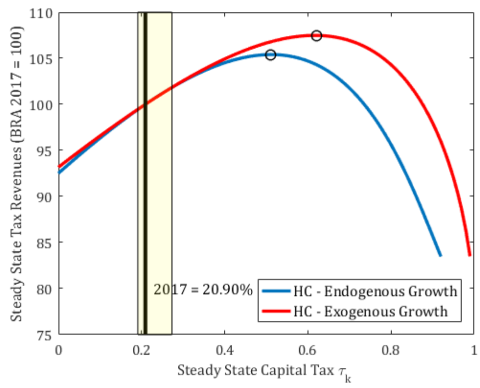
Peru

Source: Authors' calculations.

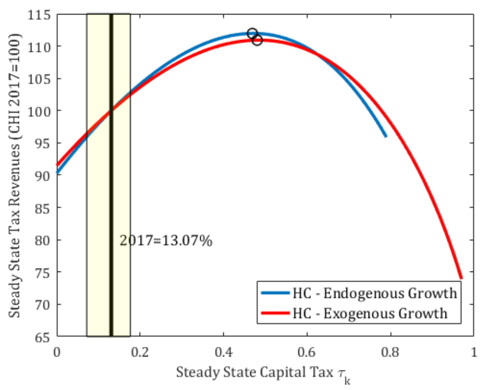
Appendix 3. Laffer Curves for Capital Gains in Latin America: Exogenous and Endogenous Growth Models



Argentina



Brazil



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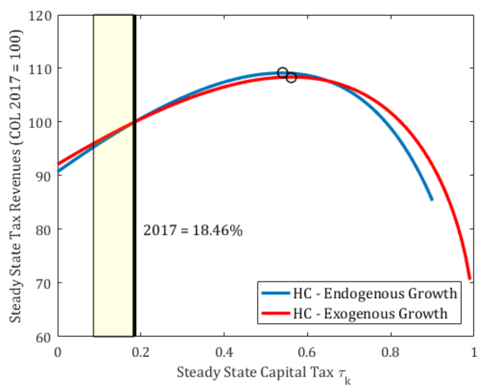
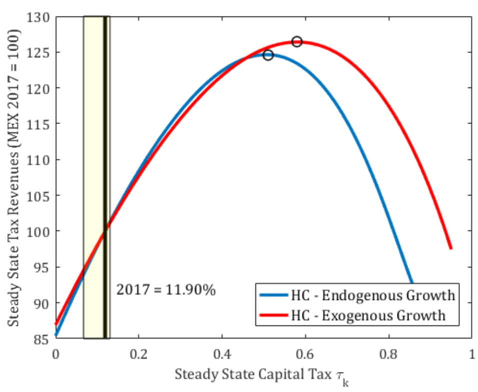
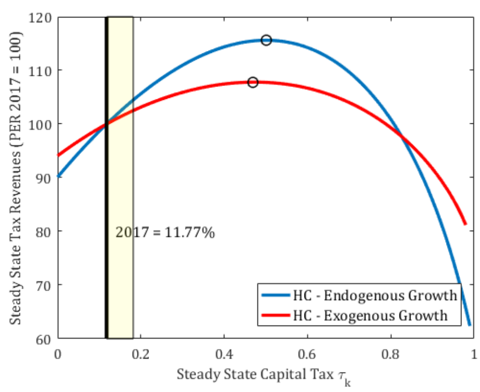


Colombia



Mexico



Peru

Source: Authors' calculations.

Appendix 4. Laffer Curves in LAC for Labor and Capital Income Using Statutory Tax Rates

In this appendix we perform a Laffer Curve analysis based on the same parameters as in Table 1 but employing statutory tax rates instead of effective tax rates. The source of the information is the CIAT and the OECD. Table A4.1 describes the rates we use. For labor we work with the maximum marginal tax rate applied to personal income, while for capital we employ the country's legal general tax rate plus any surcharge incorporated in its tax codes.

Table A4.1. Set of Statutory Tax Rates for Capital and Labor Income - 2017

Country	Statutory Tax Rate on Labor Income*	Statutory Tax Rate on Capital Income
Argentina	0.35	0.35
Brazil	0.275	0.34
Chile	0.35	0.25
Colombia	0.33	0.40
Mexico	0.35	0.30
Peru	0.30	0.28
LAC	0.306	0.318

* For each country, we use the maximum marginal tax rate applied to personal income.

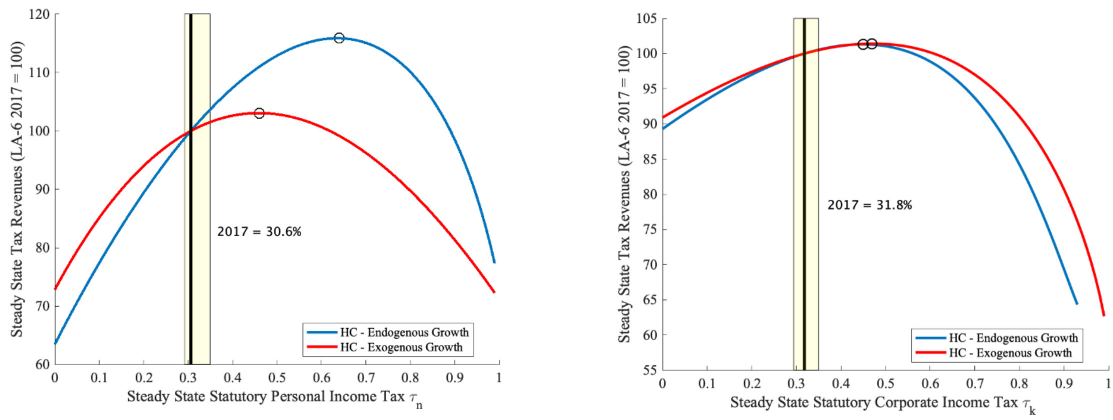
The Laffer curve estimates for taxes on labor (Panel A) and capital income (Panel B) for the major LAC are presented in Graph A4.1. Each curve shows that tax rates that maximizes revenues using statutory rates are lower (Graph A4.1. vs Graph 5). Therefore, the fiscal space is smaller than in the effective tax rates case and this occurs in both human capital versions of our modelling.

The graphs suggest that the statutory rate that maximizes government revenues coming from labor would be around 63% contrasting with the 69% we got on the effective rates estimates (Graph 5) and the rate that maximizes from capital income would be 44% comparing to the 51% with effective rates. As expected, the fiscal space in terms of additional revenues for the government also will be much lower using statutory rates. Government revenues would increase roughly 15%, on the hypothetical scenario that the rate would be increased to its maximizing level, for the labor income tax (contrasting with the 31.8% of the effective rates estimates) and the revenues would rise only by 0.96% for the capital income tax (comparing with the 9.14% on the initial case).

Across countries the results are consistent with the trend above. Nonetheless, one exception is Brazil, where its labor statutory tax rate happens to be higher than its effective tax rate. Thus, there is more fiscal space using the statutory rates. This result is in line with the main idea pertaining to the direct relationship between the size of the tax and the distortions it will bring into the economy.

Graph A4.1. Laffer Curves in LAC for Labor and Capital Income Using Statutory Tax Rates (Weighted average for the largest six economies)

A. Statutory Labor Income Tax	**B. Statutory Capital Income Tax**



Endogenous HC. Model		**Argentina**	**Brazil**	**Chile**	**Colombia**	**Mexico**	**Peru**	**LAC**
Personal Income	Tax rate 2017	0.35	0.275	0.35	0.33	0.35	0.30	0.31
	Maxim. Rate	0.62	0.70	0.52	0.52	0.65	0.40	0.63
	Fiscal Space (% labor Income)	10.10	25.03	4.24	5.33	13.29	1.48	15.08
	Fiscal Space (%GDP)	4.21	8.34	1.47	2.18	4.77	0.52	5.37
Corporate Income	Tax rate 2017	0.35	0.34	0.25	0.40	0.30	0.28	0.32
	Maxim. Rate	0.42	0.55	0.31	0.40	0.36	0.30	0.44
	Fiscal Space (% labor Income)	1.44	3.48	0.22	0.0	0.31	0.03	0.96
	Fiscal Space (%GDP)	0.10	1.15	0.078	0.0	0.11	0.011	0.41

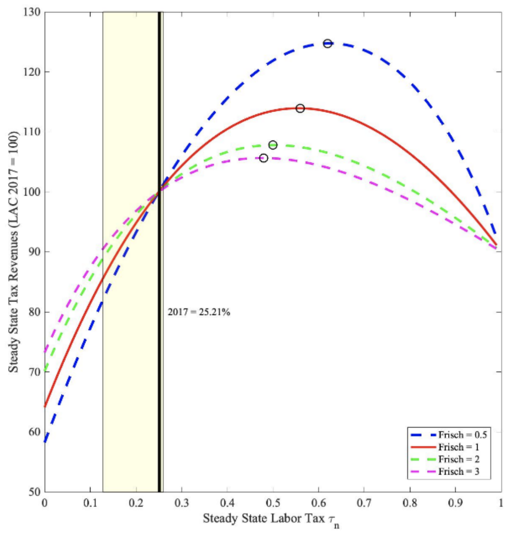
Source: Authors' calculations.

Appendix 5. Sensitivity Analysis of Laffer Curves to Frisch Elasticity in Latin America

In this appendix we calculate Laffer Curves for effective labor and capital tax rates with Frisch elasticity values (φ) ranging from 0.5 to 3.5. These are calculated for each one of the six main Latin American countries as well as a weighted average for all of them. We present here what we find for labor income tax rate for the weighted average LAC in 2017, leaving the supplementary calculus available in a supplementary material document. The tax revenues are normalized using the closest value of the estimates and the results of the evaluated tax rates.

Graph A5.1. Sensitivity of Laffer Curves to Frisch Elasticity in Latin America (Weighted average for the largest six economies)

Effective Labor Income Tax of 2017



	Frisch Elasticities	0.5	1	2	3
Effective Labor Tax LAC of 2017	Tax rate 2017	0.252	0.252	0.252	0.252
	Maxim. Rate	0.62	0.56	0.50	0.48
	Fiscal Space (% labor Income)	24.7	13.9	7.8	5.6
	Fiscal Space (%GDP)	6.60	3.72	2.08	1.51

Source: Authors' calculations.

The results that are shown in Graph A5.1 suggest that revenue-maximizing tax rates are slightly higher as the labor supply is more inelastic. Thus, the more sensitive the labor supply is to changes in taxes, the less margin for the government to increase tax burden without generating disincentives on the labor market. In fact, when Frisch elasticities take the values 0.5, 1, 2, and 3, the revenue-maximizing tax rates are 62%, 56%, 50%, and 48% respectively, implying that for higher Frisch elasticity values, the government reaches less revenue-maximizing tax rates. The same happens when we analyze the fiscal space as a percentage of labor income, it diminishes from 25% (at Frisch elasticity equal to 0.5) to 5.6% (with Frisch elasticity equal to 3) for the last year.