The Distribution of Tax Burden in Türkiye: An Analysıs of Effective Tax Rates for the 1998–2023 Period[1]

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Summary: Since tax incentives significantly reduce the tax burden calculated according to statutory tax rates, the statutory tax rate becomes less informative, while the effective tax rate, which represents the actual tax burden on taxpayers, gains prominence as a more accurate measure. Both the reasons behind the implementation of tax incentives and their impact on the tax burden should be evaluated in terms of achieving the objectives of justice and efficiency in taxation. This study estimates average effective tax rates (AETR) using the methodology developed by Carey and Rabesona (2004). According to the estimation results for Türkiye for the 1998–2023 period, the AETR on salaries and consumption is high, whereas the AETR on capital and on personal income other than wages is low. This finding, which undermines the principle of equity in taxation, shows that the principle of efficiency predominantly shapes Turkish taxation and that the tax structure does not adequately reflect individuals' financial capacity.

Keywords: Statutory tax rate, Effective tax rate, Tax incentives, Tax expenditures, Türkiye

JEL: H20, H21, H24

The effective tax rate (ETR) is considered a more realistic and functional indicator than the statutory tax rate, as it reflects the actual tax burden borne by taxpayers. Statutory rates often fail to represent the true tax burden due to the presence of deductions, exemptions, and exclusions applied to the tax base. Consequently, both private sector actors engaged in tax planning and policymakers increasingly rely on ETRs to assess the efficiency and equity of the tax system. While tax incentives included in ETR calculations may lead to short-term reductions in public revenue, they can serve long-term objectives such as promoting economic growth, encouraging investment, fostering sectoral development, improving income distribution, and supporting environmental sustainability. However, evaluating the impact of these incentives on the trade-off between efficiency and equity requires not only technical

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analysis but also normative assessment. In the case of Türkiye, research in this field remains limited, often focusing on a narrow range of tax categories and relying on short-term analyses. This limitation hinders a comprehensive assessment of how the tax system affects income distribution, saving behavior, and consumption patterns in Türkiye. It also creates data gaps that restrict the scope for meaningful international comparisons. This study aims to address this gap by estimating the AETR for four main income types—personal income, wages, consumption, and capital gains—using data from Türkiye covering the period of 1998–2023. This comprehensive analysis identifies sectoral, structural, and temporal variations in AETRs, facilitating a discussion of the institutional and macroeconomic factors underlying imbalances in Türkiye's tax system. In doing so, the study offers an empirical framework for understanding the Turkish tax structure and contributes uniquely to the field by integrating methodological approaches from the international literature.

1.The Effective Tax Rate Concept: An Analysis and Reflections in Türkiye

Effective tax rates are classified into two types based on how they're calculated: the AETR and the marginal effective tax rate (METR). AETR refers to the ratio of actual taxes paid after exemptions, allowances, and deductions from the total tax base. In contrast to AETR, the METR is determined by relating the amount of tax paid by the taxpayer after applying deductions to the incremental rise in the tax base.

AETR is an invaluable metric for comparing multinational corporations' average tax burdens across countries. However, if structural factors such as company size, sectoral activity area, and income level are not considered, this ratio may produce deceptive results. Indeed, in contrast to high-income countries, which frequently offer tax reductions for R&D and intellectual property income, low- and middle-income countries prefer implementing tax exemptions and temporary tax vacations instead. Such techniques are typically tailored to certain industries, regions, or business types (Alessandra Celani, Luisa Dressler and Martin Wermelinger 2022 p.16). Although AETR is preferable for cross-country comparisons and calculating the overall tax burden, it may not be enough for analyzing investment decisions. In this particular case, METR takes precedence. When assessing the tax burden of investment projects, the marginal tax rate is of greater assistance because it represents the direct impact on investment returns. Empirical studies have demonstrated that METR produces more accurate outcomes in investing decisions since it is based on the most recent unit changes applied to income. The marginal tax burden varies, particularly in countries with frequently changing tax laws and a variety of incentive programs in place. For this reason, the use of METR in such calculations is especially significant. However, AETR is regarded as a more appropriate indicator in long-term comparisons, tax revenue projections, and economic efficiency analyses.

The statutory tax rate must be considered when determining effective tax rates. No additional assessment is necessary to calculate the statutory tax rate, which is the rate that is directly specified in tax laws and applied to the tax base. On the other hand, the deductions, exemptions, and allowances used during the taxation process must be taken into account to determine the effective tax rate.

The concept of effective tax rates is essential for evaluating the true tax burden along with the fairness, effectiveness, and sustainability of a country's tax regime. In the case of Türkiye, studies reveal that the tax system suffers from structural challenges. A key issue is the extensive use of exemptions, exceptions, and incentives, as well as the frequent enactment of tax amnesties, all of which contribute to an imbalanced tax burden across income groups. Moreover, excessive reliance of the taxation system on indirect taxes exacerbates this imbalance, weakening the principle of equity in taxation. The expansion of the scope of tax expenditures reduces effective tax rates; this situation leads to both a deterioration in income distribution and sustainability risks in public finance. Therefore, the analysis of effective tax rates provides an opportunity to more effectively evaluate the imbalances created by the incentive mechanisms and the structure based on indirect taxes in the Turkish tax system.

The low proportion of direct taxes in tax revenues is the primary structural issue with Türkiye's tax system. By using indirect taxes to close this gap, low-income groups are disproportionately burdened with taxes and income distribution becomes unequal. Furthermore, the system's predictability is weakened, and taxpayer compliance is adversely impacted by the frequent recurrence of tax amnesties and restructuring rules. In the long term, such actions erode voluntary tax compliance and run counter to the values of justice and stability.

One of the primary issues undermining the equitable nature of taxation in Türkiye is the widespread use of tax incentives. Even though they are intended to support objectives like regional development and job creation, their selective and dispersed implementation restricts benefits to a small percentage of the population.

Indeed, another complementary objective in economic growth and development is social objectives. To ensure that implemented tax incentives do not lead to inequality, sectors and regions need to be carefully analyzed. If a tax advantage applied in one sector creates unfair competition for other sectors, it hinders the achievement of social objectives through tax incentive policies (Sercan Yavan 2016 p.162). Maintaining these policies without evaluating their effectiveness or social return jeopardizes the sustainability of public revenue and undercuts effective tax rates.

Although they may draw investment in the short term, capital income exemptions have a tendency to decrease the tax base over time and increase the tax burden on salaried individuals, jeopardizing income equity. The effectiveness of such incentives is the subject of much discussion in the literature. Although some studies reveal a rise in investment activity, low-return firms seem to benefit only marginally. Highly profitable businesses benefit disproportionately from such incentives, as so evidenced by empirical data from Türkiye.

There is ongoing debate regarding the impact of tax incentives on corporate investment strategies. According to theoretical contributions presented by Robert E. Hall and Dale W. Jorgensen (1967) and Mervyn A. King and Don Fullerton (1984), these incentives encourage investment by bringing down the cost of capital. More recent studies, such as those by Michael P. Devereux and Rachel Griffith (2003), cast doubt on this effect, particularly for less successful businesses. Accordingly, Turkish research, such as that conducted by Sinan Dundar et al. (2024), finds that tax incentives

are primarily beneficial to extremely profitable capital groups and do not yield consistent results.

2. Literature Abstract

The majority of studies on ETR calculations focus either on the theoretical models (e.g., Devereux and Griffith 2003; King and Fullerton 1984), which analyze corporate behaviors in developed countries, or on comparative analyses of tax systems across country level (Enrique G. Mendoza, Razin Assaf and Linda L. Tesar (1994), David Carey and Josette Rabesona (2004), Francisco J. Delgado et al. (2019)). However, the substantial portion of such studies were conducted at the countries with relatively higher income while it is observed that extensive and long-term ETR analyses seem to be scarce in the developing countries. This makes it questionable if the generalised models are applicable in countries like Türkiye, where there is a high degree of informality, frequent changes to tax legislation, and apparent wide variations in sectoral taxation. In this context, the literature on ETR can generally be categorized into three groups. The first group of studies focuses on the macroeconomic effects of effective tax rates on economic growth, investment, capital accumulation, and social welfare. The second group examines the roles of the marginal effective tax rate (METR) and the average effective tax rate (AETR) in shaping investment, production, and financing decisions at the firm level. The third group attempts to measure the effectiveness of tax structures by producing macro-level AETR estimates and conducting cross-country comparisons.

In the early studies on ETR in the literature, the effects of ETR on macroeconomic growth, capital accumulation, and welfare were addressed while subsequent studies, however, have focused particularly on its impact on investment behaviors at the corporate level. Hall and Jorgensen (1967) examined the impact of tax regulations implemented in the 1950s and 1960s in the USA on investments; they revealed that tax deductions and credits played a role in encouraging investments. King and Fullerton (1984) later developed this approach and introduced the METR concept, which incorporates firms' financing preferences and their partners' tax liabilities. Devereux and Griffith (1999, 2003) built on these ideas and brought the AETR concept into the discussion, showing how AETR affects where companies decide to set up by looking closely at the average tax costs of a particular investment project. These studies indicate that tax incentives have a limited impact on firms with low profitability, while they are decisive for highly profitable firms.

The most widely used model for macro-level AETR calculations was developed by Mendoza, Razin, and Tesar (1994), who identified effective rates by equating the base components in relation with the tax revenues. This approach was extended by Carey and Rabesona (2004), who introduced variables like individual retirement plans and social security contributions in the model. This allowed for a more precise assessment of the tax burden on capital and labor.

The effective tax rates of numerous countries, mostly those in the European Union, have been examined in studies that are based on country comparisons. For instance, studies conducted by Petr Jansky (2019) and Delgado et al. (2019) have

shown that there are notable country-wise differences in the disparities between legal and effective rates. According to this analysis, the effective corporate tax rates in European Union countries range from 9% to 38%. Luxembourg has the largest difference between the statutory and effective tax rates, at 27% (29% statutory, 2% effective), while Germany has the smallest difference, at 10% (29% statutory, 19% effective). One most recent study, Pierre Bachas et al. (2022), examined the AETR on capital and labor over the period of 1965–2018 across 154 countries and reported that capital tax rates in wealthy countries have declined over time, while they have gone up in less developed countries. This trend has been ascribed to international tax competition and structural inequalities in financing development.

There is less literature available in Türkiye. In their estimation of the AETRs for capital, labor, and consumption, Birsen Nacar and Yakup Karabacak (2022) focused in particular on the high tax burden on labor. These studies also argue that AETR estimations in Türkiye should be made with methodological revisions because of the significant level of informality and the frequent changes in tax laws. In the context of Türkiye, this situation restricts the direct use of international methods and calls for the creation of more adaptable models. Table 1 lists other studies in the literature that estimate the AETR.

Table 1 Literature about AETR

Publication	Period	Average ETR	Method
AETR on Labor Income			
Mendoza, Razin, and Tesar (1994)	1970	USA (23%), France (34%), UK (28%), Japan (17%)	Own method
	1988	USA (29%), France (47%), UK (27%), Japan (27%)	
David Carey and Harry Tchilinguirian (2000)	1980–1985	OECD (30%), EU (33%)	Mendoza, Razin and Tesar (1994)
	1991–1997	OECD (33%), EU (37%)	
Carey and Rabesona (2004)	1975–1980	OECD (27%), EU (32%)	Mendoza, Razin and Tesar (1994)
	1980-1990	OECD (29,6%), EU (35,1%)	
	1990–2000	OECD (32,3%), EU (38%)	
Sung H. Park (2020)	1995-2015	Japan (30%), Korea (17,2%)	Mendoza, Razin and Tesar (1994).
	1995-2015	Japan (26%), Korea (13%)	Carey and Tchilinguirian (2000)
	1995-2015	Japan (26,5%), Korea (14,2%)	Carey and Rabesona (2004)
	1995-2015	Japan (26%), Korea (13%)	Adapted own method
Ilter Unlukaplan and Ibrahim Arısoy (2011)	1980-1990	Türkiye (24,5%)	Carey and Rabesona (2004)
	2000-2006	Türkiye (33,4%)	
Xiao Cheng and Yanping Pu (2017)	2007-2013	China (11%)	Spatial Durbin Model

Kevin X.D Huang, Qinglai Meng, and Jianpo Xue (2019)	2014	USA (28%), UK (24%), Japan (27%)	Mendoza, Razin, and Tesar (1994)
Basak T. Yucememis and Kazım O. Erol (2017)	1981–1990	Türkiye (14,7%)	Mendoza, Razin, and Tesar (1994); McDaniel (2007)
	1990–2000	Türkiye (16,9%)	
	2000–2010	Türkiye (26,4%)	
	2010–2014	Türkiye (34,4%)	
Ilias Kostarakos and Petros Varthalitis (2020)	1995–2001	Ireland (36%) EU (43%)	Mendoza, Razin, and Tesar (1994)
	2012–2017	Ireland (38%) EU (46%)	
Nacar and Karabacak (2022)	2006–2010	Türkiye (27,3%)	Mendoza, Razin, and Tesar (1994)
	2010–2015	Türkiye (30,7%)	
	2015–2019	Türkiye (29,4%)	
AETR on Consumption			
Mendoza, Razin, and Tesar (1994)	1970	USA (6%), Italy (13%), UK (15%), Japan (6%)	Own method
	1988	USA (5%), Italy (14%), UK (17%), Japan (5%)	
Carey and Tchilinguirian (2000)	1980–1985	OECD (16%), EU (17%)	Mendoza, Razin, and Tesar (1994)
	1991–1997	OECD (17%), EU (19%)	
Carey and Rabesona (2004)	1975–1980	OECD (14,6%), EU (15,9%)	Mendoza, Razin, and Tesar (1994)
	1980–1990	OECD (15,6%), EU (17,3%)	
	1990–2000	OECD (15,7%), EU (17,8%)	
Park (2020)	1995–2015	Japan (6,7%), Korea (12,3%)	Mendoza, Razin, and Tesar (1994)
	1995–2015	Japan (%6,8), Korea (12,1%)	Carey and Tchilinguirian (2000)
Unlukaplan and Arısoy (2011)	1980–1990	Türkiye (6,8%)	Carey and Rabesona (2004)
	2000–2006	Türkiye (20,3%)	
Cheng and Pu (2017)	2007–2013	China (11%)	Spatial Durbin Model
Kostarakos and Varthalitis (2020)	1995–2001	Ireland (22%), EU (17%)	Mendoza, Razin and Tesar (1994)
	2012–2017	Ireland (19%), EU (17%)	
Nacar and Karabacak (2022)	2006–2010	Türkiye (20%)	Mendoza, Razin and Tesar (1994)
	2010–2015	Türkiye (21,4%)	
	2015–2019	Türkiye (20,2%)	
AETR on Household Income (Gross)			
Mendoza, Razin, and Tesar (1994)	1970	USA (49%), France (17%), UK (56%), Japan (22%)	Own method
	1988	USA (41%), France (26%), UK (59%), Japan (56%)	

Carey and Tchilinguirian (2000)	1980–1985	OECD (25%), EU (24%)	Mendoza, Razin, and Tesar (1994)
	1991–1997	OECD (27%), EU (25%)	
Carey and Rabesona (2004)	1975–1980	OECD (39,9%), EU (42,4%)	Mendoza, Razin, and Tesar (1994)
	1980–1990	OECD (43,9%), EU (46%)	
	1990–2000	OECD (46,3%), EU (47,5%)	
Unlukaplan and Arısoy (2011)	1980–1990	Türkiye (13,9%)	Carey and Rabesona (2004)
	2000–2006	Türkiye (13,5%)	
Huang, Meng, and Xue (2019)	2014	USA (40%), UK (47%), Japan (43%)	Mendoza, Razin, and Tesar (1994)
Cheng and Pu (2017)	2007–2013	China (29%)	Spatial Durbin Model
Kostarakos and Varthalitis (2020)	1995–2001	Ireland (22%), EU (36%)	Mendoza, Razin, and Tesar (1994)
	2012–2017	Ireland (17%), EU (39%)	
AETR on Capital Income (Corporate)			
Mendoza, Razin, and Tesar (1994)	1970	USA (39%), France (24%), UK (46%), Japan (22%)	Own method
	1988	USA (32%), France (26%), UK (50%), Japan (55%)	
Carey and Tchilinguirian (2000)	1980–1985	OECD (52%), EU (45%)	Mendoza, Razin, and Tesar (1994)
	1991–1997	OECD (52%), EU (48%)	
Carey and Rabesona (2004)	1975–1980	OECD (24,4%), EU (24,6%)	Mendoza, Razin and Tesar (1994)
	1980–1990	OECD (26,6%), EU (27%)	
	1990–2000	OECD (28,1%), EU (28,7%)	
Unlukaplan and Arısoy (2011)	1980–1990	Türkiye (8%)	Carey and Rabesona (2004)
	2000–2006	Türkiye (15%)	
Park (2020)	1995–2015	Japan (17,6%), Korea (19,4%)	Mendoza, Razin, and Tesar (1994)
	1995–2015	Japan (21,2%), Korea (45,6%)	Carey and Tchilinguirian (2000)
	1995–2015	Japan (21,5%), Korea (22,4%)	Carey and Rabesona (2004)
	1995–2015	Japan (16,5%), Korea (15,8%)	Adapted own method
Yucememis and Erol (2017)	1981–1990	Türkiye (5,8%)	Mendoza, Razin, and Tesar (1994); McDaniel (2007)
	1990–2000	Türkiye (6,7%)	
	2000–2010	Türkiye (9,2%)	
	2010–2014	Türkiye (10%)	
Kostarakos and Varthalitis (2020)	1995–2001	Ireland (10,4%), EU (18%)	Mendoza, Razin, and Tesar (1994)
	2012–2017	Ireland (7,7%), EU (18%)	
European Commission (2020)	2008–2015	EU (21%)	Devereux and Griffith (1999, 2003)
	2015–2021	EU (19,9%)	

Bachas et al. (2022)	1960–1970	High-income countries (38%)	Mendoza, Razin, and Tesar (1994)
	2010–2020	High-income countries (32%)	
	1989	Developing countries (10%)	
	2018	Developing countries (18%)	
	1989	China (6%), India (5%), Brazil (7%)	Mendoza, Razin, and Tesar (1994)
	2018	China (24%), India (12%), Brazil (27%)	
Nacar and Karabacak (2022)	2006–2010	Türkiye (9,9%)	
	2010–2015	Türkiye (9,5%)	
	2015–2019	Türkiye (10%)	

When the studies in Table 1 are divided into four categories, it is clear that the AETR on household income and labor is high, but the AETR on consumption and capital is low. As a result, the lowest AETR is 14.6% for consumption, and the highest is 36.5% for household income. Given that the studies in Table 1 primarily cover high-income countries, the low effective tax rate on consumption suggests that these governments attach importance on the principle of fair taxation.

Some important conclusions can be drawn from the information in Table 1. One of these conclusions is that, over time, the AETR on capital has illustrated a declining trend in developed countries and an increasing trend in developing countries. In fact, this tendency is also supported by the findings of the study by Bachas et al. (2022), which estimated the AETRs on labor and capital and encompassed 154 countries. The study found that at the end of the 2010s, the AETR in countries with high incomes had dropped to 32%–33% from about 38%–39% in the late 1960s. On the other hand, the AETR in developing countries increased from about 10% in 1989 to 18% in 2018. The divergence of these patterns is thought to be caused by a number of variables. The trend of globalization and the resulting rise in international tax competitiveness are two of the primary reasons for a decline in effective capital tax rates in developed countries. In contrast, it might be considered that the increase observed in developing countries is mostly attributable to the need to raise public revenues to fund development and initiatives to lessen disparities in income distribution.

In reality, multinational corporations have shifted their investments to developing countries in an effort to produce at lower costs as a result of the trend toward globalization. Developed countries have changed their policies to lower the tax burden on capital to maintain their competitiveness and enhance the investment climate (see Peter H.Egger, Nigai Serger and Nora M. Strecker 2019). On the other hand, developing countries that have had trouble to finance their growth have steadily required more tax income to sustain their development and pay for increasing government expenditures (see Oya Ekici 2022). The following is retrieved when making a comparison by years and region:

- In Türkiye, the AETR on labor has gone up over time (from 14.7% to 34.4%). Türkiye's post-2010 rates are higher than the average for the OECD and EU, although these groups are experiencing an upward trend.

- Türkiye's consumption AETR increased dramatically (from 6.8% to 20.3%). In the post-2000 period, this rate has outpaced that of the OECD, EU, USA, and East Asian countries.
- Comparing Türkiye to developed countries like the OECD, EU, and USA, the average effective tax rate on capital and household income is relatively low.

A general analysis of Table 1 shows that, over time, Türkiye's labor and consumption tax burden has surpassed the OECD and EU averages, but the country's capital and household income tax burden has stayed low. This circumstance shows that Türkiye has a tax regime that levies greater indirect taxes and labor taxes while reducing capital and household income taxes.

3. Data and Methodology

The AETR calculation models used in this study are mostly based on techniques developed by Carey and Rabesona (2004) and Mendoza, Razin and Tesar (1994), which are widely used within the context of the OECD countries. However, the transfer of such models mutatis mutandis entails a number of challenges, including the high rate of the informal economy in Türkiye, the declaration system's inadequacies, frequent regulatory changes, and methodological variations among data sources. The following modifications have been made to the study in light of these limitations:

- Comparative analysis has been employed to analyze the differences between the national income components of the Turkish Statistical Institute and the OECD Revenue Statistics; in particular, grossing processes have been used to lessen the influence of undeclared income.
- Because tax revenues are mostly dependent on cash and GDP components rely heavily on accruals, the data has been handled in three-year average periods to prevent inconsistency, and the impact of fluctuations in the seasons has been restricted.
- The impact of Türkiye-specific tax exemptions and allowances on the AETR has been analyzed not only at the computation level, but also by sector and income category.

In this context, the primary objective of the study is to demonstrate the structural distribution of the relative tax burdens on various income components in Türkiye rather than to calculate the overall AETR levels. This approach aligns with a commonly used methodological framework in empirical assessments, which frequently work with the data constraints observed in developing countries (Petr Jansky and Miroslav Palansky 2019; IMF, 2021).

The study's analysis period spans the years 1998–2023. Four distinct AETRs—related to capital income, wages, consumption, and personal income—have been computed in this context. The four-digit tax revenue figures used for the analysis are displayed in Table 2 and were retrieved from the OECD database (OECD 2020).

Table 2 OECD Revenue Statistics

Code	Names of Variables
1100	Taxes collected on individuals' income, earnings, and capital gains
1200	Taxes on businesses' incomes, profits, and capital gains
2000	This code denotes the total social security contributions made by the persons and institutions indicated below. 2100 premiums paid by employees 2200 premiums paid by employers 2300 premiums paid by the self-employed individuals 2400 other premiums not listed above.
3000	Taxes collected from salaried employees
4000	Taxes collected on wealth
4100	Multiple taxes collected on real estates
4400	Taxes collected on financial transactions
5110	Taxes collected on consumption (5111 value-added tax)
5120	This code represents the total of the specifically imposed consumption taxes as shown below. 5121 special consumption tax 5122 revenues that the government collected from financial monopolies 5123 customs duties 5125 taxes collected on capital goods 5126 taxes levied on specific taxes 5128 other forms of consumption taxes
5200	Taxes levied on the use of wealth (5212 motor vehicle tax payable by the entities)
6100	Other taxes payable by the businesses only

Table 3 shows macroeconomic statistics about the components of national income and the government budget.

Table 3 Statistics on National Income Components and Government Budget

Code	Names of Variables
CP	Special final consumption expenditures
CG	Final public consumption expenditures
CGW	Governments wage payments
OS	Aggregate net operating surplus
OSPUE	Net earnings of the unincorporated entities
PEI	Interest, dividends and investment incomes
W	Wages of the employees serving for any employer or employer-dependent employees
WSSS	Gross wage earnings

Table 3 shows data analysis on national income components taken from the Turkish Statistical Institute database (TUIK 2020). The data for the government budget, on the other hand, was sourced from Republic of Turkiye Ministry of Treasury and Finance's data distribution system. Table 4 shows Carey and Rabesona's (2004) models to estimate average tax rates on labor, income, consumption, and capital.

Table 4 Calculation of AETR (Model with Reduced Social Security Contributions)

Expected Value of Average Personal Income	$\mathbf{T_h} = \dfrac{\mathbf{1100}}{\mathbf{OSPUE + PEI + W - 2100 - 2300 - 2400}}$
Expected Value of Wages	$\mathbf{T}_1 = \dfrac{Th* W + 2100 + 2200 + \alpha* 2400+3000}{WSSS+3000}$
Expected Value of Average Consumption	$T_c = \dfrac{5110 + 5121 + 5122 + 5123 + 5126 + 5128+ 5200-5212}{CP + CG - CGW}$
Expected Value of Average Capital Income	$\mathbf{T}_k = \dfrac{Th * (OSPUE + PEI) + 2300 + \beta * 2400 + 1200 + 4000}{5125 + 5212 + 6100}$ / $OS - 3000$

Source: Carey and Rabesona 2004 p. 216.

Notes: α: $\left(\frac{W}{OSPUE+PEI+W}\right)$; represents the share of wage income within personal income while β: $(1-\alpha)$; represents the share of capital income within personal income.

Table 4 shows the models developed by Carey and Rabesona (2004) to cover the deficiencies in the Mendoza, Razin, and Tesar (1994) model for estimating the AETR. The income data included in the model and retrieved from the OECD database were generated using a series of restricted assumptions to assure cross-country harmonization. Another issue is that personal income tax statistics does not differentiate between taxes collected on wages and capital gains. To address this issue, Mendoza, Razin, and Tesar (1994) assumed that wages and capital gains would have the same effective tax rate. However, Bjørn Volkerink and Jakob de Haan (2001) suggested in their study on the inappropriate use of tax rates that this assumption is inaccurate for many countries in the OECD. It is undisputed that various countries apply income taxes differently. Some tax both capital and wage income simultaneously, while others let dividends and other capital income to be deducted from the tax base to avoid double taxation. Carey and Rabesona (2004) summarised some issues with tax revenue and national income estimates in Mendoza, Razin, and Tesar (1994) model as follows:

- It can occasionally be deceptive to compare tax revenue numbers with national income accounts.
- The net operating surplus (OS) was estimated using fixed capital consumption data. However, the method employed for assessing fixed capital consumption statistics may not produce reliable findings in all countries.
- Calculations for national accounts and tax revenues may fluctuate among countries. In some countries, profit shares are included in tax collections, but not in national accounts due to their lack of added value.
- Another challenge is the incorporation of data into statistics using various methodologies depending on cash and accrual basis. Indeed, national income data are compiled on an accrual basis, whereas tax revenue figures are calculated on a cash basis.

Furthermore, several structural limitations could impede the direct application of ETR calculation methods that are frequently used in the international literature in Türkiye. The models developed by Mendoza, Razin, and Tesar (1994) and Carey and Rabesona (2004) in particular have some technical and practical hurdles due to Türkiye's high rate of informal sector, inconsistent income declarations, and frequent changes in regulations. Similarly, because the advanced micro business data used in the Devereux and Griffith (2003) model cannot be brought together in Türkiye in a systematic manner, the breadth of micro-level analysis is constrained. Actually, due to such constraints, customized models have typically been favored in Türkiye's limited number of empirical investigations (for example, Nacar and Karabacak 2022). It emphasizes the necessity of performing ETR assessments in developing countries using international methods while also adapting them effectively to account for country-specific institutional and data-based limitations.

Therefore, in estimating the AETR for Türkiye below, the models developed by Carey and Rabesona (2004) have been used to handle such issues. However, since some of the data included in the models do not comply with the tax regulations in Türkiye, corrections were made to the existing models, and explanations were provided in the relevant section.

4. AETR Estimations for Türkiye

4.1 AETR for Personal Income

Mendoza, Razin, and Tesar (1994) assume that social security contributions will not be deducted from the tax base when calculating the AETR levied on personal income. While this type of practice is correct for the USA, Turkish tax laws allow for the deduction of social security premiums from the taxable income when determining net income. Therefore, in the left column of Table 5, social security premiums have also been included in the model created by Mendoza, Razin, and Tesar (1994).

Table 5 Differences in the Calculation of Personal Income

Mendoza, Razin, and Tesar (1994)	**Carey and Rabesona (2004)**
$\boldsymbol{Th} = \dfrac{\mathbf{1100}}{\mathbf{OSPUE + PEI + W}}$	$Th = \dfrac{1100}{OSPUE + PEI + W - 2100 - 2300 - 2400}$

The model revised by Carey and Rabesona (2004), where social security contributions can be deducted from the taxable income, is seen in the right column. If we pay attention to the equation, it can be seen that the contributions paid by employees (2100), employers (2200), and self-employed individuals (2300) are deducted from the gross income to reach the net income. Table 6 shows the AETR on personal income in Türkiye for the period of 1998-–2023, taking these changes into account.

Table 6 Estimations for AETR on Personal Income in Türkiye

	1998–2004	**2005–2010**	**2011–2016**	**2017–2022**	**2023**
AETR	13,1%	11,2%	10,6%	8,9%	6,5%
Difference	-	-14,5%	-5,4%	-16%	-27%
Legal Tax Rate	15%-40%	15%-40%	15%-40%	15%-40%	15%-40%

According to the projection figures, the average personal income effective tax rate was 6.5% as of 2023. The legal tax rates for personal income in Türkiye, however, varied from 15% to 35% over the relevant period. Since 2020, the maximum rate has been raised to 40%. This circumstance demonstrates that, in comparison to the legal rates, the effective tax burden is still quite modest. One may argue that the 642 exemptions, deductions, and tax holiday rules found in Income Tax Law No. 193 have a major influence on the development of this discrepancy (SBB, 2024)[2]. Indeed, the tax expenditure report issued by the Turkish Revenue Administration estimates a total of 1,476.7 billion TL in tax expenditures in 2023 across income, corporate, value-

[2] For further details, visit **SBB.** 2024. 2023 Yılı Vergi Harcamaları Listesi, Strateji Bütçe Başkanlığı Ankara. https://www.sbb.gov.tr/wp-content/uploads/2023/01/4-2023-Yili-Vergi-Harcamalari-Listesi_2023Butcesi.pdf, (accessed February 10, 2024).

added, special consumption, bank and insurance transaction, motor vehicle, and special communication taxes. When compared with the GDP of the same year, this figure rises to an astounding 5.79%, thus highlighting the impact of tax expenditures on state finances (GİB 2023 p. 2).

4.2. Calculation of AETR for Wage Income

Mendoza, Razin, and Tesar (1994), when calculating the AETR on labor, take into account the taxes on wage income and social security contributions. Carey and Rabesona (2004 p. 219) developed this method by including social security contributions paid by both employees and employers in the formula. The basic assumption is that the premiums paid by the employer also benefit the employee. Because of these premiums, employees benefit from social rights such as health and retirement. Therefore, these premiums are considered part of the wage income. On the other hand, since the employee's gross earnings (WSSS) already include social security premium deductions (for example, 3000), both the employee and employer shares need to be separately considered and added to the total income. Details on how this method is applied can be seen in the right column of Table 7.

Table 7 Differences in the Calculation of the AUTR for Wage Income

Mendoza, Razin, and Tesar (1994)	**Carey and Rabesona (2004)**
$T_1 = \frac{T_h * W + 2000 + 3000}{W + 2200}$	$T_1 = \frac{T_h * W + 2100 + 2200 + \alpha * 2400 + 3000}{WSSS + 3000}$

In addition, Carey and Rabesona (2004) contend that capital income, not wage income, should include the social security contributions made by self-employed people (those classified as category 4B in Türkiye). To incorporate the social security premiums for employees (2100), employers (2200), and others (2400) into the model, the authors deleted the data (2000) used by Mendoza, Razin and Tesar (1994), which reflected the overall social security premium burden. However, to differentiate exclusively the wage-related component, this amount has been adjusted by multiplying it by the α coefficient, which reflects the percentage of wages in personal income, i.e., W / (OSPUE + PEI + W), because the 'other contributions' (2400) item also contains capital-related contributions. Considering these changes, the AETR on wage income estimated for the period of 1998–2023 in Türkiye can be seen in Table 8.

Table 8 Estimations of AETR on Wage Income in Türkiye

	1998–2004	**2005–2010**	**2011–2016**	**2017–2022**	**2023**
AETR	26,1%	27,3%	31,3%	29,5%	25,4%
Difference	-	4,6%	14,7%	-5,8%	-13,9%
Legal Tax Rate	15%–40%	15%–40%	15%–40%	15%–40%	15%–40%

The estimated results reveal that the AETR on wage income is at a level of 25.4% as of 2023. The information in Table 8 indicates that there was a notable growth in AETR, particularly in 2011, when it increased by 14.7% over the year before. The primary cause of this rise stems from the tax and social security premium incentives offered to companies following the 2008 global financial crisis, which expired in December 2010.

It is noted that the average AETR on wage incomes is at a high level of 28.3% when analyzed for the years 1998–2023. The withholding tax on wage earnings is the primary cause of this particular issue. Compared to taxpayers who are subject to the declaration method, employees who are taxed using the withholding method have fewer chances for deductions. This circumstance raises the tax burden on wage employees, particularly because of the inadequate deductions made in the income tax base. In fact, withholding at the source accounted for 92% of income tax collections in 2023, according to data from Republic of Turkiye Ministry of Treasury and Finance[3], while the disclosure method only accounted for 5.8%.

The results obtained show that the withholding tax approach significantly reduces the rate of tax evasion and offers high efficiency in tax collection. On the other hand, it is noted that the stated tax bases are regularly changed during audits, and that fiscal compliance is poor among income categories covered by the declaration method. This is further supported by the results of the audits carried out by the Ministry of Treasury and Finance in 2023[4]. Accordingly, the tax base disparity found in the 2023 taxpayer statements was estimated to be 43.4 billion TL, and its proportion to income tax revenue was 6.3%. The progressive shift to withholding tax for income components of tax policy is also brought to light by this setting, which accentuates the significance of efficient audit procedures for tax administration. Increasing the use of withholding tax procedures rather than the declaration method will promote voluntary tax compliance and improve revenue collection predictability, particularly in industries where informality is pervasive.

4.2 Calculation of AETR for Consumption

In the top row of Table 9 is the AETR estimate model for consumption that Mendoza, Razin, and Tesar (1994) brought up.

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[3] For further details, please see **Republic of Turkiye Ministry of Treasury and Finance.** 2025. Genel Yönetim Bütçe İstatistikleri, Muhasebat Genel Müdürlüğü, Ankara, https://muhasebat.hmb.gov.tr/genel-yonetim-butce-istatistikleri, (accessed April 6, 2024).

[4] For further details, please see **Republic of Turkiye Ministry of Treasury and Finance.** 2024. 2023 Yılı Faaliyet Raporu. Ankara, 2024. https://ms.hmb.gov.tr/uploads/sites/17/2024/03/VDK-2023-Yili-Faaliyet-Raporu.pdf, (accessed April 6, 2024).

Table 9 Differences in Calculating the AETR for Consumption

Mendoza, Razin, and Tesar (1994)
$$T_C = \frac{5110 + 5121}{CP + CG - CGW - 5110 - 5121}$$
Carey and Rabesona (2004)
$$T_C = \frac{5110 + 5121 + 5122 + 5123 + 5126 + 5128 + 5200 - 5212}{CP + CG - CGW - (5110 + 5121 + 5122 + 5123 + 5126 + 5128 + 5200 - 5212)}$$

The Carey and Rabesona (2004) method is shown in the bottom line of Table 9. In addition to VAT and SCT, this method includes other indirect taxes (such as 5122, 5123, 5126, 5128, 5200, and 5212) to quantify the tax burden on consumption more thoroughly. In this regard, the approach in issue is more suited to Türkiye's consumption tax system.

Nonetheless, several modifications were needed to apply the Carey and Rabesona (2004) model to Türkiye. First, the model has been cleared of several components that are not specific to Türkiye or that, because of inconsistent data, do not yield accurate outcomes (such as items coded 6100 and 5122). Second, the indirect taxes that are part of the calculation (the amounts in the numerator) have been deducted from the denominator because they are also part of consumer expenditures. In many countries, including Türkiye, where indirect taxes are incorporated in consumer prices, this adjustment guarantees a more precise estimation of the actual consumption base. Table 10 displays the predicted AETRs on consumption for the 1998–2023 period after accounting for these methodological modifications.

Table 10 AETR Estimations for Consumption in Türkiye

	1998–2004	**2005–2010**	**2011–2016**	**2017–2022**	**2023**
AETR	23,5%	25,9%	26,8%	24,2%	26,3%
Difference	-	10,2%	3,5%	-9,7%	8,6%
Legal Tax Rate	1%–220%	1%–220%	1%–220%	1%–220%	1%–220%

The AETR on consumption in Türkiye has risen dramatically over time, according to the data in Table 10. In 2023, the rate increased to 26.3% from 23.5% in 1998–2004. The new tax laws put into place since 2002 have a direct correlation with the upward trend in AETR. In this regard, it can be claimed that the comparatively high AETR on consumption has three main reasons.

First and foremost, Türkiye has a structural savings shortfall, which is being filled by imposing high consumer taxes. Second, indirect taxes are more politically appealing since they are concealed inside pricing, which reduces societal resentment. Thirdly, the tax burden on consumption has grown dramatically since the Special Consumption Tax Law No. 4760 went into force in 2002.

4.4 AETR Calculation for Capital Income

In the model developed by Mendoza, Razin, and Tesar (1994), while the AETR on capital income is calculated, the AETR calculated on personal income tax is associated with non-corporate business income (OSPUE) and investment income (PEI). The Carey and Rabesona model expanded this framework and included taxes on wealth, motor vehicles, and investment goods in the calculations. Both calculation methods are shown in Table 11.

Table 11 Differences in the Calculation of AETR for Capital Income

Mendoza, Razin, and Tesar (1994)
$$T_k = \frac{T_h * (\text{OSPUE} + \text{PEI}) + 1200 + 4100 + 4400}{\text{OS}}$$
Carey and Rabesona (2004)
$$T_k = \frac{[T_h * (\text{OSPUE} + \text{PEI} - 2300 - \beta * 2400) + 2300 + \beta * 2400 + 1200 + 4000 + 5125 + 5212 + 6100]}{\text{OS} - 3000}$$

Due to some limitations encountered in the implementation specific to Türkiye, country-specific adaptations were made in the model developed by Carey and Rabesona (2004). Especially, to separate only the portion of social security premiums related to capital income, the relevant coefficients were used; taxes on wage income were excluded from the capital tax base. Additionally, some tax items that are not directly applicable to Türkiye (for example, 6100) have been excluded from the model. The calculations made in accordance with this methodological framework are presented in Table 12.

Table 12 AETR Estimations on Capital Income in Türkiye (1998–2023)

	1998–2004	**2005–2010**	**2011–2016**	**2017–2022**	**2023**
AETR	11,9%	11,5%	11,8%	12,0%	13,3%
Difference	-	-3,4%	2,6%	1,7%	10,8%
Legal Tax Rate	25%–30%	25%–30%	25%–30%	25%–30%	25%–30%

It is projected that the average effective tax burden on capital income is to be 13.3% in 2023. The strategic contribution of capital in economic growth is the primary cause of this exceptionally low rate. Investments are largely funded by outsourcing in

countries like Türkiye where the accumulation of capital is constrained. Due to this particular case, the economy becomes more reliant on external financing, which has detrimental effects including high unemployment rates and capital flight. As a result, the capital tax burden is maintained at a level that won't have an adverse effect on the investment climate. Additionally, this condition is in line with global trends[5]. As a result of globalization, capital has become more mobile and is taxed at lower rates in various countries; hence, the objective is to attract and retain capital. Türkiye's low AETR policy might be examined in light of this global trend.

5. A Total Assessment of the Estimates on Effective Tax Rates

The estimation results attained in the study reveal that the AETR on personal income and capital income in Türkiye is comparatively low; however, the AETR on wage income and consumption is high. This structural distribution demonstrates the tax system's noncompliance with the principle of equity, as well as a policy approach influenced by efficiency concerns.

The disproportionate tax burden on consumption can be largely explained by the desire to compensate for Türkiye's low savings rate. To preserve economic stability, mainstream economic theory suggests striking a balance between investment and savings. However, Türkiye's insufficient domestic savings force investments to be financed mostly by external sources, exacerbating balance-of-payment deficits and reliance on foreign resources. According to data from the Directorate of Strategy and Budget (2023), the private sector savings deficit will be 4.4%, the public sector budget deficit will be 5.1%, and the foreign trade deficit will be 2.5%. These findings suggest that total internal and external deficits have reached around 12% of GDP, making a shift to indirect taxation a budgetary necessity.

The stringent control of tax collection through the withholding method and limitations on deduction options in comparison to the declaration system are the primary contributors to the high AETR on wage income. Labor income is a reliable source of tax revenue since it is particularly prevalent among groups that are unlikely to evade taxes. It has been noted, therefore, that this security appears at the price of an unjust tax burden allocation.

On the other hand, policy preferences meant to maintain world-wide movable capital at competitive rates are contributing factors of the low AETR on capital income. Devereux and Griffith's (2003) emphasis on location-wise decision-making and tax competition is also consistent with this option. Because the tax burden is concentrated on labor and consumption, low tax rates intended to attract capital have the potential to raise direct foreign investment inflows, but they also have the opposite effect on income distribution. In contrast, growth theories attribute important roles to capital accumulation on the way to progress. Both domestic and foreign investors consider net return on capital and effective tax rates when making investment decisions and therefore they prefer regions with lower taxation. Hence, even though increasing

[5] Please see **Unlukaplan and Arısoy** 2011¸ **Yucememis and Erol** 2017; **Kostarakos, and Varthalitis** 2020 for low AETR rates on capital

capital taxes could be regarded as fair policy tool in terms of income distribution, it actually goes against the objectives of economic efficiency. Thus, the concepts of efficiency and justice must be balanced in tax policy. But in Türkiye's tax system, this balance results in a system that prioritizes capital over labor and consumption.

Table 13 Conclusions about AETR for Türkiye

	Effective Tax Ratio for Total Household Income	**Effective Tax Ratio on Labor Income**	**Effective Tax Ratio on Consumption**	**Effective Tax Ratio on Capital Income**
1998	14,2%	22,4%	17,1%	9,8%
1999	13,6%	24,4%	17,8%	11,8%
2000	14,0%	25,8%	22,5%	12,1%
2001	15,1%	31,5%	24,0%	13,4%
2002	12,0%	25,3%	27,5%	11,9%
2003	11,9%	26,5%	29,9%	12,9%
2004	10,7%	26,4%	26,0%	11,3%
2005	10,7%	25,5%	27,1%	11,3%
2006	11,7%	26,3%	27,4%	11,2%
2007	11,9%	26,5%	25,5%	10,9%
2008	11,5%	27,9%	24,4%	11,9%
2009	10,8%	28,2%	23,8%	11,8%
2010	10,3%	29,2%	27,0%	11,7%
2011	11,0%	32,6%	27,4%	12,5%
2012	10,8%	31,0%	26,1%	11,9%
2013	10,8%	32,2%	27,7%	11,1%
2014	10,6%	31,0%	25,8%	11,5%
2015	10,7%	31,6%	27,0%	11,5%
2016	9,9%	29,3%	26,6%	12,4%
2017	10,1%	30,6%	26,2%	11,6%
2018	10,1%	30,3%	24,1%	12,6%
2019	9,8%	29,8%	21,5%	12,1%
2020	8,4%	29,7%	25,5%	12,0%
2021	8,5%	30,1%	25,0%	11,8%
2022	6,7%	26,2%	23,2%	12,0%
2023	6,5%	25,4%	26,3%	13,3%

Regarding the average effective tax rates applicable to four fundamental income components of Türkiye, the projected figures shown in Table 13 provide a clear picture. In contrast, the AETR on wage income is 25.4% and the AETR on consumption is 26.3% as of 2023. The AETR on personal income is 6.5%, while the AETR on capital income is 13.3%.

The above results suggest that while capital and other personal incomes are taxed at lower rates in Türkiye, the tax burden has moved towards labor and consumption. This conclusion necessitates a re-evaluation of political and economic priorities together with a reconsideration of current tax methods.

The efficiency and equality principles of the Turkish tax system are under a great deal of pressure in this case. The proliferation of tax incentives intended to increase efficiency, especially through exemptions and incentives made available to capital owners, is causing wage earners and consumers to pay more in taxes. Furthermore, such pressure implies that the tax code is deviating from the vertical and horizontal equity tenets.

Low-income groups suffer a disproportionately greater tax burden as a result of the high AETR on consumption, particularly because of the weighted pattern of indirect taxes. Indirect taxes exacerbate these inequities, according to classic research like Atkinson and Stiglitz (1976). According to some studies, by promoting savings, taxes like these may help with long-term capital accumulation (Busra Ozden, Hale Balseven and Fulya Celebi 2023). However, it is noted that this potential advantage has limits in the case of Türkiye due to the impacts that contribute to inequality.

6. Conclusion

In this study, the distribution of the tax burden across several income components is estimated followed by a calculation of the AETR for personal income, wages, consumption, and capital income in Türkiye for the years spanning between 1998 and 2023. The results show that while the tax burden on personal (non-wage) income, particularly capital income, is relatively low, the tax burden on wages and consumption is substantial. According to efficiency and equitable principles, this structure shows a recurring mismatch in the Turkish tax system.

Such findings correspond with a tax structure that is regularly observed in the literature, especially in developing countries. In the context of increasing global capital mobility, countries' participation in tax competition is associated with a low EATR on capital. According to Devereux and Griffith (2003), many countries intentionally cut their tax rates to attract capital, and businesses take low effective tax rates into account when deciding for a location. Tax laws designed to promote capital accumulation and draw in foreign direct investment are responsible for low AETR imposed on capital in Türkiye. In the pretext of Türkiye, this tendency can be regarded as an empirical representation of the Devereux and Griffith (1999) model, which indicates that the AETR on capital regularly decreases over time. Similarly, the high wage AETR estimations in this study is consistent with AETR predictions by Carey and Rabesona (2004) and Mendoza, Razin, and Tesar (1994) for several countries. However, the fact that Türkiye's rates are much higher than the country averages in the studies suggests

that the tax burden is disproportionately placed on workers, leading to a system that contradicts taxation justice. This contradicts both the separation theory and the ability-to-pay concept, resulting in an obvious disparity across income components.

High AETR on consumption has a negative impact on low-income populations in particular. Türkiye's heavy reliance on indirect taxes, combined with efforts to close the savings gap, is pushing the tax system towards a more regressive structure. However, the literature, particularly in developed countries (e.g., Delgado et al. 2019; Jansky, 2019), shows that the AETR on household income is high, while the AETR on consumption is relatively low. The AETR comparisons presented in Table 1 also clearly highlight this disparity and demonstrate that Türkiye is moving away from the principle of fairness. In this context, the results of the study reveal that Turkish taxation system functions in a way that extends beyond its technical framework, resulting in an unambiguous distinction between income levels. Addressing this imbalance is critical not only for a more egalitarian taxation system, but also for greater prosperity.

Developing some policy recommendations to restructure the taxation system in line with the efficiency and fairness principles is necessary with regard to such structural challenges. These may include the following:

- The tax base is expanded by means of narrowing the scope of exemptions and exemptions for capital income.
- Increasing rates of luxury consumption while decreasing the indirect tax burden on necessary consumer goods.
- Expanding the mechanisms for discounts and exemptions to reduce the tax burden on wage income.
- Strengthening the statement system for the income categories excluding the withholding tax together with an increase in the audit capacity.

As a result, the present Turkish tax system is supported by efficiency-oriented policies aimed at maintaining capital and converting labor and consumption into sources of funding. This framework disrupts not only budgetary stability, but also social justice. Establishing an effective and fair tax system necessitates not only technical regulations, but also a thorough tax reform process guided by normative priorities.

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