# **United States**

This chapter includes data on the income taxes paid by workers, their social security contributions, the family benefits they receive in the form of cash transfers as well as the social security contributions and payroll taxes paid by their employers. Results reported include the marginal and average tax burden for eight different family types.

Methodological information is available for personal income tax systems, compulsory social security contributions to schemes operated within the government sector, universal cash transfers as well as recent changes in the tax/benefit system. The methodology also includes the parameter values and tax equations underlying the data.

United States 2020 The tax/benefit position of single persons

|     | Wage level (per cent of average wage)                              |         | 67     | 100    | 167     | 67      |
|-----|--|---------|--------|--------|---------|---------|
|     | Number of cl   | nildren | none   | none   | none    | 2       |
| 1.  | Gross wage earnings  |         | 40 348 | 60 220 | 100 568 | 40 348  |
| 2.  | Standard tax allowances  |         |        |        |         |         |
|     | Basic allowance  |         | 12 400 | 12 400 | 12 400  | 18 650  |
|     | Married or head of family  |         |        |        |         |         |
|     | Dependent children   |         | 0      | 0      | 0       | 0       |
|     | Deduction for social security contributions and income taxes       |         |        |        |         |         |
|     | Work-related expenses  |         |        |        |         |         |
|     | Other  |         |        |        |         |         |
|     |  | Total   | 12 400 | 12 400 | 12 400  | 18 650  |
| 3.  | Tax credits or cash transfers included in taxable income           |         | 0      | 0      | 0       | 0       |
| 4.  | Central government taxable income (1 - 2 + 3)                      |         | 27 948 | 47 820 | 88 168  | 21 698  |
| 5.  | Central government income tax liability (exclusive of tax credits) |         | 3 156  | 6 310  | 15 240  | 2 322   |
| 6.  | Tax credits  |         |        |        |         |         |
|     | Basic credit   |         | 0      | 0      | 0       | 1 494   |
|     | Married or head of family  |         |        |        |         |         |
|     | Children   |         | 0      | 0      | 0       | 4 000   |
|     | Other  |         |        |        |         |         |
|     |  | Total   | 0      | 0      | 0       | 5 494   |
| 7.  | Central government income tax finally paid (5-6)                   |         | 3 156  | 6 310  | 15 240  | - 3 172 |
| 8.  | State and local taxes  |         | 2 467  | 3 788  | 6 472   | 1 945   |
| 9.  | Employees' compulsory social security contributions                |         |        |        |         |         |
|     | Gross earnings   |         | 3 087  | 4 607  | 7 693   | 3 087   |
|     | Taxable income   |         |        |        |         |         |
|     |  | Total   | 3 087  | 4 607  | 7 693   | 3 087   |
| 10. | Total payments to general government (7 + 8 + 9)                   |         | 8 710  | 14 706 | 29 405  | 1 859   |
| 11. | Cash transfers from general government                             |         |        |        |         |         |
|     | For head of family   |         |        |        |         |         |
|     | For two children   |         | 1 200  | 1 200  | 0       | 2 200   |
|     |  | Total   | 1 200  | 1 200  | 0       | 2 200   |
| 12. | Take-home pay (1-10+11)  |         | 32 838 | 46 715 | 71 163  | 40 688  |
| 13. | Employer's compulsory social security contributions                |         | 3 404  | 4 924  | 8 011   | 3 404   |
| 14. | Average rates  |         |        |        |         |         |
|     | Income tax   |         | 13.9%  | 16.8%  | 21.6%   | -3.0%   |
|     | Employees' social security contributions                           |         | 7.7%   | 7.7%   | 7.7%    | 7.7%    |
|     | Total payments less cash transfers                                 |         | 18.6%  | 22.4%  | 29.2%   | -0.8%   |
|     | Total tax wedge including employer's social security contributions |         | 24.9%  | 28.3%  | 34.5%   | 7.0%    |
| 15. | Marginal rates   |         |        |        |         |         |
|     | Total payments less cash transfers: Principal earner               |         | 26.3%  | 36.3%  | 38.3%   | 48.6%   |
|     | Total payments less cash transfers: Spouse                         |         | n.a.   | n.a.   | n.a.    | n.a.    |
|     | Total tax wedge: Principal earner                                  |         | 31.5%  | 40.8%  | 42.7%   | 52.3%   |
|     | Total tax wedge: Spouse  |         | n.a.   | n.a.   | n.a.    | n.a.    |

United States 2020 The tax/benefit position of married couples

|     | Wage level (per cent of average wage)                              |         | 100-0  | 100-67  | 100-100 | 100-67  |
|-----|--|---------|--------|---------|---------|---------|
|     | Number of cl   | nildren | 2      | 2       | 2       | none    |
| 1.  | Gross wage earnings  |         | 60 220 | 100 568 | 120 441 | 100 568 |
| 2.  | Standard tax allowances  |         |        |         |         |         |
|     | Basic allowance  |         | 24 800 | 24 800  | 24 800  | 24 800  |
|     | Married or head of family  |         |        |         |         |         |
|     | Dependent children   |         | 0      | 0       | 0       | 0       |
|     | Deduction for social security contributions and income taxes       |         |        |         |         |         |
|     | Work-related expenses  |         |        |         |         |         |
|     | Other  |         |        |         |         |         |
|     |  | Total   | 24 800 | 24 800  | 24 800  | 24 800  |
| 3.  | Tax credits or cash transfers included in taxable income           |         | 0      | 0       | 0       | 0       |
| 4.  | Central government taxable income (1 - 2 + 3)                      |         | 35 420 | 75 768  | 95 641  | 75 768  |
| 5.  | Central government income tax liability (exclusive of tax credits) |         | 3 855  | 8 697   | 12 621  | 8 697   |
| 6.  | Tax credits  |         |        |         |         |         |
|     | Basic credit   |         | 0      | 0       | 0       | 0       |
|     | Married or head of family  |         |        |         |         |         |
|     | Children   |         | 4 000  | 4 000   | 4 000   | 0       |
|     | Other  |         |        |         |         |         |
|     |  | Total   | 4 000  | 4 000   | 4 000   | 0       |
| 7.  | Central government income tax finally paid (5-6)                   |         | - 145  | 4 697   | 8 621   | 8 697   |
| 8.  | State and local taxes  |         | 3 140  | 5 823   | 7 144   | 6 255   |
| 9.  | Employees' compulsory social security contributions                |         |        |         |         |         |
|     | Gross earnings   |         | 4 607  | 7 693   | 9 214   | 7 693   |
|     | Taxable income   |         |        |         |         |         |
|     |  | Total   | 4 607  | 7 693   | 9 214   | 7 693   |
| 10. | Total payments to general government (7 + 8 + 9)                   |         | 7 602  | 18 213  | 24 979  | 22 646  |
| 11. | Cash transfers from general government                             |         |        |         |         |         |
|     | For head of family   |         |        |         |         |         |
|     | For two children   |         | 3 400  | 3 400   | 3 400   | 2 400   |
|     |  | Total   | 3 400  | 3 400   | 3 400   | 2 400   |
|     | Take-home pay (1-10+11)  |         | 56 019 | 85 755  | 98 862  | 80 322  |
|     | Employer's compulsory social security contributions                |         | 4 924  | 8 328   | 9 849   | 8 328   |
| 14. | Average rates  |         |        |         |         |         |
|     | Income tax   |         | 5.0%   | 10.5%   | 13.1%   | 14.9%   |
|     | Employees' social security contributions                           |         | 7.7%   | 7.7%    | 7.7%    | 7.7%    |
|     | Total payments less cash transfers                                 |         | 7.0%   | 14.7%   | 17.9%   | 20.1%   |
|     | Total tax wedge including employer's social security contributions |         | 14.0%  | 21.3%   | 24.1%   | 26.2%   |
| 15. | Marginal rates   |         |        |         |         |         |
|     | Total payments less cash transfers: Principal earner               |         | 26.3%  | 26.3%   | 36.3%   | 26.3%   |
|     | Total payments less cash transfers: Spouse                         |         | 26.3%  | 26.3%   | 36.3%   | 26.3%   |
|     | Total tax wedge: Principal earner                                  |         | 31.5%  | 31.5%   | 40.8%   | 31.5%   |
|     | Total tax wedge: Spouse  |         | 32.0%  | 31.5%   | 40.8%   | 31.5%   |

The national currency is the dollar (USD). In 2020, the average worker earned USD 60 220 (Secretariat estimate).

# 1. Personal Income Tax System

#### 1.1. Central/federal government income taxes

#### 1.1.1. Tax unit

Families are generally taxed in one of three ways:

- As married couples filing jointly on the combined income of both spouses;
- As married individuals filing separately and reporting actual income of each spouse; or
- As heads of households (only unmarried or separated individuals with dependents).

All others, including dependent children with sufficient income, file as single individuals.

#### 1.1.2. Tax allowances and tax credits

#### 1.1.2.1. Standard reliefs

- Basic reliefs: In 2020 a married couple filing a joint tax return is entitled to a standard deduction of USD 24 800. The standard deduction is USD 18 650 for heads of households and USD 12 400 for single individuals. This relief is indexed for inflation. More liberal standard deductions are available for taxpayers who are age 65 or older and taxpayers who are blind. Special rules apply to children who have sufficient income to pay tax and are also claimed as dependents by their parents.
- Standard marital status reliefs: Married couples generally benefit from a more favourable schedule
  of tax rates for joint returns of spouses (see Section 1.1.3). There are no other general tax reliefs
  for marriage.
- Relief for children: Low income workers with dependents are allowed a refundable (non-wastable) earned income credit. For taxpayers with one child, the credit is 34% of up to USD 10 540 of earned income in 2020. The credit phases down when income exceeds USD 19 330 (25 220 for married taxpayers) and phases out when it reaches USD 41 756 (47 646 for married taxpayers). The earned income threshold and the phase-out threshold are indexed for inflation. For taxpayers with two children, the credit is 40% of up to USD 14 800 of earned income in 2020. The credit phases down when income exceeds USD 19 330 (25 220 for married taxpayers) and phases out when it reaches USD 47 440 (53 330 for married taxpayers). For taxpayers with three or more children the credit is 45% of up to USD 14 800 of earned income. The credit phases down when income exceeds USD 19 330 (25 220 for married taxpayers) and phases out when it reaches USD 50 954 (56 844 for married taxpayers).
- Since 1998, taxpayers are permitted a tax credit for each qualifying child under the age of 17. In 2020 the maximum credit is USD 2 000. The refundable (non-wastable) child credit is the lesser of 15% of earned income in excess of USD 2 500 and USD 1 400 per child. The refundable portion of the credit (USD 1 400) is indexed for inflation and rounds down to the next lowest multiple of USD 100 but is capped at USD 2 000.
- Other dependent tax credit: For qualifying dependents other than qualifying children for whom a child tax credit was claimed, there is a USD 500 non-refundable credit. The Taxing Wages calculations do not include the other dependent tax credit.
- Phase out of child tax credit and other dependent tax credit: The maximum credit is reduced for taxpayers with income in excess of certain thresholds. The total of the child tax credit and other

- dependent tax credit is reduced by USD 50 for each USD 1 000 by which modified aggregate gross income exceeds USD 400 000 for married taxpayers filing jointly (USD 200 000 for single and head of household taxpayers). These threshold amounts are indexed for inflation.
- Relief for low income workers without children: In 1994 and thereafter, low income workers without children are eligible for the earned income credit. In 2020 low income workers without children are permitted a non-wastable earned income credit of 7.65% of up to USD 7 030 of earned income. The credit phases down when income exceeds USD 8 790 (14 680 for married taxpayers) and phases out when income reaches USD 15 820 (21 710 for married taxpayers). This credit is available for taxpayers at least 25 years old and under 65 years old.
- Relief for social security and other taxes. In 2020, the withholding rate for Social Security taxes
  and Medicare for employees is 7.65%. The earned income credits described above are sometimes
  considered an offset to Social Security and Medicare contributions made by eligible employees.
  Furthermore, only a portion of Social Security benefits are subject to tax.

#### 1.1.2.2. Main non-standard reliefs applicable to an AW

The basic non-standard relief is the deduction of certain expenses to the extent that, when itemised, they exceed in aggregate the standard deduction. For the purposes of this Report, it is assumed that workers claim the standard deduction. The principal itemised deductions claimed by individuals where the standard deduction is not being claimed are:

- Medical and dental expenses that exceed 10% of income (7.5% in 2017 through 2019);
- State and local income taxes, real property taxes, and personal property taxes are capped at USD 10 000 per return;
- Home mortgage interest on USD 750 000 of qualified residence loans;
- Investment interest expense up to investment income with an indefinite carry forward of disallowed investment interest expense;
- Contributions to qualified charitable organisations (including religious and educational institutions);
- Casualty and theft losses to the extent that each loss exceeds USD 100 and that all such losses combined exceed 10% of income;
- Miscellaneous expenses such as gambling losses, casualty and theft losses of income-producing property, and impairment related work expenses of disabled persons to the extent that, in aggregate; they exceed 2% of income.
- In 2017 based on preliminary statistics<sup>1</sup>, the most recent year for which such statistics are available, the 43% of taxpayers with income between USD 50 000 and USD 100 000 (the AW range) who itemised their deductions claimed average deductions as follows: taxes paid, USD 6 559; charitable contributions, USD 3 454; home mortgage interest expense, USD 6 906;
- Contributions to pension and life insurance plans. No relief is provided for employee contributions to employer sponsored pension plans or for life insurance premiums. However, tax relief is provided for certain retirement savings.

#### 1.1.3. Tax schedule

## **Federal Income Tax rates**

|                   | Marginal Tax Rate (%)  |                  |    |  |
|-------------------|--|------------------|----|--|
| Single Individual | Single Individual Joint Return of Married Couple Head of Household |                  |    |  |
| 0 to 9 875        | 0 to 19 750  | 0 to 14 100      | 10 |  |
| 9 875 to 40 125   | 19 750 to 80 250   | 14 100 to 53 700 | 12 |  |

| 40 125 to 85 525   | 80 250 to 171 050  | 53 700 to 85 500   | 22 |
|--------------------|--------------------|--------------------|----|
| 85 525 to 163 300  | 171 050 to 326 600 | 85 500 to 163 300  | 24 |
| 163 300 to 207 350 | 326 600 to 414 700 | 163 300 to 207 350 | 32 |
| 207 350 to 518 400 | 414 700 to 622 050 | 207 350 to 518 400 | 35 |
| 518 400 and over   | 622 050 and over   | 518 400 and over   | 37 |

<sup>1.</sup> The taxable income brackets are indexed for inflation.

There is a 3.8% tax on the lesser of certain net investment income or income in excess of USD 200 000 (USD 250 000 for joint returns). Net investment income includes interest, dividends, capital gains, rental and royalty income, and income from businesses trading financial instruments.

Beginning in 2018, owners of sole proprietorships, partnerships, S corporations, and some trusts and estates are eligible to deduct 20 percent of qualified business income (QBI). QBI is subject to limitations, depending on the taxpayer's taxable income, that may include the type of trade or business, the amount of wages paid by the business and the unadjusted basis of qualified property held by the trade or business.

#### 1.2. State and local income taxes

#### 1.2.1. General description of the system

The District of Columbia and 41 of the 50 States impose some form of individual income tax.<sup>2</sup> In addition, some local governments (cities and counties) impose an individual income tax, although this is not generally the case. State individual income tax structures are usually related to the federal tax structure by the use of similar definitions of taxable income, with some appropriate adjustments. This linkage is not a legal requirement but a practical convention that functions for the convenience of the taxpayer who must fill out both federal and State income tax returns.

The Taxing Wages calculations assume that the average worker lives in Detroit, Michigan. The state of Michigan permits a personal exemption of USD 4 750 for the taxpayer, the taxpayer's spouse and each child, and taxes income at the rate of 4.25%. Michigan allows taxpayers who are eligible to claim the federal earned income tax credit to claim a Michigan earned income tax credit. The Michigan earned income tax credit is a refundable (non-wastable) credit equal to 6% of the federal earned income tax credit.

The city of Detroit permits a personal exemption of USD 600 and taxes income at the rate of 2.4%.

# 2. Compulsory Social Security Contributions to Schemes Operated within the Government Sector

#### 2.1. Employees' contributions

#### 2.1.1. Pensions

In 2020, the rate for employee contributions is 7.65% (6.2% for old age, survivors, and disability insurance, and 1.45% for old age hospital insurance). The 6.2% rate applies to earnings up to USD 137 700. Beginning in 1994, there is no limit on the amount of earnings subject to the 1.45% rate. There is an additional 0.9% tax on employee wages and salaries that exceed USD 200 000 (USD 250 000 for joint returns) as the additional hospital insurance tax on high-income taxpayers. The additional tax on wages and salaries is subject to withholding (but without regard to the earnings of the spouse) when wages from a particular job exceed USD 200 000 per year. These thresholds are not indexed for inflation.

There is no distinction by marital status or sex.

#### 2.1.2. Other

No compulsory employee contributions exist.

### 2.2. Employers' contributions

#### 2.2.1. Pensions

The rate for employers' contributions is 6.2% on earnings up to USD 137 700 and 1.45% of all earnings (without limit).

#### 2.2.2. Unemployment

Employers are required by the federal government to pay unemployment tax of 6% on earnings up to USD 7 000. Taxes are also paid to various state-sponsored unemployment plans which may generally be credited against the required federal percentage. In 2019 the estimated average unemployment insurance tax rate in Michigan was 3.06% of the first USD 9 000 of wages. The Taxing Wages model considers that the Federal government allows employers to take a credit for state unemployment taxes of up to 5.4%, resulting in a net Federal tax of 0.6% on earnings up to USD 7 000.

#### 3. Universal Cash Transfers

#### 3.1. Transfers related to marital status

None.

#### 3.2. Transfers for dependent children

No general cash transfers exist, although low-income mothers qualifying for categorical welfare grants may receive cash transfers.

## 4. Principal Changes since 2017

In December 2017, Congress passed and the President signed the Tax Cuts and Jobs Act — the most significant change in U.S. tax law in a generation, incorporating change to the taxation of individuals and businesses. For individuals, the Act temporarily lowers income tax rates, increases the standard deduction, increases the child tax credit, and adds a credit for other dependents. The Act also temporarily eliminates some deductions, credits and exemptions for individuals. In addition the individual alternative minimum tax (AMT) exemption and phase-out thresholds are temporarily increased so that fewer taxpayers are subject to the AMT. Pass-through entities that are generally taxed at the individual level only and may be eligible for a new temporary deduction. These temporary provisions expire at the end of 2025. In addition, inflation adjustments of amounts and thresholds are changed to be determined by the chained consumer price index. Finally, there are substantial changes in business taxation, many that are permanent, such as lowering the top corporate tax rate from 35 to 21 percent and moving the U.S. international tax system towards a territorial system.

## 4.1. Changes to labour taxation due to the covid-19 pandemic

Families First Coronavirus Response Act enacted 18 March 2020 provides employers with less than 500 employees with a refundable tax credit to offset the cost of providing a worker with paid sick and family leave through 2020. The Act caps the amount of qualified sick leave wages taken into account for each employee at USD 511 per day for 10 work days. Similarly, the family leave credit offsets USD 200 per day of wages for employees who must care for a loved one or whose child is home because of a school or day care closing. Self-employed workers would also qualify for the same level of refundable sick and family leave tax credits to offset wages. Businesses can retain and access funds that they would otherwise paid in the employer's Social Security taxes. If those amounts are not sufficient to cover the cost of paid leave, employers can seek an expedited advance from the IRS by submitting a streamlined claim form. Employers with U.S. Small Business Administration Loans are not eligible for employee retention credit.

The Coronavirus Aid, Relief, and Economic Security Act (the CARES Act) was enacted on 27 March 2020 in response to the pandemic. Among other provisions, there is a tax credit paid in general to citizens, the so-called Economic Impact Payment (EIP). While the EIP can be claimed on the 2020 tax return filed in 2021, an advance payment of the credit was made in 2020 of USD 1 200 per taxpayer (USD 2 400 for married couples) plus USD 500 per child under age 17. While there is no cap on the EIP credit, it phases out at 5 percent of Adjusted Gross Income (AGI) in excess of USD 150 000 for married couples, USD 112 500 for head of household, and USD 75 000 for all other filers.

The CARES Act also delays the timing of required federal tax deposits for certain employer payroll taxes and self-employment taxes incurred between March 27, 2020 (the date of enactment) and December 31, 2020. Fifty percent of the deferred amount has to be paid by 31 December 2021 and the remainder by 31 December 2022. These taxes include the 6.2 percent Social Security tax for wage earners and comparable 6.2 percent Self-Employment Contributions Act tax due on net earnings from self-employment.

The CARES Act also provides businesses with a refundable Social Security tax credit for 50 percent of qualified wages up to USD 10 000 for each employee for qualifying calendar 2020 quarters during the COVID-19 crisis. The credit is available to employers whose (1) operations were fully or partially suspended, due to a COVID-19-related shut-down order, or (2) gross receipts declined by more than 50 percent when compared to the same quarter in the prior year. For employers with greater than 100 full-time employees, qualified wages are wages paid to employees when they are not providing services due to the COVID-19-related circumstances described above. For eligible employers with 100 or fewer full-time employees, all employee wages qualify for the credit, whether the employer is open for business or subject to a shut-down order. The credit is provided for the first USD 10 000 of compensation, including health benefits, paid to an eligible employee. The credit is provided for wages paid or incurred from 13 March 2020 through 31 December 2020. Employers with Small Business Administration Loans under the CARES Act are not eligible for the employee retention credit.

Finally, for 2020, taxpayers can deduct USD 300 of cash contributions to charities whether or not the taxpayer itemizes or takes standard deduction.

#### 5. Memorandum Items

#### 5.1. Identification of an AW at the wage calculation

The AW is identified from monthly data compiled from establishment questionnaires covering more than 40 million non-agricultural full- and part-time workers. Beginning in March 2006, data on average weekly hours and average hourly earnings cover all employees rather than solely production or non-supervisory workers. To obtain average annual wages, the product of average weekly hours (including overtime) and

average hourly earnings (including overtime) is multiplied by 52 and is adjusted to reflect a full-time equivalent worker. The AW is estimated to be USD 56 577 for 2019.

# 5.2. Employer contributions to private social security arrangements

Employers commonly contribute to private pension plans (both defined benefit and defined contribution), health insurance and life insurance. Data for these contributions are available only on a total workforce basis. It is not possible to state with accuracy the levels applicable to the AW. The following are estimates for 2019 for employees in private industry:

|   | Pension | Health                           | Life |
|---|---------|----------------------------------|------|
| % of workers covered                      | 52      | 55                               | 55   |
| USD employer portion per covered employee | n.a.    | 8 645 (family)<br>4 269 (single) | n.a. |

# 2020 Parameter values

| Average earnings/yr                 | Ave_earn           | 60 220  | Secretariat estimate |           |                    |               |
|-------------------------------------|--------------------|---------|----------------------|-----------|--------------------|---------------|
| Standard deductions                 | Married_al         | 24 800  |                      |           |                    |               |
|                                     | hh_al              | 18 650  |                      |           |                    |               |
|                                     | single_al          | 12 400  |                      |           |                    |               |
| Federal tax schedules               | Fed_sch_s          | 0.1     | 9 875                |           |                    |               |
|                                     |                    | 0.12    | 40 125               |           |                    |               |
| Single individuals                  |                    | 0.22    | 85 525               |           |                    |               |
|                                     |                    | 0.24    | 163 300              |           |                    |               |
|                                     |                    | 0.32    | 207 350              |           |                    |               |
|                                     |                    | 0.35    | 518 400              |           |                    |               |
|                                     |                    | 0.37    | 0.0.00               |           |                    |               |
| Married filing jointly              | Fed_sch_m          | 0.1     | 19 750               |           |                    |               |
| Warriod minig jointly               | 1 00_0011_111      | 0.12    | 80 250               |           |                    |               |
|                                     |                    | 0.12    | 171 050              |           |                    |               |
|                                     |                    | 0.24    | 326 600              |           |                    |               |
|                                     |                    | 0.24    | 414 700              |           |                    |               |
|                                     |                    | 0.32    | 622 050              |           |                    |               |
|                                     |                    | 0.35    | 022 030              |           |                    |               |
| Head of household                   | Fod ook b          | 0.37    | 14 100               |           |                    |               |
| ricau di fidusefidiu                | Fed_sch_h          | 0.12    | 53 700               |           |                    |               |
|                                     |                    | 0.12    |                      |           |                    |               |
|                                     |                    |         | 85 500               |           |                    |               |
|                                     |                    | 0.24    | 163 300              |           |                    |               |
|                                     |                    | 0.32    | 207 350              |           |                    |               |
|                                     |                    | 0.35    | 518 400              |           |                    |               |
| <b>-</b>                            | 510 1              | 0.37    |                      |           |                    |               |
| Earned income credit                | EIC_sch            | rate    | income limit         | threshold | thresh-<br>married | phase-<br>out |
|                                     | no children        | 0.0765  | 7 030                | 8790      | 14 680             | 0.0765        |
|                                     | 1 child            | 0.34    | 10 540               | 19 330    | 25 220             | 0.1598        |
|                                     | 2 children         | 0.4     | 14 800               | 19 330    | 25 220             | 0.2106        |
|                                     | 3 or more children | 0.45    | 14 800               | 19 330    | 25 220             | 0.2106        |
| Child credit                        | chcrd_max          | 2 000   |                      |           |                    |               |
|                                     | Chcrd_lim          | 1 400   |                      |           |                    |               |
|                                     | chcrd_rdn          | 50      |                      |           |                    |               |
|                                     | chcrd_thrsh_m      | 400 000 |                      |           |                    |               |
|                                     | chcrd_thrsh_oth    | 200 000 |                      |           |                    |               |
|                                     | chcrd_ref_perct    | 0.15    |                      |           |                    |               |
|                                     | chcrd_ref_thresh   | 2 500   |                      |           |                    |               |
| Detroit                             | Detroit_ex         | 600     |                      |           |                    |               |
|                                     | Detroit_rate       | 0.024   |                      |           |                    |               |
| Michigan                            | Mich_ex            | 4 750   |                      |           |                    |               |
|                                     | Mich_ex_child      | 0       |                      |           |                    |               |
|                                     | Mich_rate          | 0.0425  |                      |           |                    |               |
| Michigan's earned income tax credit | Mich_EIC_rate      | 0.06    |                      |           |                    |               |
| credit schedule on city tax         | Mich_cr_sch        | 0       |                      |           |                    |               |
|                                     |                    | 0       |                      |           |                    |               |
|                                     |                    | 0       |                      |           |                    |               |
| maximum                             | Mich_cr_max        | 0       |                      |           |                    |               |
| Pension contributions               | pens_rate_er       | 0.062   |                      |           |                    |               |
|                                     | pens_rate_ee       | 0.062   |                      |           |                    |               |

| ·                                   | hosp_rate               | 0.0145  |  |  |
|-------------------------------------|-------------------------|---------|--|--|
|                                     | add_hosp_rate           | 0.009   |  |  |
| Ceiling for employers and employees | pens_ceil               | 137 700 |  |  |
|                                     | add_hosp_thresh_m       | 250 000 |  |  |
|                                     | add_hosp_thresh_oth     | 200 000 |  |  |
| Unemployment insurance tax          | Unemp_rate              | 0.006   |  |  |
|                                     | Unemp_dedn_rate         | 0.054   |  |  |
|                                     | Unemp_max               | 7 000   |  |  |
| Michigan unemploy insur             | Mich_unemp_rate         | 0.0306  |  |  |
|                                     | Mich_unemp_max          | 9 000   |  |  |
|                                     | Covid EIP adult         | 1200    |  |  |
|                                     | Covid EIP child         | 500     |  |  |
|                                     | Covid_EIP_limit_married | 150000  |  |  |
|                                     | Covid_EIP_limit_head    | 112500  |  |  |
|                                     | Covid_EIP_limit_others  | 75000   |  |  |
|                                     | Covid_EIP_red           | 0.05    |  |  |

# 2020 Tax equations

The equations for the US system in 2020 are mostly calculated on a family basis. There is a special function EIC which is used to calculate the earned income credit. Variable names are defined in the table of parameters above, within the equations table, or are the standard variables "married" and "children". A reference to a variable with the affix "\_total" indicates the sum of the relevant variable values for the principal and spouse. And the affixes "\_princ" and "\_spouse" indicate the value for the principal and spouse, respectively. Equations for a single person are as shown for the principal, with "\_spouse" values taken as 0.

|     | Line in country table and intermediate steps  | Variable name | Range | Equation   |
|-----|---|---------------|-------|--|
| 1.  | Earnings                                      | earn          |       |  |
| 2.  | Allowances:                                   | tax_al        | J     | IF(Married, Married_al, IF(Children=0, single_al, hh_al))  |
| 3.  | Credits in taxable income                     | taxbl_cr      | J     | 0  |
| 4.  | CG taxable income                             | tax_inc       | J     | positive(earn-tax_al+taxbl_cr)   |
| 5.  | CG tax before credits                         | CG_tax_excl   | J     | Tax(tax_inc, IF(Married, Fed_sch_m, IF(Children, Fed_sch_h, Fed_sch_s)))   |
| 6.  | 6. Tax credits :                              | EIC           | J     | EIC(Children, earn_total, EIC_sch)   |
|     |   | ch_crd_max    | J     | Children*Positive((chcrd_max-chcrd_rdn*Positive(TRUNC(earn, -3)-IF(Married>0, chcrd_thrsh_m, chcrd_thrsh_oth))/1000))  |
|     |   | ch_crd_tax    | J     | IF(ch_crd_tax>0, MIN(ch_crd_max, CG_tax_excl), 0)  |
|     |   | ch_crd_ref    |       | IF(ch_crd_tax <ch_crd_max, 0)),="" 0)<="" max(chcrd_ref_perct*(earn-chcrd_ref_thresh),="" min(min(ch_crd_max-ch_crd_tax,chcrd_lim*children),="" td=""></ch_crd_max,>   |
|     |   | tax_cr        | J     | EIC+ch_crd_tax+ch_crd_ref  |
| 7.  | CG tax  | CG_tax        | J     | CG_tax_excl-tax_cr   |
| 8.  | State and local taxes                         | local_tax     | J     | Detroit_rate* Positive(earn_total-<br>Detroit_ex*(1+Married+Children))+<br>Mich_rate*Positive(earn_total -<br>Mich_ex*(1+Married+Children) - Mich_ex_child*Children) -<br>MIN(Mich_cr_max, Tax(AJ7, Mich_cr_sch)) -<br>Mich_EIC_rate*EIC |
| 9.  | Employees' soc security                       | SSC           | В     | pens_rate_ee*MIN(earn,<br>pens_ceil)+hosp_rate*earn+add_hosp_rate*Positive(earn-<br>IF(Married,add_hosp_thresh_m,add_hosp_thresh_oth))   |
| 11. | Cash transfers                                | Cash_tran     | J     | TAPER((IF(Married=0,Covid_EIP_adult,2*Covid_EIP_adult))+(Children*Covid_EIP_child),total_earn,IF(Married,Covid_EIP_limit_married,IF(Children>0,Covid_EIP_limit_head,Covid_EIP_limit_others)),Covid_EIP_red)                              |
| 13. | Employer's soc security                       | SSC_empr      | В     | pens_rate_er*MIN(earn, pens_ceil) +hosp_rate*earn+MIN(earn,Unemp_max)*Unemp_rate +MIN(earn,Mich_unemp_max)*Mich_unemp_rate   |
|     | Memorandum item: non-<br>wastable tax credits |               |       |  |
|     | tax expenditure component                     | taxexp        |       | (rate_rd_crd+EIC)-transfer   |
|     | cash transfer component                       | transfer      |       | IF(CG_tax<0, -CG_tax, 0)   |

Key to range of equation B calculated separately for both principal earner and spouse P calculated for principal only (value taken as 0 for spouse calculation) J calculated once only on a joint basis.

# **Notes**

<sup>&</sup>lt;sup>1</sup> These statistics do not reflect the effects of the Tax Cuts and Jobs Act where more individual taxpayers do not itemize deductions but instead use the standard deduction.

<sup>&</sup>lt;sup>2</sup> New Hampshire and Tennessee tax only interest and dividend income received by individuals.



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