

## 2.4 Effective Taxable Payroll (TAXPAY)

### 2.4.1 Ratio of taxable employee to total covered OASDI wages (RWTEE)

```
if (relmax > 12.1735780592725d0) then
    taxableRatio = -(0.273245883726556d0 / 0.86d0) * relmax**(-0.86d0) + &
                  0.9987d0
else if (relmax > 2.37096753676532d0) then
    taxableRatio = -(0.0117856970005267d0 / 0.15d0) * exp(-0.15d0 * relmax) - &
                  (0.0511846803376859d0 / 0.40d0) * exp(-0.40d0 * relmax) - &
                  (0.830367654271823d0 / 1.25d0) * exp(-1.25d0 * relmax) + &
                  0.000166660118101223d0 * relmax + 0.9689d0
else if (relmax > 1.52779089050241d0) then
    taxableRatio = -(0.107457676694312d0 / 0.30d0) * exp(-0.30d0 * relmax) - &
                  (1.24726153506163d0 / 1.55d0) * exp(-1.55d0 * relmax) - &
                  0.0132984557884609d0 * relmax + 1.0582d0
else if (relmax > 0.725920773954031d0) then
    taxableRatio = -(0.145790565272216d0 / 0.25d0) * exp(-0.25d0 * relmax) - &
                  (1.06355416951773d0 / 1.3d0) * exp(-1.3d0 * relmax) - &
                  0.0744675074545115d0 * relmax + 1.3601d0
else if (relmax > 0.242287838436218d0) then
    taxableRatio = (0.341827369708108d0 / 1.5d00) * relmax**1.5d0 - &
                  (1.76932778063926d0 / 0.69d0) * exp(-0.69d0 * relmax) - &
                  0.901294429842495d0 * relmax + 2.5685d0
else
    taxableRatio = relmax - &
                  (0.284264263729929d0 / 1.5d0) * relmax**1.5d0 - &
                  (0.404939275941294d0 / 2.00d0) * relmax**2d0
end if
```

Where

relmax = OASDI taxable maximum / average covered OASDI wage  
RWTEE = Ratio of OASDI taxable employee to covered wages

### 2.4.2 Taxable employee OASDI wages (WTEE)

$$WTEE = RWTEE * WSC$$

Where

RWTEE = Ratio of OASDI taxable employee to covered wages  
WSC = OASDI total covered wages  
WTEE = OASDI taxable employee wages

### 2.4.3 Ratio of multi-employer refund wages to total OASDI covered wages (RMER)

$$RMER = (MER(-1) / WSC(-1)) - 0.03217 * (RWTEE - RWTEE(-1)) - 0.00024 * (RU - RU(-1))$$

Where

MER(-1) = Multi-employer refund wages in prior year  
RMER = Ratio of multi-employer refund wages to total OASDI covered wages  
RU = Annual average civilian unemployment rate  
RWTEE = Ratio of OASDI taxable employee to covered wages  
WSC(-1) = OASDI total covered wages in prior year

### 2.4.4 Multi-employer refund wages (MER)

$$MER = RMER * WSC$$

Where

MER = OASDI multi-employer refund wages  
RMER = Ratio of multi-employer refund wages to total OASDI covered wages  
WSC = OASDI total covered wages

### 2.4.5 Taxable employer OASDI wages (WTER)

$$WTER = WTEE + MER$$

Where

MER = OASDI multi-employer refund wages  
WTEE = OASDI taxable employee wages

WTER = OASDI taxable employer wages

#### 2.4.6 Ratio of taxable to covered self-employment net earnings (RSET)

##### Preliminary

BASECT = 77074.88  
BASECW = 59157.14  
BASEO = 38188.22

##### Self-employed only

SECSEO = CSE – SECCMB  
ASESEO = SECSEO / SEO  
ASEO17 = ASESEO(2017)  
ASESEO = ASESEO \* BASEO / ASEO17  
O = TAXMAX / ASESEO

```
if ( o < 0.026186088d0 ) then
    otr = o - (9.574544d0 / 2.5d0) * o**2.5d0
else if ( o < 0.104744354d0 ) then
    otr = -(1.04227d0 / 1.5d0) * o**1.5d0 + (0.67587d0 / 2.15d0) * o**2.15d0 - &
        (3.471502d0 / 3.3d0) * o**3.3d0 + 1.110432d0 * o - 0.00049085d0
else if ( o < 0.209488707d0 ) then
    otr = (2.185075d0 / 1.3d0) * o**1.3d0 - (4.972755d0 / 1.75d0) * o**1.75d0 + &
        (3.184795d0 / 2.4d0) * o**2.4d0 + 0.475027d0 * o + 0.00377668d0
else if ( o < 0.471349592d0 ) then
    otr = (7.17629d0 / 1.25d0) * o**1.25d0 - (0.28816d0 / 1.6d0) * o**1.6d0 - &
        (4.650629d0 / 2.4d0) * dexp(-2.4d0 * o) - 6.893912d0 * o + 1.987803109d0
else if ( o < 1.021257449d0 ) then
    otr = -(0.52704d0 / 0.85d0) * dexp(-0.85d0 * o) + (0.369144d0 / 1.55d0) * &
        dexp(-1.55d0 * o) - (0.845421d0 / 3.1d0) * dexp(-3.1d0 * o) - &
        0.001447d0 * o + 0.665888025d0
else if ( o < 1.309304422d0 ) then
    otr = -(0.174971d0 / 0.55d0) * dexp(-0.55 * o) - (0.393885d0 / 1.75d0) * &
        dexp(-1.75d0 * o) - (0.003202d0 / 2.6d0) * dexp(-2.6d0 * o) + &
        0.013703d0 * o + 0.64673395d0
else if ( o < 1.728281837d0 ) then
    otr = (0.338456d0 / 0.3d0) * dexp(-0.3d0 * o) - (0.904979d0 / 1.15d0) * &
        dexp(-1.15d0 * o) + (0.51182d0 / 2.5d0) * dexp(-2.5d0 * o) + &
        0.185928d0 * o - 0.351278731d0
else if ( o < 2.17344534d0 ) then
    otr = (0.358360d0 / 0.55d0) * dexp(-0.55d0 * o) - (5.475731d0 / 1.85d0) * &
        dexp(-1.85d0 * o) + (9.368262d0 / 2.6d0) * dexp(-2.6d0 * o) + &
        0.121142d0 * o + 0.156160373d0
else if ( o < 3.142330612d0 ) then
    otr = -(0.067751d0 / 0.2d0) * dexp(-0.2d0 * o) - (2.812835d0 / 1.9d0) * &
        dexp(-1.9d0 * o) + (8.107091d0 / 2.75d0) * dexp(-2.75d0 * o) + &
        0.00956d0 * o + 0.79107633d0
else if ( o < 52.372176875d0 ) then
    otr = -(0.024629d0 / 0.1d0) * dexp(-0.1d0 * o) - (0.11274d0 / 0.4d0) * &
        dexp(-0.4d0 * o) + 0.001128d0 * o + 0.893694435d0
else if ( o < 1000d0 ) then
    otr = -(1.22364d0 / 0.85d0) * o**(-0.85d0) + 1.001234831d0
else
    otr = 1d0
end if
```

SETSEO=OTR\*SECSEO

#### OASDI taxable wages of workers with both wages and self-employment net earnings

AWSCMB=WSCCMB/CMBNT  
AWSCMB17=AWSCMB(2017)  
AWSCMB=AWSCMB\*BASECW/AWSCMB17  
CW=TAXMAX/AWSCMB

```
if ( cw < 0.0190413d0 ) then
    cwtr = cw - (1.269097d0 / 1.72d0) * cw**1.72d0
else if ( cw < 0.059164455d0 ) then
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cwtr = (0.733496d0 / 1.45d0) * cw**1.45d0 - (1.932995d0 / 1.6d0) * cw**1.6d0 + &
0.982734d0 * cw + 0.00003324d0
else if ( cw < 0.160589235d0 ) then
  cwtr = -(1.777645d0 / 1.8d0) * cw**1.8d0 + (1.737345d0 / 2.65d0) * cw**2.65d0 + &
1.002541d0 * cw - 0.00013743d0
else if ( cw < 0.236657820d0 ) then
  cwtr = -(1.264913d0 / 1.3d0) * cw**1.3d0 + (0.225457d0 / 2.2d0) * cw**2.2d0 + &
1.381608d0 * cw - 0.00414044d0
else if ( cw < 0.388794990d0 ) then
  cwtr = -(1.257299d0 / 1.2d0) * cw**1.2d0 - (0.286311d0 / 6.5d0) * cw**6.5d0 + &
1.542586d0 * cw - 0.00150659d0
else if ( cw < 0.540932161d0 ) then
  cwtr = -(1.607077d0 / 1.2d0) * cw**1.2d0 - (1.475696d0 / 1.55d0) * &
dexp(-1.55d0 * cw) - 1.637803d0 * cw + 0.98777752d0
else if ( cw < 0.862110631d0 ) then
  cwtr = -(0.687757d0 / 0.35d0) * dexp(-0.35d0 * cw) - (0.424043d0 / 1.35d0) * &
dexp(-1.35d0 * cw) - 0.351856d0 * cw + 2.29858919d0
else if ( cw < 1.081864321d0 ) then
  cwtr = -(0.51421d0 / 0.4d0) * dexp(-0.4d0 * cw) - (0.877948d0 / 2.9d0) * &
dexp(-2.9d0 * cw) - 0.147171d0 * cw + 1.50626904d0
else if ( cw < 1.572084092d0 ) then
  cwtr = -(4.289368d0 / 0.25d0) * dexp(-0.25d0 * cw) + (4.153888d0 / 0.55d0) * &
dexp(-0.55d0 * cw) - (2.186503d0 / 1.3d0) * dexp(-1.3d0 * cw) - &
1.292888d0 * cw + 11.23676668d0
else if ( cw < 3.211784704d0 ) then
  cwtr = -(0.102092d0 / 0.3d0) * dexp(-0.3d0 * cw) - (0.647197d0 / 1.4d0) * &
dexp(-1.4d0 * cw) + 0.00085d0 * cw + 0.84811899d0
else if ( cw < 16.904130019d0 ) then
  cwtr = -(0.028188d0 / 0.15d0) * dexp(-0.15d0 * cw) - (0.221879d0 / 0.63d0) * &
dexp(-0.63d0 * cw) + 0.000527d0 * cw + 0.8767982d0
else if ( cw < 1d3 ) then
  cwtr = -(0.088498d0 / 0.254d0) * cw**(-0.254d0) + 1.0407112d0
else
  cwtr = 1d0
end if

```

WSTCMB=CWTR\*WSCCMB

#### OASDI taxable earnings of workers with both wages and self-employment net earnings

```

TECCMB=SECCMB+WSCCMB
ATECMB=TECCMB/CMBNT
ATECMB17=ATECMB(2017)
ATECMB=ATECMB*BASECT/ATECMB17
CT=TAXMAX/ATECMB

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if ( ct < 0.025948791d0 ) then
  ctr = ct - (40.88231d0 / 3.3d0) * ct**3.3d0
else if ( ct < 0.051897583d0 ) then
  ctr = -(0.015962d0 / 1.4d0) * ct**1.4d0 - (2.849709d0 / 2.5d0) * ct**2.5d0 + &
1.005757d0 * ct - 0.00002946d0
else if ( ct < 0.097307968d0 ) then
  ctr = -(1.740332d0 / 2.25d0) * ct**2.25d0 - (4.39659d0 / 4.3d0) * ct**4.3d0 + &
1.010732d0 * ct - 0.00017087d0
else if ( ct < 0.233539123d0 ) then
  ctr = -(3.007061d0 / 2.35d0) * ct**2.35d0 + (29.74953d0 / 5.5d0) * ct**5.5d0 + &
1.047821d0 * ct - 0.00257006d0
else if ( ct < 0.376257476d0 ) then
  ctr = -(17.9483d0 / 1.85d0) * ct**1.85d0 + (56.48945d0 / 0.34d0) * dexp(-0.34d0 * ct) + &
58.06407d0 * ct - 166.16320626d0
else if ( ct < 0.518975828d0 ) then
  ctr = (0.35103d0 / 0.65d0) * dexp(-0.65d0 * ct) - (1.220332d0 / 1.25d0) * &
dexp(-1.25d0 * ct) + 0.050683d0 * ct + 0.455703736d0
else if ( ct < 0.700617368d0 ) then
  ctr = -(0.158062d0 / 0.45d0) * dexp(-0.45d0 * ct) - (0.865629d0 / 1.25d0) * &
dexp(-1.25d0 * ct) - 0.139568d0 * ct + 1.069620633d0
else if ( ct < 0.869284513d0 ) then
  ctr = -(10.956926d0 / 0.45d0) * dexp(-0.45d0 * ct) + (13.02327d0 / 1.35d0) * &
dexp(-1.35d0 * ct) - (8.498083d0 / 2.45d0) * dexp(-2.45d0 * ct) - &
4.127007d0 * ct + 17.95991367d0

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else if ( ct < 1.076874844d0 ) then
    ctr = -(2.015557d0 / 0.35d0) * dexp(-0.35d0 * ct) + (3.017185d0 / 1.2d0) * &
        dexp(-1.2d0 * ct) - (3.225627d0 / 2.0d0) * dexp(-2.0d0 * ct) - &
        0.725524d0 * ct + 4.75386607d0
else if ( ct < 7.784637426d0 ) then
    ctr = -(0.100861d0 / 0.35d0) * dexp(-0.35d0 * ct) - (0.166637d0 / 1d0) * &
        dexp(-1d0 * ct) - (0.732639d0 / 2.15d0) * dexp(-2.15d0 * ct) + &
        0.004175d0 * ct + 0.809186759d0
else if ( ct < 25.948791419d0 ) then
    ctr = -(0.036719d0 / 0.18d0) * dexp(-0.18d0 * ct) - (0.780182d0 / 0.9d0) * &
        dexp(-0.9d0 * ct) + 0.001067d0 * ct + 0.865444162d0
else if ( ct < 1d3 ) then
    ctr = -(0.142018d0 / 0.34d0) * ct**(-0.34d0) + 1.029280103d0
else
    ctr = 1d0
end if

```

TETCMB=CTTR\*TECCMB  
SETCMB=TETCMB-WSTCMB

#### **Ratio OASDI taxable to covered self-employment net earnings**

$$RSET = (SETCMB+SETSEO)/CSE$$

Where

ASEO17	=	Average self-employment net earnings of workers with no OASDI taxable wages in 2017
ATECMB	=	Average OASDI covered earnings of workers with both OASDI covered wages and self-employment net earnings
ATECMB17	=	Average OASDI covered earnings of workers with both OASDI covered wages and self-employment net earnings in 2017
AWSCMB	=	Average OASDI covered wage of workers with both wages and self-employment net earnings
AWSCMB17	=	Average OASDI covered wage of workers with both wages and self-employment net earnings in 2017
ASESEO	=	Average self-employment net earnings of workers with no OASDI taxable wages
AWSCMB	=	Average OASDI covered wage of workers with both wages and self-employment net earnings
BASECT	=	Average total earnings of workers with both self-employment net earnings and wages in 1% sample data for 2017
used to		
BASECW	=	produce equations Average OASDI covered wages of workers with both self-employment net earnings and wages in 1% sample data for 2017 used to produce equations
BASEO	=	Average self-employment net earnings of workers with no OASDI taxable wages in 1% sample data for 2017 used to produce equations
CMBNT	=	Number or workers with both OASDI taxable wages and self-employment net earnings
CSE	=	OASDI covered self-employment net earnings
CT	=	Ratio OASDI taxable maximum to average earnings of workers with both self-employment net earnings and OASDI taxable wages
CW earnings	=	Ratio OASDI taxable maximum to average self-employment net earnings of workers with both self-employment net earnings and OASDI taxable wages
CTTR	=	Ratio of OASDI taxable to covered earnings for workers with both wages and self-employment net earnings
CWTR	=	Ratio of OASDI taxable to covered wages for workers with both wages and self-employment net earnings
O	=	Ratio OASDI taxable maximum to average self-employment net earnings of workers with no OASDI taxable wages
OTR	=	Ratio of OASDI taxable self-employment to covered net earnings for workers with no OASDI taxable wages
SECCMB taxable	=	OASDI covered self-employment net earnings of workers with both self-employment net earnings and OASDI taxable wages
SECSEO	=	OASDI covered self-employment net earnings of workers with no OASDI taxable wages
SEO	=	Number or workers with OASDI covered self-employment net earnings and no OASDI taxable wages
SETCMB earnings	=	OASDI taxable self-employment income of workers with both OASDI taxable wages and self-employment net earnings
SETSEO	=	OASDI taxable self-employment income of workers with no OASDI taxable wages
TAXMAX	=	OASDI taxable maximum
TECCMB	=	OASDI covered net earnings of workers with both wages and self-employed net earnings
TETCMB	=	OASDI taxable income of workers with both wages and self-employed net earnings
WSCCMB	=	OASDI covered wages of workers with both wages and self-employed net earnings
WSTCMB	=	OASDI taxable wages of workers with both wages and self-employed net earnings

#### **2.4.7 OASDI taxable self-employment income (SET)**

$$SET = RSET * CSE$$

Where

$$CSE = \text{OASDI covered self-employment net earnings}$$

SET = OASDI taxable self-employment income  
RSET = Ratio of OASDI taxable to covered self-employment income

#### 2.4.8 OASDI effective taxable payroll (ETP)

$$ETP = WTER + SET - 0.5 * MER$$

Where

ETP = OASDI effective taxable payroll  
MER = OASDI multi-employer refund wages  
SET = OASDI taxable self-employment income  
WTER = Annual OASDI taxable employer wages