Personal Income Projections for Wisconsin

Updates on the Effects of the Changing Labor Force 2020-2040

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May 2025

STATE OF WISCONSIN
DWD
Department of Workforce Development

WisConomy

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1) Executive Summary

A large share of Wisconsin's population will be leaving the workforce in the coming years, posing challenges to the state's workforce and its economy. As Wisconsin's population ages, concerns over the state's labor force trajectory are at the forefront of economic and workforce development initiatives. This report is an update to DWD's analysis of Wisconsin job supply capacity and analyzes and forecasts some of the major components of Wisconsin personal income under the impact of changing labor force dynamics. These findings include:

- In real terms, total personal income will grow 7.4% from 2020 to 2040.
- Total wage income will remain relatively flat, growing from $119 billion (2010 dollars) in 2020 to $121 billion in 2040 – growth of 1.7% over 20 years.
- In real terms, the total income earned from social security in the state has been increasing and is projected to increase 10.5% by 2040, from 8.0% in 2010.
- The number of people earning personal business income will decline. In 2000, 10% of men 25-64 earned business income. By 2019, that number had declined to 7.8%. By 2040, it will fall to 6.5%.

2) Introduction

This report augments DWD's earlier report examining and projecting Wisconsin's labor force, job supply, and demand. This paper's objective is to study the impact of the declining labor force on the state's overall personal income. Building on the prior forecasts of Wisconsin's changing workforce, this report illustrates the demographic shift's implications on various components of personal income.

3) Methods

The data for this analysis came from the American Community Survey (ACS), using the microdata compiled by the IPUMS (Ruggles et al. 2024). The ACS asks questions about various income sources for individuals. For each of those income sources, statistical program R was used to estimate both the percentage of the population who earn income from that source by age group and gender.

The average income earned for each source was then estimated for the group who earn income from that source. This allowed for the estimation of separate trends: the prevalence of earners from that source as well as the average real income earned from that source. Estimating these two components allowed an analysis of two potentially different trends which could contribute to changes in source income. Variations in total income can be driven by change in the number of earners as well as change in the income source.

The boundaries of the age groupings were adjusted for some income sources to improve estimate accuracy. For example, there are only a small number of individuals between the ages of 25 to 29 earning retirement income, yielding a very noisy estimate. This necessitated expanding certain age groupings to increase confidence of the estimates of earner share and average earned income. The equation below represents the model for total personal income.

$$Y_t = \sum_{ags} P_{agt} \times \phi_{agst} \times \mu_{agst}$$

Where

- Y - Total personal income
- t - Year
- a - Age grouping
- g - Gender
- s - Income source (wage, business, Social Security, etc)
- P_{agt} - Population of Wisconsin residents in age group a and gender g during year t
- ϕ_{agst} - Share of population in age group a and gender g during year t who earn income from source s
- μ_s - Average income earned from source s

With those estimates, time series forecasts were generated using the statistical programming language R with the fable package (R Core Team 2025; O'Hara-Wild, Hyndman, and Wang 2024). Time was the only independent variable used in forecasting. A handful of different models were used, including mean, linear and damped trend exponential smoothing. Logit transformations were applied to these models of the earner share to ensure the logical bounds within 0 to 1. The performance of each of these models was assessed by minimizing the root mean square error over time series cross validation. By and large, the damped trend exponential smooth model was used. This concurs with other research that it is an effective model over long time periods, such as this project (Gardner and McKenzie 2011).

Congruent with the previous report, three population projections were used: Wisconsin Department of Administration Demographic Services Center, Weldon Cooper Center, and the average of the two. These population projects were then used as an input to generate final estimates of total personal income. For each income source, multiplying the population share of earners by the population within that age and gender group results in the number of individuals who are estimated to earn any amount of income from that source. Multiplying that number by the average earned income results in the total income earned from that source in Wisconsin.

For each income source and for each age group and gender, two components were estimated and forecast: the percentage who earned income from that source and the average income of those who earned from that source. The exact groupings of ages varied depending on the income source due to the availability of data at various age groups. Estimating these two components allowed an analysis of two potentially different trends which could contribute to changes in source income. Variations in total income can be driven by change in the number of earners as well as change in the income source.

4) Analysis

4.1) Income Components and Projections

To project total personal income, data from various ACS data sources was used. The ACS surveys American households about how they earn income. Income is broken down into various sources, for which separate forecasts were produced.

These income sources include wages, business, social security, welfare, supplemental security, investment, retirement, and a catch-all amount for any other source of income.

4.1.1) Wage Income

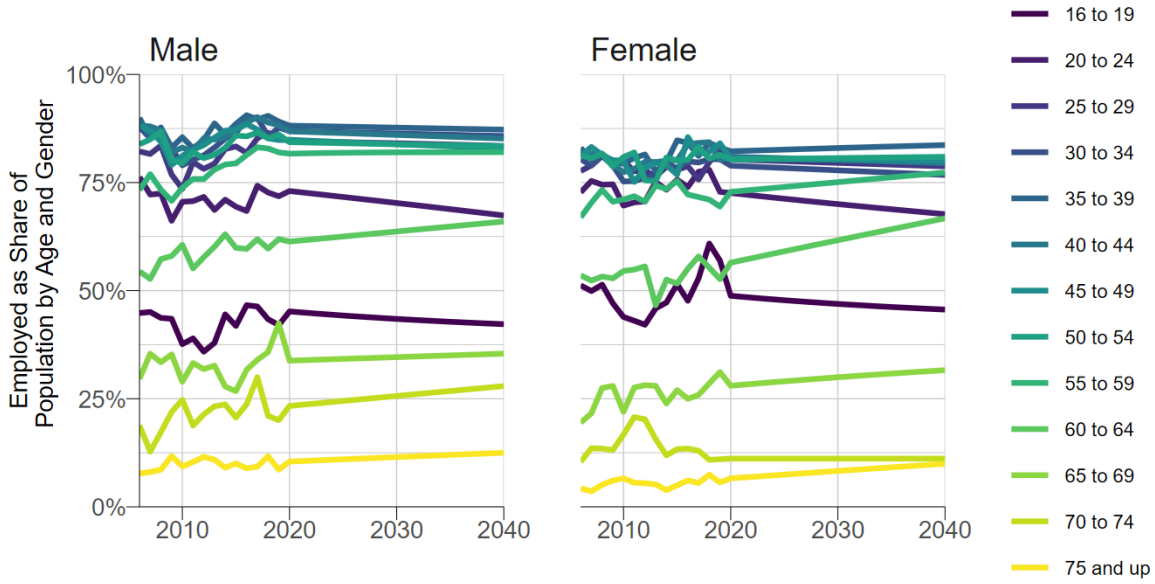
Wage income in the ACS includes wages, salaries, commissions, cash bonuses, tips, and any other money income from an employer. This income does not include in-kind payments (insurance, childcare, etc.) or reimbursements for business expenses. Wage income was grouped by age (10-year age groupings), gender, and five educational attainment groups (less than high school, high school or some college, associate degree, bachelor's degree, and graduate degree). Education was included because of its well-established causal effect on earnings (Card 1999; Harmon, Oosterbeek, and Walker 2003). The trends in educational attainment and employment were in-

corporated from a previous report (Winters, Kaur, and Otis 2024). For most wage-earners, there has been no significant trend in real, average wage income, refer to Figure 35 in the appendix.[1]

However, as seen in Figure 34 in the appendix, patterns in educational attainment are changing and will continue to change. There has been an upward trend in those who achieve a bachelor's degree, especially among women. This has been concomitant with a decline in those residents whose highest educational attainment is high school or some college.

The share of those employed by age and gender has remained relatively stable, with some notable increases in the share of employed in older age groups.

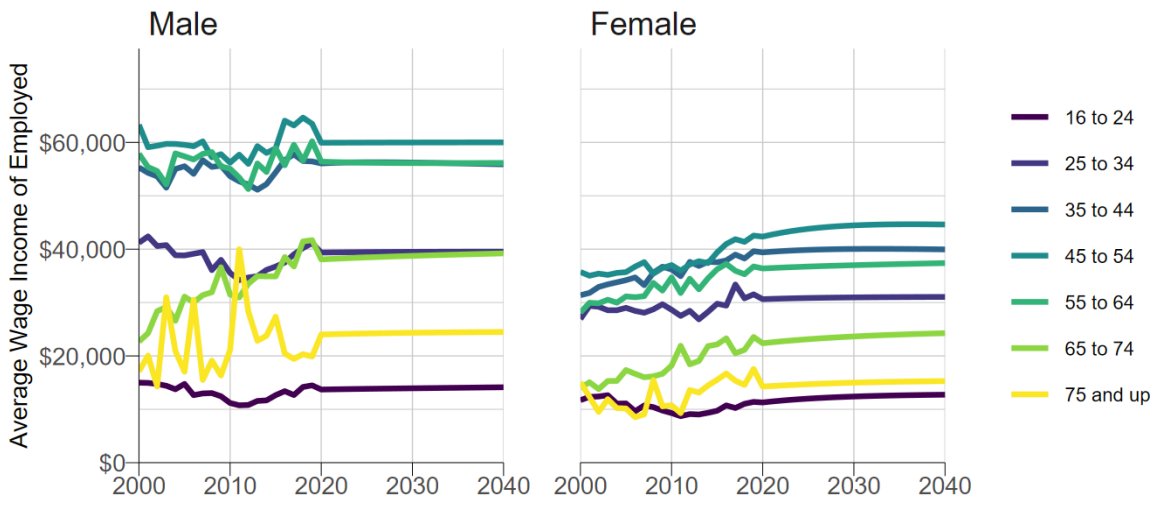
Figure 1 — Employed as share of population by age and gender.



The model uses an average wage income weighted by educational attainment, see Figure 2. For males, this model predicts a primarily flat average wage by age group. However, for most female age groups, there will be slight increases in average wage. Despite these increases in wage, the average wage of female wage-earners will still be less than their male counterparts.

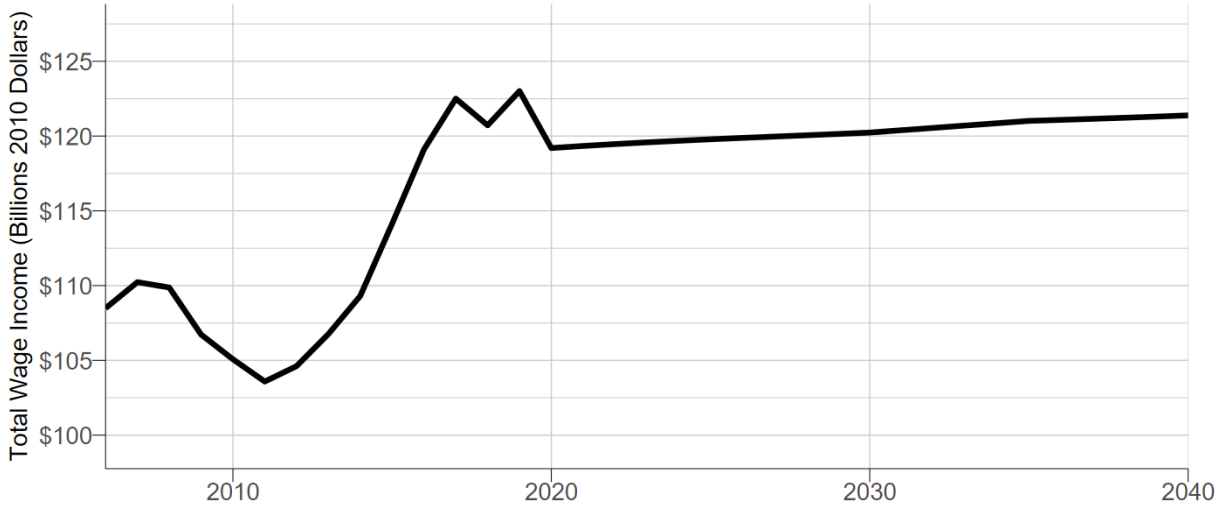
[1]Note that this wage is the average annual wage earned by an an employed individual, rather than the wage per job. Additionally, the population of employed only includes employed Wisconsin residents, excluding the commuters who reside outside of Wisconsin but are employed within the state.

Figure 2 — Average wage of employed by age and gender.



Total wage income will remain relatively constant, growing slightly from $119 billion in 2020 to $121 billion in 2040 in real terms. This is primarily due to the relatively constant number of wage earners over the projections period, as the number of new earners roughly equals the number of exits.

Figure 3 — Total wage income.



4.1.2) Business Income

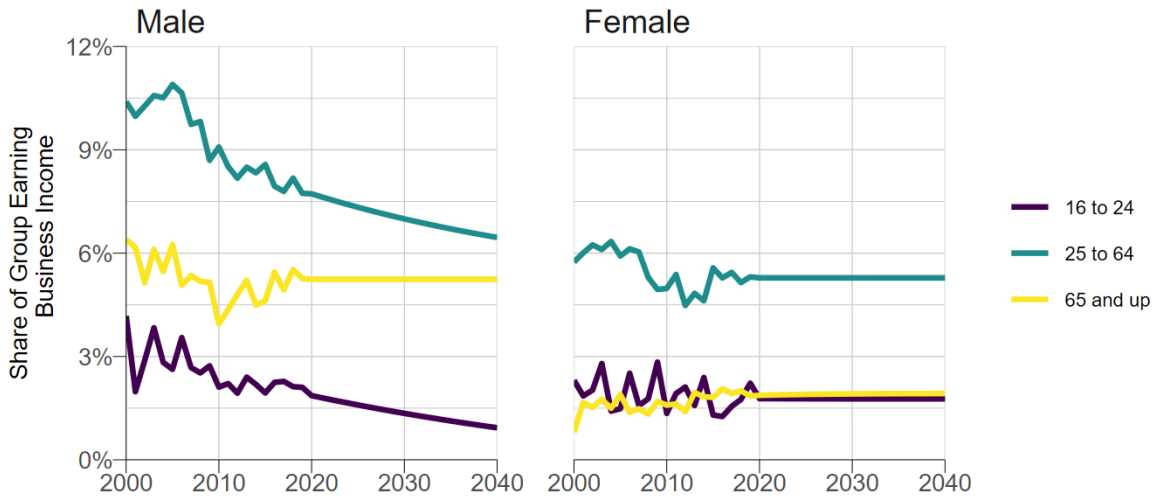
The ACS survey defines business income as the net income from non-farm business or professional practice – it includes any money earned "working for one's own concerns." (Ruggles, Flood, Sobek, Backman, Chen, Cooper, Richards, Rodgers, and Schouweiler 2024). In the case of an individual who is both an employee and an owner of an incorporated business and are paid a salary. This income is not included in business income. However, owners of unincorporated business

who pay themselves a salary are instructed to report this as business income. Some respondents may miss this distinction.[2]

These observations are in line with an observed general decline in self-employment which has been occurring since the 1950s. However, one point of ambiguity is how the rise of the "gig economy" could show up in the data and trends (Huang et al. 2020).

The most dramatic observation is the decline in the rate of men aged 25-64 who earn business income. In 2000, 10% of men 25-64 earned business income. By 2019, that number had declined to 7.8%, a decline of almost a third. By 2040, this will continue to decline to 6.5%.

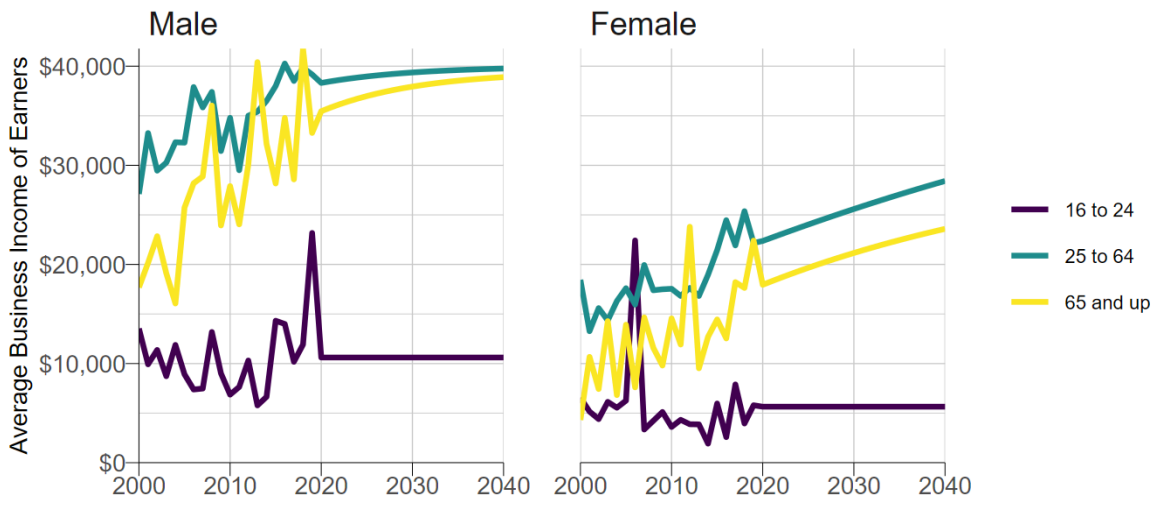
Figure 4 — Share of business income earners by age and gender.



Despite this decline in the rate, the average earned business income has increased for most groups. Business income earnings have increased in real terms for both men and women over 25. This is most readily apparent for women older than 65. In 2000, women 65 and older with business income earned $4,300. By 2019, this grew by 420% to $22,400. Even with these gains, women business earners still earn less from businesses than men.

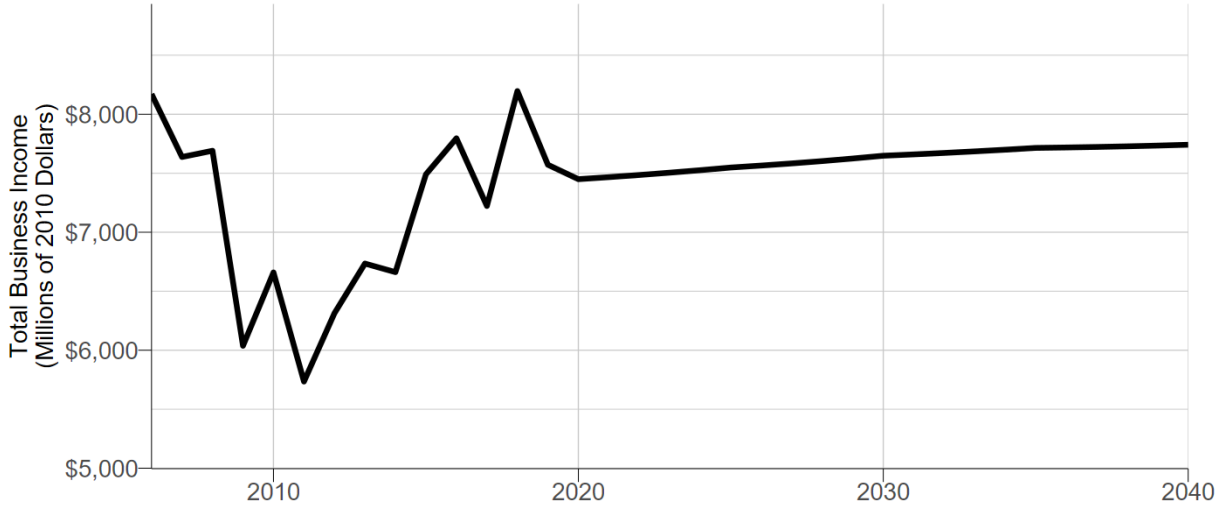
[2]Research on self-employment has been scarce and contradictory. As noted by Schweitzer and Shane, "not only do we not know the magnitude of the effect of a decline in economic output on the fraction of the people in the labor force who work for themselves, but also policy makers and researchers do not agree on the direction of those effects" (Schweitzer and Shane 2016).

Figure 5 — Share of business income earners by age and gender.



These changes balance out in total. Total personal business income will remain essentially flat. From 2020, business income will increase from $7.4 billion to $7.7 billion in 2040. This is an average 0.1% annual growth rate over twenty years.

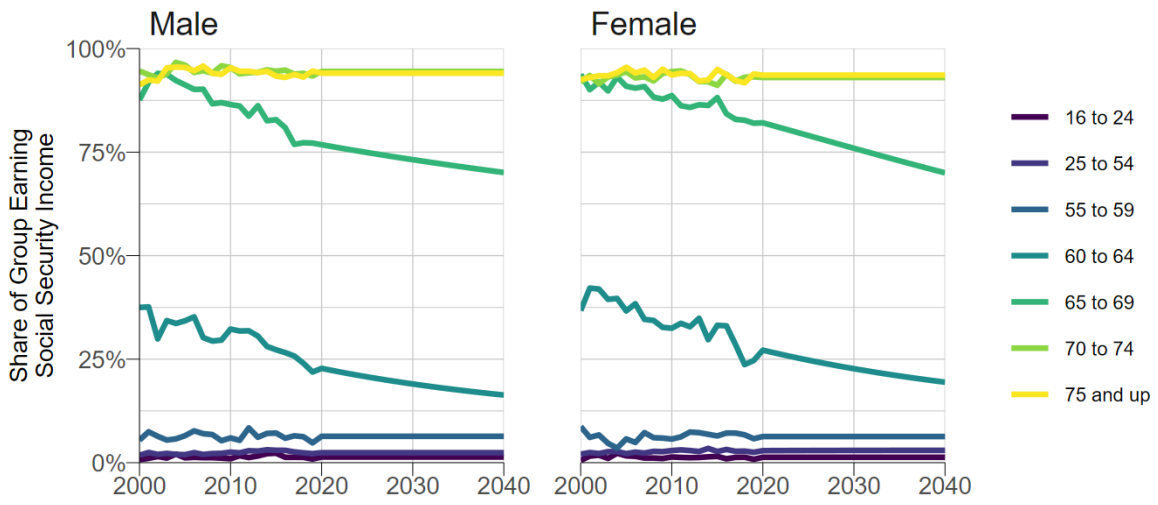
Figure 6 — Total business income.



4.1.3) Social Security Income

Social security reports how much an individual earned from Social Security pensions, survivors' benefits, disability insurance, and Railroad Retirement insurance. This category primarily affects older individuals. Social Security income by age groups reflect that (the estimates were done with a relatively finer grain of age groupings at old age).

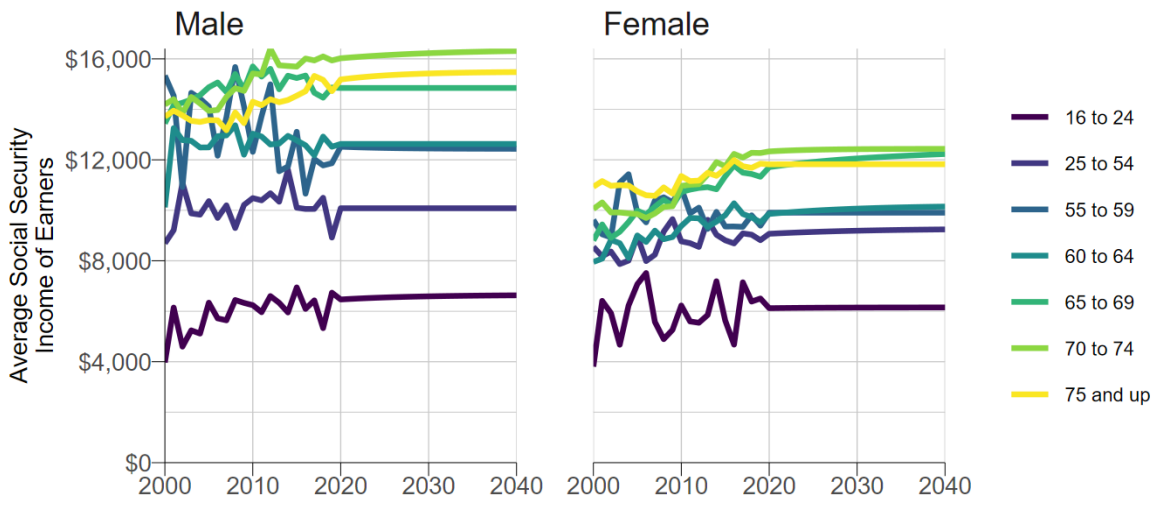
Figure 7 — Share of Social Security income earners by age and gender.



Findings show a decline in the percentage of some age groups who earn social security income. This is reflected in both males and females in their 60s. In 2000, 88% of males and 94% of females 65-69 earned social security income. That number declined to 77% and 83%, respectively, in 2020. Individuals eligible for social security retirement income used to be allowed to claim the full retirement benefit amount at age 65. That age has been progressively raised to 67 over the years, which is one possible reason for the decrease in the number of people in that age group claiming social security income. Social security income is by and large universal for the elderly, there are few factors at the present time which could change the rate of uptake of social security.

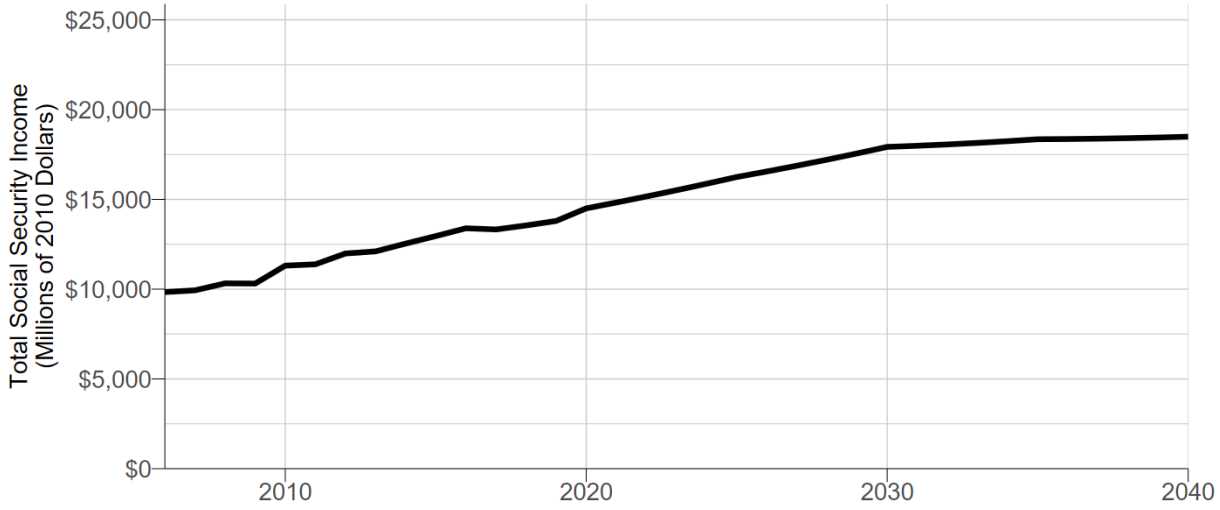
There is negligible change in the amount of social security income earned in real dollar terms. This is expected given that social security benefits are pegged to inflation. There are some slight increases in the average social security income received, especially for those in their 70s. The amount received depends on when they choose to receive payment – those who delay benefits are eligible for the full amount while those who receive payments at a younger age receive less. This would corroborate the story seen in the rate observed above – a declining rate of those in their 60s taking social security would increase the average earned social security income as they age into the older age groups when they begin to receive payment.

Figure 8 — Average Social Security Income of earners by age and gender.



In real terms, the total income earned from social security in the state has been increasing and is projected to increase. The rate of increase from 2020 to 2030 is an annual average of 2.1%, down from the 2.53% it was during the 2010s. After 2030, the annual growth rate slows to 0.31% over the next ten years as the number of Social Security entrants is roughly equal to the number of exiters.

Figure 9 — Social Security Income Total.

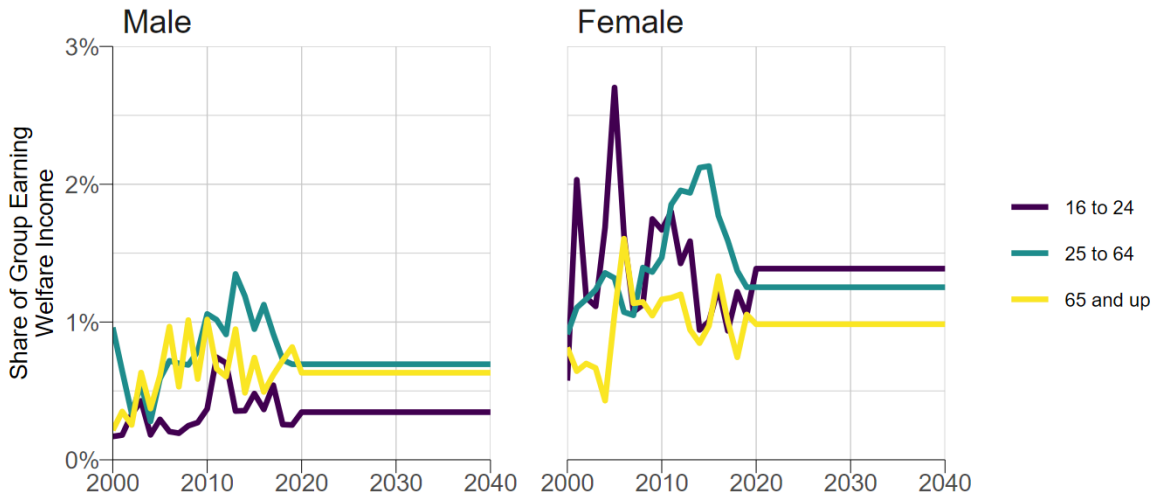


4.1.4) Welfare Income

Welfare income includes money earned from various federal and state programs like Temporary Assistance for Needy Families or General Assistance. The percentage of Wisconsinites earning money from welfare is small. Women in general are more likely than men to earn money from

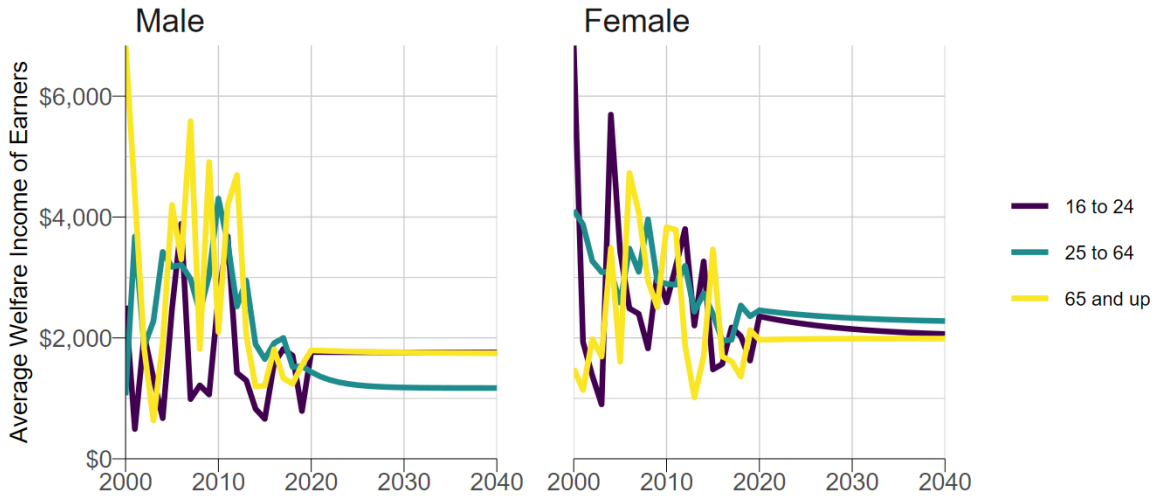
welfare. For example, 1.47% of women 25-64 earned welfare income, compared to only 0.69% of men 25-64.

Figure 10 — Share of welfare income earners by age and gender.



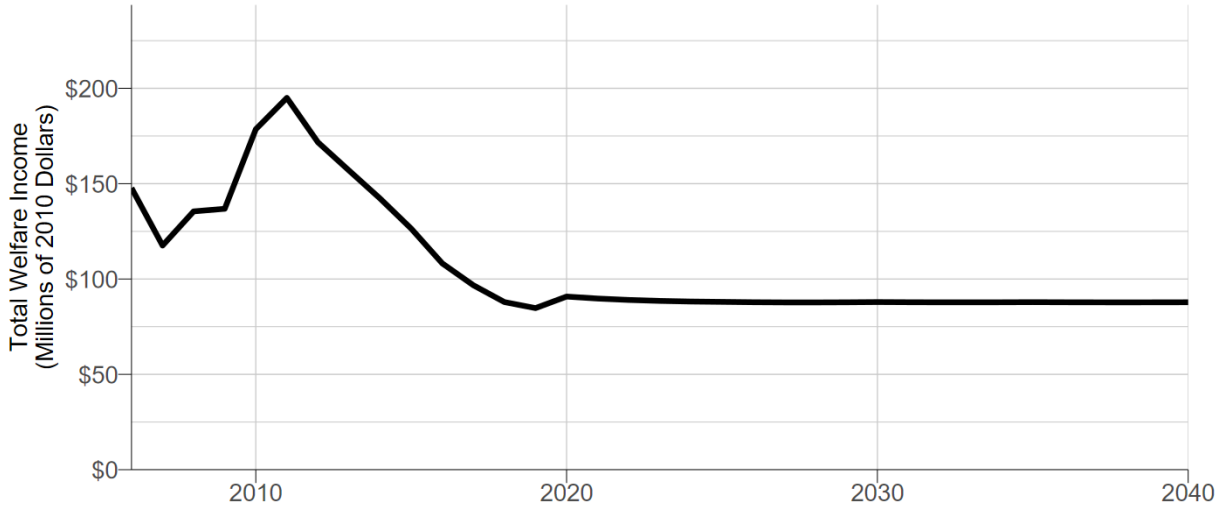
This share is relatively volatile and appears to correspond to recessions – note the increase in share earning welfare following the 2007 recession for men and women 16-24 and 25-64. However, no strong upward or downward trend was observed.

Figure 11 — Average welfare income of earners by age and gender.



Total welfare income has been declining since 2011. However, due to the difficulty in determining trends with the small population of welfare-earners, the steady-level forecasts essentially hold growth flat at 2020 levels.

Figure 12 — Total Welfare Income.

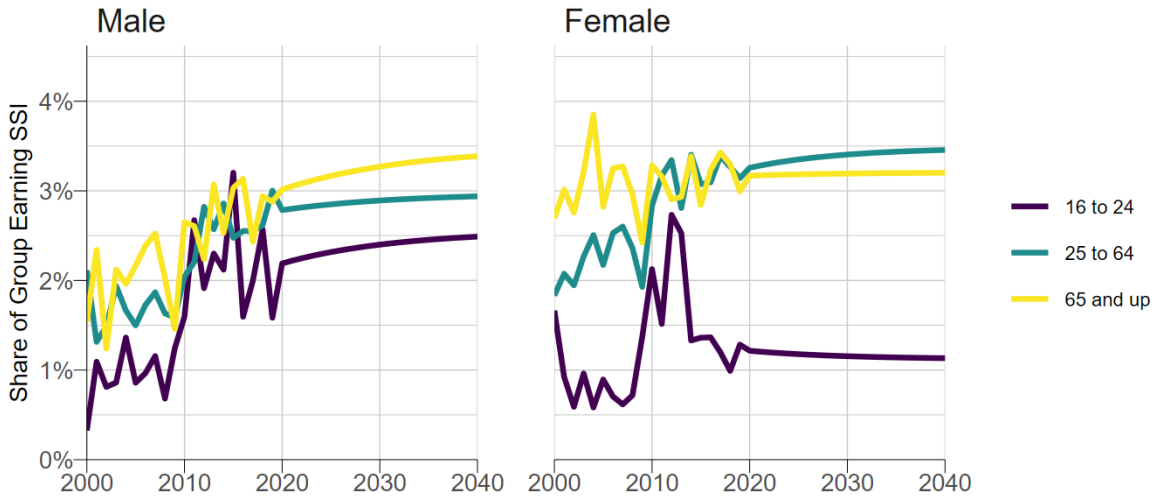


Welfare income is exogenously correlated with factors, such as federal policy, family structure, and poverty levels. The model construct allows for simulation of alternative factors.

4.1.5) Supplemental Security Income

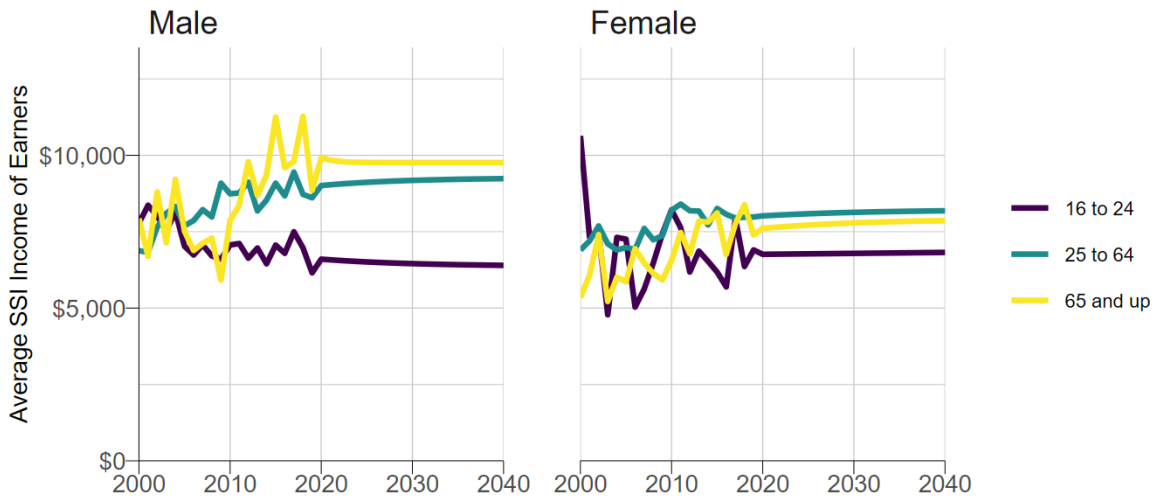
Supplemental Security Income (SSI) is a federal program which provides payments to people with disabilities and older adults who earn little or no income (Social Security Administration 2023). While a small percentage of individuals overall, there has been an increasing share of individuals earning SSI since 2000. This trend is projected to continue for most age groups, except women 16 to 24, where there has been a decline to pre-2011 levels.

Figure 13 — Share of Supplemental Security Income earners by age and gender.



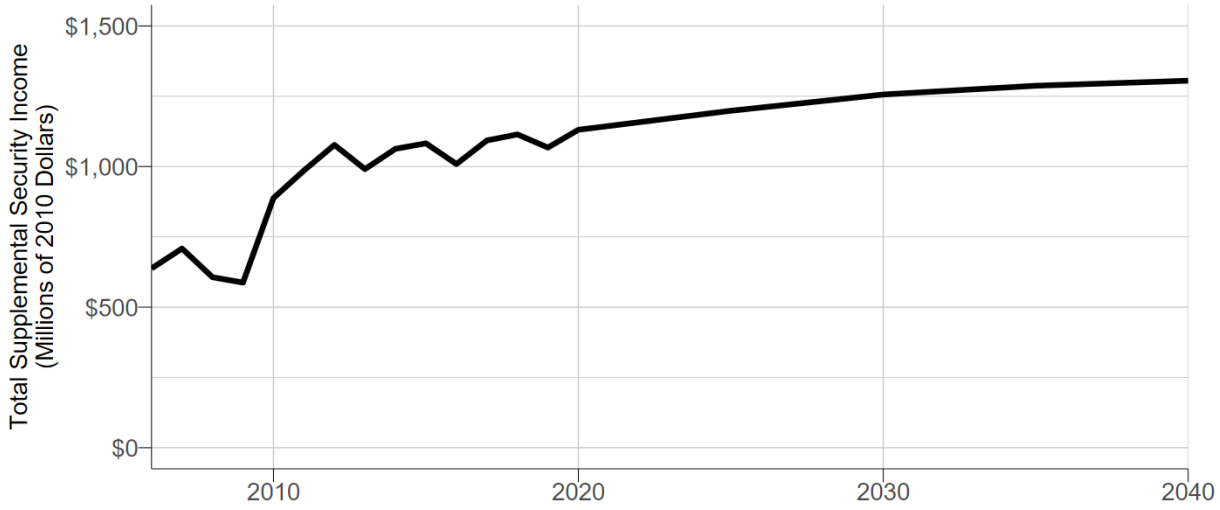
It is expected that supplemental security income will remain relatively constant. Like welfare income, SSI is subject to legislative and policy changes that determine both eligibility and SSI amount.

Figure 14 — Average Supplemental Security Income of earners by age and gender.



Overall, total SSI for the state has been steadily increasing since 2011. These projections carry forward that trend.

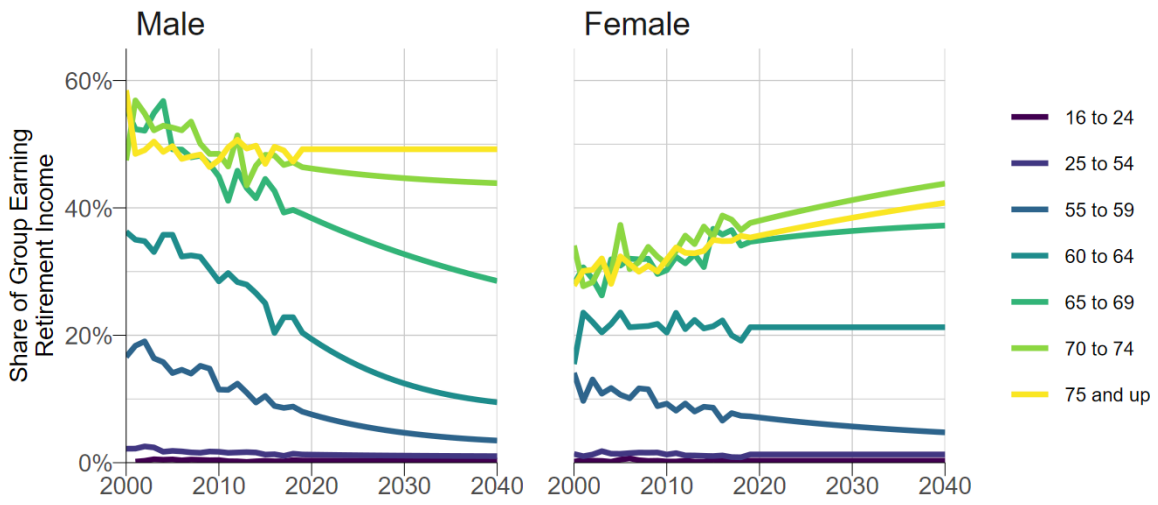
Figure 15 — Supplemental Security Income Total.



4.1.6) Retirement Income

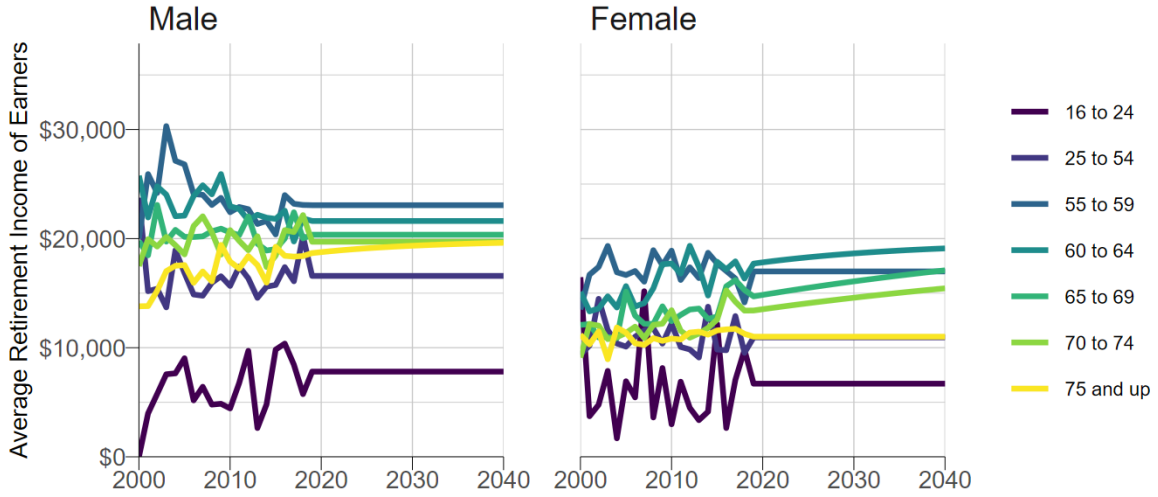
The ACS defines retirement income as money earned from retirement as well as survivor and disability pensions, excluding Social Security. This is an income category primarily affecting older individuals. This report used age groups which provided further granularity above age 55.

Figure 16 — Share of retirement income earners by age and gender.



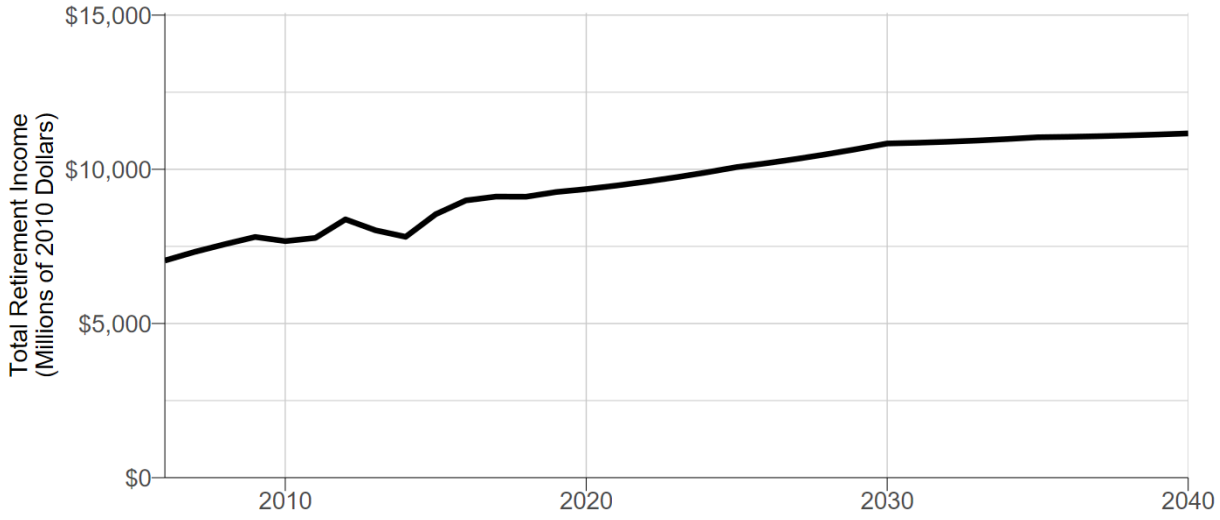
The most dramatic change is the decline in share of men in their 50s and 60s earning retirement income. For example, men 60-64 earning retirement income decreased from 36% in 2000 to 20% by 2019. This change is likely driven by the increasing labor force participation for that group. In contrast, there has been a slight increase in the share of retirement earners for older women. One hypothesis for this is that an increasing number of women who entered the workforce during earlier decades, earning retirement savings and pensions, are now retiring. The effects of changing pension plan constructs, such as the movement from “defined pensions” to “defined contributions” may also play a role (Coile 2016).

Figure 17 — Average Retirement Income of earners by age and gender.



For men, there are no significant changes in real retirement income of those retirement earners. There have been some slight increases in retirement income for some female age cohorts.

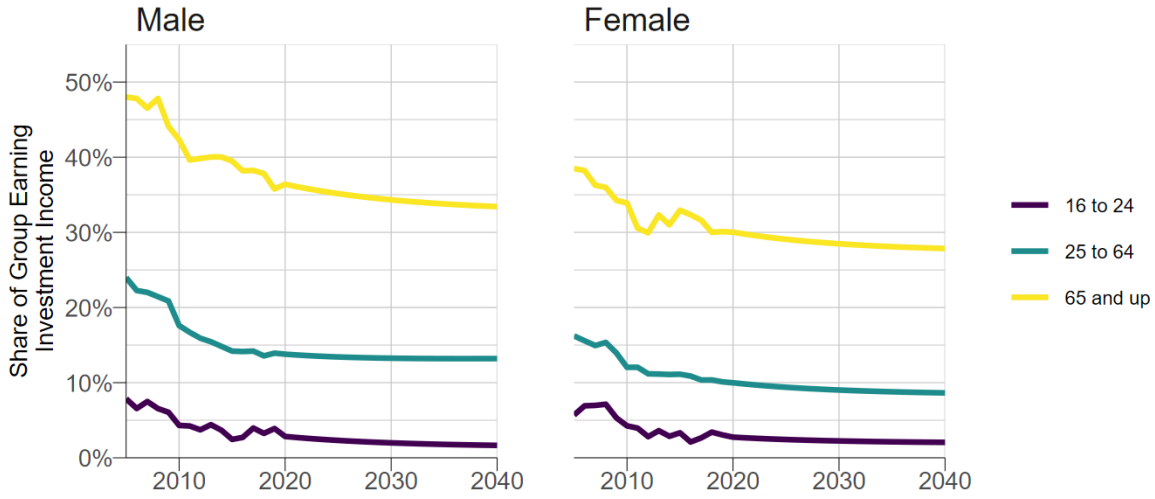
Figure 18 — Retirement income total.



4.1.7) Investment Income

The ACS definition of investment income covers a variety of sources: “an estate or trust, interest, dividends, royalties, and rents” (Ruggles, Flood, Sobek, Backman, Chen, Cooper, Richards, Rodgers, and Schouweiler 2024). Across all genders and age groups there has been a decline in the share of individuals earning income from investment sources. However, these forecasts do not include the first few years of the 2020s which saw an expansion in the number of Americans owning stocks, driven by a variety of factors (Miao 2023).

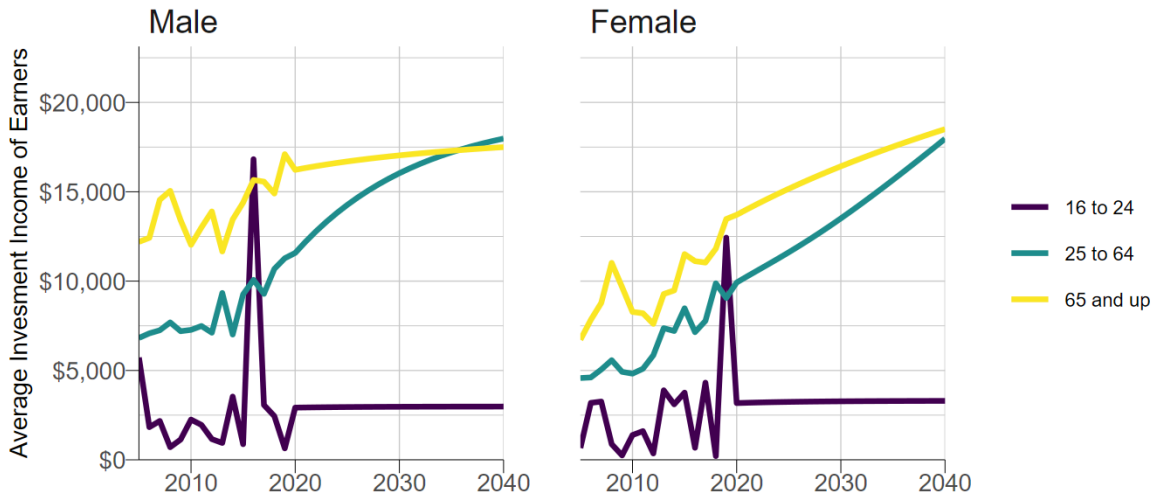
Figure 19 — Share of investment income earners by age and gender.



The share of individuals earning income from investments has been declining, while investment income has been increasing dramatically. The rate of growth in investment income is particularly

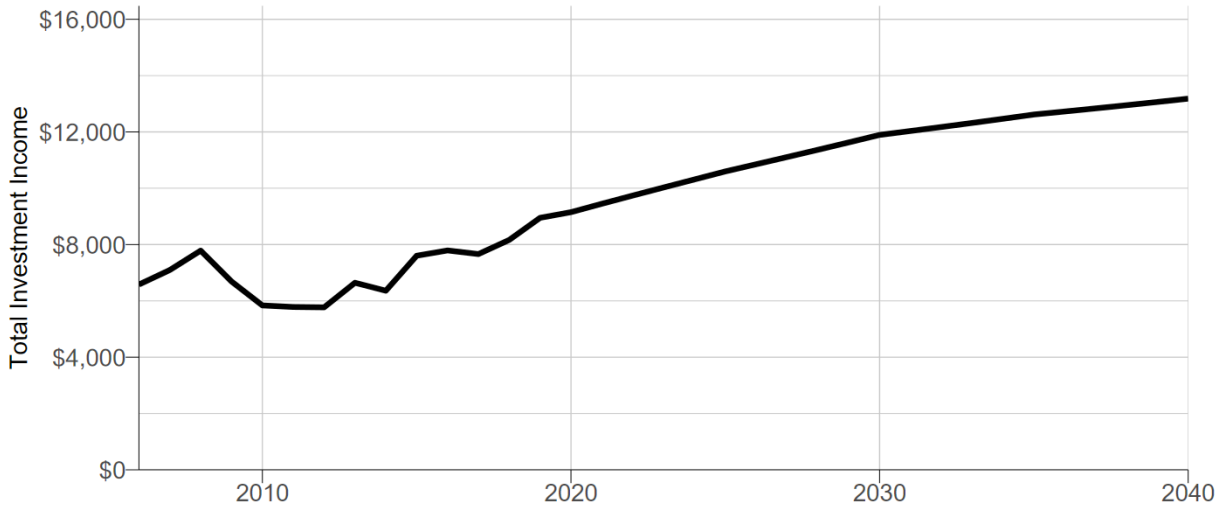
noticeable for women, where income parity between male and female investment earners aged 25 to 64 was reached in 2019.

Figure 20 — Average investment income of earners by age and gender.



Total investment income is projected to grow in real terms. This is largely driven by the increasing population age coupled with a greater share of older individuals earning investment income.

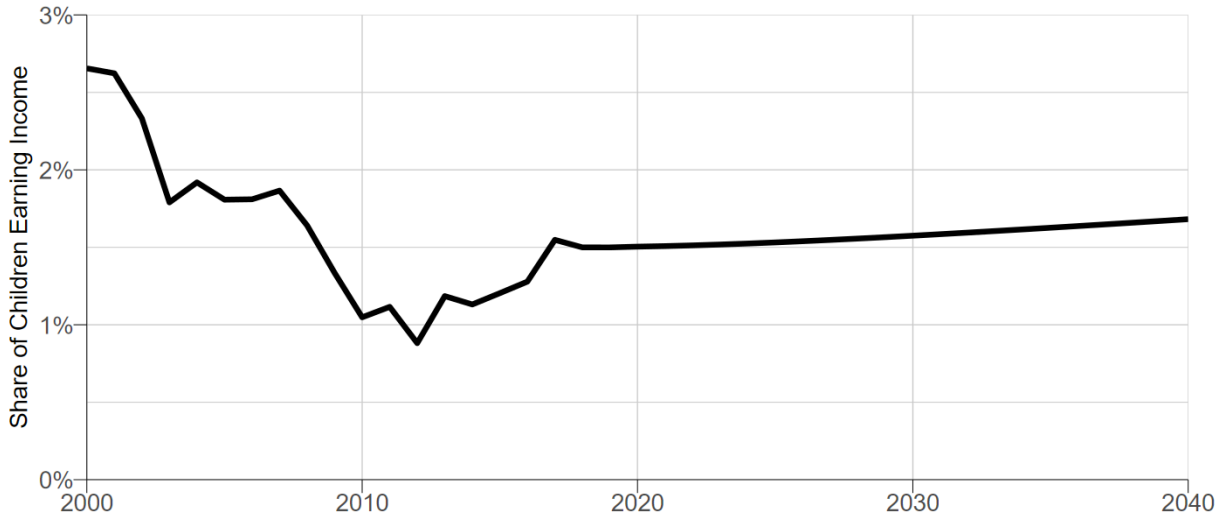
Figure 21 — Investment income Total.



4.1.8) Child Income

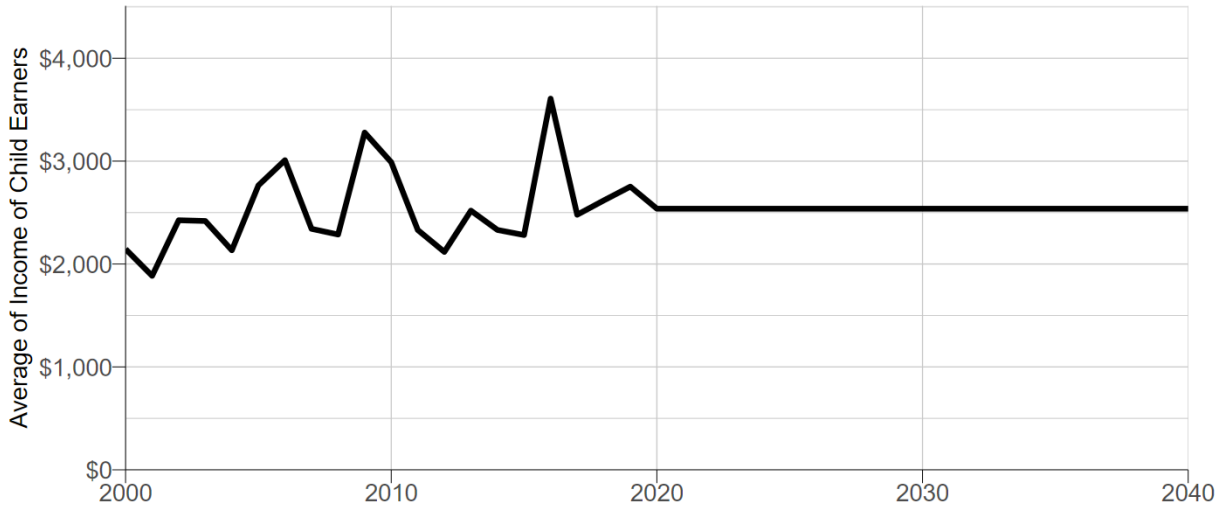
All other income categories in this report deliberately exclude the age group from 0 to 15. Because so few children earn income, this income category combines all sources of income earned by children up to 15. From 2000 to 2011, the share of children earning income declined followed by a slight increase. This report forecasts that share to increase slightly, but not to the highs of the early 2000s.

Figure 22 — Share of children (age 0-15) earning income.



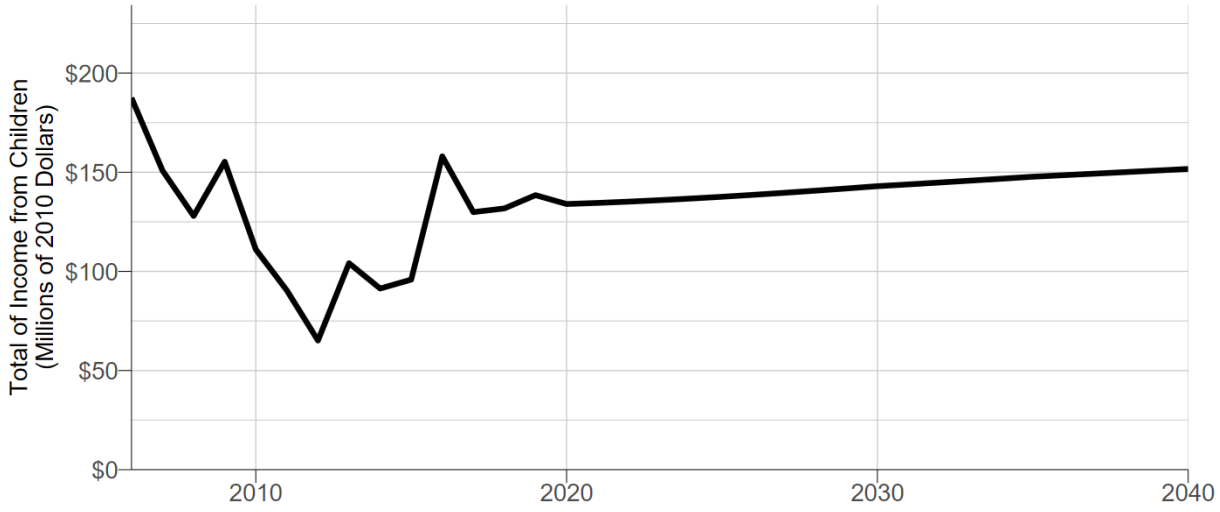
However, the real income earned by children is, perhaps unsurprisingly, quite small, and somewhat volatile. No clear trend is present.

Figure 23 — Average income of children (age 0-15) who earn income.



Compared to income earned by adults, the total earned by children is insignificant. With no change in real terms for the average income earned by children, the total income is driven by the projected slight increase in share of children earning income as well as the increase in the total population of children.

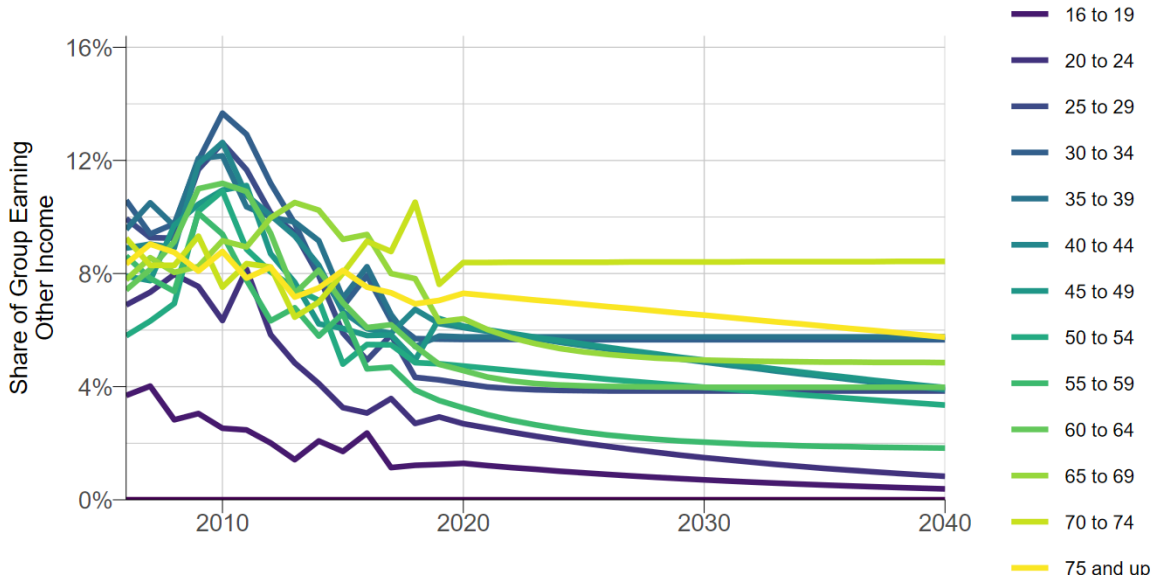
Figure 24 — Total income earned by children.



4.1.9) Other Income

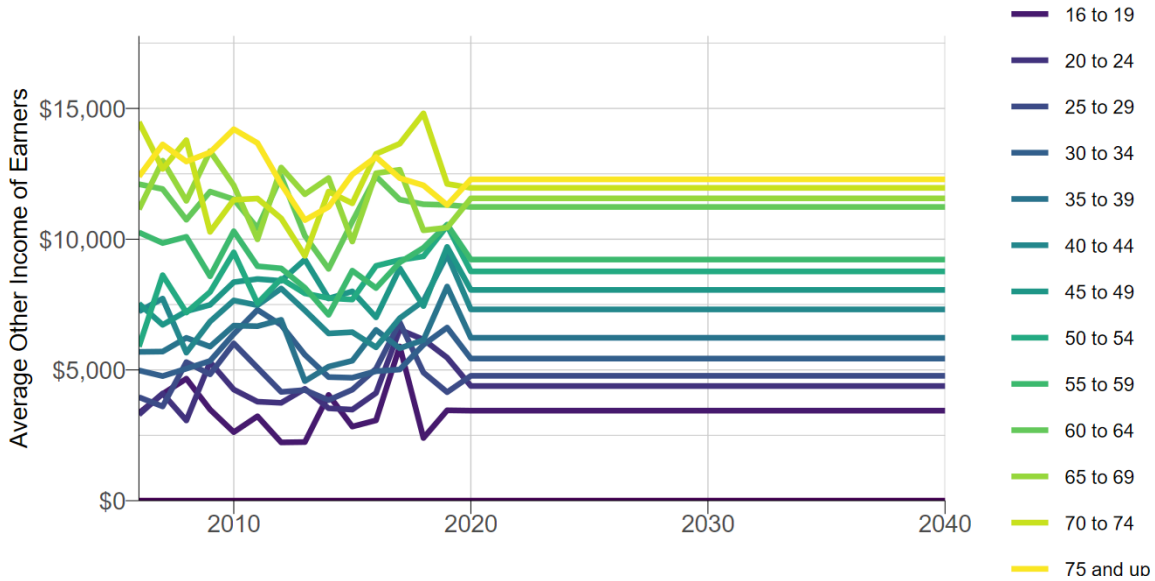
The final, most ambiguous source is “other income.” This represents the residual income that makes up the difference between total income and the combined amount of specified data sources. According to a Census report, this likely captures “some retirement income and government transfer income as well as private interpersonal transfers (alimony, child support, etc.)” (Rothbaum 2015).

Figure 25 — Share of other income earners by age.



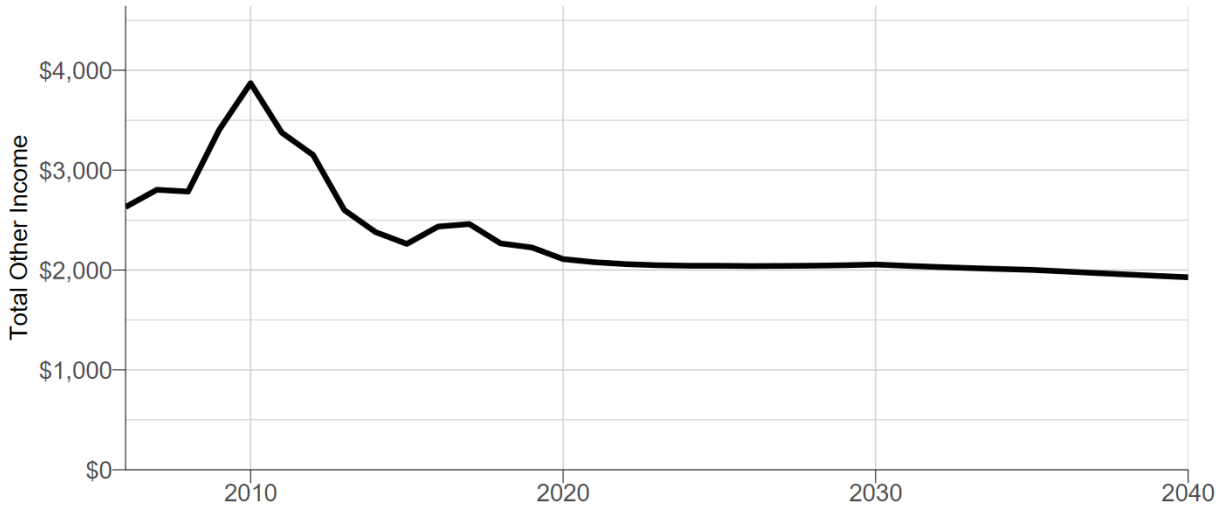
The income share and amount did not vary noticeably by gender. For age groups, the share was found to decline since 2009. However, there were no significant trends for the amount earned by those with other income. The amount earned is directly proportional to age, with each successive age group earning more than the younger.

Figure 26 — Average other income of earners by age.



While an older population will earn more from other income sources, the declining rates overwhelm this effect. In total, other income is projected to decline slightly over the next two decades.

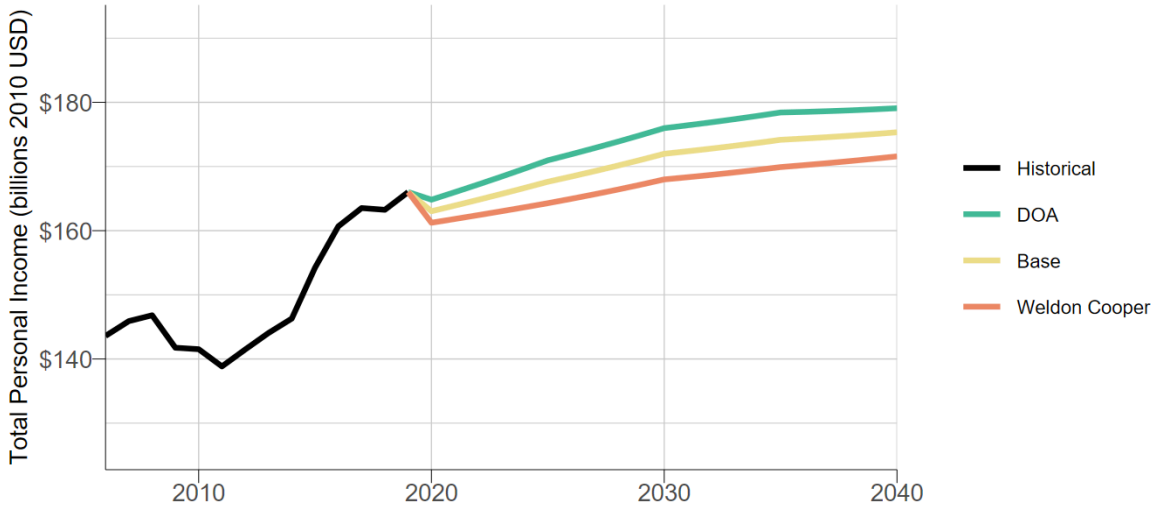
Figure 27 — Other income total.



4.2) Total Personal Income

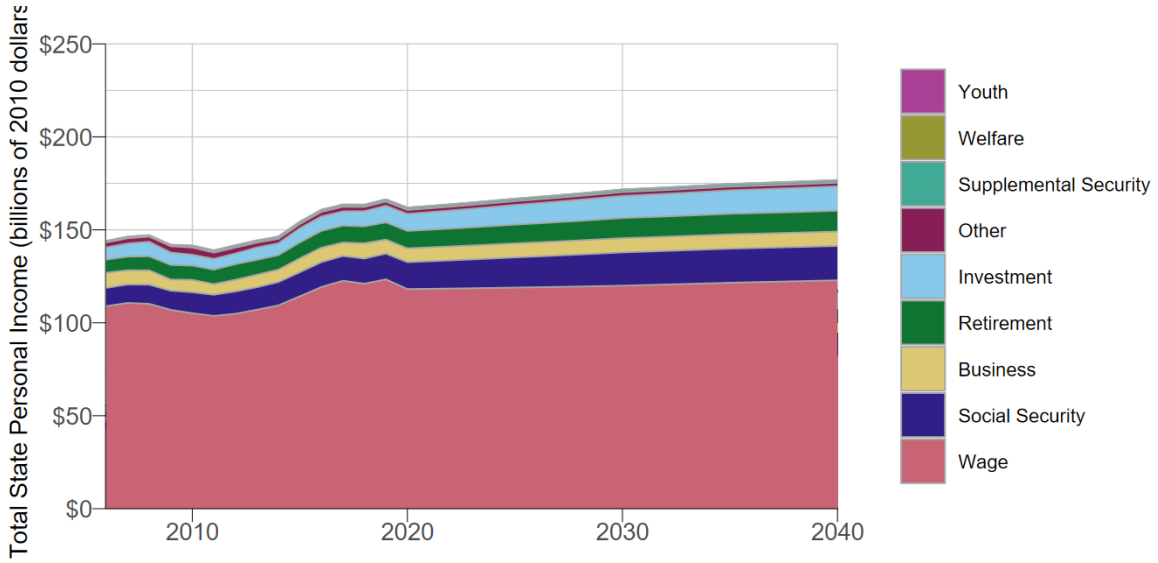
The sum of the components of income yields total personal income. Total personal income is affected by which population scenario is chosen; larger populations yield larger total income in the state. In 2030, the total personal income using Wisconsin Department of Administration (DOA) projections is larger than the total personal income using the Weldon Cooper Center population projections by $7.99 billion dollars (4.76%).

Figure 28 — Comparison of total personal income by population model.



Earnings make up the bulk of personal income. Social Security payments are significant and will increase over time. Investment earnings constitute a significant share of personal income and will increase with the ageing population reaping rewards of early investing. Earnings from sources other than wages, social security, business, retirement, and investment are relatively small.

Figure 29 — Components of total personal income over time.



The composition of personal income will only change slightly over the projection period. The income sources which will have the largest changes are wages and social security. In 2010, Wages made up 74% of the total personal income in 2010. By 2040, that share will decline to 69% of the total. In contrast, Social Security payments grow from an 8% share in 2010 to 11% in 2040.

Figure 30 — Components of total personal income by percentage of total.

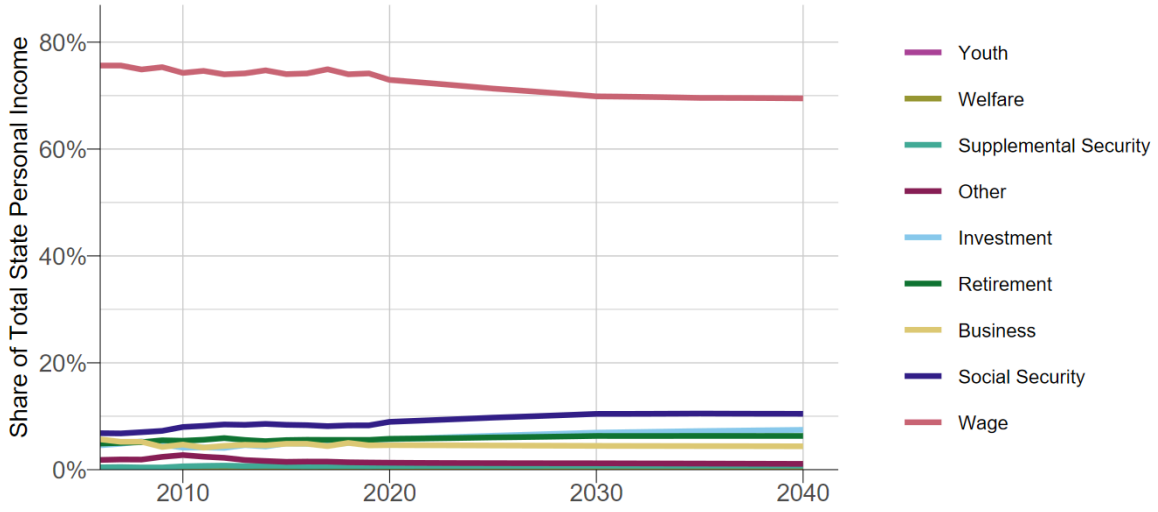
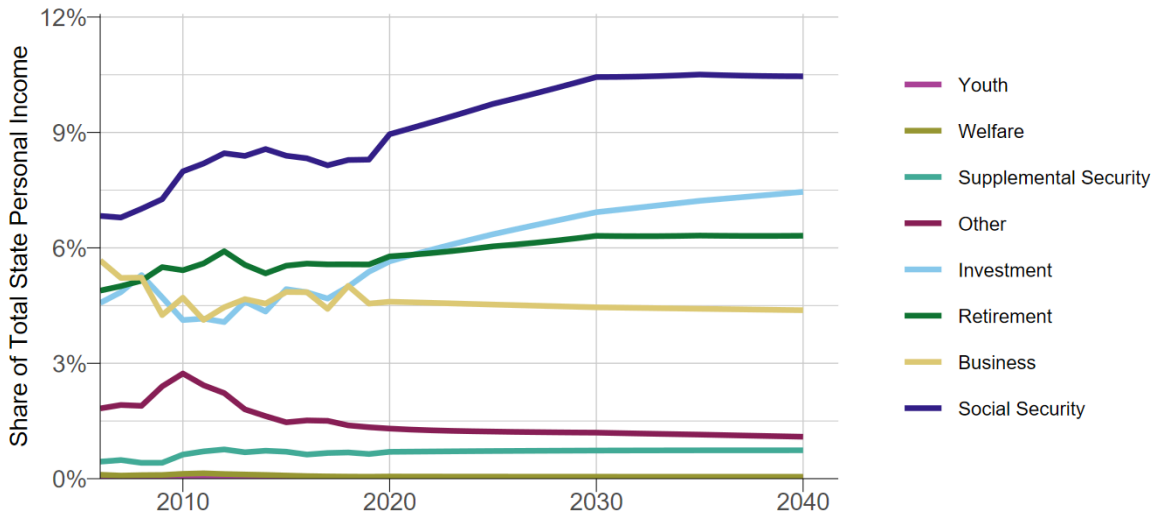


Figure 31 — Components of total personal income by share (excluding wages).



4.3) Per capita Income

Total per capita personal income is projected to increase, but at a lower rate than it has previously. In 2020, per capita personal income was $27,352. By 2040, this is projected to be $28,312. This value does not vary significantly based on which population projection source is used, as seen in Table 1. For example, in 2040, per capita total personal income was $28,234 using the DOA population projections, only $161 lower than the estimate using the Weldon Cooper Center population projections.

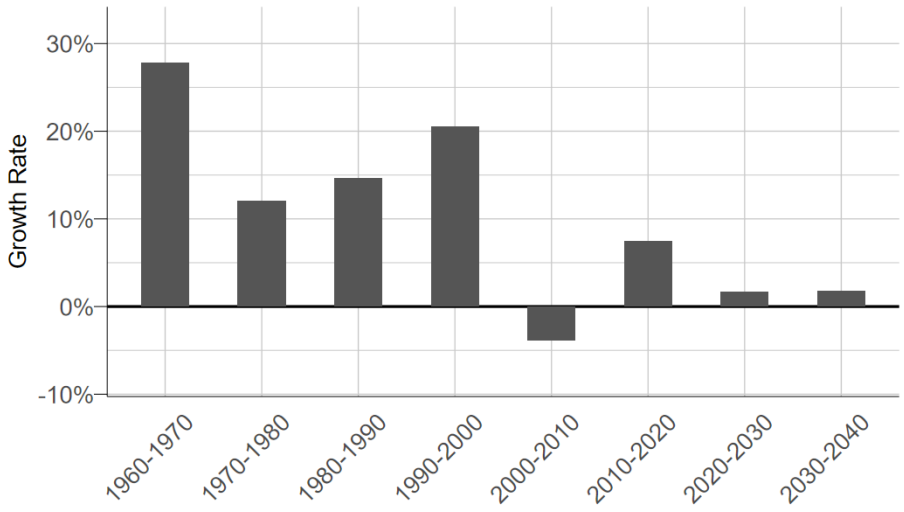
Table 1 — Per capita income by population model.

Year	Base	Weldon Cooper	DOA
2020	$27,352	$27,383	$27,323
2030	$27,810	$27,884	$27,740
2040	$28,312	$28,395	$28,234

As seen in Figure 33, per capita income grew rapidly in the 20th century. After the post-war economic boom, the growth during the 1990s was at least partially a result of productivity increases due to rapid development and deployment of information technology (Fernald and Wang 2015).

Figure 32 — Population and income growth by decade.

Figure 33 — Per capita income growth by decade.



However, that came to an end with The Great Recession, which caused a decline in per capita wages from 2000 to 2010. Although per capita income grew in the 2010s, it did not reach the growth rate seen during the 20th century. Looking ahead, this model indicates that Wisconsin will not see even that level of growth in the future. If current trends continue, Wisconsin will experience an unprecedented level of long term stagnation in per capita personal income. However, this model does not account for unforeseen or dynamic changes to the economy. It is entirely possible that the economic stresses of the worker shortage will spur increases in wages or development of labor-saving technology.

5) Conclusion

As Wisconsin's population ages and leaves the active workforce, income composition will change. Real wage income will remain relatively constant, growing from $119 billion in 2020 to $121 billion in 2040 as a significant portion of the workforce moves from earned income to transfer payments.

In real terms, the total income earned from social security in the state has been increasing and is projected to continue to increase, due to the increasing number of people earning Social Security payments as the population ages (Social Security payments are assumed to remain flat in real dollar terms).

Slower personal income growth suggests slower consumption and savings gains, which directly translate into muted GDP growth. By definition, decreasing propensity for saving will affect investment levels. The extent of the tradeoff will depend on inflation, investment returns, and increased costs for expenditures such as health care and housing.

Slower income per capita growth may also affect relative class living standards and the support for public infrastructure investment.

This report highlights how slowing labor force growth impacts personal and per capita income. Slower income growth can be seen in all population cases presented.

Further research is required to determine the broader economic effects on consumption, investment, infrastructure, and fiscal policy.

6) Appendix

Figure 34 — Share of employed by highest educational attainment by age and gender.

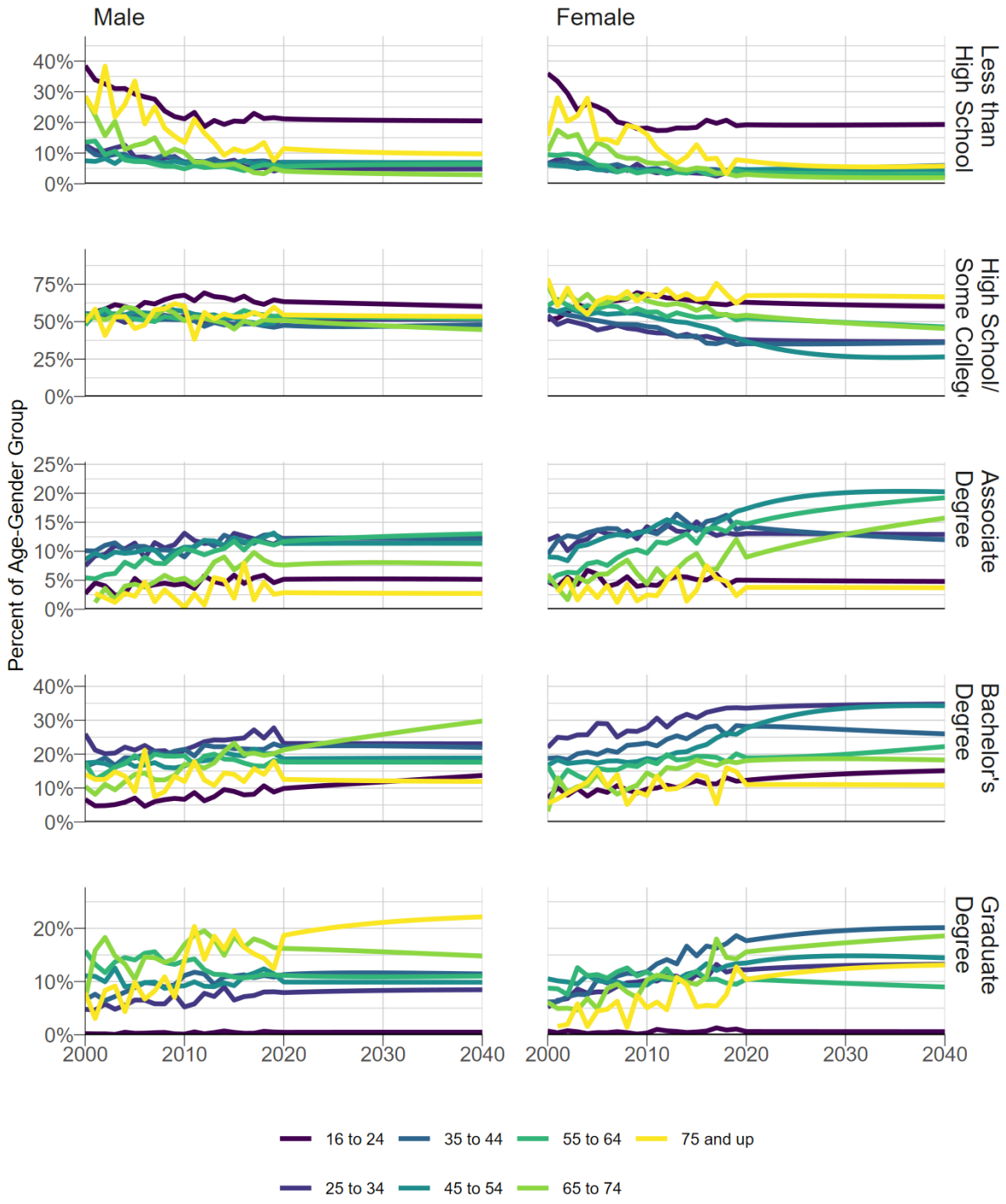


Figure 35 — Average wage of employed by age, gender, and education.

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