The Wage Pyramid: Wage Variance in Indiana

No one is surprised that an experienced, successful attorney draws higher wages than a legal secretary or a law clerk. A store manager takes home a bigger paycheck than the employees working the front counter of a fast-food restaurant. Experience pays. Training and possessing skills in demand do too. Entry-level workers typically form the base of a wage pyramid. As the pyramid grows higher, it reflects the shrinking numbers of employees with more experience, training, skills and ultimately wages. The Indiana Department of Workforce Development (DWD) works to close wage and skill gaps with a mission to raise workers up one level. DWD’s goals include raising Hoosier per capita income and the skills of our workforce (see Figure 1).

In collaboration with the Bureau of Labor Statistics, DWD operates the Occupational Employment Statistics (OES) program and produces survey-based wage estimates for 750 Indiana occupations. The OES survey includes all industries and presents estimates in terms of wages that represent the arithmetic average, the 10th percentile, the first quartile, the median, the third quartile and the 90th percentile. Examination of the wages of those earning the least (the lowest 10 percent of wages) and the most (the highest 10 percent) provides a measure of the amount of wage variance. For more information about OES, or to search for state and local occupation or wage data, check out Hoosiers by the Numbers at www.hoosierdata.in.gov/nav.asp?id=8.

Measuring the Wage Distribution

For all occupations in Indiana, the average wage is $34,080. However, a wage you hear more often is the median wage for Indiana, which was $27,670 in 2005. The median is a more useful measure of central tendency, illustrating the typical wage for Hoosier workers. This is the wage of the “middle” worker—50 percent of workers earn wages vary within and across various occupational families or groups. The OES survey includes all industries and presents estimates in terms of wages that represent the arithmetic average, the 10th percentile, the first quartile, the median, the third quartile and the 90th percentile. Examination of the wages of those earning the least (the lowest 10 percent of wages) and the most (the highest 10 percent) provides a measure of the amount of wage variance. For more information about OES, or to search for state and local occupation or wage data, check out Hoosiers by the Numbers at www.hoosierdata.in.gov/nav.asp?id=8.
less than this amount, and 50 percent earn more. The 10th percentile wage for all occupations in Indiana is $14,710, reflecting that 10 percent of workers earn this amount or less. In contrast, the 90th percentile wage for all occupations in Indiana is $58,860. This tells us that only 10 percent of workers in Indiana earn wages of that amount or more. Overall, the Hoosier wage earner at the 90th percentile makes four times the income of the wage earner at the 10th percentile. The higher the 90/10 ratio (in this case 4.0), the greater the variance between wages paid at each end of the distribution. Table 1 displays the ratio, or variance, between wages within each occupational group.

The 90/10 ratio and the level of variance among wages varies widely across occupational groups. For occupations in the legal sector, the wage earner at the 90th percentile earns $116,340, 481 percent of the $24,200 income the worker at the 10th percentile earns, with a ratio of 4.81. In contrast, the ratio of food preparation and serving-related occupations is 1.96. The largest contrast can be seen when we examine wages across occupational groups.

**TABLE 1: WAGE PYRAMIDS BASED ON 90/10 RATIOS BY OCCUPATIONAL GROUPS, 2005**

<table>
<thead>
<tr>
<th>Occupational Groups</th>
<th>Total Employment</th>
<th>Annual Mean</th>
<th>10th Percentile</th>
<th>Median</th>
<th>90th Percentile</th>
<th>90/10 Ratio</th>
<th>Number of Workers in the 10 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Occupational Groups</td>
<td>2,891,360</td>
<td>$34,080</td>
<td>$14,710</td>
<td>$27,670</td>
<td>$58,860</td>
<td>4.00</td>
<td>289,136</td>
</tr>
<tr>
<td>Legal</td>
<td>12,130</td>
<td>$58,300</td>
<td>$24,200</td>
<td>$44,530</td>
<td>$116,340</td>
<td>4.81</td>
<td>1,213</td>
</tr>
<tr>
<td>Sales and Related</td>
<td>285,420</td>
<td>$30,130</td>
<td>$13,060</td>
<td>$20,670</td>
<td>$59,090</td>
<td>4.52</td>
<td>28,542</td>
</tr>
<tr>
<td>Arts, Design, Entertainment, Sports and Media</td>
<td>29,640</td>
<td>$34,430</td>
<td>$13,540</td>
<td>$29,980</td>
<td>$59,530</td>
<td>4.40</td>
<td>2,964</td>
</tr>
<tr>
<td>Management</td>
<td>113,130</td>
<td>$77,380</td>
<td>$33,940</td>
<td>$67,350</td>
<td>$139,750</td>
<td>4.12</td>
<td>11,313</td>
</tr>
<tr>
<td>Education, Training and Library</td>
<td>163,970</td>
<td>$38,320</td>
<td>$16,740</td>
<td>$34,400</td>
<td>$64,560</td>
<td>3.86</td>
<td>16,397</td>
</tr>
<tr>
<td>Life, Physical and Social Science</td>
<td>18,960</td>
<td>$53,640</td>
<td>$26,320</td>
<td>$44,030</td>
<td>$100,060</td>
<td>3.80</td>
<td>1,896</td>
</tr>
<tr>
<td>Health Care Practitioners and Technical</td>
<td>151,500</td>
<td>$52,710</td>
<td>$23,480</td>
<td>$43,940</td>
<td>$85,910</td>
<td>3.66</td>
<td>15,150</td>
</tr>
<tr>
<td>Business and Financial Operations</td>
<td>89,140</td>
<td>$50,230</td>
<td>$24,740</td>
<td>$45,500</td>
<td>$81,760</td>
<td>3.30</td>
<td>8,914</td>
</tr>
<tr>
<td>Protective Service</td>
<td>54,170</td>
<td>$31,230</td>
<td>$15,470</td>
<td>$28,790</td>
<td>$50,770</td>
<td>3.28</td>
<td>5,417</td>
</tr>
<tr>
<td>Transportation and Material Moving</td>
<td>260,500</td>
<td>$28,950</td>
<td>$14,730</td>
<td>$25,810</td>
<td>$46,980</td>
<td>3.19</td>
<td>26,050</td>
</tr>
<tr>
<td>Computer and Mathematical</td>
<td>37,200</td>
<td>$54,940</td>
<td>$28,150</td>
<td>$52,120</td>
<td>$87,040</td>
<td>3.09</td>
<td>3,720</td>
</tr>
<tr>
<td>Construction and Extraction</td>
<td>140,000</td>
<td>$40,160</td>
<td>$21,940</td>
<td>$37,790</td>
<td>$62,850</td>
<td>2.86</td>
<td>14,000</td>
</tr>
<tr>
<td>Installation, Maintenance and Repair</td>
<td>132,820</td>
<td>$37,710</td>
<td>$20,340</td>
<td>$35,450</td>
<td>$57,610</td>
<td>2.83</td>
<td>13,282</td>
</tr>
<tr>
<td>Architecture and Engineering</td>
<td>47,710</td>
<td>$57,220</td>
<td>$31,440</td>
<td>$54,530</td>
<td>$88,080</td>
<td>2.80</td>
<td>4,771</td>
</tr>
<tr>
<td>Production</td>
<td>400,680</td>
<td>$31,430</td>
<td>$18,220</td>
<td>$28,660</td>
<td>$50,920</td>
<td>2.79</td>
<td>40,068</td>
</tr>
<tr>
<td>Community and Social Services</td>
<td>30,180</td>
<td>$33,880</td>
<td>$19,750</td>
<td>$31,120</td>
<td>$52,740</td>
<td>2.67</td>
<td>3,018</td>
</tr>
<tr>
<td>Office and Administrative Support</td>
<td>450,180</td>
<td>$27,710</td>
<td>$16,280</td>
<td>$25,540</td>
<td>$43,050</td>
<td>2.64</td>
<td>45,018</td>
</tr>
<tr>
<td>Farming, Fishing and Forestry</td>
<td>2,780</td>
<td>$25,490</td>
<td>$15,030</td>
<td>$22,380</td>
<td>$39,340</td>
<td>2.62</td>
<td>278</td>
</tr>
<tr>
<td>Building and Grounds Cleaning and Maintenance</td>
<td>92,550</td>
<td>$21,640</td>
<td>$13,760</td>
<td>$19,750</td>
<td>$32,750</td>
<td>2.38</td>
<td>9,255</td>
</tr>
<tr>
<td>Personal Care and Service</td>
<td>58,340</td>
<td>$19,660</td>
<td>$12,460</td>
<td>$17,810</td>
<td>$29,050</td>
<td>2.33</td>
<td>5,834</td>
</tr>
<tr>
<td>Health Care Support</td>
<td>64,340</td>
<td>$23,590</td>
<td>$16,170</td>
<td>$21,870</td>
<td>$33,290</td>
<td>2.06</td>
<td>6,434</td>
</tr>
<tr>
<td>Food Preparation and Serving Related</td>
<td>256,020</td>
<td>$16,460</td>
<td>$11,750</td>
<td>$15,170</td>
<td>$23,010</td>
<td>1.96</td>
<td>25,602</td>
</tr>
</tbody>
</table>

Note: Yellow highlighted occupations indicate the three occupational groups with the highest wage earners at the 90th percentile; blue highlighted cells indicate the three lowest wage earners at the 90th percentile.

Source: Indiana’s May 2005 Occupational Employment Survey

“The 90/10 wage ratios are highest in legal occupations, where those earning the top 90 percent make nearly five times the wages of those earning the lowest 10 percent. Meanwhile, for food preparation and serving workers, top wages are less than twice as much as the lowest wages.”
groups. For example, the ratio of the 10th percentile wage earners in food preparation occupations and the 90th percentile wage earners in management occupations is 11.9.

**Recent Trends and a National Comparison**

The 90/10 ratio has been used as a measure of income variance by the Bureau of Labor Statistics (BLS) since 1967. The BLS measure is based on the Current Population Survey (CPS) and is broken out by gender. Changes in data collection over the years make it difficult to compare data before 1992. According to the CPS figures, the ratio of the male worker at the 90th percentile to the 10th percentile was 5.77 in 2001, compared to 4.62 for female workers. For men, this ratio has increased 9 percent since 1995, when the ratio was 5.31. The ratio among women has increased by 4 percent, up from 4.46 in 1995.3

While the CPS survey provides a good source of data to calculate the 90/10 ratio on a national scale, the smaller sample size at the state level makes a similar ratio difficult to replicate for Indiana. To accurately compare how Hoosier wage variance might compare to the nation, we compared the 90/10 ratio with national and statewide OES data. The OES program is also based on a survey, and the results for wage earners who make over $150,000 are footnoted and aggregated, but the actual wage figure amount is not documented. This is consistent for the state and national data, so the comparison is valid.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Occupations</td>
<td>3.91</td>
<td>3.94</td>
<td>3.96</td>
<td>3.96</td>
<td>4.00</td>
<td>2.2%</td>
<td>4.47</td>
<td>4.49</td>
<td>4.54</td>
<td>4.60</td>
<td>4.65</td>
<td>3.9%</td>
</tr>
<tr>
<td>Life, Physical, and Social Science</td>
<td>3.08</td>
<td>3.20</td>
<td>3.23</td>
<td>3.83</td>
<td>3.80</td>
<td>23.5%</td>
<td>3.53</td>
<td>3.56</td>
<td>3.61</td>
<td>3.58</td>
<td>3.56</td>
<td>0.8%</td>
</tr>
<tr>
<td>Arts, Design, Entertainment, Sports, and Media</td>
<td>3.81</td>
<td>3.95</td>
<td>4.29</td>
<td>4.33</td>
<td>4.40</td>
<td>15.4%</td>
<td>4.73</td>
<td>4.64</td>
<td>4.70</td>
<td>4.67</td>
<td>4.68</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Computer and Mathematical</td>
<td>2.68</td>
<td>2.83</td>
<td>2.90</td>
<td>3.06</td>
<td>3.09</td>
<td>15.3%</td>
<td>3.05</td>
<td>3.02</td>
<td>3.05</td>
<td>3.05</td>
<td>3.08</td>
<td>0.9%</td>
</tr>
<tr>
<td>Business and Financial Operations</td>
<td>2.97</td>
<td>3.08</td>
<td>3.13</td>
<td>3.25</td>
<td>3.30</td>
<td>11.2%</td>
<td>3.14</td>
<td>3.15</td>
<td>3.13</td>
<td>3.11</td>
<td>3.09</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Protective Service</td>
<td>2.95</td>
<td>2.94</td>
<td>2.97</td>
<td>3.41</td>
<td>3.28</td>
<td>11.1%</td>
<td>3.82</td>
<td>3.81</td>
<td>3.84</td>
<td>3.86</td>
<td>3.90</td>
<td>2.3%</td>
</tr>
<tr>
<td>Health Care Support</td>
<td>1.91</td>
<td>1.90</td>
<td>1.91</td>
<td>1.95</td>
<td>2.06</td>
<td>7.7%</td>
<td>2.24</td>
<td>2.22</td>
<td>2.22</td>
<td>2.23</td>
<td>2.24</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Sales and Related</td>
<td>4.22</td>
<td>4.24</td>
<td>4.30</td>
<td>4.36</td>
<td>4.52</td>
<td>7.1%</td>
<td>4.42</td>
<td>4.47</td>
<td>4.54</td>
<td>4.65</td>
<td>4.72</td>
<td>6.7%</td>
</tr>
<tr>
<td>Architecture and Engineering</td>
<td>2.64</td>
<td>2.72</td>
<td>2.71</td>
<td>2.83</td>
<td>2.80</td>
<td>6.0%</td>
<td>2.98</td>
<td>2.99</td>
<td>2.98</td>
<td>2.99</td>
<td>3.04</td>
<td>2.2%</td>
</tr>
<tr>
<td>Office and Administrative Support</td>
<td>2.52</td>
<td>2.50</td>
<td>2.55</td>
<td>2.60</td>
<td>2.64</td>
<td>5.0%</td>
<td>2.72</td>
<td>2.71</td>
<td>2.72</td>
<td>2.73</td>
<td>2.77</td>
<td>2.0%</td>
</tr>
<tr>
<td>Community and Social Services</td>
<td>2.55</td>
<td>2.54</td>
<td>2.51</td>
<td>2.54</td>
<td>2.67</td>
<td>4.9%</td>
<td>2.98</td>
<td>2.98</td>
<td>2.97</td>
<td>2.97</td>
<td>2.94</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Management</td>
<td>3.93</td>
<td>4.02</td>
<td>4.08</td>
<td>4.10</td>
<td>4.12</td>
<td>4.7%</td>
<td>4.56</td>
<td>4.54</td>
<td>4.40</td>
<td>4.13</td>
<td>5.50</td>
<td>20.8%</td>
</tr>
<tr>
<td>Building and Grounds Cleaning and Maintenance</td>
<td>2.30</td>
<td>2.29</td>
<td>2.34</td>
<td>2.40</td>
<td>2.38</td>
<td>3.6%</td>
<td>2.46</td>
<td>2.46</td>
<td>2.49</td>
<td>2.52</td>
<td>2.49</td>
<td>1.2%</td>
</tr>
<tr>
<td>Food Preparation and Serving Related</td>
<td>1.89</td>
<td>1.91</td>
<td>1.92</td>
<td>1.96</td>
<td>1.96</td>
<td>3.6%</td>
<td>2.03</td>
<td>2.06</td>
<td>2.11</td>
<td>2.18</td>
<td>2.19</td>
<td>7.9%</td>
</tr>
<tr>
<td>Transportation and Material Moving</td>
<td>3.11</td>
<td>3.12</td>
<td>3.10</td>
<td>3.15</td>
<td>3.19</td>
<td>2.7%</td>
<td>3.20</td>
<td>3.16</td>
<td>3.15</td>
<td>3.14</td>
<td>3.15</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Education, Training and Library</td>
<td>3.80</td>
<td>3.79</td>
<td>3.78</td>
<td>3.88</td>
<td>3.86</td>
<td>1.6%</td>
<td>4.16</td>
<td>4.15</td>
<td>4.12</td>
<td>4.07</td>
<td>4.03</td>
<td>-3.1%</td>
</tr>
<tr>
<td>Farming, Fishing and Forestry</td>
<td>2.60</td>
<td>2.03</td>
<td>1.96</td>
<td>1.98</td>
<td>2.62</td>
<td>0.6%</td>
<td>2.47</td>
<td>2.45</td>
<td>2.46</td>
<td>2.45</td>
<td>2.44</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Construction and Extraction</td>
<td>2.85</td>
<td>2.85</td>
<td>2.86</td>
<td>2.92</td>
<td>2.86</td>
<td>0.6%</td>
<td>3.15</td>
<td>3.18</td>
<td>3.17</td>
<td>3.20</td>
<td>3.19</td>
<td>1.2%</td>
</tr>
<tr>
<td>Health Care Practitioners and Technical</td>
<td>3.69</td>
<td>3.66</td>
<td>3.80</td>
<td>3.77</td>
<td>3.66</td>
<td>-0.8%</td>
<td>3.82</td>
<td>3.81</td>
<td>3.81</td>
<td>3.83</td>
<td>3.94</td>
<td>3.3%</td>
</tr>
<tr>
<td>Installation, Maintenance and Repair</td>
<td>2.86</td>
<td>2.86</td>
<td>2.87</td>
<td>2.86</td>
<td>2.83</td>
<td>-0.9%</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
<td>2.96</td>
<td>2.97</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Production</td>
<td>2.84</td>
<td>2.89</td>
<td>2.84</td>
<td>2.77</td>
<td>2.79</td>
<td>-1.7%</td>
<td>3.01</td>
<td>3.01</td>
<td>3.01</td>
<td>3.00</td>
<td>3.01</td>
<td>0.1%</td>
</tr>
<tr>
<td>Legal</td>
<td>5.15</td>
<td>5.37</td>
<td>5.71</td>
<td>4.87</td>
<td>4.81</td>
<td>-6.7%</td>
<td>5.56</td>
<td>5.39</td>
<td>5.24</td>
<td>5.03</td>
<td>4.92</td>
<td>-11.6%</td>
</tr>
<tr>
<td>Personal Care and Service</td>
<td>2.54</td>
<td>2.54</td>
<td>2.53</td>
<td>2.56</td>
<td>2.33</td>
<td>-8.0%</td>
<td>2.81</td>
<td>2.79</td>
<td>2.79</td>
<td>2.81</td>
<td>2.76</td>
<td>-2.1%</td>
</tr>
</tbody>
</table>

Source: Occupational Employment Survey
also may explain why the OES 90/10 ratio is significantly less than the CPS wage ratio. It might also serve to give a clearer picture of the variance in wages for typical workers, as the extremely high wage earners are taken out of the OES wage distribution. According to OES data, the national ratio was 4.65 in 2005, compared to 4.0 in Indiana. Wage variance is greater at the national level, and we can also see that the growth in variance of income has been stronger for the U.S. than in Indiana. The 90/10 ratio has increased by 3.9 percent across the nation since 2001, yet in Indiana it has only increased by 2.2 percent (see Table 2). The differences within each occupational group are striking. In Indiana, the wage ratio has increased the most in life, physical and social science occupations, computer and mathematical occupations, and art and media occupations. Wages in these industries have changed greatly, and the wage earners in the 90th percentile are seeing increasingly higher wages. At the national level, most of the increase in the wage ratio seems to be a result of extreme growth in the variance among wages in management occupations.

Learn More ➞ Earn More

Remember the highly paid managers discussed earlier, in contrast to the workers in food service occupations? How many Hoosiers earn wages at these two extremes? Ten percent or approximately 11,300 managers earn over $139,750, while twice as many food preparation workers (approximately 25,600) earn less than $11,750. Table 1 includes an estimate of how many Hoosiers make the highest wages, in contrast to how many make the lowest wages. The wages are highly dependent upon not only the job title itself, but the occupational group displayed here. The three occupational groups with the highest wage earners at the 90th percentile employ approximately 14,400 workers at wages greater than $100,000. These wage earners include Indiana’s chief executive officers, scientists and lawyers. In contrast, the three occupational groupings with the lowest wages employ approximately 59,978 Hoosiers at wages under $13,500. These low wage earners include many growing service sector occupations such as restaurant workers, retail sales associates and other personal care workers. In total, only 128 out of more than 750 specific occupations (2005 OES) have 90th percentile wages above $80,000. This equates to approximately 71,800 Hoosier workers and accounts for 2 percent of total 2005 Indiana OES employment (2,891,360).

Highly specialized occupations pay higher wages as the economy influences which skills are in demand. This analysis illustrates once again that education (and/or skill development) pays. Higher education leads to higher wages. The economy has always rewarded those in the workforce with higher levels of education and/or specialized skills. In the 21st century knowledge-based economy, the disparity in wages grows as the skills we require of our workforce continue to evolve (see Table 3).

To ensure higher wages for all Hoosiers, the focus at DWD continues to be on increasing the educational levels of our workforce.

Several DWD initiatives are working to close the income gap, and ensure higher wages for all Hoosiers. The state is promoting programs in science, technology, engineering and mathematics (STEM). The STEM initiative in Indiana includes planning grants to help high schools prepare their students for postsecondary success in STEM study and work. An educated workforce needs quality job opportunities, so DWD and the Indiana Economic Development Corporation strive to bring quality jobs, businesses and training opportunities. Current initiatives focus on high growth industries such as advanced manufacturing, logistics and life sciences. With increased education and job growth, Indiana can hope to see higher wages—without higher levels of wage variance.

Notes
1. The OES data used for this article includes workers regardless of full-time or part-time classification.
2. May 2005 OES Estimate

—Allison Leeuw, Research and Analysis Department, Advanced Economic and Market Analysis Group, Indiana Department of Workforce Development

| TABLE 3: MEDIAN WAGES BY EDUCATIONAL REQUIREMENTS, 2005 |
|-----------------|---------------------|
| Median Wage     | Educational Requirement       |
| $57,409         | Bachelor’s Degree or More    |
| $39,185         | All Occupations             |
| $30,785         | Associate’s Degree or Less   |

Source: Indiana’s May 2005 Occupational Employment Survey, Long-Term Occupational Projections