Workforce Skills and Wages Across the Urban Rural Hierarchy

Recent Insights by the Martin Prosperity Institute have focused on the current economic opportunities and challenges in rural Ontario communities. It was found that many communities had low average and median incomes compared to the Metro Ontario’s average, as many of these rural communities lack the human capital of cities like Toronto. Regions with higher levels of human capital generally are more innovative, leading to greater economic growth and higher wages. This Insight focuses on a recent paper by Jaison R. Abel, Todd M. Gabe and Kevin Stolarick. The paper looks at the differences in “the skill content of work” throughout the United States. Occupation-based cluster analysis is used to measure the spatial distribution of workforce skills and patterns of earnings across the urban-rural hierarchy, to determine whether there is a correlation between skills, wages and place of occupation. As a Richard Florida argues in recent blog post on Atlantic Cities, “America’s urban-rural divide may no longer reflect the difference between farms and factories, but it continues to turn on the very real differences in the types of work people do.”

In this report, the author’s analysis begins by looking at the correlation between skills and average wage, where it was demonstrated that occupational clusters that require a diverse range of high level intellectual skills such as complex problem solving, also have the substantially highest average incomes. The authors used a skills based measure of human capital, which allows for a more accurate analysis, than simply classifying human capital with education alone. The authors used the O*NET system (U.S. Department of Labor’s Occupational Information Network) which ranks occupational skills on a scale of one to five (whereby 1 indicates that the specified workplace skills are un-important to the job and 5 displays that the skills are extremely important). Combining this information with the U.S. Census Bureau's American Community Survey, the authors were able to create 11 clusters of jobs to develop their analysis. The clusters range from Engineers, with high levels of complex problem solving and skills, to Laborers, which have very low requirements of the dimensions of skills studied such as resource management and social skills. With these clusters created according to a Skills Index, average income was combined in order to display the differences in wage depending on the skill level of an occupation.

Exhibit 1 displays the different levels of income (in US $) across the Skills Index. Also displayed in the scatter plot along the reference line, is the level of average earnings and the Skills Index for the 11 different occupational clusters.

Exhibit 1 reveals that there is a direct correlation between skills and income. As displayed, wages tend to increase when the average Skills Index score of a job increases. In most cases, when an occupational cluster has at least a 0.20 increase in Skills Index, the position also held an increase of around $10,000 more in average income per year. The largest gap is found between the occupational clusters of Laborers and Executives, with an approximate skill difference of 0.65, and a $50,000 per year difference in average wage. As such, it is demonstrated that a job with a higher skill content of work, where these skills are crucial to the position, will also have a higher average annual income than a position with lower skill content of work. The occupational cluster with the highest average wage was found to be Executives. Generally this position would entail
the necessity of a number of complex and social skills as there would be the need to co-ordinate and develop a number of individuals with varying levels of human capital. The study provides insight into the notion that the possession of, and ability to apply and exercise skills such as critical thinking and analysis in a job could lead to higher wages as the skill requirements of varying occupations are a key determinant of income levels. The authors then go on to examine the spatial distribution of these differences in wage and skills in relation to occupation.

To determine whether or not a place of work is defined as urban or rural, PUMA level classifications were used (defined by the U.S. Census Bureau as contiguous geographic areas — within the same state — with a population of approximately 100,000 people). In turn, PUMA’s are then ranked by population density and proximity to a central city. They are ranked from 1 to 10; with 1 being a PUMA that is at least 90% within a central city and 2-10 being ranked according to distance between the centroid of the PUMA to the central city and population density.

Exhibit 2 displays the average wage for the different occupational clusters across the urban rural hierarchy. For full analysis the Skills Index in Exhibit 1 can be applied to the occupational clusters in Exhibit 2.

Exhibit 2 displays that when looking across the Urban Rural Hierarchy, the three occupational clusters with the highest Skills Index are the occupations with the highest average wage regardless of their location. Depending on location, we see several differences between occupational clusters; for example, when looking at the occupational clusters with the highest skills index (executives, scientists, engineers and analysts), have the highest average wages when the jobs location, scores a 1-4 on the urban rural Hierarchy scale. As we look at these occupations moving from 1-10, there is a drastic fall in average income. For example, an Executive working in a location with a score of 1 or 2 is making $25,000 more a year on average than someone in the same occupational cluster in a location with a score of 9 or 10. As the urban rural Hierarchy scores are based on density and distance from a major urban centre (10 being a combination of low density
and far distance), this means that on average, higher skilled occupations are worth more in areas with higher densities and within a close proximity to a major urban centre. As a result, if you are employed in a highly skilled occupation, the data suggests that working in a dense urban area or urban fringe is more attractive.

And, when looking at more rural, lower density areas (6-10), the higher skilled occupations still have substantially the highest average income. Despite the continuing disparity, it was found that when the locations of work falls within 6-10 on the urban-rural scale that the gap in income between high and low skill occupational clusters lessens. For the low skill occupational clusters where skills such as assembly, production and maintenance are predominant, the average income is minimally affected by location and density of workplace. These occupations do not benefit from the knowledge spillovers, like the higher skill positions would, and therefore the economic return for their skills are usually not increased across the urban rural hierarchy. Repair men, servers, mechanics, laborers, barbers and other occupations are needed in all areas and these occupations sometimes have similar wages despite location. These positions are dependent on interaction with the public as opposed to complex problem solving or knowledge interaction. Other than possible volume increases associated with lower skilled jobs in dense urban centers, for the most part a server or salesmen at an electronic chain or a Walmart greeter will make a similar wage despite where the occupation is located on the urban-rural continuum.

These findings reflect Florida's work whereby it is argued that the above average income associated with high skilled jobs in locations that are tolerant and have concentrations of creative, highly skilled people is increasingly clustered in urban areas with a combination of these fac-
tors. There are a number of explanations for why these highly skilled occupational clusters have increased average income in more urban, high density areas. Within high skill occupations generating ideas, creativity and problem solving are essential characteristics, which coalesce to form knowledge spillovers. These skills benefit from the close proximities offered to those in urban environments, increasing innovation in these regions. Therefore, the higher skilled occupations will on average have higher incomes within more urban areas as they will likely produce better results due to the innovation that comes from increased human capital.

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