Economic Outlook and Forecast: 2020

Webinar
May 5, 2020
Economic Outlook & Forecast

- COVID-19
  - National Economic Outlook
    - How bad will this get?
    - When will the rebound start?
  - Regional Issues Will Vary Depending on
    - Spread of COVID-19
    - Type of industries in the region
- Germanna Community College Region
  - Strong underlying economy
  - Little impact from COVID-19
National Economy
We Entered the Crisis with a Strong Economy

Employment Growth
Monthly Change in Thousands

Real Gross Domestic Product
Quarterly Annualized Percent Change
How Will Economy Be Affected?

2 Scenarios

- Scenario 1
  - COVID-19 lasts 3 months through May

- Scenario 2
  - COVID-19 lasts 6 months through August
Outcome of Scenarios 1 and 2

Scenario 1
Real GDP Q2 = annualized -23.6%
Real GDP Q3 = annualized -7.4%
Real GDP Q4 = annualized +4.1%
Unemployment rates peaks at 20.6% in Q3 2020
Outcome of Scenarios 1 and 2

Scenario 1
Real GDP Q2 = annualized -23.6%
Real GDP Q3 = annualized -7.4%
Real GDP Q4 = annualized +4.1%
Unemployment rates peaks at 20.6% in Q3 2020

Scenario 2
Real GDP Q2 = annualized -24.7%
Real GDP Q3 = annualized -12.7%
Real GDP Q4 = annualized -5.1%
Real GDP Q1 2021 = annualized +3.5%
Unemployment rates peaks at 23.3% in Q4 2020
Employment Growth (Monthly Change in Thousands)

Source: Bureau of Labor Statistics
Initial Unemployment Claims (in Thousands)

Source: Bureau of Labor Statistics
Last 2 Months Initial Unemployment Claims (In Thousands)

Source: Bureau of Labor Statistics
Job Postings Are a Leading Indicator of Jobs Lost

Total Online Job Ads
United States, by Week Posted

Source: JobsEQ
COVID-19 Economic Impact: Sharp and Short; Not Sustained (Real GDP)

Forecast: Scenario 1

Great Recession

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Not a Depression

(a) The Unemployment Rate

(b) Aggregate Output

27% fall in real GDP from 1929 to 1933
Great Variation by Region
Deaths Related to COVID-19 Very Low in Germanna Region
How Vulnerable Is My Region to COVID-19?

Impact of Coronavirus
Average Projected Job Losses, United States

<table>
<thead>
<tr>
<th>Industry</th>
<th>Job Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation and Food Services</td>
<td>&gt; 60%</td>
</tr>
<tr>
<td>Arts, Entertainment, and Recreation</td>
<td>&gt; 60%</td>
</tr>
<tr>
<td>Other Services (except Public Administration)</td>
<td>10-25%</td>
</tr>
<tr>
<td>Transportation and Warehousing</td>
<td>10-25%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>10-25%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>10-25%</td>
</tr>
<tr>
<td>Information</td>
<td>10-25%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5-10%</td>
</tr>
<tr>
<td>Construction</td>
<td>5-10%</td>
</tr>
<tr>
<td>Mining, Quarrying, and Oil and Gas Extraction</td>
<td>5-10%</td>
</tr>
<tr>
<td>Real Estate and Rental and Leasing</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Educational Services</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Administrative and Support and Waste Management and Remediation Services</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Professional, Scientific, and Technical Services</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Management of Companies and Enterprises</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Utilities</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Active Military</td>
<td>&lt; 5%</td>
</tr>
</tbody>
</table>

Source: Chmura Economics & Analytics
Germanna Community College Region
Employment Growth Just Slightly Less Than National Average

Source: JobsEQ®. Data as of 2019Q4. The shaded areas represent national recessions.
Germanna: Defense Spending –2% Since FY 2012

Millions

<table>
<thead>
<tr>
<th>Year</th>
<th>Dollars (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$655.2</td>
</tr>
<tr>
<td>2009</td>
<td>$831.9</td>
</tr>
<tr>
<td>2010</td>
<td>$832.6</td>
</tr>
<tr>
<td>2011</td>
<td>$980.7</td>
</tr>
<tr>
<td>2012</td>
<td>$1,025.7</td>
</tr>
<tr>
<td>2013</td>
<td>$862.1</td>
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<tr>
<td>2014</td>
<td>$740.1</td>
</tr>
<tr>
<td>2015</td>
<td>$700.5</td>
</tr>
<tr>
<td>2016</td>
<td>$791.4</td>
</tr>
<tr>
<td>2017</td>
<td>$771.5</td>
</tr>
<tr>
<td>2018</td>
<td>$945.8</td>
</tr>
<tr>
<td>2019</td>
<td>$1,007.3</td>
</tr>
</tbody>
</table>
### Germanna: Top 10 Defense Contractors By Place of Performance, FY 2019

<table>
<thead>
<tr>
<th>Company Name</th>
<th>DoD Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukpeagvik Inupiat Corp</td>
<td>$61,664,908</td>
</tr>
<tr>
<td>ScCi</td>
<td>$51,943,572</td>
</tr>
<tr>
<td>Covant Management Inc.</td>
<td>$51,855,894</td>
</tr>
<tr>
<td>General Dynamics Corp</td>
<td>$49,313,768</td>
</tr>
<tr>
<td>Aerojet Rocketdyne Holdings, Inc.</td>
<td>$47,469,556</td>
</tr>
<tr>
<td>Simventions, Inc.</td>
<td>$35,737,941</td>
</tr>
<tr>
<td>Patricio Enterprises, Inc</td>
<td>$33,795,361</td>
</tr>
<tr>
<td>Aecom</td>
<td>$33,634,876</td>
</tr>
<tr>
<td>Booz Allen Hamilton Holding Corp</td>
<td>$30,493,185</td>
</tr>
<tr>
<td>Davis Defense Group, Inc.</td>
<td>$30,415,364</td>
</tr>
</tbody>
</table>
Job Ads -61% in Germanna Region, Late March 2020 vs. 2019

New Job Posts by Date

Occupations

- SOC 41-2001.00 Retail Salespersons: 4,109
- SOC 15-1142.00 Network and Computer Systems Administrators: 2,199
- SOC 29-1141.00 Registered Nurses: 2,000
- SOC 95-0102.00 First-Line Supervisors of Food Preparation and Serving Workers: 1,791
- SOC 35-0911.00 Combined Food Preparation and Serving Workers, Including Fast Food: 1,638
- SOC 41-2011.00 First-Line Supervisors of Retail Sales Workers: 1,541
- SOC 53-3022.00 Heavy and Tractor-Trailer Truck Drivers: 1,512
- SOC 15-1111.00 Computer User Support Specialists: 1,335
- SOC 21-3098.00 Social and Human Service Assistants: 1,236
- SOC 15-1132.00 Software Developers, Applications: 1,084

Source: JobEdge

Data reflect online job postings for the 169 day period ending 5/5/2020

Note: Data are subject to revision. Time series data can be volatile with trends unrelated to actual changes in demand; use with caution.
Job Ads in Germanna Region, Late March 2020 vs. 2019: Network & Computer Systems Administrators

RTI (Job Postings)

New Job Posts by Date

Note: Data are subject to revision. Time series data can be volatile with trends unrelated to actual changes in demand; use with caution.

Occupations

15-1142.00 Network and Computer Systems Administrators

Source: Jobs2019

Data reflect online job postings for the 965 day period ending 5/3/2020

Note: Data are subject to revision. Time series data can be volatile with trends unrelated to actual changes in demand; use with caution.
Economic Vulnerability Index By County

Source: Chmura Economics & Analytics, JobsEQ

Germanna Community College Counties
Economic Vulnerability Index

- King George County: 49.34
- Caroline County: 66.12
- Madison County: 71.27
- Stafford County: 78.32
- Orange County: 86.67
- Culpeper County: 94.55
- Germanna CC Region: 97.05
- U.S. National Average: 100.00
- Spotsylvania County: 119.81
- Fredericksburg City: 140.43

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The Economic Vulnerability Index measures the negative impact the coronavirus can have on employment based on a region’s mix of industries. The Germanna Community College region scored slightly lower than average with a 97.05 score.

Source: Chmura Economics & Analytics, JobsEQ
Germanna CC Region Online Job Ads By Week

- One of the leading indicators of COVID-19 is the recent decline in job postings in the Germanna market. Job postings fell 55.9% from the week of February 23rd, through the week of March 22nd. However, job postings have since increased 27.6% through the week of April 26th.

- The hardest hit occupations with the largest declines in job postings were those in the entertainment, cleaning and maintenance, and construction industries.

Source: Chmura Economics & Analytics, JobsEQ
# Industries in Germanna Region, 2019Q4

<table>
<thead>
<tr>
<th>Industry</th>
<th>Current Empl</th>
<th>Current Avg Wages</th>
<th>Total Demand</th>
<th>Exits</th>
<th>Transfers</th>
<th>Empl Growth</th>
<th>Ann % Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Trade</td>
<td>22,131</td>
<td>$29,199</td>
<td>3,004</td>
<td>1,307</td>
<td>1,650</td>
<td>47</td>
<td>0.2%</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>21,128</td>
<td>$46,743</td>
<td>2,394</td>
<td>984</td>
<td>1,017</td>
<td>393</td>
<td>1.9%</td>
</tr>
<tr>
<td>Educational Services</td>
<td>16,395</td>
<td>$41,723</td>
<td>1,634</td>
<td>731</td>
<td>788</td>
<td>114</td>
<td>0.7%</td>
</tr>
<tr>
<td>Accommodation and Food Services</td>
<td>16,004</td>
<td>$17,754</td>
<td>2,784</td>
<td>1,149</td>
<td>1,447</td>
<td>188</td>
<td>1.2%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>15,689</td>
<td>$93,024</td>
<td>1,532</td>
<td>611</td>
<td>830</td>
<td>91</td>
<td>0.6%</td>
</tr>
<tr>
<td>Professional, Scientific, &amp; Technical Services</td>
<td>11,690</td>
<td>$79,787</td>
<td>1,202</td>
<td>374</td>
<td>631</td>
<td>197</td>
<td>1.7%</td>
</tr>
<tr>
<td>Construction</td>
<td>10,442</td>
<td>$48,703</td>
<td>1,169</td>
<td>369</td>
<td>659</td>
<td>141</td>
<td>1.3%</td>
</tr>
<tr>
<td>Other Services (except Public Admin)</td>
<td>9,218</td>
<td>$29,632</td>
<td>1,107</td>
<td>480</td>
<td>572</td>
<td>55</td>
<td>0.6%</td>
</tr>
<tr>
<td>Administrative and Support and Waste Management and Remediation Services</td>
<td>7,626</td>
<td>$36,451</td>
<td>956</td>
<td>373</td>
<td>508</td>
<td>75</td>
<td>1.0%</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>7,502</td>
<td>$62,347</td>
<td>733</td>
<td>266</td>
<td>435</td>
<td>32</td>
<td>0.4%</td>
</tr>
<tr>
<td>Transportation and Warehousing</td>
<td>5,844</td>
<td>$48,844</td>
<td>680</td>
<td>265</td>
<td>359</td>
<td>56</td>
<td>1.0%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5,786</td>
<td>$51,523</td>
<td>584</td>
<td>222</td>
<td>380</td>
<td>18</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>4,091</td>
<td>$54,112</td>
<td>437</td>
<td>162</td>
<td>268</td>
<td>7</td>
<td>0.2%</td>
</tr>
<tr>
<td>Arts, Entertainment, and Recreation</td>
<td>3,093</td>
<td>$19,510</td>
<td>471</td>
<td>195</td>
<td>241</td>
<td>35</td>
<td>1.1%</td>
</tr>
<tr>
<td>Real Estate and Rental and Leasing</td>
<td>2,722</td>
<td>$45,019</td>
<td>300</td>
<td>126</td>
<td>150</td>
<td>24</td>
<td>0.9%</td>
</tr>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting</td>
<td>2,250</td>
<td>$27,100</td>
<td>248</td>
<td>104</td>
<td>140</td>
<td>4</td>
<td>0.2%</td>
</tr>
<tr>
<td>Information</td>
<td>2,241</td>
<td>$58,312</td>
<td>241</td>
<td>78</td>
<td>139</td>
<td>24</td>
<td>1.1%</td>
</tr>
<tr>
<td>Management of Companies &amp; Enterprises</td>
<td>1,609</td>
<td>$90,749</td>
<td>151</td>
<td>54</td>
<td>92</td>
<td>6</td>
<td>0.3%</td>
</tr>
<tr>
<td>Utilities</td>
<td>1,022</td>
<td>$78,406</td>
<td>99</td>
<td>33</td>
<td>59</td>
<td>7</td>
<td>0.7%</td>
</tr>
<tr>
<td>Mining, Quarrying, and Oil &amp; Gas Extraction</td>
<td>245</td>
<td>$48,732</td>
<td>27</td>
<td>8</td>
<td>17</td>
<td>2</td>
<td>0.7%</td>
</tr>
<tr>
<td><strong>Total - All Industries</strong></td>
<td><strong>167,140</strong></td>
<td><strong>$47,568</strong></td>
<td><strong>19,770</strong></td>
<td><strong>7,808</strong></td>
<td><strong>10,453</strong></td>
<td><strong>1,509</strong></td>
<td><strong>0.9%</strong></td>
</tr>
</tbody>
</table>

Source: JobsEQ
## Top Occupations in Germanna Region, 2019Q4

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Current</th>
<th>1-Year Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Empl</td>
<td>Avg Ann Wages²</td>
</tr>
<tr>
<td>1 Cashiers</td>
<td>5,796</td>
<td>$21,300</td>
</tr>
<tr>
<td>2 Retail Salespersons</td>
<td>5,443</td>
<td>$25,100</td>
</tr>
<tr>
<td>Combined Food Preparation and Serving Workers, Including Fast Food</td>
<td>4,806</td>
<td>$20,800</td>
</tr>
<tr>
<td>3 Waiters and Waitresses</td>
<td>3,069</td>
<td>$23,800</td>
</tr>
<tr>
<td>Office Clerks, General</td>
<td>3,067</td>
<td>$32,500</td>
</tr>
<tr>
<td>Janitors Cleaners, Except Maids, Housekeeping Cleaners</td>
<td>2,699</td>
<td>$24,600</td>
</tr>
<tr>
<td>4 Customer Service Representatives</td>
<td>2,641</td>
<td>$33,200</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>2,463</td>
<td>$65,800</td>
</tr>
<tr>
<td>Personal Care Aides</td>
<td>2,442</td>
<td>$21,600</td>
</tr>
<tr>
<td>5 Stock Clerks and Order Fillers</td>
<td>2,416</td>
<td>$25,500</td>
</tr>
<tr>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>2,139</td>
<td>$26,700</td>
</tr>
<tr>
<td>Heavy and Tractor-Trailer Truck Drivers</td>
<td>2,109</td>
<td>$39,500</td>
</tr>
<tr>
<td>6 First-Line Supervisors of Retail Sales Workers</td>
<td>2,107</td>
<td>$43,000</td>
</tr>
<tr>
<td>Elementary School Teachers, Except Special Education</td>
<td>2,096</td>
<td>$62,400</td>
</tr>
<tr>
<td>General and Operations Managers</td>
<td>2,075</td>
<td>$118,400</td>
</tr>
<tr>
<td>Management Analysts</td>
<td>1,892</td>
<td>$90,500</td>
</tr>
<tr>
<td>Secretaries/Administrative Assistants, Ex Legal, Medical, Executive</td>
<td>1,790</td>
<td>$36,500</td>
</tr>
<tr>
<td>Teacher Assistants</td>
<td>1,753</td>
<td>$26,800</td>
</tr>
<tr>
<td>Bookkeeping, Accounting, and Auditing Clerks</td>
<td>1,666</td>
<td>$40,300</td>
</tr>
<tr>
<td>Construction Laborers</td>
<td>1,648</td>
<td>$30,300</td>
</tr>
</tbody>
</table>
Estimated 47% of National Employment at Risk of Future Automation

High Risk
- Transportation and Logistics
- Office and Administrative Support
- Production
- Service, sales, and construction

Tasks: Routine, controlled conditions

Medium Risk
- Installation, maintenance, and repair

Tasks: Complex perception and manipulation

Low Risk
- Management, business, and finance
- Education
- Healthcare
- Arts and Media
- Creative engineering and science

Tasks: Social intelligence, creative, wide ranging

No Clear Time Horizon: It Depends

- Relative cost and availability of labor
- Regulatory hurdles
- Resistance to technological change
- Pace of technological breakthroughs
- COVID-19 accelerator?

“Executing a left turn against oncoming traffic involves so many factors that it is hard to imagine discovering the set of rules that can replicate a driver’s behaviour”

The New Division of Labor, Levy and Murnane (2004)
Automation Will Also Drive New Job Creation

• Rising incomes and consumption could lead to more jobs
  • Durable goods,
  • Leisure,
  • Financial and telecommunication services,
  • Housing,
  • Health care, and
  • Education

• The development and deployment of technology creates jobs
  • Computer science,
  • Engineering, and
  • IT administration

### Impact of Automation on Job Growth

Browse by O*NET Data

<table>
<thead>
<tr>
<th>Work Context — Degree of Automation</th>
<th>Job Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all automated</td>
<td>Farmworkers and Laborers, Crop</td>
</tr>
<tr>
<td>Slightly automated</td>
<td>Claims Examiners: Property and Casualty Insurance</td>
</tr>
<tr>
<td>Moderately automated</td>
<td>Travel Agents</td>
</tr>
<tr>
<td>Highly automated</td>
<td>Postal Service Mail Sorters, Processors, and Processing Machine Operators</td>
</tr>
<tr>
<td>Completely automated</td>
<td>Medical and Clinical Laboratory Technologists</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1S</td>
<td>Chemical Plant and System Operators</td>
</tr>
<tr>
<td>4D</td>
<td>Telephone Operators</td>
</tr>
<tr>
<td>4F</td>
<td>Air Traffic Controllers</td>
</tr>
<tr>
<td>4G</td>
<td>Reservation and Transportation Ticket Agents and Travel Clerks</td>
</tr>
<tr>
<td>4J</td>
<td>Botways Processing Technicians</td>
</tr>
<tr>
<td>5I</td>
<td>Separating Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders</td>
</tr>
<tr>
<td>5L</td>
<td>Airline Pilots, Co-pilots, and Flight Engineers</td>
</tr>
<tr>
<td>5M</td>
<td>Customs Brokers</td>
</tr>
<tr>
<td>5N</td>
<td>Petroleum Pump System Operators, Refinery Operators, and Gaugers</td>
</tr>
<tr>
<td>6A</td>
<td>Botways Production Managers</td>
</tr>
<tr>
<td>6B</td>
<td>Robotics Technicians</td>
</tr>
<tr>
<td>6C</td>
<td>Insurance Claims Clerks</td>
</tr>
<tr>
<td>6D</td>
<td>Biomass Power Plant Managers</td>
</tr>
<tr>
<td>6E</td>
<td>Computer-Controlled Machine Tool Operators, Metal and Plastic</td>
</tr>
<tr>
<td>6F</td>
<td>Immigration and Customs Inspectors</td>
</tr>
<tr>
<td>6G</td>
<td>Lathe and Turret Machine Tool Setters, Operators, and Tenders, Metal and Plastic</td>
</tr>
<tr>
<td>6H</td>
<td>Brokerage Clerks</td>
</tr>
<tr>
<td>6I</td>
<td>Laundry and Dry-Cleaning Workers</td>
</tr>
<tr>
<td>6J</td>
<td>Stationary Engineers and Boiler Operators</td>
</tr>
<tr>
<td>6K</td>
<td>Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders</td>
</tr>
<tr>
<td>6L</td>
<td>Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders</td>
</tr>
<tr>
<td>6M</td>
<td>Insurance Appraisers, Auto Damage</td>
</tr>
<tr>
<td>6N</td>
<td>Photographic Process Workers and Processing Machine Operators</td>
</tr>
<tr>
<td>6O</td>
<td>Accountants</td>
</tr>
<tr>
<td>6P</td>
<td>Gas Plant Operators</td>
</tr>
</tbody>
</table>

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The COVID-19 Crisis

- This Crisis Will End!
- National Economic Outlook
  - Sharp and short; not sustained
- Regional Issues Will Vary Depending on
  - Spread of COVID-19
  - Type of industries in the region
- Germanna Region
  - Withstanding COVID-19 well
  - Long-run growth better than national average
  - Benefitting from increase in defense spending