

| | <i>HDI</i> | <i>Unemployment rate</i> | <i>FDI in USD (billion)</i> |
|----------------------|--------------|--------------------------|-----------------------------|
| HDI | 1 | | |
| Unemployment rate | -0.949051457 | 1 | |
| FDI in USD (billion) | 0.267413287 | -0.425707642 | 1 |
| Average Income (USD) | 0.855485439 | -0.713903555 | 0.582769864 |
| Time Vector | 0.985096897 | -0.92223309 | 0.229079766 |

Average Income (USD) *Time Vector*

1
0.832290329 1

SUMMARY OUTPUT

| <i>Regression Statistics</i> | |
|------------------------------|-------------|
| Multiple R | 0.990882282 |
| R Square | 0.981847696 |
| Adjusted R Square | 0.977007082 |
| Standard Error | 0.006152032 |
| Observations | 20 |

ANOVA

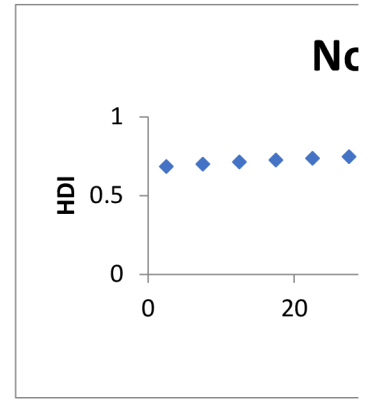
| | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> |
|------------|-----------|-------------|-------------|-------------|
| Regression | 4 | 0.030707238 | 0.007676809 | 202.8353466 |
| Residual | 15 | 0.000567712 | 3.78475E-05 | |
| Total | 19 | 0.03127495 | | |

| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
|----------------------|---------------------|-----------------------|---------------|----------------|
| Intercept | 0.754992145 | 0.026214286 | 28.80079039 | 1.51822E-14 |
| Unemployment rate | -0.005579069 | 0.00227504 | -2.452295471 | 0.026919693 |
| FDI in USD (billion) | -2.04988E-13 | 3.97166E-13 | -0.516126329 | 0.613290364 |
| Average Income (USD) | 1.14866E-06 | 2.34231E-05 | 0.049039485 | 0.961534851 |
| Time Vector | 0.004838346 | 0.000718753 | 6.731586278 | 6.73236E-06 |

RESIDUAL OUTPUT

| <i>Observation</i> | <i>Predicted HDI</i> | <i>Residuals</i> | <i>Standard Residuals</i> |
|--------------------|----------------------|------------------|---------------------------|
| 1 | 0.688535444 | -0.003535444 | -0.646780029 |
| 2 | 0.706041865 | -0.006041865 | -1.105308828 |
| 3 | 0.717081222 | -0.003081222 | -0.563683923 |
| 4 | 0.72512794 | 0.00087206 | 0.159536043 |
| 5 | 0.731475322 | 0.005524678 | 1.010693706 |
| 6 | 0.738502003 | 0.008497997 | 1.554637634 |
| 7 | 0.744263273 | 0.009736727 | 1.781253029 |
| 8 | 0.751197746 | 0.006802254 | 1.24441562 |
| 9 | 0.758627593 | -0.000627593 | -0.114812835 |
| 10 | 0.764378413 | -0.002378413 | -0.435110848 |
| 11 | 0.775099647 | -0.011099647 | -2.030587869 |
| 12 | 0.780805963 | -0.008805963 | -1.610977534 |
| 13 | 0.786268856 | -0.004268856 | -0.780951576 |
| 14 | 0.792404218 | 0.002595782 | 0.474876583 |
| 15 | 0.79861451 | -0.00061451 | -0.112419512 |
| 16 | 0.804204929 | 0.001795071 | 0.328393234 |
| 17 | 0.806817095 | 0.005182905 | 0.948169238 |
| 18 | 0.814310726 | 0.000689274 | 0.126096942 |
| 19 | 0.820387298 | -0.001387298 | -0.253794508 |
| 20 | 0.824855935 | 0.000144065 | 0.026355433 |

| |
|-----------------------|
| <i>Significance F</i> |
| 7.31804E-13 |



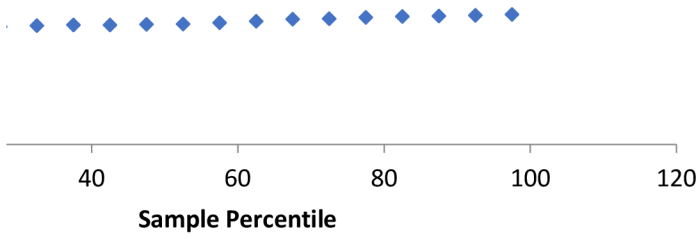
| <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95,0%</i> | <i>Upper 95,0%</i> |
|------------------|------------------|--------------------|--------------------|
| 0.699117717 | 0.810866572 | 0.699117717 | 0.810866572 |
| -0.010428201 | -0.000729937 | -0.010428201 | -0.000729937 |
| -1.05153E-12 | 6.41552E-13 | -1.05153E-12 | 6.41552E-13 |
| -4.87765E-05 | 5.10738E-05 | -4.87765E-05 | 5.10738E-05 |
| 0.003306361 | 0.006370331 | 0.003306361 | 0.006370331 |

Removing Average Income.

PROBABILITY OUTPUT

| <i>Percentile</i> | <i>HDI</i> |
|-------------------|------------|
| 2.5 | 0.685 |
| 7.5 | 0.7 |
| 12.5 | 0.714 |
| 17.5 | 0.726 |
| 22.5 | 0.737 |
| 27.5 | 0.747 |
| 32.5 | 0.754 |
| 37.5 | 0.758 |
| 42.5 | 0.758 |
| 47.5 | 0.762 |
| 52.5 | 0.764 |
| 57.5 | 0.772 |
| 62.5 | 0.782 |
| 67.5 | 0.795 |
| 72.5 | 0.798 |
| 77.5 | 0.806 |
| 82.5 | 0.812 |
| 87.5 | 0.815 |
| 92.5 | 0.819 |
| 97.5 | 0.825 |

Normal Probability Plot



Model with three explanatory variables and the time vector:

1) Beginning model

| Model | Coefficients ^a | | Standardi Coefficie Beta |
|-------|-----------------------------|------------|--------------------------------|
| | Unstandardized Coefficients | | |
| | B | Std. Error | Beta |
| | | | |

| | | | | |
|---|----------------------|------------|------|--|
| 1 | (Constant) | ,755 | ,026 | |
| | Unemployment rate | -,006 | ,002 | |
| | FDI in USD (billion) | -2,050E-13 | ,000 | |
| | Average Income (USD) | 1,149E-6 | ,000 | |
| | t | ,005 | ,001 | |

a. Dependent Variable: HDI

2) Model 2 – removing average income

| | | Coefficients ^a | | Standardized |
|-------|----------------------|-----------------------------|------------|--------------|
| | | Unstandardized Coefficients | | Coefficients |
| Model | | B | Std. Error | Beta |
| 1 | (Constant) | ,756 | ,022 | |
| | Unemployment rate | -,006 | ,002 | -,3 |
| | FDI in USD (billion) | -1,940E-13 | ,000 | -,0 |
| | t | ,005 | ,001 | ,7 |

a. Dependent Variable: HDI

3) Model 3 – removing FDI

| | | Coefficients ^a | | Standardized |
|-------|-------------------|-----------------------------|------------|--------------|
| | | Unstandardized Coefficients | | Coefficients |
| Model | | B | Std. Error | Beta |
| 1 | (Constant) | ,748 | ,017 | |
| | Unemployment rate | -,005 | ,002 | -,2 |
| | t | ,005 | ,001 | ,7 |

a. Dependent Variable: HDI

| ized nts | t | Sig. |
|-------------|--------|------|
| | 00 000 | 000 |

| | | |
|-------|--------|-------|
| | 28,801 | <,001 |
| -,305 | -2,452 | ,027 |
| -,027 | -,516 | ,613 |
| ,005 | ,049 | ,962 |
| ,706 | 6,732 | <,001 |

| d | t | Sig. |
|----|--------|-------|
| | 35,083 | <,001 |
| 08 | -2,907 | ,010 |
| 26 | -,610 | ,550 |
| 07 | 7,171 | <,001 |

| d | t | Sig. |
|----|--------|-------|
| | 44,980 | <,001 |
| 71 | -3,174 | ,006 |
| 35 | 8,595 | <,001 |

SUMMARY OUTPUT

| <i>Regression Statistics</i> | |
|------------------------------|-------------|
| Multiple R | 0.990880813 |
| R Square | 0.981844786 |
| Adjusted R Square | 0.978440683 |
| Standard Error | 0.005957156 |
| Observations | 20 |

ANOVA

| | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> |
|------------|-----------|-------------|-------------|-------------|
| Regression | 3 | 0.030707147 | 0.010235716 | 288.4298399 |
| Residual | 16 | 0.000567803 | 3.54877E-05 | |
| Total | 19 | 0.03127495 | | |

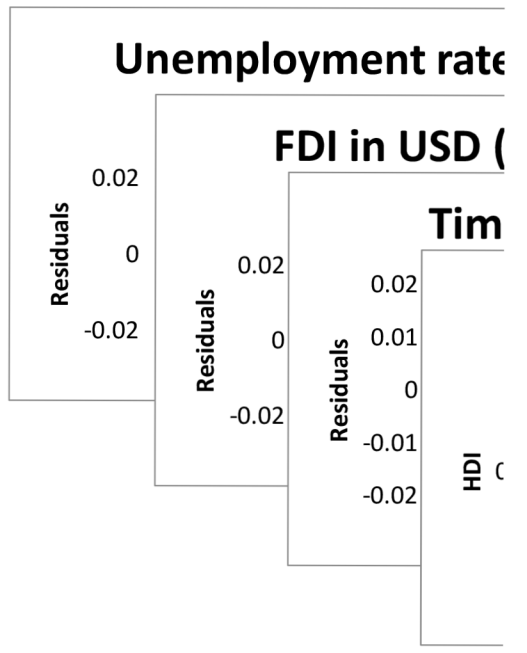
| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
|----------------------|---------------------|-----------------------|---------------|----------------|
| Intercept | 0.755672322 | 0.02153974 | 35.08270467 | 1.45273E-16 |
| Unemployment rate | -0.005632175 | 0.001937397 | -2.907083157 | 0.010288608 |
| FDI in USD (billion) | -1.94036E-13 | 3.18022E-13 | -0.610133024 | 0.550341997 |
| Time Vector | 0.004846761 | 0.000675856 | 7.171290887 | 2.22305E-06 |

RESIDUAL OUTPUT

| <i>Observation</i> | <i>Predicted HDI</i> | <i>Residuals</i> | <i>Standard Residuals</i> |
|--------------------|----------------------|------------------|---------------------------|
| 1 | 0.688442924 | -0.003442924 | -0.629803769 |
| 2 | 0.706075697 | -0.006075697 | -1.111409024 |
| 3 | 0.717162156 | -0.003162156 | -0.57844362 |
| 4 | 0.725127033 | 0.000872967 | 0.159689198 |
| 5 | 0.731506299 | 0.005493701 | 1.004946146 |
| 6 | 0.738469282 | 0.008530718 | 1.560498611 |
| 7 | 0.744248172 | 0.009751828 | 1.783872573 |
| 8 | 0.751233666 | 0.006766334 | 1.237745212 |
| 9 | 0.758688391 | -0.000688391 | -0.12592529 |
| 10 | 0.76447916 | -0.00247916 | -0.453505246 |
| 11 | 0.775042297 | -0.011042297 | -2.019934152 |
| 12 | 0.78080605 | -0.00880605 | -1.610864226 |
| 13 | 0.786237791 | -0.004237791 | -0.775206424 |
| 14 | 0.792297126 | 0.002702874 | 0.494428694 |
| 15 | 0.798456905 | -0.000456905 | -0.083580289 |
| 16 | 0.804177551 | 0.001822449 | 0.333375033 |
| 17 | 0.806790199 | 0.005209801 | 0.953013295 |
| 18 | 0.814401954 | 0.000598046 | 0.109398813 |
| 19 | 0.820428558 | -0.001428558 | -0.261321901 |
| 20 | 0.824928789 | 7.12107E-05 | 0.013026365 |

Significance F
3.90864E-14

| <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95,0%</i> | <i>Upper 95,0%</i> |
|---------------------|--------------------|---------------------|--------------------|
| 0.710010114 | 0.801334531 | 0.710010114 | 0.801334531 |
| -0.009739274 | -0.001525076 | -0.009739274 | -0.001525076 |
| -8.68212E-13 | 4.80141E-13 | -8.68212E-13 | 4.80141E-13 |
| 0.00341401 | 0.006279513 | 0.00341401 | 0.006279513 |



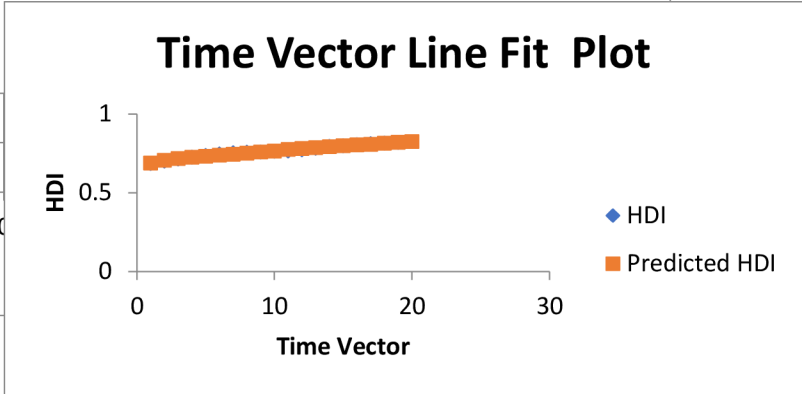
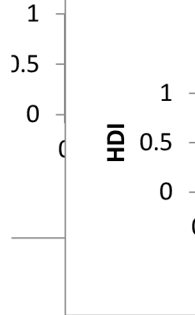
e Residual

(billion) Residual

e Vector Residual Plot

Unemployment rate Line Fit

FDI in USD (billion) Line Fit



SUMMARY OUTPUT

| <i>Regression Statistics</i> | |
|------------------------------|-------------|
| Multiple R | 0.990667643 |
| R Square | 0.981422379 |
| Adjusted R Square | 0.979236777 |
| Standard Error | 0.005846136 |
| Observations | 20 |

ANOVA

| | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> |
|------------|-----------|-------------|-------------|------------|
| Regression | 2 | 0.030693936 | 0.015346968 | 449.039757 |
| Residual | 17 | 0.000581014 | 3.41773E-05 | |
| Total | 19 | 0.03127495 | | |

| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
|-------------------|---------------------|-----------------------|---------------|----------------|
| Intercept | 0.74755151 | 0.016619755 | 44.97969487 | 4.06073E-19 |
| Unemployment rate | -0.004958641 | 0.00156246 | -3.173611023 | 0.005553979 |
| Time Vector | 0.005039502 | 0.000586351 | 8.594685296 | 1.35669E-07 |

RESIDUAL OUTPUT

| <i>Observation</i> | <i>Predicted HDI</i> | <i>Residuals</i> | <i>Standard Residuals</i> |
|--------------------|----------------------|------------------|---------------------------|
| 1 | 0.689368336 | -0.004368336 | -0.789949706 |
| 2 | 0.705911885 | -0.005911885 | -1.069078104 |
| 3 | 0.716405892 | -0.002405892 | -0.435070507 |
| 4 | 0.724172647 | 0.001827353 | 0.33045012 |
| 5 | 0.731096432 | 0.005903568 | 1.067573987 |
| 6 | 0.737474767 | 0.009525233 | 1.722499222 |
| 7 | 0.744200207 | 0.009799793 | 1.772149415 |
| 8 | 0.751867789 | 0.006132211 | 1.108920823 |
| 9 | 0.760031235 | -0.002031235 | -0.367319144 |
| 10 | 0.765467428 | -0.003467428 | -0.627033698 |
| 11 | 0.77437467 | -0.01037467 | -1.87610755 |
| 12 | 0.781298455 | -0.009298455 | -1.681489874 |
| 13 | 0.786833821 | -0.004833821 | -0.874126003 |
| 14 | 0.792319601 | 0.002680399 | 0.484711038 |
| 15 | 0.798053312 | -5.33125E-05 | -0.009640784 |
| 16 | 0.803737438 | 0.002262562 | 0.409151357 |
| 17 | 0.80862818 | 0.00337182 | 0.609744362 |
| 18 | 0.813965201 | 0.001034799 | 0.187128368 |
| 19 | 0.819252634 | -0.000252634 | -0.04568525 |
| 20 | 0.824540068 | 0.000459932 | 0.083171926 |

| | |
|------------|------------|
| TR^2 | 5.61 |
| Chi-Square | 0.00162776 |



| |
|-----------------------|
| <i>Significance F</i> |
| 1.93382E-15 |

| <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95,0%</i> | <i>Upper 95,0%</i> |
|------------------|------------------|--------------------|--------------------|
| 0.712486892 | 0.782616128 | 0.712486892 | 0.782616128 |
| -0.008255144 | -0.001662138 | -0.008255144 | -0.001662138 |
| 0.003802409 | 0.006276594 | 0.003802409 | 0.006276594 |

| <i>DW Numerator</i> | <i>DW denominator</i> |
|---------------------|-----------------------|
| | 1.90824E-05 |
| 2.38255E-06 | 3.49504E-05 |
| 1.2292E-05 | 5.78832E-06 |
| 1.79204E-05 | 3.33922E-06 |
| 1.66155E-05 | 3.48521E-05 |
| 1.31165E-05 | 9.07301E-05 |
| 7.53833E-08 | 9.60359E-05 |
| 1.34512E-05 | 3.7604E-05 |
| 6.66418E-05 | 4.12591E-06 |
| 2.06265E-06 | 1.20231E-05 |
| 4.771E-05 | 0.000107634 |
| 1.15824E-06 | 8.64613E-05 |
| 1.9933E-05 | 2.33658E-05 |
| 5.64635E-05 | 7.18454E-06 |
| 0.000357473 | 2.84222E-09 |
| 5.36328E-06 | 5.11919E-06 |
| 1.23045E-06 | 1.13692E-05 |
| 5.46166E-06 | 1.07081E-06 |
| 1.65749E-06 | 6.38242E-08 |
| 5.0775E-07 | 2.11537E-07 |
| 0.000641516 | 0.000581014 |

PROBABILITY OUTPUT

| | Variable | Alfa | Sign |
|--|----------|------|------|
| | x1 | 0.05 | < |

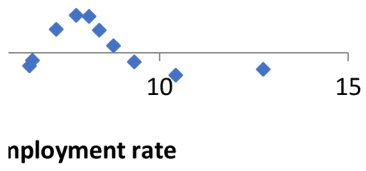
| <i>Percentile</i> | <i>HDI</i> |
|-------------------|------------|
| 2.5 | 0.685 |
| 7.5 | 0.7 |
| 12.5 | 0.714 |
| 17.5 | 0.726 |
| 22.5 | 0.737 |
| 27.5 | 0.747 |
| 32.5 | 0.754 |
| 37.5 | 0.758 |
| 42.5 | 0.758 |
| 47.5 | 0.762 |
| 52.5 | 0.764 |
| 57.5 | 0.772 |
| 62.5 | 0.782 |
| 67.5 | 0.795 |
| 72.5 | 0.798 |
| 77.5 | 0.806 |
| 82.5 | 0.812 |
| 87.5 | 0.815 |
| 92.5 | 0.819 |
| 97.5 | 0.825 |

| | |
|---------|-------------|
| DW Test | 1.104132174 |
|---------|-------------|

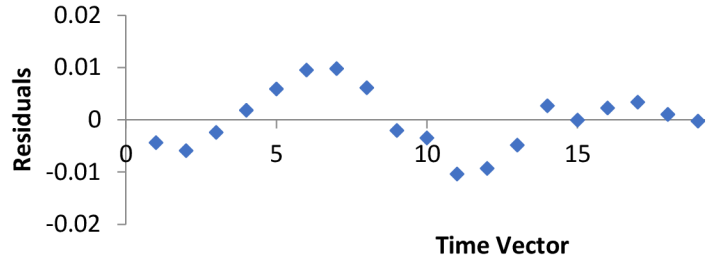
| | | |
|---------------------|---------------|------------------|
| <i>Rounded and</i> | | |
| <i>Sorted</i> | | |
| <i>St.Residuals</i> | <i>Sorted</i> | <i>Frequency</i> |

| | | |
|------|------|---|
| -0.8 | -1.9 | 1 |
| -1.1 | -1.7 | 1 |
| -0.4 | -1.1 | 1 |
| 0.3 | -0.9 | 1 |
| 1.1 | -0.8 | 1 |
| 1.7 | -0.6 | 1 |
| 1.8 | -0.4 | 1 |
| 1.1 | -0.4 | 1 |
| -0.4 | 0 | 1 |
| -0.6 | 0 | 1 |
| -1.9 | 0.1 | 1 |
| -1.7 | 0.2 | 1 |
| -0.9 | 0.3 | 1 |
| 0.5 | 0.4 | 1 |
| 0 | 0.5 | 1 |
| 0.4 | 0.6 | 1 |
| 0.6 | 1.1 | 1 |
| 0.2 | 1.1 | 1 |
| 0 | 1.7 | 1 |
| 0.1 | 1.8 | 1 |

Unemployment rate Residual Plot

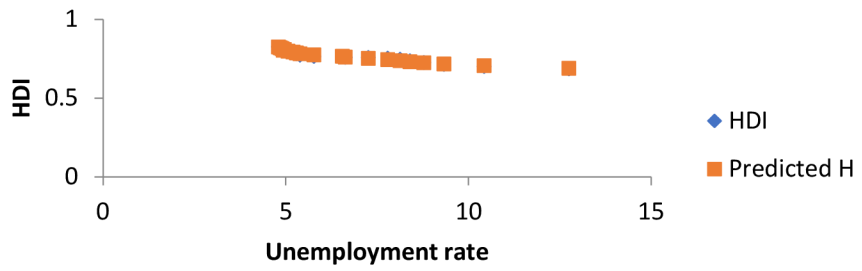


Time Vector Residual Plot

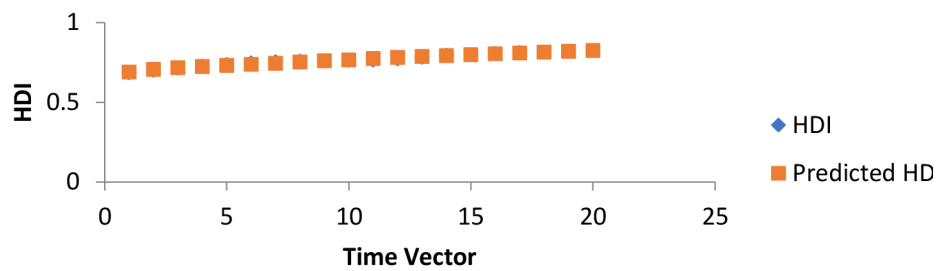


| P - value | Accept/Reject |
|-----------|---------------|
| 0.005 | Reject |

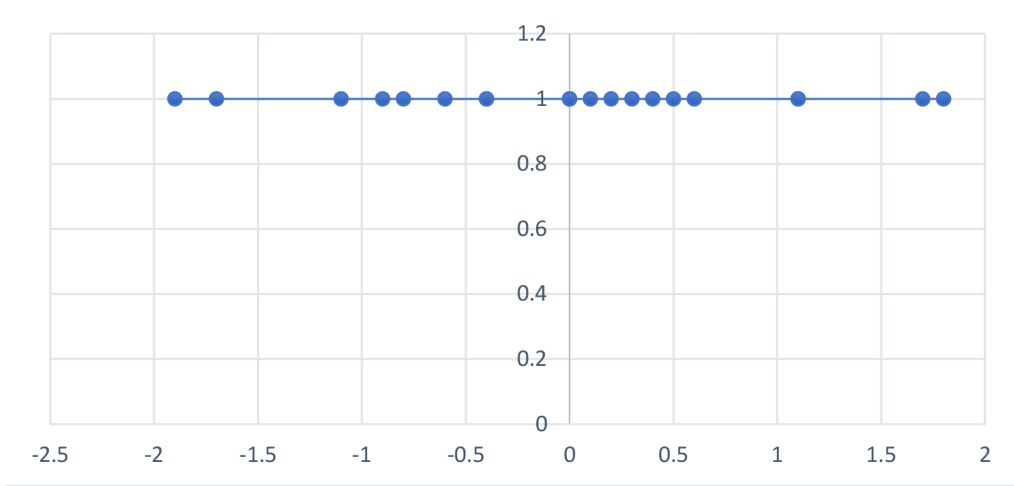
Unemployment rate Line Fit Plot

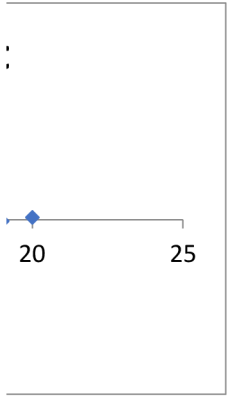


Time Vector Line Fit Plot



Název grafu





IDI

DI

Kazakhstan

| Year | HDI | Unemployment rate | Time Vector | Average Income (USD) | FDI in USD (billion) |
|------|-------|-------------------|-------------|----------------------|----------------------|
| 2000 | 0.685 | 12.75 | 1 | 103.6231884 | 1370521199 |
| 2001 | 0.7 | 10.43 | 2 | 122 | 2816823050 |
| 2002 | 0.714 | 9.33 | 3 | 137 | 2588491060 |
| 2003 | 0.726 | 8.78 | 4 | 240 | 2483253230 |
| 2004 | 0.737 | 8.4 | 5 | 267 | 5615262947 |
| 2005 | 0.747 | 8.13 | 6 | 313 | 2546065710 |
| 2006 | 0.754 | 7.79 | 7 | 369 | 7611168450 |
| 2007 | 0.758 | 7.26 | 8 | 398 | 11972842989 |
| 2008 | 0.758 | 6.63 | 9 | 459 | 16818890680 |
| 2009 | 0.762 | 6.55 | 10 | 411 | 14275888207 |
| 2010 | 0.764 | 5.77 | 11 | 527 | 7456117901 |
| 2011 | 0.772 | 5.39 | 12 | 562 | 13760291529 |
| 2012 | 0.782 | 5.29 | 13 | 600 | 13648134374 |
| 2013 | 0.795 | 5.2 | 14 | 643 | 10011293285 |
| 2014 | 0.798 | 5.06 | 15 | 675 | 7308112644 |
| 2015 | 0.806 | 4.93 | 16 | 568 | 6577824050 |
| 2016 | 0.812 | 4.96 | 17 | 675 | 17220962548 |
| 2017 | 0.815 | 4.9 | 18 | 463 | 4712631471 |
| 2018 | 0.819 | 4.85 | 19 | 472 | 83409074.56 |
| 2019 | 0.825 | 4.8 | 20 | 485 | 3320645021 |

Source UNDP WorldBank

Worldbank

HDI

| | |
|--------------------|--------------|
| Mean | 0.76645 |
| Standard Error | 0.009072073 |
| Median | 0.763 |
| Mode | 0.758 |
| Standard Deviation | 0.040571542 |
| Sample Variance | 0.00164605 |
| Kurtosis | -0.657512729 |
| Skewness | -0.35475928 |
| Range | 0.14 |
| Minimum | 0.685 |
| Maximum | 0.825 |
| Sum | 15.329 |
| Count | 20 |

| <i>Unemployment rate</i> | | <i>FDI in USD (billion)</i> | | <i>Average Income (USD)</i> | |
|--------------------------|-------------|-----------------------------|--------------|-----------------------------|--|
| Mean | 6.86 | Mean | 7609931471 | Mean | |
| Standard Error | 0.496441018 | Standard Error | 1201254074 | Standard Error | |
| Median | 6.16 | Median | 6942968347 | Median | |
| Mode | #N/A | Mode | #N/A | Mode | |
| Standard Deviation | 2.220151725 | Standard Deviation | 5372171534 | Standard Deviation | |
| Sample Variance | 4.929073684 | Sample Variance | 2.88602E+19 | Sample Variance | |
| Kurtosis | 1.016049099 | Kurtosis | -1.065890576 | Kurtosis | |
| Skewness | 1.182717001 | Skewness | 0.464600031 | Skewness | |
| Range | 7.95 | Range | 17137553473 | Range | |
| Minimum | 4.8 | Minimum | 83409074.56 | Minimum | |
| Maximum | 12.75 | Maximum | 17220962548 | Maximum | |
| Sum | 137.2 | Sum | 1.52199E+11 | Sum | |
| Count | 20 | Count | 20 | Count | |

Time Vector

| | | |
|--------------|--------------------|-------------|
| 424.4811594 | Mean | 10.5 |
| 40.22975696 | Standard Error | 1.322875656 |
| 461 | Median | 10.5 |
| 675 | Mode | #N/A |
| 179.9129426 | Standard Deviation | 5.916079783 |
| 32368.6669 | Sample Variance | 35 |
| -0.797876198 | Kurtosis | -1.2 |
| -0.420555936 | Skewness | 0 |
| 571.3768116 | Range | 19 |
| 103.6231884 | Minimum | 1 |
| 675 | Maximum | 20 |
| 8489.623188 | Sum | 210 |
| 20 | Count | 20 |
