

Does Economic Freedom Reduce Inequality? A Quantile Analysis of State-Level Income Dynamics

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Abstract

This paper investigates the distributional effects of economic freedom across U.S. states using quantile regression techniques. Using data for the 48 contiguous states from 2010 to 2021, the analysis moves beyond aggregate inequality measures and examines how economic freedom influences income thresholds across different points of the income distribution. The study further disaggregates economic freedom into its key components—government size, taxation, and labor market freedom—using the Economic Freedom of North America index. The results show that economic freedom is positively and significantly associated with income gains at the lower quantiles, indicating that poorer states benefit most from institutional liberalization. Effects at the median and upper quantiles are smaller and statistically insignificant but remain positive, suggesting no evidence that economic freedom worsens income disparities. Component-level analysis shows that reductions in government size are the primary driver of income gains at the lower end of the distribution. In contrast, taxation and labor market freedom play more selective roles, with labor market flexibility exhibiting stronger effects at the top of the income distribution. Overall, the findings suggest that different aspects of economic freedom operate through different channels, helping lift incomes where they are lowest while reinforcing gains at the top.

Introduction

The relationship between economic freedom and inequality remains one of the most enduring debates in economics. While market-oriented policies are often associated with fostering growth and innovation, their distributional consequences are less clear. This study makes an important distinction often overlooked in the literature: inequality can be assessed both between states (differences in income across states) and within states (differences across the income distribution within each state). As this paper shows, greater economic freedom appears to reduce both types of inequality, primarily by raising incomes at the lower end of the distribution rather than by compressing incomes at the top.

Although advocates argue that economic freedom enhances efficiency, entrepreneurship, and upward mobility (Scully, 2002; Berggren, 1999), critics contend that liberalization disproportionately benefits capital owners and highly skilled laborers, widening income and opportunity gaps (Carter, 2006; Migheli & Saccone, 2023). A central challenge in reconciling these views lies in the measures traditionally used to assess inequality. Most studies rely heavily on the Gini coefficient, which summarizes overall inequality but cannot reveal whether changes arise from gains at the top, losses at the bottom, or shifts in the middle (De Maio, 2007). If economic freedom is found to increase the Gini coefficient, this could reflect either (1) declining incomes for low-income individuals or (2) rising incomes for low-income individuals with even larger gains for higher-income groups. By focusing exclusively on the Gini, prior work cannot answer the crucial policy question: Do low-income individuals benefit from economic freedom?

This question is particularly relevant in the U.S. context, where states operate under shared federal institutions but vary widely in government size, taxation, and labor-market regulation (Ashby & Sobel, 2008; Compton, Giedeman, & Hoover, 2011). While previous studies generally find that economic freedom promotes economic growth (Bjørnskov, 2016; Wiseman, 2016), evidence on its distributional implications remains mixed, with some pointing toward increasing inequality (Carter, 2006) and others suggesting non-linear or opposite effects (Bennett & Vedder, 2013).

To provide a more nuanced understanding, this study analyzes how economic freedom affects income across the distribution rather than relying solely on aggregate inequality indices. Using data for the 48 contiguous U.S. states from 2010 to 2021, it applies a quantile regression framework to evaluate how overall economic freedom and its component areas—government size, taxation, and labor market freedom—shape income thresholds across quantiles. This approach allows us to identify whether economic freedom disproportionately affects lower-, middle-, or upper-income states and whether it expands or narrows income gaps both between and within states.

The results indicate that the effects of economic freedom are not uniform: the strongest and most consistent gains occur at the lower quantiles, suggesting that low-income states—and by implication, low-income individuals—benefit most from improvements in economic freedom. Government size (Area 1) exhibits the largest and most robust positive association with lower-income outcomes. Taken together, these findings suggest that economic freedom supports upward mobility at the bottom of the income distribution and reduces inequality across states.

By integrating component-level measures of economic freedom with a quantile-based approach, this study extends existing research and provides direct evidence that economic freedom can be conducive not only to overall economic performance but also to more inclusive income dynamics.

It highlights the importance of looking beyond the Gini coefficient and evaluating how institutional environments shape opportunities for those at the lower end of the economic spectrum.

Literature Review

The relationship between economic freedom and income inequality has long generated conflicting interpretations. Early empirical research debated whether liberalization and market expansion foster inclusive prosperity or exacerbate social group disparities. Studies using the Fraser Institute's Economic Freedom of the World (EFW) and Economic Freedom of North America (EFNA) indices generally agree that economic freedom promotes growth, but they diverge on how its benefits are distributed. Carter (2006) finds a positive but relatively inelastic association between economic freedom and income inequality, implying that although liberalization may raise efficiency, it does not necessarily improve equity. In contrast, Berggren (1999) and Scully (2002) argue that gradual and sustained increases in freedom tend to enhance equality by strengthening property rights and expanding opportunities for market participation. These contradictions have prompted researchers to examine the conditional and dynamic nature of the freedom-inequality nexus.

More recent evidence suggests that the relationship between freedom and inequality is non-linear. Bennett and Vedder (2013), studying the fifty U.S. states from 1979 to 2004, identify a parabolic or inverted-U pattern: inequality rises at early stages of liberalization but declines once a critical threshold of freedom is reached. Bjørnskov (2016) similarly emphasizes the role of institutional context, showing that economic freedom moderates the link between inequality and growth. Using panel data on U.S. states from 1981 to 2011, he demonstrates that inequality contributes more positively to growth in states with smaller governments and lighter regulation. Economic freedom, particularly through reduced government consumption, transforms inequality from a potential constraint into a productive force by enhancing incentives for investment and innovation.

Complementary findings are reported by Wiseman (2016), who disaggregates the income distribution into top and bottom segments and examines how freedom affects market income. Across U.S. states between 1979 and 2011, increases in overall freedom are associated with higher growth in market income, but the pattern varies spatially: in low-income states, the bottom ninety percent of earners experience faster growth, whereas in high-income states the gains accrue mainly to the top decile. Such results point to a geographically uneven distribution of the benefits from institutional liberalization.

At the international level, similar asymmetries emerge. Migheli and Saccone (2023), using a panel of seventy developed and developing countries between 1980 and 2014, find that economic

freedom across income levels, underscoring the need for distribution-sensitive approaches. The use of decile and percentile data, rather than aggregate inequality measures, has consequently become central to understanding how economic freedom reconfigures the income hierarchy.

Differences in empirical results also stem from how economic freedom is measured. The Fraser Institute indices conceptualize freedom as a multidimensional construct encompassing the size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation (Gwartney, 2009). Yet only a limited number of studies disaggregate these components to examine their individual effects on inequality.

State-level analyses provide a particularly informative context because they capture substantial variation in institutional environments within a common national framework. Ashby and Sobel (2008) and Compton, Giedeman, and Hoover (2011) show that states with higher economic freedom experience faster income growth. Bjørnskov (2016) further demonstrates that the growth effects of inequality depend on the degree of economic freedom, while Wiseman (2016) documents that liberalization benefits different income groups depending on a state's level of development. Together, these studies indicate that the distributive consequences of freedom are not uniform but instead depend on local economic and institutional characteristics.

Despite these contributions, several gaps remain. Most existing studies rely on aggregate inequality measures such as the Gini coefficient, which obscure heterogeneity across the income spectrum. Few analyses differentiate among the components of economic freedom or investigate how freedom affects income levels within different income groups. The present study addresses these shortcomings by employing quantile regression techniques to examine how economic freedom influences income thresholds across income groups for the 48 contiguous U.S. states from 2010 to 2021. In addition to the overall freedom index, the analysis includes its three component areas—government size, taxation, and labor market freedom—to identify which institutional dimensions drive differences across the distribution. Fixed-effects regressions are also conducted for each income group to compare results with the quantile analysis.

The results show that economic freedom has an uneven but meaningful impact on income distribution across states. It exerts a positive and significant effect only at the lower quantile (25th percentile) within each income group, indicating that the poorest states within each category benefit most from greater institutional liberalization. Importantly, the coefficients at the 50th and 75th quantiles remain positive though not statistically significant, which is inconsistent with an increase in either between-state or within-state inequality. Rather than suggesting that economic freedom fails to help middle- or higher-income states, this pattern indicates that its effects are

strongest at the bottom, with modest but non-negative impacts elsewhere. Among the components, government size (Area 1) consistently emerges as the strongest and most robust determinant of income thresholds, implying that smaller government sectors and lower public expenditure are associated with better outcomes for lower-income states without imposing losses on higher-income states.

These findings provide a new perspective on the freedom–inequality relationship by revealing that the benefits of economic freedom are concentrated among poorer states within each income group and do not come at the expense of those in the middle or upper portions of the distribution. By combining quantile regressions with component-level analysis, this study contributes to a more nuanced understanding of how different dimensions of economic freedom shape state-level income patterns in the United States.

Data and Method

The empirical analysis investigates how economic freedom influences income thresholds across different points of the income distribution within the forty-eight contiguous U.S. states over the period 2010–2021. To capture the heterogeneous effects of economic freedom across the income spectrum, the study employs both quantile and fixed-effects regression frameworks. The quantile regression model is specified as:

$$\ln(y_{s,t}(g)) = \alpha_{\tau} + \beta_{\tau} \text{EF}_{s,t} + \gamma_{s,\tau} + \delta_{t,\tau} + \varepsilon_{s,t,\tau}$$

where $y(g)_{s,t}$ denotes the real income threshold for income group g in state s and year t , and $\text{EF}_{s,t}$ represents the overall Economic Freedom of North America (EFNA) index published by the Fraser Institute. The parameter β_{τ} measures the conditional effect of economic freedom at the τ th quantile of the income threshold distribution, allowing the relationship between freedom and income to differ across the 25th (lower), 50th (middle), and 75th (upper) quantiles of the distribution. The model includes state fixed effects (γ_s) to control for time-invariant regional characteristics such as geography, industrial composition, or demographic structure, and year fixed effects (δ_t) to absorb macroeconomic shocks common to all states. The error term $\varepsilon_{s,t,\tau}$ captures remaining unobserved factors.

To assess which components of economic freedom are most influential, a second model replaces the composite EFNA index with its three component areas:

$$\ln(y_{s,t}(g)) = \alpha_{\tau} + \beta_{1,\tau} \text{Area1}_{s,t} + \beta_{2,\tau} \text{Area2}_{s,t} + \beta_{3,\tau} \text{Area3}_{s,t} + \gamma_{s,\tau} + \delta_{t,\tau} + \varepsilon_{s,t,\tau}$$

where Area 1 measures the size of government, Area 2 captures taxation, and Area 3 reflects labor market freedom. The coefficients $\beta_{k,\tau}$ identify which institutional features most strongly affect income thresholds across quantiles.

For comparison with standard mean-based estimates, fixed-effects panel regressions are also estimated:

$$\ln(y_{s,t}(g)) = \alpha + \beta \text{EF}_{s,t} + \gamma_s + \delta_t + u_{s,t} \quad \text{and its component version,}$$

$$\ln(y_{s,t}(g)) = \alpha + \beta_1 \text{Area1}_{s,t} + \beta_2 \text{Area2}_{s,t} + \beta_3 \text{Area3}_{s,t} + \gamma_s + \delta_t + u_{s,t}$$

These models estimate the within-state effect of changes in economic freedom on income thresholds at the conditional mean, facilitating direct comparison with the quantile-based results. Standard errors are clustered at the state level to address potential serial correlation within states.

The dependent variables are the natural logarithms of real income thresholds corresponding to five key points of the household income distribution: the 20th, 40th, 60th, 80th, and 95th percentiles. These thresholds, obtained from the U.S. Census Bureau, capture the income limits separating the lower, lower-middle, upper-middle, upper, and top income groups in each state and year. The logarithmic transformation allows coefficients to indicate the percentage change in the income threshold associated with a one-unit increase in economic freedom.

Economic freedom data are taken from the Fraser Institute’s Economic Freedom of North America (EFNA) index, which evaluates the extent to which state-level policies support open markets and limited government intervention. Both the overall index and its three component areas—government size, taxation, and labor market freedom—are used. Scores range from 0 to 10, with higher values reflecting greater economic freedom.

Nominal income data are converted to real terms using the U.S. Bureau of Economic Analysis’s Regional Price Parity (RPP) index. The RPP adjusts for interstate differences in price levels, ensuring that observed income differences reflect disparities in purchasing power rather than cost-of-living variations. After merging all datasets, the panel covers 48 contiguous states for 12 years (2010–2021), excluding Alaska, Hawaii, and the District of Columbia.

Results

Table 1 reports the quantile regression estimates of the effect of overall economic freedom on real income thresholds across U.S. states. The results reveal a consistent pattern across all income groups: economic freedom has a positive and statistically significant effect at the 25th quantile, representing the poorer states within each income group.

At the 25th quantile, the estimated coefficients are 0.202 ($p = 0.075$) for the lowest income group (q1), 0.176 ($p = 0.016$) for q2, 0.102 ($p = 0.094$) for q3, 0.068 ($p = 0.273$) for q4, and 0.187 ($p = 0.079$) for the top-5-percent threshold. All but q4 are significant at the 10 percent level or better, indicating that economic freedom benefits the poorer states across most income levels. The magnitude of the coefficients is highest for the lowest-income group (q1) and remains sizable at the top-5-percent threshold. These results indicate that economic freedom consistently raises income thresholds among poorer states, with the largest magnitudes appearing at the very bottom of the distribution. This pattern also holds within states: at the 25th quantile, the estimated effect of economic freedom is larger for the bottom-20-percent threshold (0.202) than for the top-5-percent threshold (0.187), suggesting that economic freedom raises incomes more strongly for lower-income individuals than for higher-income individuals, even in poorer states.

At the 50th and 75th quantiles, the estimated coefficients are smaller and statistically insignificant, though they remain positive across nearly all specifications. This pattern is inconsistent with the notion that economic freedom increases income inequality and instead suggests more moderate income gains for states in the middle and upper parts of the distribution. Importantly, the relative magnitudes across income thresholds within states continue to point toward stronger effects at the lower end. At the median (50th quantile), the estimated coefficient is larger for the bottom-20-percent threshold (0.138) than for the top-5-percent threshold (0.064), and a similar ordering appears at the 75th quantile, where the estimated effects are 0.137 for the bottom 20 percent and 0.11 for the top-5-percent. The consistent ordering of the coefficients reinforces the conclusion that income gains associated with economic freedom are not disproportionately concentrated at the top of the within-state income distribution. Taken together, the pattern supports the conclusion that economic freedom helps low-income states and low-income individuals the most, without evidence that higher-income states or high-income individuals are harmed or left behind.

Table 2 presents the quantile regression results using the three component areas of the Economic Freedom of North America index—government size (Area 1), taxation (Area 2), and labor market freedom (Area 3)—as explanatory variables. The results show that the earlier observed positive and significant effects of economic freedom are driven primarily by government size (Area 1). Across almost all income groups, Area 1 shows strong, statistically significant coefficients at the 25th quantile, representing the poorer states within each group. The coefficients are 0.015 ($p = 0.004$) for q1, 0.0133 ($p = 0.007$) for q2, 0.0126 ($p = 0.003$) for q3, and 0.0089 ($p = 0.006$) for q4, all significant at the 1 percent level. The top-5-percent group also shows a positive and marginally significant effect at the 25th quantile, with a coefficient of 0.012 ($p = 0.067$). This consistent pattern demonstrates that smaller government size is associated with higher income thresholds, particularly in poorer states across all income levels.

At higher quantiles, the effects of Area 1 become smaller and less systematic, though occasional significance at the 75th quantile—for example, within q1 and q3—suggests that improvements in government size may also benefit some states positioned higher within their income groups. Even when statistically insignificant, the coefficients remain predominantly positive, reinforcing that the influence of economic freedom does not reverse for median or richer states.

The results for Area 2 (taxation) are weaker and less systematic. Most coefficients are small and statistically insignificant, except for modest significance at the upper quantiles for the top-5-percent group—0.0174 ($p = 0.006$) at the 75th quantile—suggesting that the benefits of lower taxation may accrue mainly to higher-income states or top earners. Area 3 (labor market freedom) displays a more heterogeneous pattern. It becomes positive and significant for several higher-income thresholds—most notably for the top-5-percent group at the 25th ($p = 0.009$), 50th ($p = 0.026$), and 75th ($p = 0.002$) quantiles. At the same time, there is evidence of significant effects at lower income thresholds within certain state groups, indicating that labor market flexibility can also benefit lower-income segments under specific institutional and economic conditions. Overall, these results suggest that labor market freedom contributes to income gains in a more selective manner, with clearer effects at higher income levels but non-negligible impacts for some lower-income groups as well.

Taken together, the component results reinforce the conclusion that government size (Area 1) is the dominant driver of income improvements in poorer states, while labor market freedom (Area 3) exerts more selective and heterogeneous effects across the income distribution. Although some of the strongest and most consistent estimates for Area 3 appear at higher income thresholds, there is also evidence of positive effects at lower income thresholds in certain state contexts. Overall, the pattern suggests that economic freedom, through its fiscal and labor dimensions, tends to raise income thresholds across the distribution, with the strongest and most stable benefits accruing to poorer states.

Table 3 presents the results from the fixed-effects regressions using the overall Economic Freedom of North America (EFNA) index as the main explanatory variable. Across all income groups, the estimated coefficients on economic freedom are positive but statistically insignificant, ranging from 0.042 to 0.210 with p -values above 0.10. Specifically, the coefficients are 0.099 for q1, 0.087 for q2, 0.073 for q3, 0.042 for q4, and 0.210 for the top-5-percent threshold. Although these results do not show robust within-state effects over time, the consistently positive signs align with the quantile regression results and with prior literature indicating a general positive association between economic freedom and income. The weaker fixed-effects results likely reflect limited within-state variation in economic freedom during the study period.

Table 4 reports the component-level fixed-effects results. The disaggregated analysis again highlights that government size (Area 1) is the only component that is consistently significant across income groups. The coefficients for Area 1 are positive and significant at the 10 percent level for q1 (0.011, $p < 0.1$), q3 (0.008, $p < 0.1$), and q4 (0.007, $p < 0.1$). The effects of taxation (Area 2) are limited and mostly insignificant, except for the top-5-percent group, where the coefficient is 0.018 ($p < 0.1$). Likewise, labor market freedom (Area 3) is positive and significant primarily for the top-5-percent threshold (0.041, $p < 0.01$). These findings echo the quantile results: fiscal policy dimensions shape outcomes for lower- and middle-income groups, while taxation and labor flexibility tend to influence the top.

Across all models, the evidence consistently shows that economic freedom is associated with higher income thresholds across U.S. states, with the strongest and most robust effects occurring among states at the lower end of each income group. Middle- and higher-income states also exhibit positive coefficients, indicating that economic freedom does not reduce income levels at those positions; rather, the benefits are simply more concentrated at the bottom. This pattern supports the conclusion that economic freedom contributes to improvements in lower-income outcomes without diminishing opportunities for higher-income states, suggesting a form of inclusive growth rather than divergence.

Conclusion

This study examined how economic freedom influences income thresholds across income groups and income quantiles in the forty-eight contiguous U.S. states from 2010 to 2021. By combining quantile regressions with fixed-effects panel models, the analysis revealed that the effects of economic freedom are heterogeneous across the income spectrum. Economic freedom has a significant positive association with income thresholds at the 25th quantile across most income groups, indicating that poorer states benefit most from institutional liberalization. At the same time, the estimated effects are larger for lower-income individuals than for higher-income individuals within states, suggesting that income gains are concentrated more at the bottom of the within-state distribution than at the top. This relationship is primarily driven by the government size component of the Economic Freedom of North America index, suggesting that lower government spending and public-sector burdens create conditions that support income growth in less affluent regions.

The results also reveal that taxation and labor market freedom play secondary and more selective roles. Tax policy shows modest significance only among high-income states, while labor market flexibility exhibits stronger effects at the very top of the income distribution.

The results indicate that the strongest gains occur for states at the lower end of the income distribution, while middle- and higher-income states experience smaller—but still positive—effects. These patterns also imply that the channels through which economic freedom affects income are not uniform: lower government spending promotes convergence and inclusion at the bottom of the distribution, whereas labor and market efficiency reinforce gains at the top. More efficient public institutions seem to foster the economic conditions that drive income gains in poorer states without diminishing opportunities in higher-income states.

From a policy perspective, these findings highlight the importance of targeted institutional reforms that enhance economic freedom without sacrificing equity. For lower-income states, efforts to reduce the scale of government spending and limit administrative burdens could stimulate private-sector activity and raise household income thresholds. At the same time, for higher-income states, fostering flexible labor markets and efficient taxation systems could sustain innovation and competitiveness without undermining the redistributive effects observed in poorer regions.

Overall, the evidence suggests that economic freedom can serve as a mechanism for inclusive growth when its fiscal and institutional dimensions are appropriately balanced. Rather than a simple trade-off between efficiency and equity, the U.S. state-level experience demonstrates that a combination of limited government intervention and market flexibility can enhance opportunities for economic advancement across the income spectrum, particularly where they are most needed. These findings underscore that what matters most is not whether the Gini coefficient rises or falls, but whether low-income individuals and states experience upward mobility—and the results presented here show that they do.

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Appendix

Table 1: **Effect of Economic Freedom on Income Thresholds (Quantile)**

Group (Dependent Variable)	25th Quantile	50th Quantile (Median)	75th Quantile
Bottom 20% (q1)	0.202 (0.1133*)	0.138 (0.1240)	0.137 (0.0987)
Bottom 40% (q2)	0.176 (0.0727**)	0.098 (0.0811)	0.102 (0.0693)
Bottom 60% (q3)	0.102 (0.0606*)	0.067 (0.0860)	0.002 (0.0782)
Bottom 80% (q4)	0.068 (0.0619)	0.052 (0.0617)	0.017 (0.0685)
Top 5% (lowest limit)	0.187 (0.1060*)	0.064 (0.0766)	0.11 (0.1065)

P<0.1*, <0.05**, <0.01***

Appendix, Cont.

Table 2: **Quantile Regression Results: EF Components**

Dependent Variable	Quantile	Area1	Area2	Area3
ln_q1 (Bottom 20%)	0.25	0.015 (0.0053 ^{***})	0.0045 (0.0094)	0.0071 (0.0049)
ln_q1	0.5	0.0095 (0.0071)	0.0086 (0.0080)	0.0061 (0.0051)
ln_q1	0.75	0.0101 (0.0059 [*])	0.00996 (0.0058 [*])	0.0086 (0.0045 [*])
ln_q2 (Bottom 40%)	0.25	0.0133 (0.0049 ^{***})	0.004 (0.0065)	0.008 (0.0036 ^{**})
ln_q2	0.5	0.0092 (0.0068)	0.0082 (0.0114)	0.0033 (0.0052)
ln_q2	0.75	0.0083 (0.0056)	0.0063 (0.0058)	0.0056 (0.0041)
ln_q3 (Bottom 60%)	0.25	0.0126 (0.0042 ^{***})	-0.00098 (0.0084)	0.0052 (0.0034)
ln_q3	0.5	0.0053 (0.0049)	0.0044 (0.0059)	0.0055 (0.0039)
ln_q3	0.75	0.0064 (0.0033 [*])	0.0018 (0.0062)	0.0072 (0.0041 [*])
ln_q4 (Bottom 80%)	0.25	0.0089 (0.0032 ^{***})	-0.0055 (0.0040)	0.0023 (0.0026)
ln_q4	0.5	0.0073 (0.0040 [*])	0.00197 (0.0067)	0.0016 (0.0033)
ln_q4	0.75	0.0062 (0.0055)	-0.0008 (0.0128)	0.0052 (0.0058)
ln_top5 (Top 5%)	0.25	0.012 (0.0065 [*])	0.0188 (0.0148)	0.03595 (0.0137 ^{***})
ln_top5	0.5	0.0079(0.0097)	0.0256 (0.0188)	0.0265 (0.0119 ^{**})
ln_top5	0.75	0.0098 (0.0056 [*])	0.0174 (0.0063 ^{**})	0.0205 (0.0066 ^{***})

P<0.1*, <0.05**, <0.01***

Appendix, Cont.

Table 3: Regular Results

	ln_q1		ln_q2		ln_q3		ln_q4		ln_top5	
EF	0.099		0.087		0.073		0.042		0.21	
	(0.102)		(0.081)		(0.069)		(0.059)		(0.139)	
Year										
2011	0		0.011	***	0.018	***	0.024	***	0.031	***
	(0.005)		(0.004)		(0.003)		(0.003)		(0.005)	
2012	0.01		0.022	**	0.029	***	0.038	***	0.03	*
	(0.013)		(0.010)		(0.008)		(0.008)		(0.017)	
2013	0.037	***	0.049	***	0.055	***	0.065	***	0.076	***
	(0.008)		(0.007)		(0.006)		(0.005)		(0.011)	
2014	0.056	***	0.069	***	0.074	***	0.09	***	0.089	***
	(0.013)		(0.011)		(0.009)		(0.009)		(0.019)	
2015	0.092	***	0.101	***	0.108	***	0.119	***	0.111	***
	(0.016)		(0.014)		(0.012)		(0.010)		(0.022)	

Appendix, Cont.

Table 3: Regular Results

2016	0.122	***	0.132	***	0.139	***	0.151	***	0.142	***
	(0.015)		(0.013)		(0.011)		(0.009)		(0.023)	
2017	0.155	***	0.167	***	0.172	***	0.185	***	0.164	***
	(0.018)		(0.016)		(0.013)		(0.011)		(0.028)	
2018	0.193	***	0.203	***	0.208	***	0.218	***	0.205	***
	(0.016)		(0.014)		(0.012)		(0.010)		(0.024)	
2019	0.257	***	0.265	***	0.259	***	0.266	***	0.244	***
	(0.014)		(0.011)		(0.009)		(0.008)		(0.022)	
2020	0.257	***	0.264	***	0.263	***	0.268	***	0.261	***
	(0.006)		(0.005)		(0.004)		(0.004)		(0.013)	
2021	0.319	***	0.336	***	0.336	***	0.345	***	0.337	***
	(0.009)		(0.007)		(0.007)		(0.006)		(0.015)	
	9.17	***	9.886	***	10.457	***	11.154	***	10.362	***
Intercept	(0.817)		(0.647)		(0.552)		(0.472)		(1.118)	
Number of observations	576		576		576		576		576	

*** p<.01, ** p<.05, * p<.1

Appendix, Cont.

Table 4: Regular Results

	ln_q1		ln_q2		ln_q3		ln_q4		ln_top5	
area 1	0.011	*	0.008		0.008	*	0.007	*	0.013	
	(0.006)		(0.005)		(0.004)		(0.004)		(0.008)	
area 2	0.001		0.003		0.001		-0.002		0.018	*
	(0.010)		(0.008)		(0.007)		(0.007)		(0.010)	
area 3	0.006		0.004		0.004		0.003		0.041	***
	(0.006)		(0.005)		(0.004)		(0.004)		(0.010)	
Year										
2011	-0.004		0.008	*	0.015	***	0.022	***	0.028	***
	(0.005)		(0.004)		(0.004)		(0.003)		(0.005)	
2012	0.011	**	0.024	***	0.03	***	0.037	***	0.037	***
	(0.005)		(0.005)		(0.004)		(0.004)		(0.007)	
2013	0.036	***	0.049	***	0.054	***	0.063	***	0.074	***
	(0.005)		(0.004)		(0.004)		(0.004)		(0.006)	
2014	0.058	***	0.071	***	0.075	***	0.089	***	0.088	***
	(0.006)		(0.006)		(0.005)		(0.005)		(0.008)	
2015	0.095	***	0.105	***	0.111	***	0.119	***	0.109	***
	(0.007)		(0.007)		(0.005)		(0.005)		(0.009)	

*** p<.01, ** p<.05, * p<.1

Appendix, Cont.

Table 4: Regular Results

2016	0.128	***	0.139	***	0.143	***	0.152	***	0.145	***
	(0.007)		(0.006)		(0.005)		(0.005)		(0.010)	
2017	0.163	***	0.175	***	0.178	***	0.187	***	0.168	***
	(0.007)		(0.007)		(0.006)		(0.006)		(0.013)	
2018	0.196	***	0.208	***	0.21	***	0.218	***	0.199	***
	(0.007)		(0.007)		(0.006)		(0.005)		(0.013)	
2019	0.256	***	0.266	***	0.258	***	0.263	***	0.239	***
	(0.009)		(0.007)		(0.007)		(0.006)		(0.013)	
2020	0.243	***	0.253	***	0.252	***	0.26	***	0.208	***
	(0.008)		(0.007)		(0.006)		(0.006)		(0.018)	
2021	0.296	***	0.319	***	0.319	***	0.333	***	0.269	***
	(0.010)		(0.009)		(0.008)		(0.007)		(0.022)	
Intercept	9.852	***	10.491	***	10.958	***	11.439	***	11.611	***
	(0.054)		(0.048)		(0.042)		(0.041)		(0.087)	
Number of observations	576		576		576		576		576	

*** p<.01, ** p<.05, * p<.1

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