

Economic Freedom and Development: Productive, Unproductive, and Destructive

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Abstract. Why are some countries more prosperous than others? This question dates back to Adam Smith's (1776) *Wealth of Nations*, and the consensus is that institutions such as economic freedom matter for economic development. Depending on the quality, economic freedom can either encourage or discourage economic development. In this chapter, I provide a ranking of 118 countries according to productive (i.e., STEM) and unproductive activities (business, administration, and law) in education. First, I find that these measures are negatively correlated—countries that have more graduates in STEM tend to also have less graduates in business, administration, and law. Second, I compute a net ranking according to these two metrics (i.e., net productivity). My analysis reveals that economic freedom encourages greater net productivity for OECD countries only. For non-OECD countries, more economic freedom is associated with *lower* net productivity. This result is driven by higher rates of graduates in business, administration, and law and not STEM graduates. Thus, economic freedom is associated with more development and net productivity, but these results are weaker for non-OECD countries.

Keywords: Development, Economic Freedom, Emerging, Entrepreneurship, Institutions, Productive, Unproductive

1. Introduction

A substantial body of research demonstrates a strong link between institutions and entrepreneurship (Boudreaux et al. 2019; Boudreaux and Nikolaev 2019; Chowdhury et al. 2019; Estrin et al. 2013; Urbano et al. 2019; Urbano and Alvarez 2014). Moreover, a consensus has emerged that it is the institutions like economic freedom that matter for economic growth and development (Acemoglu et al. 2005; Baumol 2002; Bosma et al. 2018; Gwartney et al. 1999) operating through the channel of entrepreneurship. Economic freedom can encourage productive activities like entrepreneurship, but the lack of economic freedom can also encourage unproductive activities like rent-seeking (Acs and Szerb 2007; Audretsch et al. 2006; Baumol 1990; Sobel 2008) or even destructive activities such as corruption, raiding, confiscation, and extortion (Boudreaux et al. 2018; Desai et al. 2013; Dimant and Tosato 2018).

Yet, the literature reveals the returns to rent-seeking dominate productive activities in most countries (Murphy et al. 1991, 1993). For example, Murphy et al. (1991) use country-level data to contrast productive activities proxied by STEM education with unproductive ones proxied by lawyers per capita. They contend that STEM education measures productive activities since much innovation comes from science and engineering, and lawyers serve as a proxy for unproductive activities since they redistribute resources through rent seeking and the political process. They find the returns to unproductive activities outweigh the returns to productive ones and explain how the institutional environment favors unproductive activities over productive ones in most countries (Murphy et al. 1993). At the state-level, Sobel (2008) finds pro-market institutions, measured as economic freedom, encourage productive activities (e.g., patents, venture capital, and establishment births) and discourage unproductive ones (i.e., political and legal entrepreneurship).

Despite the importance of these studies, we still know little about how institutions like economic freedom relate to specific productive, unproductive, and destructive activities, which has important implications for the entrepreneurship literature (Baumol 1990; Boudreaux et al. 2022; Lucas and Fuller 2017). Although these

studies shed light on how institutions influence productive and unproductive entrepreneurship, the literature has not fully explored these relationships. For instance, Murphy et al. (1991) provided country-level evidence, but they did not examine the role of institutions in the allocation of talent. Likewise, although Sobel (2008) examined the role of economic freedom in the allocation of talent, he only examined the 48 states in the US and did not examine the role of economic freedom at the country-level or the allocation of STEM education and lawyers like Murphy et al. (1991).

The objective of this study is twofold: First, I examine the relationship between productive and unproductive activities, and I examine how economic freedom influences the allocation of talent between them. Using data from UNESCO Institute for Statistics¹, I begin by providing a ranking of 118 countries according to their STEM graduates and graduates in business, administration, and law². These measures are negatively correlated—countries that have more graduates in STEM tend to also have less graduates in business, administration, and law. Second, I compute a net ranking according to these two metrics (i.e., net productivity). I find that economic freedom encourages greater net productivity for OECD countries only. For non-OECD countries, more economic freedom is associated with *lower* net productivity. This result is driven by higher rates of graduates in business, administration, and law and not STEM graduates.

Based on these findings, I draw two main conclusions. The first is that there is a tradeoff between productive and unproductive activities like STEM education and education in business, administration, and law. Countries that have a high proportion of STEM graduates tend to have a smaller proportion of graduates in business, administration, and law. I therefore provide evidence to support earlier studies like Murphy et al (1991) using updated data for the year 2020 and for a broader variety of countries including emerging economies. The second is that economic freedom encourages productive activity like STEM education and

¹ <http://data.uis.unesco.org/>

² The category of tertiary education groups business, administration, and law together. Administration and law are consistent with unproductive activities, but business is more ambiguous. In a robustness check, I gather data only on lawyers per capita and find similar results, but these data are not available for emerging market economies.

discourages unproductive or destructive activities such as business, administration, and law. However, the evidence is stronger for OECD than non-OECD countries. This finding has several implications for how scholars discuss the relationship between economic freedom, entrepreneurship, and development (Bosma et al. 2018; Boudreaux 2019; Lafuente et al. 2020). I elaborate on these implications in the discussion section.

2. Productive, Unproductive, and Destructive Activities

Baumol (1990) argues the supply of entrepreneurship seldom changes. Rather, it is the *allocation* of entrepreneurship that changes between productive and unproductive activities. Institutions like economic freedom can therefore either encourage productive or destructive activities, depending on the context (Boudreaux et al. 2018; Sobel 2008).

Murphy et al. (1991) make a similar argument that institutions influence the allocation of talent—talent is general rather than specific to an occupation and its allocation is governed by comparative advantages and returns to absolute advantages in different sectors. Thus, depending on the context, talented people can realize greater returns in productive or unproductive activities. For example, Great Britain during the Industrial Revolution, the US in the 19th and 20th centuries, and some modern East Asian countries all have allowed talented people to organize firms and retain profits (Baumol 1990; Murphy et al. 1991). As a result, entrepreneurship flourished. In contrast, many other countries have discouraged entrepreneurship and instead encouraged talented individuals to become bureaucrats, join the army, join organized religion, or participate in other rent-seeking activities. Mandarin China, Medieval Europe, and many African countries today have institutions that encourage talented individuals to solicit bribes and engage in corruption (Baumol 1990; Murphy et al. 1991).

Following this line of thought, Murphy et al. (1991) provide proxy measures for productive and unproductive activities—STEM graduates and graduates in business, administration, and law, respectively. Their argument is based on the premise that STEM education enhances productive entrepreneurship and

innovation whereas business, administration, and law education encourages unproductive activities such as rent seeking. Their research suggests that unproductive activities dominate productive activities in most countries (Murphy et al. 1991, 1993).

To examine this claim more closely, I gathered data from UNESCO Institute for statistics on STEM graduates and graduates in business, administration, and law. The former serves as a proxy for productive activities, and the latter is a proxy for unproductive activities. Table 1 reports these data. The ten countries with the largest percentage of STEM graduates are Oman (43.3%), Iran (41.9%), Tunisia (41.6%), Malaysia (41.2%), Brunei Darussalam (37.1%), Germany (36.0%), Singapore (35.2%), Belarus (34.1%), Myanmar (33.7%), and India (32.6%). The ten countries with the smallest are Tanzania (9.5%), Guatemala (9.8%), Mozambique (10.1%), Bangladesh (11.2%), Egypt (11.2%), Angola (12.0%), Namibia (12.6%), Niger (13.0%), Dominican Republic (13.3%), and Lesotho (13.5%). Though there are exceptions, many of the countries with large percentages of STEM graduates are in the Middle East and Asia whereas many of the countries with small percentages are in Africa.

Next, I report the proxy for unproductive activity—tertiary education in business, administration, and lawyers. The ten countries with the largest percentage of graduates in business, administration, and law are Congo (59.1%), Bahrain (49.5%), Seychelles (47.0%), Colombia (44.2%), Lao People’s Democratic Republic (43.6%), United Arab Emirates (43.5%), Benin (43.4%), Belize (43.0%), Madagascar (41.0%), and Luxembourg (40.2%). The ten countries with the smallest are Tajikistan (5.9%), Egypt (11.2%), Myanmar (11.8%), Armenia (14.0%), Republic of Korea (15.1%), Indonesia (16.5%), Sweden (16.6%), Norway (16.7%), Trinidad and Tobago (16.8%), and Italy (17.7%).

Figure 1 reports the correlation between these productive and unproductive measures. Tertiary education in STEM (%) is on the vertical axis and tertiary education in business, administration, and law (%) is on the

horizontal axis. Overall, the scatterplot depicts a negative relationship between these productive and unproductive measures. That is, countries that have a larger proportion of STEM graduates

Table 1. Countries in Sample

Country	STEM	Business, Admin, & Law	Country	STEM	Business, Admin, & Law	Country	STEM	Business, Admin, & Law
Albania	19.05	28.84	Iceland	18.99	21.03	Singapore	35.17	31.06
Algeria	31.44	21.22	India	32.57	18.37	Slovakia	21.68	20.57
Angola	12.01	28.48	Indonesia	18.47	16.51	Slovenia	27.22	20.09
Argentina	15.21	23.19	Iran	41.91	27.67	South Africa	18.44	32.40
Armenia	14.84	14.02	Ireland	25.18	25.63	Spain	23.16	19.04
Australia	18.53	35.30	Israel	26.92	18.38	Sri Lanka	22.82	22.58
Austria	30.51	23.21	Italy	23.60	17.69	Sweden	26.84	16.57
Azerbaijan	24.24	23.89	Jordan	27.21	23.25	Switzerland	24.92	28.07
Bahrain	16.36	49.45	Kazakhstan	24.64	21.57	Syrian Arab Republic	22.96	19.40
Bangladesh	11.21	27.09	Kyrgyzstan	18.96	32.21	Tajikistan	21.74	5.88
Belarus	34.10	30.81	Laos	17.35	43.62	Thailand	27.31	20.43
Belgium	17.21	21.19	Latvia	20.21	29.91	Trinidad and Tobago	28.88	16.76
Belize	19.26	42.97	Lebanon	28.15	27.74	Tunisia	41.65	23.21
Benin	21.31	43.35	Lesotho	13.52	25.43	Türkiye	17.67	30.23
Bosnia and Herzegovina	21.29	21.14	Lithuania	25.45	27.56	Ukraine	25.41	26.36
Botswana	19.12	36.56	Luxembourg	17.75	40.22	United Arab Emirates	28.64	43.54
Brazil	17.39	34.10	Madagascar	24.93	41.01	United Kingdom	25.37	23.03
Brunei Darussalam	37.06	27.41	Malaysia	41.16	22.61	Tanzania	9.50	22.19
Bulgaria	19.93	31.96	Malta	19.50	30.62	United States	18.52	19.14
Burkina Faso	18.07	32.03	Mauritania	27.39	21.85	Uruguay	17.22	25.29
Burundi	21.53	32.16	Mauritius	23.22	38.89	Viet Nam	23.05	28.62
Cabo Verde	14.66	28.47	Mexico	26.06	30.25	Zimbabwe	30.22	26.92
Cambodia	23.20	36.74	Mongolia	21.79	31.74			
Canada	22.89	25.62	Montenegro	20.45	27.95			
Chile	20.57	25.12	Morocco	20.48	23.97			
Colombia	23.60	44.19	Mozambique	10.14	33.46			
Congo	15.13	59.06	Myanmar	33.67	11.76			
Costa Rica	14.72	35.92	Namibia	12.64	36.51			
Croatia	26.38	27.07	Netherlands	17.87	27.48			
Cyprus	15.02	36.91	New Zealand	21.57	23.79			
Czechia	24.72	19.49	Niger	13.02	36.00			
Democratic Republic Congo	15.46	20.20	North	21.51	31.00			
Denmark	21.47	24.53	Norway	21.26	16.73			
Dominican Republic	13.31	36.64	Oman	43.25	33.85			
Ecuador	15.56	21.18	Panama	15.47	28.63			
Egypt	11.24	11.24	Peru	26.56	32.17			
El Salvador	21.97	29.13	Philippines	25.02	28.87			
Estonia	27.65	23.88	Poland	21.66	24.16			
Fiji	17.15	29.06	Portugal	28.37	19.79			
Finland	28.29	18.78	Qatar	23.21	31.66			
France	25.58	34.23	Republic of	29.72	15.07			
Georgia	21.27	35.62	Republic of	24.20	34.68			
Germany	36.04	23.57	Romania	29.05	27.81			
Ghana	14.94	27.20	Russian	30.46	31.15			
Greece	28.12	20.79	Rwanda	18.77	32.81			
Guatemala	9.77	20.83	Saudi Arabia	22.61	28.73			
Honduras	15.23	27.32	Serbia	27.93	23.87			
Hungary	21.58	24.01	Seychelles	19.03	47.00			

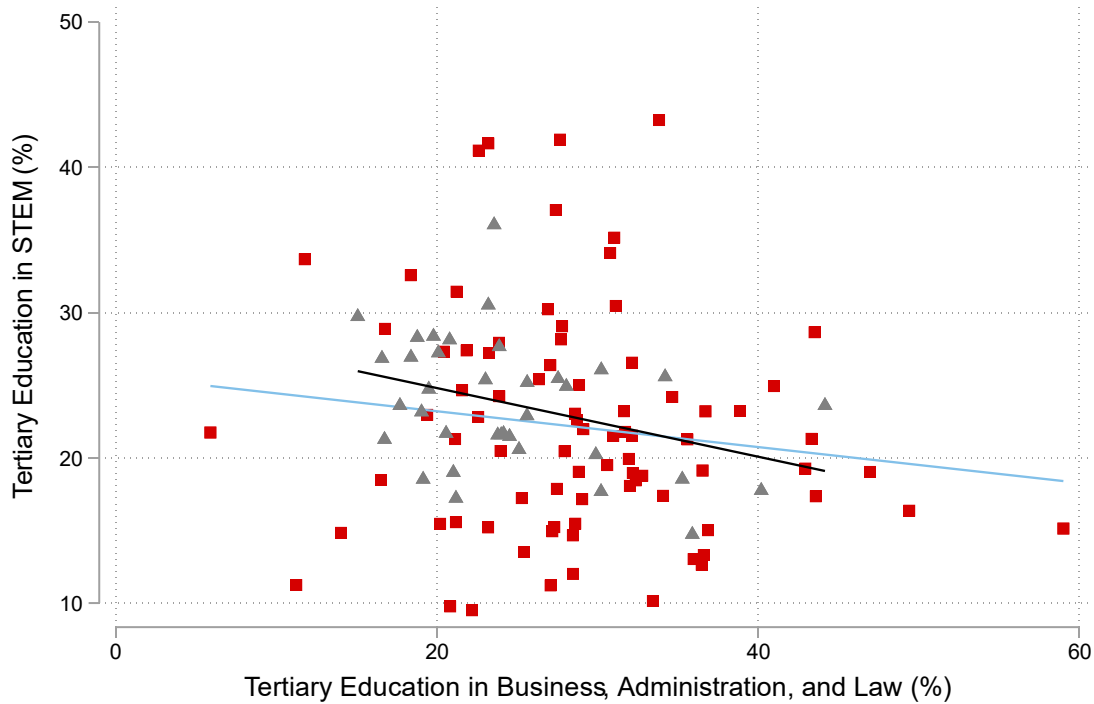


Figure 1. Tertiary Education in STEM and Business, Administration, & Law
 Notes: Squares denote non-OECD countries, and triangles denote OECD countries.

tend to have a smaller graduates in business, administration, and law. Moreover, the slope of this relationship is steeper for OECD countries than for non-OECD countries. The triangles denote OECD countries and the squares denote non-OECD countries. Thus, it appears that societies trade-off between productive and unproductive measures. This provides evidence to support Murphy et al. (1991).

3. Economic Freedom: Productive, Unproductive, and Destructive

3.1. Economic Freedom, STEM degrees, and business, administration, and law degrees

To examine the relationship between economic freedom, productive, and unproductive activities, I gathered data from the Fraser Institute's Economic Freedom of the World (EFW) index and compared this with data on STEM graduates and graduates in business, administration, and law. Figure 2 reports the scatterplots. Panel A reports the relationship between STEM degrees and economic freedom, and Panel B

reports the relationship between graduates in business, administration, and law and economic freedom. The results suggest there is only a small relationship between economic freedom and STEM education. Contrary to predictions, economic freedom is not associated with more STEM education for either OECD or non-OECD countries. On the other hand, economic freedom is associated with *more* graduates in business, administration, and law for non-OECD countries and *less* graduates for OECD countries. Thus, the hypothesis that economic freedom is positively associated with STEM education and negatively associated with business, administration, and law education is only partially supported. My findings do not provide evidence for the former, and the only evidence for the latter is from OECD countries. These results suggest that economic freedom tends to discourage unproductive activities, although it does not necessarily encourage productive activities.

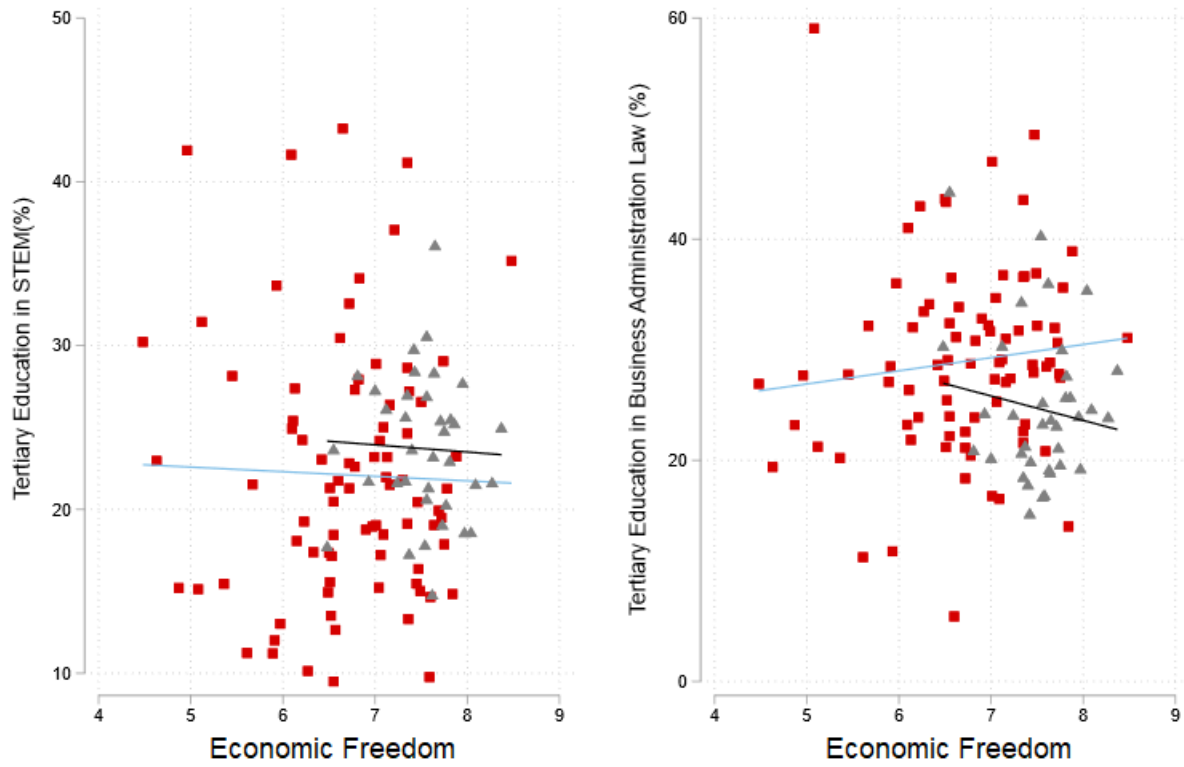


Figure 2. Economic Freedom, STEM, and Business, Administration, & Law
 Notes: Squares denote non-OECD countries, and triangles denote OECD countries.

3.2. Economic Freedom GDP per capita, and Net Score Rankings

Next, to examine the relationship between economic freedom, development, and their net score rankings, I gathered data on GDP per capita (PPP) from the World Bank, and I compared this with the economic freedom data. Following Sobel (2008), I created a net ranking between the measures of productive and unproductive activities using a Borda count method. This net ranking involves creating a ranking for each measure and then computing the difference between the STEM rank and business, administration, and law graduate rank. Table 2 provides a summary of the countries in the sample according to their STEM ranking, business, administration, and law ranking, net score, and economic freedom. Myanmar, Republic of Korea, India, Trinidad and Tobago, and Finland occupy the top five positions on the net ranking. These countries rank high on the STEM education and low on business, administration, and law. Hence, the net score ranking considers a country's ranking on both measures and computes an overall ranking.

Table 2. Country Rankings

Rank	Country	Net Score	STEM rank	Law Rank	EFW	GDP PPP
1	Myanmar	107	9	116	5.93	5218.02
2	Republic of Korea	99	15	114	7.42	45403
3	India	98	10	108	6.72	6448.87
4	Trinidad and Tobago	93	17	110	7.01	24672.4
5	Finland	86	20	106	7.64	50937.2
6	Portugal	82	19	101	7.43	34177.1
7	Sweden	82	30	112	7.56	55064.9
8	Malaysia	81	4	85	7.35	27245.6
9	Algeria	79	11	90	5.12	11438.7
10	Tunisia	78	3	81	6.09	10571.9
11	Israel	78	29	107	7.35	39489.3
12	Greece	74	22	96	6.81	27953.8
13	Slovenia	73	27	100	7	39725.3
14	Germany	73	6	79	7.65	54844.5
15	Thailand	72	26	98	6.78	17771.3
16	Austria	70	12	82	7.56	55686
17	Mauritania	63	25	88	6.13	5605.92
18	Italy	62	47	109	7.4	41995.4
19	Czechia	60	42	102	7.75	41608
20	Tajikistan	59	59	118	6.6	3851.94
21	Iran (Islamic Republic of)	54	2	56	4.96	15222.8
22	Brunei Darussalam	54	5	59	7.21	64977.3
23	Spain	54	51	105	7.63	37754.6
24	Serbia	54	23	77	6.82	19173.2
25	Jordan	52	28	80	7.37	9707.4
26	Estonia	52	24	76	7.95	37644

27	Zimbabwe	50	14	64	4.48	2099.32
28	Syrian Arab Republic	50	53	103	4.63	
29	United Kingdom	47	37	84	7.71	46526.9
30	Kazakhstan	46	43	89	7.35	26750.4
31	Norway	41	70	111	7.58	62644.8
32	Romania	38	16	54	7.74	32681
33	Slovakia	37	60	97	7.33	31356.5
34	Lebanon	34	21	55	5.45	14535.7
35	Croatia	31	32	63	7.16	29106.6
36	Sri Lanka	31	55	86	6.72	13813
37	Azerbaijan	31	44	75	6.21	14478.5
38	Belarus	30	8	38	6.83	20278.5
39	Ukraine	29	36	65	6.11	13087.3
40	Singapore	29	7	36	8.48	99681.3
41	Ireland	28	38	66	7.86	93355.6
42	Indonesia	27	86	113	7.09	12146.4
43	Bosnia and Herzegovina	25	68	93	6.72	15336.9
44	Oman	23	1	24	6.65	34910.9
45	Lithuania	22	35	57	7.82	38880.5
46	Russian Federation	22	13	35	6.62	29936.9
47	United States	19	85	104	7.97	63027.7
48	New Zealand	15	63	78	8.27	44657.8
49	Canada	13	54	67	7.81	46572.1
50	Iceland	13	81	94	7.73	53616.7
51	Hungary	11	62	73	7.24	33274.3
52	Poland	11	61	72	6.93	34449.3
53	Switzerland	11	41	52	8.37	71732
54	Armenia	9	106	115	7.84	14089.2
55	Mexico	7	33	40	7.12	19165.4
56	Philippines	6	39	45	7.09	8198.97
57	Denmark	5	66	71	8.09	60229.9
58	Egypt	3	114	117	5.61	12004.1
59	Morocco	2	72	74	6.55	7959.26
60	Democratic Republic of Congo	-1	100	99	5.36	1101.25
61	Chile	-1	71	70	7.56	24849.7
62	Peru	-2	31	29	7.5	11789
63	Viet Nam	-3	52	49	6.42	11023
64	Belgium	-4	95	91	7.37	53096.1
65	Ecuador	-6	98	92	6.51	10924.2
66	Saudi Arabia	-9	56	47	6.78	45240.7
67	United Arab Emirates	-12	18	6	7.35	71374.2
68	France	-12	34	22	7.33	46858.2
69	El Salvador	-14	57	43	7.12	8720.01
70	Qatar	-15	49	34	6.99	93894.3
71	Argentina	-19	102	83	4.87	20763.3
72	Montenegro	-20	73	53	7.46	20107.7
73	Guatemala	-22	117	95	7.59	8849.72
74	Republic of Moldova	-24	45	21	7.05	12870
75	Uruguay	-25	94	69	7.06	23024.1
76	Mongolia	-25	58	33	7.3	12305.7
77	North Macedonia	-28	65	37	7.16	16984.4
78	Madagascar	-31	40	9	6.1	1514.86

79	United Republic of Tanzania	-31	118	87	6.55	2690.92
80	Netherlands	-31	89	58	7.75	59266.9
81	Latvia	-32	74	42	7.77	31424.9
82	Albania	-33	79	46	7.64	13759.5
83	Burundi	-34	64	30	5.67	750.313
84	Mauritius	-37	48	11	7.88	21331.8
85	Malta	-37	76	39	7.72	43711.5
86	Cambodia	-37	50	13	7.13	4510.37
87	Honduras	-41	101	60	7.04	5303.51
88	Lesotho	-41	109	68	6.52	2417.73
89	Colombia	-42	46	4	6.55	14854.5
90	Bulgaria	-43	75	32	7.69	24799.1
91	Ghana	-44	105	61	6.49	5551.79
92	Türkiye	-50	91	41	6.48	27308.6
93	Georgia	-50	69	19	7.78	14731.2
94	Panama	-51	99	48	7.45	26907.4
95	Fiji	-52	96	44	6.53	11567.5
96	Bangladesh	-53	115	62	5.89	5897.59
97	Kyrgyzstan	-54	82	28	6.97	4985.03
98	Rwanda	-57	83	26	6.9	2180.88
99	Burkina Faso	-57	88	31	6.15	2208.4
100	Cabo Verde	-57	108	51	7.6	6084.46
101	South Africa	-60	87	27	6.55	13517.8
102	Benin	-60	67	7	6.51	3360.99
103	Botswana	-63	78	15	7.35	14287.5
104	Angola	-63	113	50	5.91	6362.64
105	Australia	-64	84	20	8.04	53358.2
106	Belize	-69	77	8	6.23	8124.98
107	Brazil	-69	92	23	6.33	14789.9
108	Seychelles	-77	80	3	7.01	28351.9
109	Luxembourg	-80	90	10	7.54	117846
110	Lao People's Democratic Republic	-88	93	5	6.5	8189.15
111	Costa Rica	-89	107	18	7.62	22117.9
112	Mozambique	-91	116	25	6.27	1300.51
113	Cyprus	-92	104	12	7.49	40611.7
114	Niger	-94	111	17	5.97	1281.06
115	Bahrain	-95	97	2	7.47	50468.3
116	Namibia	-96	112	16	6.57	9543.71
117	Dominican Republic	-96	110	14	7.36	17686.8
118	Congo	-102	103	1	5.08	3570.02

Now that I have introduced the net score ranking, I report the scatterplot between economic freedom, GDP per capita (PPP), and the net score in Figure 3. Panel A reports the relationship between GDP per capita and economic freedom while panel B reports the relationship between the net score ranking and economic freedom. There is a positive association between economic freedom and GDP per capita (PPP).

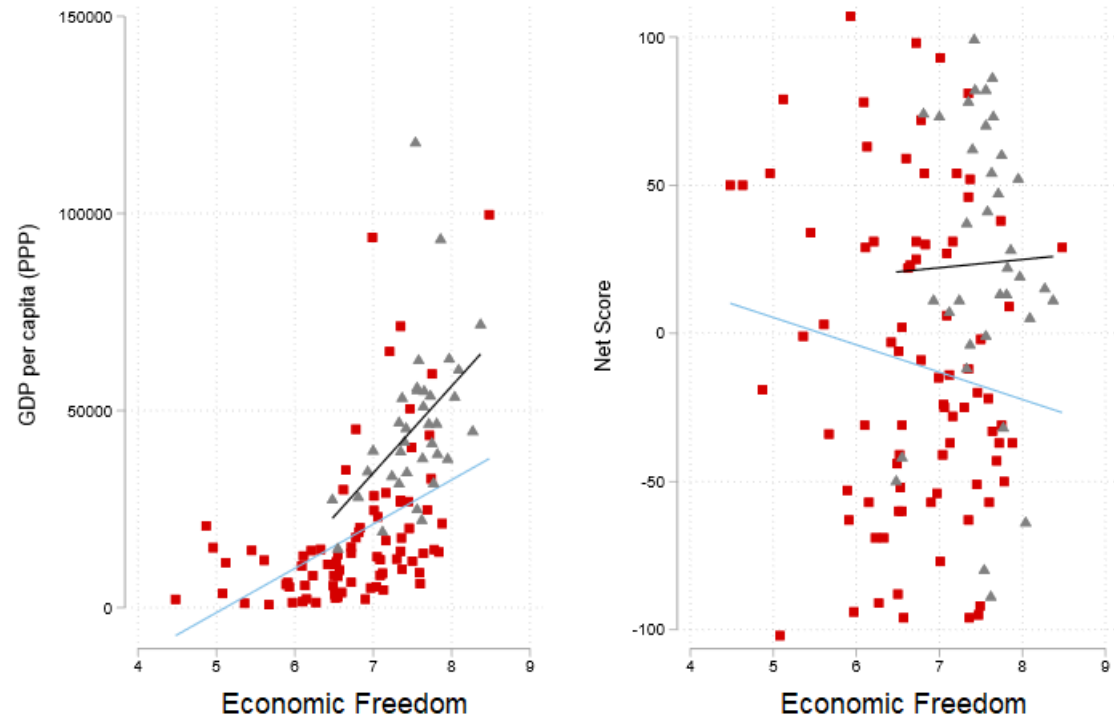


Figure 3. Economic Freedom, GDP per capita, and Net Score
 Notes: Squares denote non-OECD countries, and triangles denote OECD countries.

This supports the view that institutions encourage economic development (Acemoglu et al. 2005; Baumol 2002; Gwartney et al. 1999). Interestingly, this association is stronger for OECD countries than for non-OECD countries. The results in panel B suggest that economic freedom is positively associated with a country's net productivity score for OECD countries and negatively associated with non-OECD countries.

4. Discussion

4.1. Summary

Economic freedom matters for economic development. Depending on the quality, economic freedom can either encourage or discourage economic development. In this chapter, I provided a ranking of 118 countries according to productive (i.e., STEM) and unproductive activities (business, administration, and law) in education. I found these measures are negatively correlated—countries that have more graduates in STEM tend to also have less graduates in business, administration, and law. I also computed a net ranking according to these two metrics (i.e., net productivity) following Sobel (2008). My analysis revealed that economic freedom encourages greater net productivity for OECD countries only. For non-OECD countries, more economic freedom is associated with *lower* net productivity, which is driven by higher rates of graduates in business, administration, and law and not STEM graduates. Thus, I found support for the hypothesis that economic freedom is associated with more economic development and net productivity but only in a sample of OECD countries. In non-OECD countries, economic freedom is associated with more economic development, but this relationship is weaker and is driven by unproductive activities.

4.2. Implications

The primary implication of this study is that the institutional context is likely to have heterogeneous effects on economic activity in emerging and non-emerging economies. Thus, the hypothesis that economic freedom encourages economic development through the channel of productive entrepreneurship (Baumol 1990; Bjørnskov and Foss 2016; Sobel 2008) seems more likely to hold for developed economies and less

likely for emerging economies. As such, studies should treat this relationship differently for emerging and non-emerging economies (Boudreaux 2019). Because economic freedom is insufficient to encourage productive activities for non-OECD countries, policymakers might consider the tradeoff between STEM education and graduates in business, administration, and law. Policies that encourage greater STEM education should be prioritized, and this will reduce the allocation to business, administration, and law.

A second implication is that institutions like economic freedom influence not just the amount of entrepreneurship but rather the allocation of entrepreneurship. This is reminiscent of Baumol's (1990, p. 894) hypothesis of allocative effort:

“Entrepreneurs are always with us and always play some substantial role. But there are a variety of roles among which the entrepreneur's efforts can be reallocated, and some of those roles do not follow the constructive and innovative script that is conventionally attributed to that person.”

I found that in OECD countries more economic freedom is associated with lower graduation rates in business, administration, and law. This suggests economic freedom can help curb unproductive activities (Murphy et al. 1991). Although I did not find a positive association between economic freedom and STEM education, the substitution between STEM and business, administration, and law implies that economic freedom can also encourage STEM education, a proxy for productive activities. This is also supported by the positive association between economic freedom and net productivity. One explanation for this finding is that economic freedom helps reduce uncertainty and encourage innovation (Boudreaux 2017; Gwartney et al. 1999). For example, two components of economic freedom are money and trade stability (Gwartney et al. 2019). By increasing stability in the economy, economic freedom helps reduce uncertainty in the market process (Bennett et al. 2023). Alternatively, a lack of economic freedom stifles innovation and encourages rent-seeking at its expense (Baumol 1990; Murphy et al. 1993).

These findings also have policy implications. For example, the observation that economic freedom encourages productive activities and discourages unproductive or destructive activities depends on whether

countries are emerging economies or not. As a result, policymakers in emerging economies should consider that their context differs. Institutional voids are common in emerging economies (Mair and Marti 2009; Palepu and Khanna 1998), and the results from developed countries will not transfer perfectly.

4.3. Limitations and future research suggestions

My study has some limitations worth mentioning. The first limitation is that I use tertiary education in business, administration, and law as a proxy for unproductive activities in education. Although administration and law are suitable measures of unproductive activities due to their redistributive effects on the economy, business education is a less suitable proxy. However, this is a data limitation as UNESCO grouped these three categories together. Therefore, as a robustness check, I also gathered data on lawyers from Statista and scaled these data using country population data from the World Bank to create the metric lawyers per capita. I also gathered data on STEM education for these countries from the National Center for Education Statistics and supplemented this dataset with STEM education data from Eurostat. The results in Figure 4 support my finding that productive and unproductive activities are negatively correlated. The caveat here is that these data do not include emerging economies. Nevertheless, the results from this second dataset support my findings.

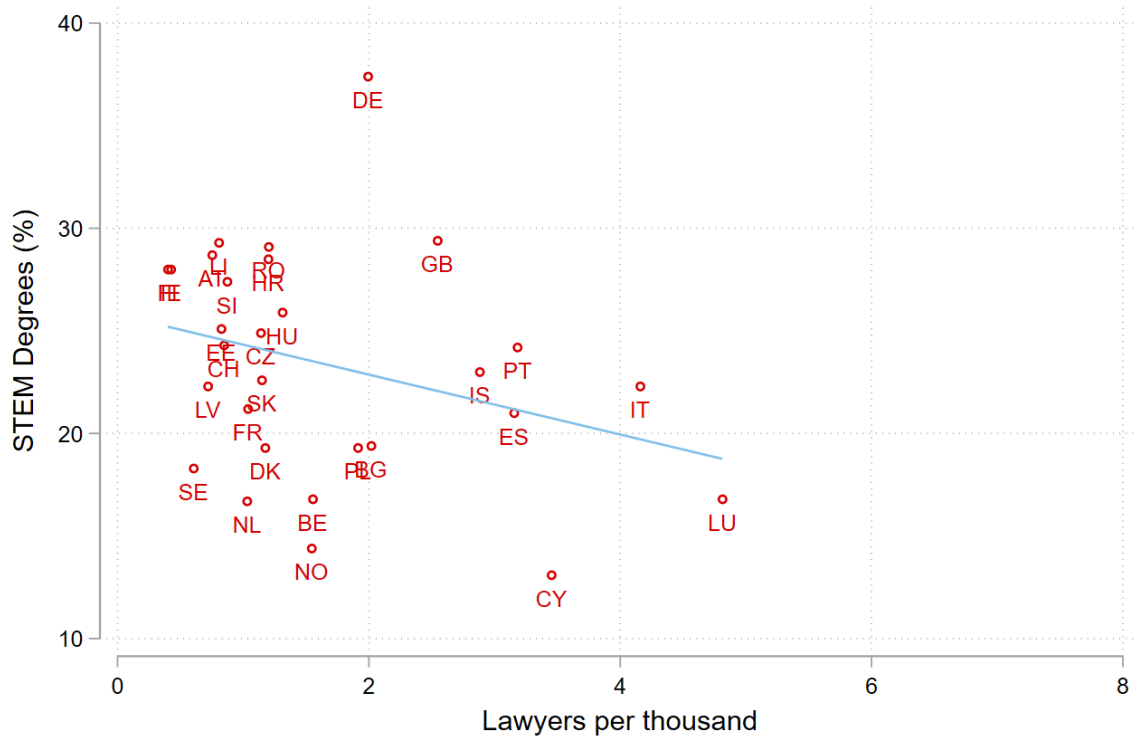


Figure 4. STEM degrees and Lawyers per thousand

A second limitation is that my study only identifies correlations. I do not claim any *causal* relationships in this study. Future research can use more sophisticated identification strategies such as Difference-in-Difference, treatment effects, and regression discontinuity to provide a causal interpretation.

Future research might also consider emphasizing the allocation between destructive entrepreneurship and unproductive entrepreneurship rather than productive and unproductive. For instance, Desai et al. (2013, p. 35) make the following observation:

“In other words, two countries with the same productive allocation (say, 50 percent) may have vastly different allocations of unproductive and destructive activities in the remaining 50 percent.”

Thus, there is substantial room for scholars to examine the relationship between institutions like economic freedom and destructive activity. In a similar vein, identifying educational investments consistent with destructive entrepreneurship would help extend the insights in this study and in Murphy et al. (1991, 1993).

5. Conclusion

Using a dataset of 118 emerging and non-emerging economy countries, I create a ranking according to productive (i.e., STEM) and unproductive activities (business, administration, and law) in education. I found these measures are negatively correlated—countries that have more graduates in STEM tend to also have less graduates in business, administration, and law. I also computed a net ranking according to these two metrics (i.e., net productivity), and my findings reveal economic freedom encourages greater net productivity for OECD countries only. For non-OECD countries, more economic freedom is associated with *lower* net productivity. This result is driven by higher rates of graduates in business, administration, and law and not STEM graduates. I therefore conclude that economic freedom is associated with more development and net productivity, as suggested by the literature, but these relationships are weaker for emerging market economies. Future research should consider how economic freedom and development interact in emerging economies since the models employed on data from developed countries will likely differ in an emerging market context.

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