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The General Financial Education in China: Evidence From Ratio of Undergraduate Financial Education Majors in Universities

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Abstract. Since the development of electronic money, the complex financial situation has raised the importance of financial education. This study focuses on universities' undergraduate financial field education coverage, which helps estimate citizens' overall financial knowledge situation for most undergraduate universities, focusing on learning the general field knowledge that is similar to primary financial thought. The study shows a low concentration of financial education majors among universities; even though the available number of majors in all universities is low, the coverage rate of financial education majors towards universities is higher than initially thought. The results point out specific majors that are worth investing in accumulating financial education in China.

1. Introduction:

Because of the development of electronic money[1] and global and domestic online trades[2], the distance is not determined as much as before. It makes working far away to get a higher payment attractive[3], increasing foreign workers and global goods transactions[4]. Nevertheless, considering the money flow within different areas, it directly increases the complexity of exchange rates and international trade. It indirectly complicates short-run fluctuation[5,6] which may lead to recession or inflation for a large amount of money pouring into or leaving the market in the same short-term period, resulting from a particular festival in their original land or the policy that makes their citizens return. This makes it more challenging to analyze financial situations and estimate the real-valued industry that should be invested[7], mainly when the electronic money system. Thus, those lead to the economic environment that consumers face today become dramatically more perilous[8].

When facing various convoluted finances, citizens need objective knowledge, subjective knowledge, and usage experience[9] to survive in dangerous financial situations and be successful through appropriate financial behaviors[10]. This stresses the importance of financial thought, which indicates a high level of financial education[11]. As universities play an essential role in educating citizens and can help spread the particular field of study and guide the overall knowledge in the right way[12], it is worth carrying out or expanding financial education in

universities for financial knowledge is essential for successful modern financial areas[13]. Realizing this point, many governments have stably invested in such areas[14].

However, even with the finance flow, government policies, and other public help, financial education in undergraduates lacks its professionals[15] due to the focus of specific fields in earlier ages. Therefore, those professionals know more about implementation, program design, next steps, and success in adult education[16]. This study focuses on universities' undergraduate financial field education coverage, which helps estimate citizens' overall financial knowledge situation for most undergraduate universities, focusing on learning the general field knowledge that is similar to primary financial thought.

2. Literature review

2.1 Financial education effects

The cost of higher education rose led to more pressure on students' debt and students needed more financial literacy than early generations[17]. Studies have addressed the crucial of financial education in students' financial literacy abilities[18]. After teaching the Financing Your Future (FYF) progressed to high school students, they got higher general finance scores than before[19] and a similar curriculum course to high school students made their money go father[20]. In addition, from gross to specific fields, financial education also positively impacted students' savings[21], contributing to preventing students from excessive debt and repaying[22,23]. Similarly to that, it also showed a positive impact on seriously students' credit problems[24]. A seminar-based financial education program (Credit Wise Cats) provided to college students effectively helped students' financial knowledge and responsible attitudes toward credit increase and decreased avoidant attitudes toward credit[25]. Taking financial education courses can motivate them to engage in financial help-seeking[26] and better manage their credit[27]. In addition, research dates based on Georgia, Idaho, and Taxes appear financial education plays a significant role in achieving high credit scores[28].

Aside from the students, previous research has proven a positive relationship between the efficiency of using money and the financial knowledge adults have[29,30] and showed that financial education had a positive effect on long-term behavior[31]. When it comes to making consumption, in the planning part, because of the lack of an outside distribution's combined effect[32], financial education positively correlates with consumer planning[33]. In the evaluation part, because of the perception side that distributes personal value judgment[34], many consumers who lack financial literacy make decisions that do not maximize their utilities[35]. Thus, experts generally agree that self-beneficial financial behaviors are positively correlated with financial knowledge[36], which is highly related to financial education[37]. By developing a study of teaching a financial curriculum to adults, their financial behaviors change, and the increased scores on financial decisions verified this point[38].

In recent decades, the internet's development has fastened liquidity flow[39,40], creating new complex investment forms[41]. In this way, it has deepened financial education contributions to stock market participation[42], retirement planning[43], and investment efficiency[44]. Moreover, Internet development helped the financial field to be more detailed and set the stage for dividing the general economy into specific areas for the urgent need of different industrial economies. It has then driven the financial education growth in nowadays.

2.2 Global

To show the overall view of financial education, Table 1 includes some countries' specific educational undergraduate majors, which include accounting and finance, business and management studies, economics and econometrics, logistics and supply chain management,

marketing, and finance. Those are the main parts of the financial field that can almost stand for its nearing areas' financial knowledge.

Table 1

	US	UK	China	Japan	Germany
With Financial Majors	214	134	29	38	64
Total (Top Selected)	678	280	134	142	256
Ratio (%)	31.56	47.86	21.64	26.76	41.03

Based on the selected universities, which are among the top 4915 universities worldwide. The United States has 678 universities, 31.56% of which have at least one of the financial education mentioned previously(214); the United Kingdom has 134 universities, 47.86% of which have that (134), China has 29 universities and 21.64% of these have that (29), Japan has 142 universities, and 26.76% of these have that. Germany has 156 universities, of which 41.03% of these have that (64). In these data, China, the only developing country among the representatives, has both the lowest universities with financial field courses and the weakest financial education ratio. These two distinct features enlarge the significance of analyzing basic financial knowledge among China because it represents developing countries that approach developed countries, which is the economic growth process. Moreover, since the necessary financial knowledge should include specific areas and other high-related majors, the relatively low ratio of specific financial education helps estimate the real popularization of the primary financial education ratio for the lowering of partial recovery. The following section discusses the real popularization of the primary financial education ratio in China.

3. Schooling Coverage of Financial Majors

Because the data above are only the data from the universities the website selects, some relative majors are not considered economical. This section will show China's comprehensive universities' overall situation instead of the selected ones, the minimum coverage of financial field majors in China, and the maximum potential in China.

3.1 Basic China Financial Education information

China has three levels of universities- *985*, *211*, and *others*. *985* universities are the best 39 universities in China; then, *211* universities are the coming 61 universities in China.

Table 2

Majors\numbers	*985*	*211*	*others*	*Total*
	45	78	1144	1267
Economics	26 (57.78)	50 (64.10)	271 (23.69)	347 (27.39)
Economic Statistics	8 (17.78)	20 (25.64)	114 (9.97)	142 (11.21)
National Economic Management	2 (4.44)	3 (3.85)	5 (0.44)	10 (0.79)
Resource and Environmental Economics	2 (4.44)	0	10 (0.87)	12 (0.95)
Business Economics	0	0	17 (1.49)	17 (1.34)

Energy Economics	1 (2.22)	1 (1.28)	10 (0.87)	12 (0.95)
Labor Economics	1 (2.22)	0	1 (0.09)	2 (0.16)
Economic Engineering	0	0	1 (0.09)	1 (0.08)
Digital Economy	0	1 (1.28)	4 (0.35)	5 (0.59)
Cameralistics	15 (33.33)	14 (17.95)	52 (4.55)	81 (6.39)
Taxation	2 (4.44)	6 (7.69)	71 (6.21)	79 (6.24)
Money and Banking	31 (68.89)	50 (64.10)	290 (25.35)	371 (29.28)
Financial Engineering	11 (24.44)	12 (15.38)	215 (18.79)	238 (18.78)
Insurance	13 (28.89)	8 (10.26)	84 (7.34)	105 (8.29)
Investment	0	7 (8.97)	119 (10.40)	126 (9.94)
Financial Mathematics	1 (2.22)	12 (15.38)	29 (2.53)	42 (3.31)
Credit Management	2 (4.44)	1 (1.28)	19 (1.66)	22 (1.74)
Economy and Finance	1 (2.22)	1 (1.28)	56 (4.90)	58 (4.58)
Actuarial Science	0	3 (3.85)	6 (0.52)	9 (0.71)
Internet Banking	1 (2.22)	1 (1.28)	42 (3.67)	44 (3.47)
Fintech	0	2 (2.56)	16 (1.40)	18 (1.42)
International Economy and Trading	28 (62.22)	48 (61.54)	591 (51.66)	667 (52.64)
Trade and Economic	2 (4.44)	2 (2.56)	36 (3.15)	40 (3.16)
Total Ratio	326.67	310.26	179.98	193.21

Collected by author
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Table 2 shows the different ratios of financial field education for the different types of universities. *985* has its absolute advantages in 11 majors(47.8%), *National Economic Management, Resource, and Environmental Economics, Energy Economy, Labor Economics, Fiscal Science/ Cameralistics, Finance/Money and Banking, Financial Engineering, Insurance, Credit Management, International Economy and Trading, and Trade and Economic*. *211* has its absolute advantages in 7 majors(30.8%), E*conomics, Economic Statistics, Digital Economy, Taxation, Financial Mathematics, Actuarial Science, and Fintech*. For *others*, they have

absolute advantages in five majors(21.7%): *Business Economy, Economic Engineering, Investment, Economic and Finance, and Internet Banking*.
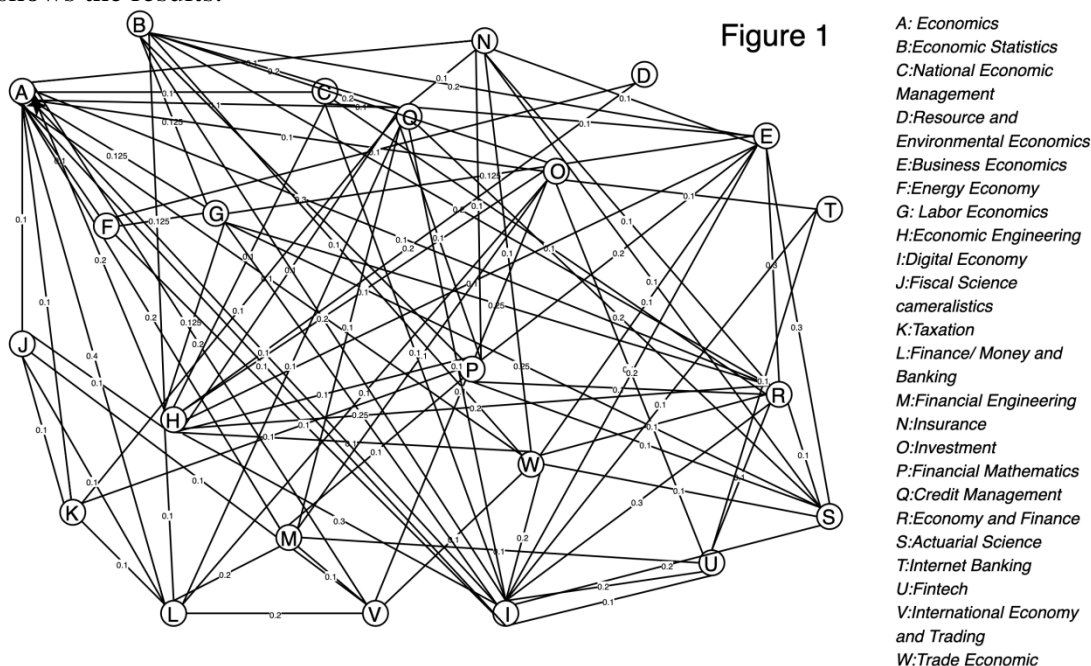
Besides the lower absolute advantages of economic majors that are carried out from *985* to *211* to *others*, summing the percent of majors in different university levels, all economic field coverage of *985* is equal to 326.7%, and that in *211* is equal to 310.26%, and that in *others* is equal to 179.89%. Considering the overall coverage rate (193.21%), which is nearing the rate in *others,* it convinces the idea that most financial education has not been widespread, especially among the ordinary persons for the other universities take up 90.3% of all universities.

To analyze Chinese real economic field majors' coverage, the author collected specific economic field majors ratios at different levels. Furthermore, the universities collected for they have carried out such majors are according to the majors students can choose after *GaoKao* in 2020.

3.2 Relative rate between majors

To find the overall rate of universities that carry out financial education majors, it is essential to find the majors' relative rates. Because the majors are made up of several courses, both in sprite[45] and material[46] sides, whether one university has a specific major is based on the existence of the courses that the university carries out[47,48].

This section analyzes all twenty-three financial education majors from the introductory courses that each of them has, usually the ten most introductory courses except F*Labor Economics,* which has eight introductory courses. Then, finding the pertinent connection between the two majors according to the courses' rates included in different majors. Figure 1 shows the results.

Figure 1

A: Economics
B:Economic Statistics
C:National Economic Management
D:Resource and Environmental Economics
E:Business Economics
F:Energy Economy
G: Labor Economics
H:Economic Engineering
I:Digital Economy
J:Fiscal Science cameralistics
K:Taxation
L:Finance/ Money and Banking
M:Financial Engineering
N:Insurance
O:Investment
P:Financial Mathematics
Q:Credit Management
R:Economy and Finance
S:Actuarial Science
T:Internet Banking
U:Fintech
V:International Economy and Trading
W:Trade Economic

4. Concentration of Financial majors in specific universities
*4.1 Methods*

From Table 2, the total ratio of universities with financial majors is more significant than one hundred%, the maximum rate of all universities, and this leads to considering the compatibility of several majors in one university. Since all majors have a high or relatively low connection with others, which will lead to the recounting of one or more universities, it will

aggregate the result when calculating universities' total ratio that carried out at least one financial major. This part aims to find the concentration expression and the rate at which the majors are in one university.

When the majors concentrate, also using the *A, B, C* until *W* to represent *Economics, Economic Statistics, National Economic Management* until *Trade Economic.* Then, making the equations based on the relative rate between twenty-three majors, and for equations, successively marking one with its real ratio, others will also have some covered together.

4.2 Results & Discussion

Figure 2 provides the results of the equations based on the total connection through the relative rate. Keys *If all cover, Real,* and *No coverage* refer to the resulting from the equation, the real ratio, and the difference between the result and actual percentage that have that majors in the universities. From figure 2, *Internet Banking* has the lowest calculated ratio of -271.353%, then *Energy Economy* is -183.727%, and *Taxation* is -180.985%. And they are then coming with *Credit Management, National Economic Management, Business Economics, Resource and Environmental, Labor Economics, and Economy and Finance.* After that, *Financial Mathematics, Insurance, and Investment* have relatively low absolute values but still have a negative ratio. In real life, the minimum rate of universities with specific majors must be greater than zero; therefore, the majors mentioned above are isolated from others. Similarly, as the real ratio should be less than one, *Fiscal Science Cameralistics,* which is 103.815%, and *Trade Economic,* which is 126.073%, are also not in a highly connected situation.

Figure 2
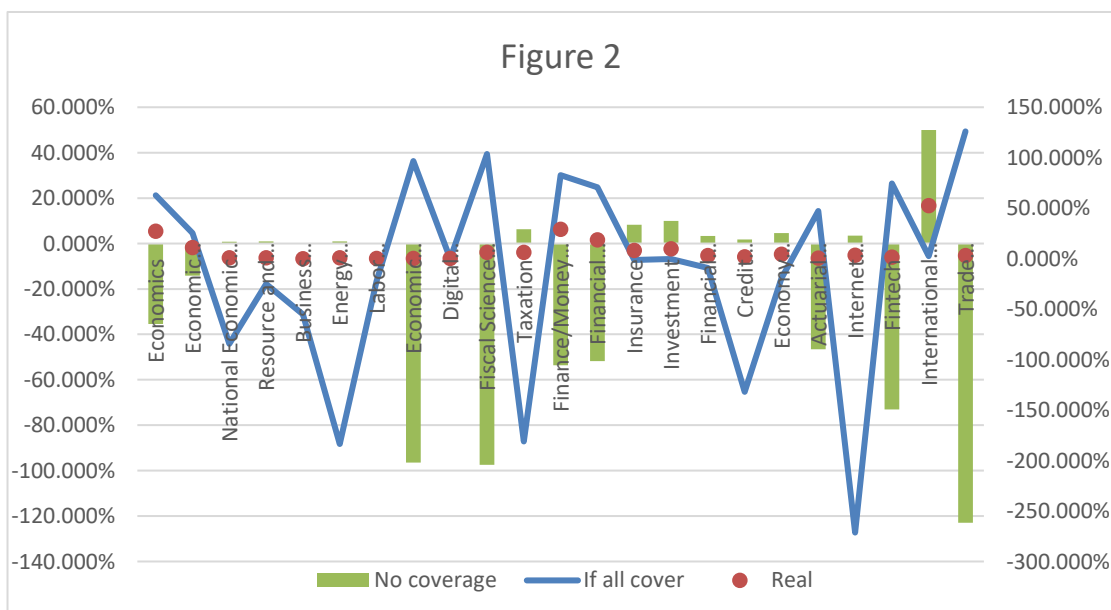
5. Coverage between majors

In the previous method, the result, according to the majors that are all intensely related to each other, shows the low concentration of majors that are gathering in one university. The low concentration strengthens the point that all majors are isolated; each major takes up one entire university and considers the majors the university's original majors. In this way, the possibility of other majors in that university depends only on the original major. Using the relative rate of majors in Figure 1 and the major's real rates in Table 2, we can calculate the minimum coverage and maximum coverage of one specific major.

5.1 Minimum coverage
5.1.1Method & Results

The study uses the basic assumption that other courses are not covered because each major's influence ought to be higher than the real situation. Thus, the result could only be lower than the real one; then, sum the relative rate between the target one and other majors to find the minimum coverage.

Moreover, all of the calculations are based on the prerequisite that others do not have, which has the maximum other major coverage. According to the minimum coverage function calculation, the data have a maximum number of universities with majors other than the target majors. Thus, after min should be the percentage of target major that can be thought apart from the universities of any relative majors and be the number that can be summed beyond the overcount number. The result of calculating in this way is showing in Table 3 at *Minimum Coverage(no overcount number)*.

Nevertheless, considering the overcount of other majors, in the previous calculation, the rate of universities that carry out other majors, except for the target one, is more significant than 100 percent, which means there is an exaggerated covering rate, and it underestimates the real minimum rate. In order to decrease the errors, this section uses another calculation model. Table 3 shows the results at *Minimum Coverage(considering maximum of total 100%)*. Like the previous calculation, finding the highest relationship rate between the target one and each of the others, sum the other majors' actual rate with the highest relative rate to the target major until the sum of other majors' initial rate is equal. Next, we calculate the relationship between the target one and the highest ones with their ratio links and sum the ratios to get the result. This process successfully eliminated errors from the rate of universities beyond 100%. It maintains the highest covering rate so that the result is still the minimum covering rate of one major in universities.
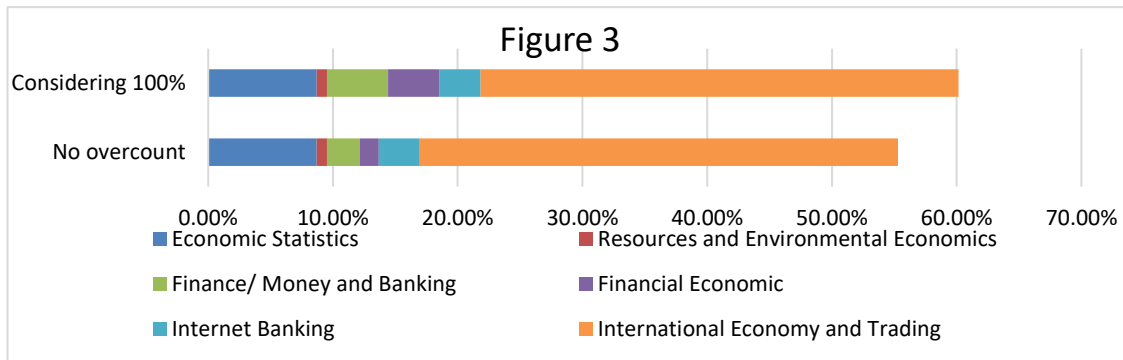
Table3

Majors	Sum from other Subject (%)	Minimum Coverage (%)	Sum from other subjects (Considering 100%) (%)	Sum from other Subject (Minimum coverage) (Considering 100%) (%)
Economic	30.579	-3.189	27.903	-0.513
Economic Statistics	2.508	8.702	11.210	8.702
National Economic Management	3.426	-2.636	0.790	-2.636
Resource and Environmental Economics	0.127	0.823	0.127	0.823
Business Economics	7.297	-7.163	0.134	-7.163
Energy Economy	3.351	-2.401	0.950	-2.401

Labor Economic	5.739	-5.579	0.160	-5.579
Economic Engineering	12.322	-12.162	0.124	-12.126
Digital Economy	8.223	-7.833	0.390	-7.833
Fiscal Science cameralistics	11.571	-5.181	4.827	-3.618
Taxation	6.777	-0.537	6.240	-0.537
Finance/Money and Banking	26.661	2.619	26.992	4.907
Financial Engineering	17.245	1.535	16.208	4.107
Insurance	14.042	-5.752	8.290	-5.752
Investment	13.772	-3.832	6.166	-0.058
Financial Mathematics	7.636	-4.326	3.310	-4.326
Credit Management	10.126	-8.386	1.740	-8.386
Economy and Finance	7.972	-3.392	4.580	-3.392
Actuarial Science	10.806	-10.096	0.710	-10.096
Internet Banking	0.181	3.289	3.470	3.289
Fintech	10.764	-9.344	-0.441	-7.483
International Economy and Trading	14.309	38.331	52.640	38.331
Trade Economy	11.583	-8.423	2.497	-7.760
Total	\	55.299	\	60.159

5.1.2Discussion

Table 3 shows that when the majors are isolated except for the target one in each equation, it gives out the data that consider or do not consider the 100%; some majors are covered, resulting in a rate below zero. Since universities' lowest rate of carrying out majors is zero, the majors with negative rates are unreasonable.

Figure 3

After finding the maximum independent rate of each major from Table 3, it can find the minimum overall rate of universities that carry out financial majors in China. In the calculation of No overcount, *Economic Statistics* is 8.702%, *Resources and Environmental Economics* is 0.832%, *Finance/ Money and Banking* is 2.619%, *Financial Economic* is 1.535%, *Internet Banking* is 3.289%, *International Economy and Trading* is 38.331%, and the overall rate is 55.299%. In calculating 100 percentages, the contributors are the same majors, but two of them have a larger rate, *Finance/ Money and Banking* is 4.907%, *Financial Economic* is 4.107%, and the overall rate is 60.159%. Figure 3 shows the results.

5.2 Maximum Potential (Future development)

Have found the minimum rate of undergraduate financial education majors in universities, which helps get an overall financial sense among citizens. Furthermore, considering that future financial developments are based on primary financial education among citizens, it is worth analyzing the maximum rate nowadays, representing the potential of carrying out primary financial education with the least help.

5.2.1 Method & Results

In this part, all of the calculations are based on the prerequisite that one university has only no major. Thus, all of the majors are isolated so that there is no coverage between each other. Because there is no influence, it can use the relative rate between each major in Figure 1, and the low-repeat coverage of each other also means that each isolated major has a maximum relative rate to others. Then, calculate the relative rate of one target major by summing the relative rates of other majors. Calculating each major's maximum potential, it can use the calculated result minus the real one; thus, the positive difference represents the maximum potential with the least help in that area. The final result, the difference between the maximum potential and the real one, is shown in Table 4, *Maximum with exist courses.*

However, considering the overcount of other majors, in the previous calculation, the rate of universities that carry out other majors, except for the target one, is more extensive than 100 percent. Thus, the real maximum rate is overestimated to recount other majors' influence towards the target one in other universities. In order to decrease the error, the study uses another calculation method. It focuses on the error occurring due to the majors' unreality rate in the universities beyond 100 percent. In each major's calculation, the new method selects the most relative majors of the target one to the target one's least relative majors. Then, summing the universities' rate that carries out the most relative majors and the majors next to it until the summing rate is 100 percent for the maximum of universities is 100 percent. This process focuses on the original problem that causes the error after calculating the potential rate, using it

minus the real rate. Table 4 shows the results on *Maximum with exist courses (considering 100%)*.

Table 4

Majors	Sum from other Subject(%)	Maximum with exist courses (%)	Sum from other subjects (Considering 100%) (%)	Maximum with exist courses (considering 100%) (%)
Economic Statistics	2.51	-8.70	2.51	-8.70
National Economic Management	3.43	2.64	3.43	2.64
Resource and Environmental Economics	0.13	-0.82	0.13	-0.82
Business Economics	7.30	7.16	7.30	7.16
Energy Economy	3.35	2.40	3.35	2.40
Labor Economic	5.74	5.58	5.74	5.58
Economic Engineering	12.32	12.16	12.29	12.13
Digital Economy	8.22	7.83	8.22	7.83
Fiscal Science cameralistics	11.57	5.18	10.01	3.62
Taxation	6.78	0.54	6.78	0.54
Finance/Moneyand Banking	26.66	-2.62	24.37	-4.91
Financial Engineering	17.25	-1.54	14.67	-4.11
Insurance	14.04	5.75	14.04	5.75
Investment	13.77	3.83	10.00	0.06
Financial Mathematics	7.64	4.33	7.64	4.33
Credit Management	10.13	8.39	10.13	8.39
Economy and Finance	7.97	3.39	7.97	3.39
Actuarial Science	10.81	10.10	10.81	10.10

Internet Banking	0.18	-3.29	0.18	-3.29
Fintech	10.76	9.34	8.90	7.48
International Economy and Trading	14.31	-38.33	14.31	-38.33
Trade Economy	11.58	8.42	10.92	7.76
Total	\	100.23	\	89.66

5.2.2 Discussion

Table 4 shows that when all of the majors are isolated except for the target one in each calculated method, it gives out the data that considers or not considering the 100 percent. Nevertheless, some results are impossible because when the initial rate, the real rate, is greater than the calculated rate, the majors' potential is less than zero. Even though few majors may leave the universities, in reality, the calculation can not represent it as it uses the relative rate between different majors. On the other hand, the real rate is greater than the calculated rate is more optimistic. It follows the idea that each major is isolated because there is not much influence of other majors on that major. After eliminating the negative result, both in no considering 100 percentage and considering 100 percentage, each major's potential is calculable.
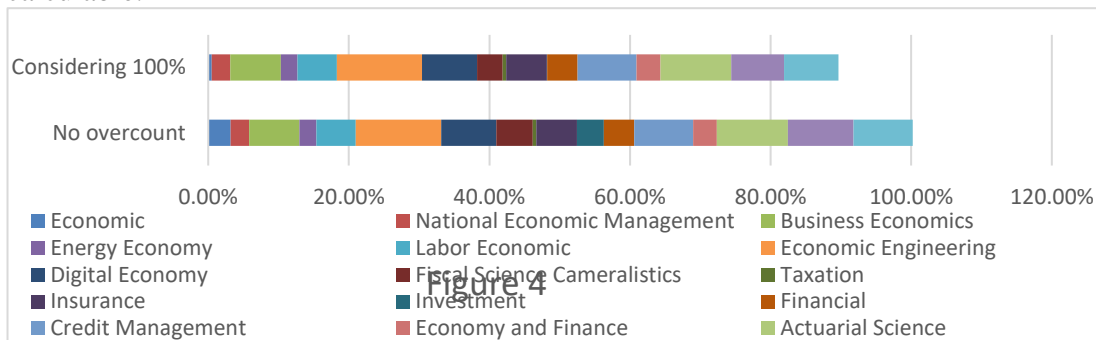
Figure 4

After finding each major's maximum potential rate, simply summing them, the calculation obtains the overall maximum potential rate. Figure 4 shows the results. Furthermore, when considering 100 percentage, the sum result is 89.659%, which has more than 29.5% in universities and is 149.03% times the minimum; the result showed the potential rate is quite optimistic. However, considering that only *Economic Statistics, Resource and Environmental Economic, Financial/ Money and Banking, Financial Engineering, Internet Banking* and *International Economy and Trade* are negative of potential rate in both considering 100 percentage and not considering 100 percentage. The results mean only a few majors could be less connected with others; the maximum rate's real result should be much lower than the calculated one.

6. Conclusion

The study shows a low concentration of financial education majors among universities; therefore, even though the available number of majors in all universities is low, the coverage rate of financial education majors towards universities is higher than initially thought. The situation of economic education is much better in China. Moreover, the universities with at least

one financial educational major mean that they carry out at least eight or ten courses related to the economic area. However, universities do not have any financial education majors, which often means they do not carry out any economic field courses. Therefore, it is much easier to carry out financial activities in universities with such majors than without such majors; thus, the minimum rate of universities with at least one financial education major is worth studying. The study showed that the rate was over fifty-five percentage. Then, to know the potential of the general financial sense, the study further analyzes the maximum rate that shows the different potential of different specific majors that helps increase the general financial sense with the least resources. Finally, both the minimum and maximum rates can help in the process of sustainable development. They give the idea of a general financial sense from the worst and best situation nowadays.

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