LONG SHI

Department of Economics, University of Oklahoma

November, 2016

Contact Information

Phone: (405) 596 – 8096 **Email:** long.shi-1@ou.edu
Mailing Address: 226 Cate Center 1, 308 Cate Center Drive, Norman, OK, 73019
Website： https://sites.google.com/site/personalsitels/

Education

Ph.D. in Economics, University of Oklahoma (expected May 2017)
Dissertation Committee: Qihong Liu (Co-chair), Myongjin Kim (Co-chair), Georgia Kosmopolou, Gary Hoover, Scott Linn (outside member)
M.S. in Economics, University of Illinois at Urbana-Champaign, 2011
B.A. in Economics, China University of Political Science and Law, 2010

Fields of Interest

Industrial Organization, Applied Microeconomics, Applied Econometrics

Working Papers

"How does competition affect product choice? An empirical analysis of the U.S. airline industry" (Job Market Paper)

Abstract : This paper studies major airlines' choice of whether or not to outsource operations to regional airlines across routes and over time. Using panel data of the U.S. airline industry, we find significant differences on the pattern of outsourcing to regional airlines depending on whether the major airlines operate their own major fleets on the route as well. Our results suggest that if HHI increases by 0.1, the log likelihood of a major airline choosing complete outsourcing relative to no outsourcing, goes up by 3.3%. This log likelihood goes down by 5.8% if the major airline's market share increases by 0.1. In contrast, the log likelihood of partial outsourcing relative to no outsourcing goes down by 16.7% if HHI goes up by 0.1, and goes up by 17.8% if the major airline's market share goes up by 0.1. Taking into account the ownership of regional airlines, we find that when facing more LCC competition, major airlines are more likely to rely on wholly owned subsidiaries relative to independent regional airlines. This lends support to the commonly held view that major airlines rely on regional airlines to compete with LCCs. We also investigate how major airlines adjust their prices when facing either LCC entry threat or actual entry. For carrier-routes with no outsourcing, we find that major airlines do not respond in prices to either threat of or actual LCC entry. In contrast, on carrier-routes with partial outsourcing, major airlines lower their prices by about 5.2% one

quarter after LCC entry.

“Airline Fuel Costs: Hedging and Pass-Through” (with Myongjin Kim and Qihong Liu)

Abstract : This paper studies fuel cost pass through in the airline industry. We use 2SLS panel regression like Gerardi and Shapiro (2009) to test whether ticket price changes with jet fuel price and whether the elasticity is different under different market structures. Our result shows that fluctuations in jet fuel price are passed through to airline ticket price and the elasticity is different given different HHI. In addition, we find some relationship between current ticket price and lagged fuel price which probably reflects the effect of airlines’ stock piling behavior. To find the level of cost pass-through, we regress airlines’ revenue on fuel cost by route. Overall, the pass-through rate is above 100%. That is to say, per dollar increase in cost per passenger will lead to an increase in ticket price by more than one dollar.

“The effect of preferential trade agreements on the trade structure of the least developed countries”

Abstract : This paper studies the effect of LDC specific preferential trade agreements on their export structure. Applying the gravity model to my panel data, I find that least developed countries are able to export more manufacture products to the participants of those agreements. I also use the synthetic control method to test whether the African Growth and Opportunity Act of United States significantly changes the overall export structure of the beneficiaries. Yet no conclusion can be drawn from the mixed results.

Work in Progress

“Airline fuel costs and product choices”

“Competition between products in the airline industry: How do airlines adjust themselves to competitors’ new product choice?”

Conference Presentations

Southern Economic Association Annual Meeting, Nov. 2016
Missouri Valley Economic Association Annual Meeting, Oct. 2016

Teaching Experience

Instructor：
Intermediate Microeconomic Theory, Summer 2016, University of Oklahoma
Overall teaching effectiveness: 4/5; Department ranking: 66.7%.

Lab Instructor：
Principles of Macroeconomics, Fall 2014 – Fall 2015, University of Oklahoma

Teaching Assistant (all at University of Oklahoma):
Advanced Price and Welfare Theory (Ph.D.), Fall 2016
Mathematical Economics (Ph.D.), Spring 2013
Statistics for Decision Making (M.A.), Fall 2016
Manegerial Economics (M.A.), Fall 2016
Econometric Analysis, Spring 2016
Intermediate Microeconomics, Fall 2013
Elements of Statistics, Fall 2013, Spring 2014
Principles of Microeconomics, Fall 2012

Awards & Fellowships

2016 TAP Travel Grant, College of Arts and Science, University of Oklahoma
2012 – 2016 Graduate Teaching Assitantship, University of Oklahoma
2010 Outstanding Graduate Award, China University of Political Science and Law
2008-2009 Top Student Scholarship, China University of Political Science and Law

Other Skills

Software: Stata, Matlab, R, LaTex
Languages: Chinese (Native), English (Fluent), Cantonese（Fluent）

References

Qihong Liu
Associate Professor of Economics
(405) 325-5846
qliu@ou.edu
University of Oklahoma

Myongjin Kim
Assistant Professor of Economics
(405) 325-3326
mjkim@ou.edu
University of Oklahoma

Georgia Kosmopoulou
Edith Kinney Gaylord Presidential Professor
(405) 325-3083
georgiak@ou.edu
University of Oklahoma

Gary Hoover (Teaching)
Pofessor and Department Chair
(405) 325-5857
ghoover@ou.edu
University of Oklahoma

Research Statement

Long Shi
Department of Economics
University of Oklahoma
November 2016

My research interest mainly lies in the field of industrial organization, with a current focus on the U.S. airline industry. My dissertation investigates major airlines' product choices, how these choices relate to market competition, as well as the role of fuel costs in airlines' pricing and quality decisions.

In my job market paper, "*How does competition affect product choices? An empirical analysis of the U.S. airline industry*", I study major airlines' choices of whether or not to outsource operations to regional airlines. Different from existing literature, I distinguish between partial outsourcing (where the major airline also operates its own main fleet on a given route) from complete outsourcing (where the major airline does not operate its main fleet). Using panel data of the U.S. airline industry, I find significant differences in major airlines' outsourcing patterns. Major carriers are more likely to introduce regional carriers as a supplement to their own fleet (partial outsourcing) when there is more competition and when their market share goes up. In contrast, they are more likely to replace their own fleet with regional airlines (complete outsourcing) when its own market share goes down or when there is less competition. These strikingly different results suggest the importance of taking into account the multiple roles of regional airlines: substituting the major fleets (complete outsourcing) vs. supplementing the major fleets (partial outsourcing).

Following Forbes and Lederman (2009), I then take into account the vertical structure of regional airlines by separating wholly owned subsidiaries and independent regional airlines. My results suggest that when facing more LCC competition, major airlines are more likely to rely on subsidiaries relative to independent regional airlines. This lends support to the commonly held view that major airlines rely on regional airlines to compete with LCCs. I also investigate how major airlines adjust their prices around the time of LCC entry. For carrier-routes with no outsourcing, I find that major airlines do not adjust their prices to LCC entry. In contrast, on carrier-routes with partial outsourcing, major airlines lower their prices by about 5.2% one quarter after LCC entry.

Fuel price has been volatile in recent decades. Partly to offset volatility, airlines may choose to hedge in an effort to smooth their fuel costs over time. Since different airlines may have different hedging positions, they could face different fuel costs at any given time. In "*Airline Fuel Costs: Hedging and Pass-Through*" (joint with Myongjin Kim and Qihong Liu), we analyze how airlines adjust their prices depending on their fuel costs, and how this adjustments depend on market structure. We first regress the logarithm of ticket price on the logarithm of jet fuel price and its interaction with HHI. Using a 2SLS panel regression similar to that in Gerardi and Shapiro (2009), we find that the cost pass through is significant (both

economically and statistically) and the pass through rate varies with market structure. To be clearer, our result shows that if fuel price per gallon goes up by 10%, ticket price will be raised by around 3%. And if HHI is 10% higher, the ticket price will be further raised by 0.15% on that basis. We also find that lagged fuel prices also have predicting power on ticket prices, suggesting that it takes time for impacts of fuel cost changes to be fully reflected in ticket prices.

While it is natural to regress ticket price on fuel price, and log-log specification means that the estimates can be interpreted as elasticity, these estimates do not directly tell us the pass through rate, in particular, whether there is incomplete pass through. This is because ticket price and fuel cost are not quoted in the same unit, instead one is per passenger and the other is per gallon. We need to convert them to the same unit, so we can say something like if the fuel cost (per passenger) goes up by $5, would the ticket price (also per passenger) goes up by more than $5, or less than $5. We achieve this by converting both ticket price and fuel cost to carrier-route-quarter level. That is, for each carrier-route-quarter combination, we calculate total ticket revenue and total fuel costs. We find that the pass-through rate is above 100%. .
That is, if an airline's per passenger fuel cost on a route increases by a $1, average ticket price will increase by more than $1. In addition to price adjustments, I am planning to analyze how fuel costs affect airlines product competition.

Airline industry is an important part of the U.S. economy and I plan to continue to identify and analyze important questions in this area. But my research is not limited to airlines and I intend to expand beyond the airline industry for future research. In "*An Empirical Study on the effect of Preferential Trade Agreements on the Trade Structure of the Least Developed Countries (LDC)*", I analyze the impacts of LDC specific preferential trade agreements on their export structure. Using the gravity model and panel data, I find that least developed countries are able to export more manufacturing products to the participants of those agreements. I also use the synthetic control method to test whether the African Growth and Opportunity Act of United States significantly changes the overall export structure of the beneficiaries, and have found mixed results.

References:

Forbes, S. and M. Lederman (2009). "Adaptation and Vertical Integration in the Airline Industry," *The American Economic Review* 99(5), 1831-1849.

Gerardi, K. and A. Shapiro (2008). "Does Competition Reduce Price Dispersion? New Evidence from the Airline Industry," *Journal of Political Economy* 117(1), 1-37.

The University of Oklahoma®

DEPARTMENT OF ECONOMICS

November 28, 2016

Dear Committee Members:

This is a letter of recommendation for Long Shi who is applying for a position at NBER. It is a pleasure to offer my opinion of Mr. Shi. He is an excellent student. He has a great analytical ability, he is intelligent, and hard working. I believe that he will be very successful working with you.

I am a member of Mr. Shi's dissertation committee and I have seen his research evolving and have seen him present his work in the department Mr. Shi is a confident, careful and knowledgeable researcher. His job market paper studies the choice of major airline companies to outsource their activities across regions and overtime. There are significant difference between the patterns of outsourcing depending on whether the major airlines operate their own major fleet as well. Those choices depend on the level of market concentration with implications for prices and the effect of entry in the market. He has written four papers on airline competition and all his work is high quality. He has presented results at conferences and received positive feedback. Mr. Shi has broad teaching experience in microeconomics, quantitative methods and is an excellent communicator.

As a summary assessment of his ability, Mr. Shi is ambitious and has the talent and intuition to advance in his career. He is motivated to succeed and willing to work hard. He has an extensive knowledge of economics, has built on a great set of statistical tools and is ready to delve into new and promising research problems. If you wish to further discuss my evaluation of Mr. Shi please contact me at (405) 325-3083, or via e-mail at georgiak@ou.edu.

Sincerely yours,

Georgia Kosmopoulou, Ph.D.
Professor of Economics
Edith Kinney Gaylord Presidential professor
University of Oklahoma

308 Cate Center Drive, Room 158 CCD1, Norman, OK 73072-2103
PHONE: (405) 325-2861 FAX: (405) 325-5842
WEB: http://www.ou.edu/cas/econ

Department of Economics
308 Cate Center Drive
Room 432
The University of Oklahoma
Norman, OK 73019

November 11, 2016

To whom it may concern:

It is my pleasure to write a strong supporting letter for Long Shi who has applied faculty position at your institution. I currently serve as a member on his doctoral committee. I have known him since he joined the graduate level Industrial Organization course designed for Ph.D. second year students in 2014. Since then, he has been working on a couple of airline research projects with me and his doctoral dissertation chair, Dr. Qihong Liu. I also had another channel, IO brown bag seminar held every other week, to evaluate his potential as an empirical IO economist. Mr. Shi has been presenting three paper projects for last two years in the IO brown bag seminar.

Mr. Shi is an outstanding candidate for the position requiring empirical data analysis skills. I believe he meets your requirements and expectations. He has evidence of well-established research agenda as well as excellent teaching evaluations from the courses that he served as a TA/grader. He is also prepared to seek and secure pipelines such as usual program skills (STATA, EViews, and MATLAB) and interesting industrial data sets for his research activities. He also has teaching experience in a variety of contexts and been presenting research papers in a couple of regional economic conferences. I'll elaborate on these qualifications in the remainder of this letter.

Our doctoral program in Economics is strongly focused on empirics and data work. As a young and emerging scholar in the field, Mr. Shi has immersed himself in the development of his research and writing skills and understands well the need to publish high quality work to be successful in a tenure-track university position. He has been a very active presenter at many good profile conferences, including SEA and Missouri Economic conference. Mr. Shi has established a good research record, with one article ready to submit to a high-quality field journal and another ready for circulating to receive feedbacks before submitting to a top field journal. Both articles are based on the U.S. airlines' performance/cost data publically available and focus on airlines' cost minimization strategy. He has several more articles "in the pipeline."

Long's dissertation involves working with two professors at OU whose recent research interests are in the topics of airline quality improvement, vertical integration, and price discrimination. Long's job market paper is a single-authored project that he initiated. His job market paper is entitled "*How does competition affect product choices? An empirical analysis of the U.S. airline industry.*" He investigates major airlines' choice of outsourcing operations to regional airlines. He has come up with an interesting extension of Forbes and Lederman (2009, AER). Unlike the Forbes and Lederman (2009, AER), he models partial outsourcing and use panel data instead of cross-sectional data. He finds that major carriers are more likely to introduce regional carriers as a supplement to their own fleet when competition becomes stronger. Instead, major carriers tend to replace their own fleet with regional carriers when the market becomes less competitive and when their own market share goes down. Also, major airlines facing more LCC competition, they more rely on wholly owned subsidiaries relative to independent regional airlines.

He still needs to perform robustness checks and add more literature review. But based on a conversation with Dr. Qihong Liu, his doctoral dissertation chair, he is making excellent progress on this project and is on track to easily defend his dissertation sometime in the spring semester. In addition to his job market

paper, he has also worked on estimating the cost pass-through rate in the U.S. airline industry, which is a join work with me and Dr. Liu. Both paper drafts are available online and more recently revised drafts are available upon requests.

In the second joint paper, he has aggregated the U.S. flight level data to airline-route level, and created revenue and fuel cost variables at the carrier-route-quarter level. His finding suggests that the cost pass-through rate of fuel price to ticket price is more than 100%. This is similar to the findings in other papers related to cost pass-through such as the one by Nathan Miller analyzing the U.S. cement industry. Besides, Long shows a preliminary test result for sunk cost fallacy in his current draft. Airlines are known to take hedging contracts on fuel to stabilize their fuel costs over time. For example, an airline A may agree to buy x amount of fuel from a supplier B at price p0 at time t in the future. Suppose that when time t arrives the market fuel price is p1. Companies A and B have no need to actually exchange fuel, rather only a financial payment. Assume that p1 > p0, then company B will pay A a lump sum. Such hedging contracts affect airline A 's financial positions, but should have no impact on its actual cost of buying/using fuel (from supplier B or not). We find two separate periods where a single major airline has significantly higher / lower fuel cost than the rest and preliminary evidence suggests that this is (at least partially) due to hedging. We believe that these facts could be used to check whether airlines make pricing decisions simply based on the economic cost of fuel (determined by the spot market price in this context). In other words, whether there is so-called "sunk-cost fallacy" in the airline industry.

Mr. Shi also has developed considerable experience teaching at the OU. Most of the teaching has been done at the summer term so I cannot comment personally on the nature of his teaching. But, my colleague, Dr. Qihong Liu, Long's primary advisor, has commented on his engaging teaching and this does not surprise me at all. Long applies his enthusiasm to teaching as well as interacting with students in class. I was told that he spent a lot of time in preparing a course and technical course material and that the students in his class were satisfied with the effort-full teaching material.

On the research integrity side, he is very trustworthy researcher. He has a tremendous work ethic. He double checks every step in constructing data sets and makes sure that he reports findings precisely and tries to avoid any small errors. Also, he is very cautious in interpreting the results and in avoiding improper bias. Due to his precautious high work-ethic attitude, his research pace could be relatively slow, but he eventually reaches his goal. He is a person who does not look for recognition or accolades, but instead focuses on doing his best in whatever task is before him.

In conclusion, I recommend Mr. Shi to you without reservation and feel certain that he will make contributions to your institution and the field. Departments outside of the top tier looking for a promising scholar in either of her areas of specialty should strongly consider Long's candidacy. He would make an excellent colleague who would be eager to collaborate with departmental faculty. If I can be of any further assistance in this matter, please feel free to contact me at mjkim@ou.edu.

Sincerely,

Myongjin Kim, Ph.D.
Assistant Professor of Economics

The University of Oklahoma
DEPARTMENT OF ECONOMICS

November 26, 2016

Letter of Recommendation for Long Shi

Dear Member of the Search Committee,

I am writing to endorse with great enthusiasm the application of **Long Shi** for an appointment at the Assistant Professor level at your department. Long is actively working on his dissertation and is strongly committed to completing his Ph.D. requirements by May 2016.

I have known Long since he entered the Ph.D. program at Oklahoma in 2012. He took Mathematical Economics with me in Fall 2012 and later on took Industrial Organization with me in Fall 2013. I have been directly working with him for the past 2 years and I am a co-chair (together with Myongjin Kim) of his dissertation committee. Long is an excellent teacher and researcher. Long's dissertation contains 3 chapters, all empirical studies of the U.S. airline industry. The first chapter looks at fuel cost pass-through. The second chapter studies major airlines' product choices in terms of whether or not outsource operations to regional carriers. The last chapter also looks at fuel cost but focus on its impacts on on-time performance.

Jet fuel costs have been volatile in recent decades. In the **first chapter** of his dissertation (joint with me and my colleague Myongjin Kim), Long studies pass-through from fuel costs to ticket prices. It is fair to say that Long is doing more of the actual work, with Dr. Kim and I giving him close supervision and constant feedback. All major airlines are required to report their fuel consumption and spending to Department of Transportation every month. Using the monthly fuel consumption and spending data, Long first calculate airline fuel cost ($ per gallon) at airline-year-quarter level. Partially due to the extreme volatility of fuel costs, some airlines turned to hedging in an effort to smooth and stabilize their fuel costs over time. As a result, different airlines ended up paying different prices for fuel. Long call this airline specific fuel cost "afc" (lower cases), for airline fuel costs. He also finds a common spot market price for Kerosene-type jet fuel and calls it "AFC" (capital letters). He then calculates average fares at the airline-route-quarter level and regresses average fare on "afc" and "AFC" respectively, controlling for various carrier and route characteristics. Since he uses log of ticket prices and log of fuel costs, the estimates can be interpreted as elasticity, that is, if the fuel cost goes up by 5%, by what percentage will ticket price go up? He then relaxes this basic test of cost pass-through in two directions. First, he uses lagged values of fuel costs, accommodating the conjecture that it may take time for fuel cost changes to be fully reflected in ticket prices. Second, he allows cost pass-through rate to vary across markets with different characteristics, in particular, market concentration measured by HHI. His preliminary results suggest that the rate of cost pass-through increases with HHI, suggesting that the same percentage increase in fuel costs will lead to a larger percentage fare increase on routes with less competition.

308 Cate Center Drive, Room 158 CCD1, Norman, OK 73072-2103
PHONE: (405) 325-2861 FAX: (405) 325-5842
WEB: http://www.ou.edu/cas/econ

Since fares and fuel costs are measured in different units ($ per passenger for fare vs. $ per gallon for fuel cost), the estimates Long has obtained cannot directly tell whether the fuel cost pass-through is complete or not. An incomplete pass-through says that if the cost goes up by a $1 per passenger, then the price will go up by less than $1 per passenger. This cost pass-through rate has been important for economists and policy makers, and has been studied in various industries. To the best of our knowledge, it has not been analyzed in the airline industry. To identify cost pass-through rate in the airline industry, Long converts ticket price and fuel cost measures to be both at the airline-route-quarter level. That is, he first calculates the total ticket revenue at the carrier-route-quarter level. He then calculates fuel cost for the same airline-route-quarter, taking into account that airlines have different types of aircrafts with different fuel efficiency levels. His preliminary results suggest that the fuel cost pass-through is above 100%, with a significant margin. Even though Long had to make several assumptions to calculate fuel cost at the airline-route-quarter level, the significant margin for error means that the fuel cost pass-through is likely to be still above 100% even if one had more accurate measures of fuel costs.

While the initial idea of the first chapter was not Long's, he has gained valuable experience while working on the project. He learned how to execute the ideas. Moreover, the eventual topics of the paper, while still resembling the initial idea, have also had significant changes. Long observed how the ideas evolved over time and was the person behind many of the new ideas. Most importantly, working on the joint paper helped Long identify his own topic of regional airlines, which constitutes the **second chapter** of his dissertation as well as his job market paper. When he explained to me the important roles regional airlines play in the U.S. airline industry, I was quite surprised. For example, it was reported that regional airlines operate 44% of passenger flights in 2015 and provide the only flights to 65% of U.S. airports with scheduled service.

Long was motivated by major airlines' heterogeneous choices across routes and over time, on whether or not outsource operations to regional airlines and the type of outsourcing if there is one. He was particularly interested in testing the hypothesis that major airlines rely on regional airlines to better compete with low-cost carriers. The literature on regional carriers is rather sparse. In a pioneering study, Forbes and Lederman (2009) investigate major airlines' decision of vertical integration, i.e., whether to rely on wholly-owned subsidiaries vs. independent regional airlines. They find that the choice critical depends on the cost and benefit of internal reshuffling (in the case subsidiaries) vs. external renegotiating (in the case of independent regional airlines). In particular, on routes why weather is likely to be bad (so reshuffling is often needed) or when the routes are a key component of the airline's network (so the benefit or quick reshuffling is large), airlines are more likely to use subsidiaries rather than independent regional airlines. There are several important aspects between Long's research and Forbes and Lederman (2009). *First,* Long uses a panel data with long time series and also includes many thin routes (which are important for his analysis of regional airlines). The choice of panel (as opposed to cross section data as in Forbes and Lederman (2009)) allow Long to control for route fixed effects, an advantage since market (route) fixed effects have shown to be very important in previous airline literature (e.g. Gerardi and Shaprio (2008)). *Second,* when major airlines outsource operations to regional airlines, Long distinguishes between complete outsourcing and partial outsourcing, depending on whether the major airlines also operates their own fleets. His

results confirm that the distinction between complete and partial outsourcing is important. For example, if HHI goes up by 0.1, relative to the case of *no outsourcing* (major airlines fly their own fleets and do not rely on regional airlines), the log likelihood of a major airline choosing *complete outsourcing* goes up by 3.3%, but the log likelihood of choosing *partial outsourcing* goes down by 16.7%. Long then takes into account the ownership structure of regional airlines and ties it with competition from low-cost carriers (LCCs). He finds that facing more LCC competition, major airlines are more likely to rely on wholly owned subsidiaries relative to independent regional airlines. This lends support to the commonly held view that major airlines rely on regional airlines to compete with LCCs. Long also investigates how major airlines adjust their prices when facing either LCC entry threat or actual entry. For carrier-routes with no outsourcing, major airlines do not respond in prices to either threat of or actual LCC entry. In contrast, on carrier-routes with partial outsourcing, major airlines lower their prices by about 5.2% one quarter after LCC entry, with no adjustments in other periods. His findings suggest smaller and less pervasive adjustments in prices than those in existing literature (e.g., Goolsbee and Syverson (2008)). This may be because Goolsbee and Syverson (2008) considers entry threat from Southwest airlines only, why Long considers several more LCCs.

In the **third chapter** of his dissertation, Long analyzes the impacts of fuel cost changes on airlines' on-time performance, and see how the impacts may vary with market characteristics (e.g., competition intensity). To see how fuel cost may affect on-time performance, consider the following example. Suppose that a flight by American Airlines is 30 minutes late in departure and the usual flight time is 3 hours. They can make up some of the departure delay by flying faster. Doing so improves their on-time performance, but also increases fuel cost (fuel burn increases dramatically when they raise the speed). The benefit likely depends on how competitive the market is, what American's position on the market is, and how average passengers on that flight values on-time performance. The cost obviously depends on the fuel cost per gallon. On-time performance data decompose the departure delay and time in the air, and these data would allow Long to test whether airlines try to make up for departure delays and how these decision may depend on airline and market characteristics. The next step is then to investigate whether and/or how fuel costs affect airlines' scheduling of flights, in anticipation of such departure delays and subsequent adjustments.

In all chapters of his dissertation, Long has worked with large data set. Long has got great empirical skills to clean, organize such data sets and test various interesting questions with strong policy implications. Such skill sets and experience would come handy when he furthers his teaching and research career later on.

Long has taught Intermediate Microeconomic Theory as an independent instructor in Summer 2016. He has obtained excellent teaching evaluations. For example, his department ranking on over teaching effectiveness was 66.7%, meaning that he scored higher than 2/3 of the instructors in the economics department. This is quite impressive given that it was his first time teaching as an independent instructor and we also had a few faculty teaching in the summer. Majority of Long's teaching experience was in the form of teaching lab sections for numerous semesters in the past. Our principle level classes had anywhere between 400 to 500 students. The whole class was usually divided into 10-15 lab sections and each lab section met once a week for 50 minutes. Because of the smaller size and face-to-face interaction, there was usually a lot of

teaching and learning taking place in the lab sections. Recently the economics department here at Oklahoma has switched away from lab sections, and as a result, Long has TAed for various instructors/courses (for a total of 8 different classes so far). His responsibilities include grading homework and exams, holding his own office hours, and other assignments required by his professors. Long's communication and presentation skills are excellent and they have been further honed by his numerous presentations, mostly at our internal bi-weekly Industrial Organization Workshop as well as several regional conferences. I am confident that he can offer superb courses in Microeconomics, Applied Econometrics, Industrial Organization and Game Theory.

On the personal front, Long is a very approachable and down to earth individual with a good sense of humor. Due to his broad interests, ability and friendly personality he can easily collaborate with other people. It has been a pleasure for me to work with Long.

If I can provide any additional information, or be of any further assistance, please do not hesitate to contact me by phone at (405) 325-5846, or by e-mail at qliu@ou.edu.

Sincerely,

Qihong Liu

Qihong Liu
Associate Professor of Economics
University of Oklahoma

References:

Forbes, S. and M. Lederman (2009). "Adaptation and Vertical Integration in the Airline Industry," *The American Economic Review* 99(5), 1831-1849.

Gerardi, K. and A. Shapiro (2008). "Does Competition Reduce Price Dispersion? New Evidence from the Airline Industry," *Journal of Political Economy* 117(1), 1-37.

Goolsbee, A. and C. Syverson (2008). "How Do Incumbents Respond to the Threat of Entry? Evidence from the Major Airlines," *Quarterly Journal of Economics* 123(4), 1611-1633.