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Going to Pot – Operating a Marijuana Business and Navigating the Law is No Easy Task in Colorado

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ABSTRACT

Colorado was the first state to legalize the recreational use of marijuana. This paper explores several civil law issues that have emerged since Amendment 64 to the Colorado Constitution, the governing legal authority, received voter approval in November 2012. The objective of this paper is to address the impact of Amendment 64 as it relates to business and offer those who teach business law an educational tool to illustrate legal principles using a current canvas. It is the author's aim to identify constitutional law, employment law and bankruptcy law matters affecting the retail marijuana industry, and further to identify banking implications for retail marijuana businesses operating in a cash based economic environment. The paper strives to assist business law educators who seek to offer students innovative instruction.

INTRODUCTION

In November 2012 Coloradans passed Amendment 64 to the state constitution making it legal for those 21 and older to purchase up to one ounce of marijuana at licensed sellers. (Colo. Const. art. XVIII §16) As the first state law to legalize recreational marijuana, Colorado attracted local and national attention. Since the law went into effect in December 2012, residents of the state have seen robust growth in an industry that often feels the weight of significant legal obstacles. An effort to challenge the constitutionality of the amendment in the U.S. Supreme Court stirred debate in 2014. Businesses have struggled with a lack of basic operational support despite envisioning unlimited opportunities for free market entrepreneurs. The case can be made for optimism in terms of economic measures but concern in terms of the law.

One group of observers reaping benefits from the experiment that is Colorado's Amendment 64 are educators who should seize the opportunity to offer their students fascinating, relatable, real world examples of an intersection between law and life. This article is designed to assist business and legal educators toward that end by offering examples of the how Amendment 64 can be used to illustrate the application of certain fundamental principles of law.

ECONOMIC BENEFITS

In a recent article, Colorado's Governor, John Hickenlooper, characterized the Colorado economy as "thriving." (Smith, 2014) Indeed, several economic indicators support such a conclusion. Reports substantiate year-over-year growth in sales of retail marijuana and resulting growth in tax revenue.

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(Henchman and Scarboro, 2016) In 2015 a reported $113 million in retail marijuana tax revenue was generated on sales of $568 million and from September 1, 2015 to February 29, 2016 the tax revenue was up 64 percent as compared to the same period one year earlier. (Id.) The effective tax rate on marijuana sits at 29 percent and is comprised of an excise tax on wholesale marijuana, a state tax on retail marijuana sales, a state sales tax and local taxes. (Id.) In addition to increasing tax revenue, Colorado is enjoying an undisputed uptick in job growth. One economic impact study by Jack Strauss, Miller Chair of Applied Economics at the University of Denver, Daniels College of Business, estimated that more than 25,000 people had licenses to work in the marijuana industry while thousands more worked in areas related to the industry in capacities such as packaging manufacturer, lawyers, accountants, construction, and marketing professionals. In addition, the study found that Colorado's unemployment rate had fallen, reaching a low of 3.5% in December 2015. (Council on Responsible Cannabis Regulation, 2016) This is noteworthy considering figures published by the Bureau of Labor Statistics listing the national average unemployment rate in December 2015 at 5%. (U.S. Department of Labor, 2016) With diminishing unemployment, Colorado job seekers have new career options because of Amendment 64. One recent article identified 16 job categories credited to the marijuana industry which include: Edible Creator, Concentrates Processor, Glass Merchant, Courier and Delivery, Security, Reviewers, Trimmer, Tourism, Administration, Budtender, Regulation, Web & Software, Retail Shop Owner, Farmer, Seed Harvester and Consulting. (Becker, 2015) Given such a strong economic picture, concerns about the viability of the industry would seem to be misguided. The emergence of several critical legal issues presents a challenging undercurrent that the retail marijuana industry should not ignore and an opportunity for focused classroom instruction that educators should embrace.

CONSTITUTIONAL LAW

Business law students may not expect to spend a significant amount of time, if any, discussing the United States Constitution. Understandably, they anticipate learning about laws related to contracts, torts, property and the Internet because these areas have an obvious relevance to their business aspirations. However, Colorado's Amendment 64 will enable students to learn how chaotic business life can be when the business is operating under state law that is in conflict with federal law. That chaos is the result of a decision by Colorado voters to enact a law that fails to heed a provision in the Constitution designed to ensure harmony between state law and federal law. The Supremacy Clause under Article VI expressly prohibits a state from enacting a law that contradicts existing federal law on the same matter. (U.S. Const. art. VI. cl. 2) Colorado's Amendment 64 is a state law that snubs the doctrine of federal preemption and beckons the enforcement of federal law under the Supremacy Clause at least in theory if not practice.

In December 2014, Nebraska and Oklahoma initiated a lawsuit against the state of Colorado by filing a motion with the United States Supreme Court. *Nebraska and Oklahoma v. Colorado*[1] sought judicial review to overturn Amendment 64 on constitutional grounds. The case illustrates relevant procedural and substantive law matters. Procedurally, the lawsuit is premised on the Court's permissible exercise of

original jurisdiction under limited circumstances, which include when a state sues another state (U.S. Const. art. III § 2). This procedural step is significant for instructional purposes because it highlights a less frequently traveled path to the Supreme Court. The vast majority of cases heard by the Supreme Court are based on appeals from lower courts. Substantively, *Nebraska and Oklahoma v. Colorado* invoked the Supremacy Clause of the U.S. Constitution as well as the doctrine of Federal Preemption and concluded with a descriptive list of the resulting harm to their states following Amendment 64's enactment into law, including alleged harm based on a failure to prevent the flow of marijuana into their states and a weakening of the existing federal drug control program.

With regard to the federal preemption question, the *Nebraska and Oklahoma v. Colorado* case offered a detailed and precise analysis of three key points: 1) the authority of the federal government to regulate drugs within the U.S.; 2) the significance of the enactment of the Controlled Substances Act, the federal law that regulates drugs within the U.S. and classifies marijuana as a Schedule I drug subject to severe criminal penalties; and 3) the parameters established by federal law under which states may also act to regulate drugs. (21 U.S. C. § 801 (5), (6)) Acknowledging that states have legitimate police power to control drugs within their borders, the motion pointed out that such power becomes illegitimate under Supremacy Clause scrutiny when it contradicts, interferes with or is counter to federal law.

To be clear, Nebraska's and Oklahoma's laws align with federal law classifying recreational marijuana use as illegal. In their motion the states alleged that "Amendment 64 and its resultant statutes and regulations are devoid of safeguards to ensure marijuana cultivated and sold in Colorado is not trafficked to other states, including Plaintiff States." (Id.) The flow of marijuana into neighboring states undermines both federal and state law. The plaintiffs further indicated that their criminal justice systems and treasuries are impinged. Plaintiffs argued that Congress anticipated such consequences and identified a need for strong intrastate controls over drug manufacture and distribution. (21 U.S.C. §§ 801 – 971) In this spirit, Colorado enacted additional laws for the purpose of administering Amendment 64, but Plaintiffs contended these laws are ineffective. They reference the Colorado Department of Revenue's Marijuana Enforcement Division 1 CCR 212-2 Permanent Rules Related to the Colorado Retail Marijuana Code (2013), which require tracking by retail marijuana stores but only from cultivation or manufacturing facilities to the point of sale. In the plaintiff's view, what happens to marijuana when the purchaser leaves the retail store is unknown and unregulated, making movement into neighboring states possible. Amendment 64 does not require that marijuana purchasers be subjected to a background check. (Colo. Const. art. XVIII § 16) Without a background check, the plaintiffs contended safeguards to prevent criminal enterprises, gangs and other criminal entities from purchasing marijuana through Colorado's retail marijuana stores do not exist. Even these last allegations circle back to the inescapable gatekeeper known as Federal Preemption.

The federal government remains silent on the matter but has kept a watchful eye on Amendment 64. In August 2013 Deputy Attorney General James M. Cole released a Memorandum for all U.S. Attorneys to assist them in carrying out their prosecutorial duties within the confines of the conflict between state laws legalizing marijuana possession, production and sale and federal law. This document, known as the Cole

Memo, identified eight enforcement priorities that trigger federal action: i.e., the federal government's "limited investigative and prosecutorial resources" in the face of a "significant threat" to the Controlled Substances Act. Two relevant enforcement priorities involve preventing revenue from the sale of marijuana from going to criminal enterprises, gangs and cartels, and preventing the diversion of marijuana from states where it is legal under state law in some form to other states like Nebraska and Oklahoma, where it is not. (U.S. Department of Justice, 2013) The Plaintiffs believed Amendment 64 ran afoul of both priorities given the lack of background checks at the point of sale and the lack of tracking after the point of sale.

Beyond the federal-state turbulence created by Amendment 64, Nebraska and Oklahoma point out the unanticipated internal struggles they now face. *Nebraska and Oklahoma v. Colorado* highlighted each state's claim of increased costs associated with the apprehension, incarceration and prosecution of suspected criminals involved in what they refer to as "Colorado-Sourced" marijuana. Additionally, they maintained that the influx of Colorado-Sourced marijuana resulted in the diversion of state resources such as personnel, time, and budget in their law enforcement, judicial and penal systems including increases in "arrests, impounding of vehicles, seizure of contraband, transfer of prisoners, and appearance of law enforcement personnel in court" since Amendment 64 went into effect. (Id.) Amendment 64 highlights an often-volatile mix of policies, politics and laws.

In March 2016, the U.S. Supreme Court denied the request filed in *Nebraska and Oklahoma v. Colorado*, declining to hear the case. The lawyer responsible for arguing cases before the U.S. Supreme Court, Solicitor General Donald B Verrilli Jr., is said to have "urged the justices to refuse to hear the case," while acknowledging that Nebraska and Oklahoma could still pursue the matter by filing a lawsuit in federal district court. (Liptak, 2016) Joined by Justice Alito and writing in dissent, Justice Clarence Thomas acknowledged a showing of harm by the plaintiff states caused by another state. (Id.) Perhaps in response to those who believe the Plaintiff's reliance on the Court's authority to exercise original jurisdiction was misplaced in a day and age when such jurisdiction is, from a practical point of view, rarely invoked, Justice Thomas cited both the U.S. Constitution, Article III, §2, cl. 2 and federal law 28 U.S.C. §1251(a) as authority for the Court's proper exercise of original jurisdiction when a controversy arises between two states and wrote, "the complaint on its face, presents a "controversy between two or more States" that this Court alone has authority to adjudicate."[2] A door closed in not necessarily a door shut.

BANKING AND RETAIL MARIJUANA BUSINESS

Amendment 64 offers unique insight into some unanticipated hurdles an entrepreneur might encounter. If success in business is a function of sales, retail marijuana qualifies as big business. In 2014 sales of recreational marijuana amounted to $313 million in Colorado, with $63 million generated in state tax revenue. (Ingraham, 2015) In addition, $13 million was generated through licenses and fees required for medical and recreational marijuana sales. (Id.) However, retail marijuana businesses face barriers to their operational efficiency. Worries regarding security, money laundering and tax matters have emerged and are directly linked to the most serious business concern, banking. While most retail marijuana businesses

are generating significant amounts of cash, they are without the ability to safely store it.   The banking industry's reluctance to deal with these businesses is rooted in the U. S. Constitution and the Supremacy Clause. Under federal law businesses that engage in the cultivation and sale of marijuana engage in illegal activity and banks risk violating federal law through receipt of deposits from illegal activities. (21 U.S.C. §§ 801 – 1971).

To secure banking rights and privileges a business first needs a "master account," which is used to deposit funds and make electronic transfers. Second, it needs deposit insurance, which is generally obtained through the Federal Deposit Insurance Corporation (FDIC). (Richtel, 2015) The FDIC preserves and promotes public confidence in the U.S. financial system by insuring deposits in banks, therefore backing by the FDIC is desirable. The consequences of failing to secure banking rights and privileges are on full display in the retail marijuana industry today. When a business lacks a bank account, it must operate on a cash basis. The money received by these businesses is often stored in boxes, in basements and in separate buildings under the watchful eye of security firms hired both to prevent theft and to transport the cash for purposes of paying business expenses, including taxes. USA Today reported it is not uncommon for retail marijuana businesses to pay their taxes by "delivering cash to the state Department of Revenue in buckets and boxes." (Hughes, 2014)

Banks have also shied away from marijuana businesses due to concerns about money laundering. So long as the conflict between federal and state law remains, revenue from retail marijuana businesses is considered illegal proceeds. Banks that accept those illegal proceeds face the possibility of stiff penalties. In an effort to address the problem, the U.S. Department of the Treasury's Financial Crimes Enforcement Network issued a Guidance document in February 2014 to "clarify Bank Secrecy Act expectations for financial institutions seeking to provide services to marijuana-related businesses." (U.S. Department of the Treasury, 2014) The guidelines offer protection for banks where the marijuana-related business is licensed in accordance with state laws legalizing marijuana use, when banks meet federal regulator reporting requirements, and when banks monitor the businesses for "suspicious activity" as defined in the document. (Grossman, 2014)

With steps in place to pave the way for a union between the banking industry and the marijuana industry, the marriage has still not occurred. This may be due in part to perception. Frank Keating, president of the American Bankers Association concisely articulated the concerns some in the banking industry have. "While we appreciate the efforts by the Department of Justice and FINCEN, guidance or regulation doesn't alter the underlying challenge for banks. As it stands, possession or distribution of marijuana violates federal law, and banks that provide support for those activities face the risk of prosecution and assorted sanctions." (Id.)

Faced with the discord in state and federal law and a lack of confidence in the government's effort to allay enforcement fears, some proponents of Amendment 64 tried another approach to extend business financial services to the retail marijuana industry: they created the Fourth Corner Credit Union and in November 2014, received state authorization to open. (Migoya, 2014) Following that decision, many retail

marijuana businesses were hopeful that the credit union would be up and running in early 2015. Despite the go-ahead from state banking regulators, the credit union needed authorization at the federal level. Because banks and credit unions offer similar financial services, the issuance of a master account by the Federal Reserve Bank is essential for both institutions. Fourth Corner Credit Union applied for a master account in November 2014 and waited months for a decision by federal authorities. This decision was anything but routine given the implications of awarding federal privileges to an industry standing on questionable constitutional ground. In July 2015, the Federal Reserve denied Fourth Corner's application for a master account. (Popper, 2015) In a further blow, the National Credit Union Administration (NCUA) denied their request for deposit insurance, the second essential component of financial operation. (Id.) The NCUA was not convinced that Fourth Corner Credit Union could overcome the risks associated with "serving a single industry that does not have an established track record of success and remains illegal at the federal level." (Id.) Fourth Corner has responded by filing a lawsuit against the Federal Reserve Bank and will consider the possibility of obtaining deposit insurance from a private source. (Richtel, 2015) The significance of banking practices for retail marijuana businesses cannot be understated. According to Chris Myklebust, commissioner of Colorado's division of financial services: "If the feds don't grant the application and really open up banking, they create a life-threatening chokehold on the businesses, cutting off their ability to profit and survive." He added: "Without banking, the industry is not sustainable in the long run." (Id.)

BANKRUPTCY LAW

The retail marijuana industry is in its infancy and the positive economic indicators that surround the industry stand as a protective barrier against the threat of bankruptcy but recent court cases caution against dismissing that threat. Bankruptcy has earned its place as a sound business solution. Bankruptcy offers debtors a solution when the burden of financial obligations becomes too great and offer creditor's relief from the uncertainty surrounding a debtors' failure to pay their debts. The Bankruptcy Act, which governs bankruptcy proceedings, is defined as "A federal law for the benefit and relief of creditors and their debtors in cases in which the latter are unable or unwilling to pay their debts." (Black's Law Dictionary, 1979) Two cases from the U.S. Bankruptcy Court for the District of Colorado are instructive regarding the application of bankruptcy laws to the retail marijuana industry.

In re Rent-Rite Super Kegs West Ltd.,[3] a case decided in 2012, involved a debtor who owned a warehouse building in Denver valued at $2.3 million that he leased to tenants who then used the space for the cultivation of marijuana. The debtor derived approximately a quarter of his business revenue from leasing the warehouse space to these tenants. In 2012, a creditor moved to dismiss the chapter 11 bankruptcy petition the debtor had previously filed with the court. (Id. at 2) In an opinion by the Bankruptcy Court in Colorado, Chief Judge Howard R. Tallman concluded that "cause" existed for either dismissal or conversion of the debtor's petition to a case under chapter 7 of the Bankruptcy Code. (Id.) The court found the debtor to be engaged in an "ongoing violation of the federal Controlled Substances Act (CSA)." (Id.)

The court was specific in characterizing the debtor's business as a violation of section 856 of the CSA, which makes it a federal crime to "manage or control any place, … as an owner, ... and knowingly and intentionally rent lease, profit from, or make available for use, with or without compensation, the place for the purpose of unlawfully manufacturing, storing, distributing, or using a controlled substance." (Id) The court acknowledged that the debtor's business was a legal operation under Colorado law and dealt with the matter of federal preemption directly. "That marijuana cultivation may not be criminally prosecuted under the laws of the state of Colorado is simply of no consequence …" to the fact that the debtor's business violated federal law. (Id.) The finding of cause for dismissal or conversion in the *Rent-Rite* case is significant on its own but also when considered in light of a later case in which the bankruptcy court dismissed the debtor's bankruptcy petition, the conclusion that bankruptcy laws do not afford protection to Colorado debtors is inescapable.

In 2014, the U.S. Bankruptcy Court for the District of Colorado issued a ruling in the case of *In re Arenas[4]* when it responded to both the U.S. Trustee's motion to dismiss the debtor's bankruptcy proceeding and the debtor's motion to convert their chapter 7 case to one under chapter 13. The bankruptcy court granted the U.S. Trustee's motion to dismiss and denied the debtor's motion to convert. (Id.) The debtors, Frank and Sarah Arenas, jointly owned a commercial building with two units located in Denver. One unit was used by the debtor to conduct his business activities, which consisted of producing and distributing marijuana on the wholesale level in Colorado. The debtor maintained the necessary licenses and permits to carry on the business in Colorado and leased the second unit to a separate marijuana dispensary. (Id.) Applying a similar rationale to that in the *Rent-Rite* case, the court concluded the debtor's business was of an "ongoing criminal nature" under the Controlled Substances Act. (Id.) The bankruptcy court determined that "the legal principles discussed in Rent-Rite apply with equal force to this case." (Id.) The court reiterated its Rent-Rite holding: "Unless and until Congress changes [federal drug] law, the Debtor's operations constitute a continuing criminal violation of the CSA and a federal court cannot be asked to enforce the protections of the Bankruptcy Court in aid of a Debtor whose activities constitute a continuing federal crime." (Id.) The debtor appealed that decision to the U.S. Bankruptcy Appellate Panel for the Tenth Circuit without success. The appellate court affirmed the bankruptcy court's decision but also recognized the debtor's plight. "The debtors are unfortunately caught between pursuing a business that the people of Colorado have declared to be legal and beneficial, but which the laws of the United States—laws that every United States Judge swears to uphold—proscribe and subject to criminal sanction." (Id.) Empathy for the debtor's position does not alter a difficult truth. When bankruptcy estates are comprised of assets garnered from a business operation deemed illegal under federal law, the administration of the estate under the bankruptcy code is virtually impossible. No current data exists which suggests business growth is adversely affected by the absence of bankruptcy protection for the retail marijuana industry in Colorado. The future, however, is unclear. The U.S. Bureau of Labor Statistics reports that roughly 50% of all new businesses survive 5 years or more and one-third survive 10 years or more. (Meszaros, 2015) Business failure is a part of business life. If bankruptcy laws don't serve the retail marijuana industry in Colorado, a disparity exists

between the industry and all others. Whether that disparity rises to the level of an unacceptable business risk is a question awaiting answers.

CONCLUSION

Observers of the experiment that is Amendment 64 are now armed with knowledge about the effects of the law, which involve legal principles as lofty as the Constitution and as practical as opening a bank account. These effects are felt within and beyond Colorado's borders. Much has been learned but attempts to draw final conclusions may be premature as legislatures in several states consider initiatives similar to Colorado's and 2016 witnesses the start of retail marijuana businesses in Oregon and Alaska. (Sullum, 2014)   Perhaps one obvious lesson is the essential link between business and law. Whether business opportunities flourish or go up in smoke can be more about the law than one might think. Even for a business where the dollar is strong, weakness in its legal foundation can signal catastrophe.

ENDNOTES

1.   Nebraska and Oklahoma v. Colorado, Dockett No. 220144, December 18, 2014.
2.   Nebraska v. Colorado, 577 U.S. ____ (2016) (THOMAS, J., dissenting) (slip. op. at 4).
3.   In re Rent-Rite Super Kegs West Ltd., 484 B.R. 799 (Bankr. D. Colo. 2012).
4.   In re Arenas, Case No 14-11406 HRT, (Bankr. D. Colo. 2014).

REFERENCES

Becker, Sam. 2015 "Need a Career Change? Here Are 16 Jobs in the Marijuana Industry" *Money & Career CheatSheet*   http://www.cheatsheet.com/money-career/16-jobs-being-created-by-the-marijuana-industry.html/?a=viewall

Cole, James. 2013 Guidance Regarding Marijuana Enforcement U.S. Department of Justice Memorandum http://www.justice.giv/iso/opa/resources/352013829132756857467.pdf

Council of Responsible Cannabis Regulation, "The Impact of Marijuana Taxation and Regulation in Colorado" citing MED 2015 Third Quarter Update. Published January 28, 2016. http://www.colorado.gov/pacific/states/default/files/FINAL%20Third%20Quarter%202015 %Update.pdf

Grossman, Andrew. 2014 "Banks Allowed to do Business with Marijuana Dispensaries" *The Wall Street Journal* http://www.wsj.com/articles/SB10001424052702304434104579383150782034282

Henchman, Joseph and Scarboro, Morgan. 2016 "Marijuana Legalization and Taxes: Lessons for Other States from Colorado and Washington" *Tax Foundation* http://www.taxfoundation.org/article/marijuana-legalization-and-taxes-lessons-other-states-colorado-and-washington

Hughes, Trevor. 2014 "Colorado OKs Marijuana Credit Union" *USA Today* http://www.usatoday.com/story/new/nation/2014/12/08/colorado-oks-marijuana-credit-union/20056367/

Ingraham, Christopher. 2015 "Colorado's Legal Weed Market: $700 Million in Sales Last Year, $1 Billion by 2016" *The Washington Post*

http://www.washingtonpost.com/news/wonkblog/wp/2015/02/12/colorados-legal-weed-market-700-million-in-sales-last-year-1-billion-by-2016.

Liptak, Adam. 2016 "Supreme Court Declines to Hear Challenge to Colorado's Marijuana Laws"

The New York Times http://www.nytimes.com/2016/03/22/us/politics/supreme-court-declines-to-hear-challenge-to-colorados-marijuana-laws.html

Meszaros, George. 2015 "What Percentage of Businesses Fail – The Real Number" SuccessHarbor http://www.successharbor.com/percentage-businesses-fail-09092015/

Migoya, David. 2014 "Colorado Pot Credit Union Could Be Open by Jan 1 Under State Charter" *The Denver Post* http://www.denverpost.com/business/ci_26980328/colorado-pot-credit-union-could-be-open-by-Jan1-under-state-charter

Popper, Nathaniel. 2015 "Banking for Pot Industry Hits a Roadblock" *The New York Times* http://www.nytimes.com/2015/07/31/business/dealbook/federal-reserve-denies-credit-union-for-cannabis.html

Richtel, Matt. 2015 "The First Bank of Bud" *The New York Times.* http://www.nytimes.com/2015/02/08/business/marijuana-industry-in-colorado-eager-for-its-own-bank-waits-on-the-fed.html

Smith, Ben. 2014 "Colorado Governor: No Economic Damage from Pot Legalization" *BuzzFeedNews* http://www.buzzfeed.com/bensmith/colorado-governor-no-economic-damage-from-pot-legalization

Sullum, Jacob. 2014 "When Will Legal Pot Be Available in Alaska, Oregon and D.C.?" *Reason.com* http://www.reason.com/blog/2014/11/07/when-will-legal-pot-be-available-in-alaska-oregon-and-dc

U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, Series Id: LNS14000000, Labor Force Status: Unemployment Rate. Data Extracted on September 26, 2016.

U.S. Department of the Treasury, Financial Crimes Enforcement Network. Guidance FIN-2014-G001. "BSA Expectations Regarding Marijuana-Related Businesses" (February 14, 2014) http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2014-G001.pdf.

Evolution and Future Prospects for U.S. – Cuba Agricultural Trade: Implications for New York State

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ABSTRACT

U.S. agricultural exports to Cuba have increased significantly since the approval of the Trade Sanctions Reform and Export Enhancement Act (TSRA) in 2000. The total value of U.S. agricultural and food exports to Cuba increased from $4.6 million in 2001 to an estimated $170.6 million in 2014.   Imports from the United States currently account for close to 40% of Cuba's agricultural imports.   However, agricultural trade between the United States and Cuba has been "one-way trade," primarily due to U.S. economic sanctions. The announcement of new U.S. policy changes towards Cuba on December 17, 2014 paved the way for closer economic and diplomatic ties between the two nations. The potential normalization of trade relations between the U.S. and Cuba will likely result in the expansion of U.S. agricultural exports to the island, as well as Cuban exports to the U.S. This paper examines the evolution of U.S. agricultural Cuba since 2000, and the potential implications for agricultural exports from New York State (NYS) to Cuba under a scenario or normalized trade relations.

THE EVOLUTION OF U.S. AGRICULTURAL EXPORTS TO CUBA SINCE 2000

President Bill Clinton signed the Trade Sanctions Reform and Export Enhancement Act (TSRA) into law in October 2000. The Trade Sanctions Reform and Export Enhancement Act (TSRA) of 2000 authorized the sale and export of certain food, medicines, and medical equipment to Cuba. However, it did not eliminate existing (general) prohibitions on imports from Cuba, and it prohibited the import of agricultural products from Cuba. The TSRA also sanctioned the extension of credit financing to facilitate U.S. agricultural exports to Cuba and prohibited the provision of U.S. government programs to support exports to the Island (American Society of International Law, 2001).

On December 17, 2014, President Obama announced a series of "updated" U.S. policy changes with regards to Cuba, allowing U.S. economic actors (e.g. individuals, private firms, and organizations) to play a more influential role in the expansion of Cuba's emerging non-State sector. These policy measures include: the expansion of authorized travel by U.S. citizens to Cuba under twelve (12) existing categories, increasing authorized remittances to Cuba from $200 to $2,000 per quarter, eliminating specific license requirements for remittances to support the development of private businesses in Cuba, and authorizing expanded commercial sales and exports from the U.S. of certain goods and services to empower the emergent non-State sector in Cuba.

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These policies also authorize U.S. suppliers to export certain building materials for private residential construction, goods for use by private sector Cuban entrepreneurs, and agricultural equipment for small farmers. Their objective is to increase the access of ordinary Cuban citizens to certain lower-priced goods in order to improve their living standards, and gain greater economic independence from the State. In addition, these policy measures seek to facilitate the flow of authorized transactions between the U.S. and Cuba by authorizing U.S. financial institutions to open correspondent accounts at Cuban financial institutions to facilitate the processing of authorized transactions, permitting the use of U.S. credit and debit cards by travelers to Cuba and revising the definition of the statutory term "cash advance" to specify that it means "cash before transfer of title" in order to provide more efficient financing of authorized trade with Cuba.

On September 18, 2015, the U.S. Treasury Department and the Department of Commerce announced a series of updates to the Cuban Assets Control Regulations (CACR) and Export Administration Regulations (EAR) to further ease U.S sanctions with respect to Cuba, without lifting the embargo. Their main goal is to "further facilitate travel to Cuba for authorized purposes; expand the telecommunications and internet-based services general licenses, authorize certain persons subject to U.S. jurisdiction (including individuals, entities, and organizations) to establish a business presence in Cuba, authorize U.S. persons and entities to provide goods and services to Cuban nationals residing outside Cuba, and facilitate the expansion of authorized activities such as the provision of legal services, imports of gifts, and educational activities.

These policy updates eliminated some existing restrictions regarding exporting and re-exporting items to Cuba to facilitate the establishment of a physical presence on the Island by persons and entities subject to U.S. jurisdiction. Regulations regarding remittances were also amended to empower Cubans with greater opportunities to engage in private self-employment. The most significant measures in this category were the immediate elimination of the $2,000 quarterly limit on remittances, and the elimination of caps on authorized remittances that individuals traveling to Cuba were allowed to carry ($10,000 for persons subject to U.S. jurisdiction and $3,000 for Cuban nationals).

THE EVOLUTION OF U.S. AGRICULTURAL EXPORTS TO CUBA: 2000 - PRESENT

As Table 1 demonstrates, between 2001 and 2008, the total value of U.S. agricultural exports to Cuba grew at annual rate of 218.5%; from about $4.6 million in 2001 to $685 million in 2008 (their peak year). U.S. agricultural exports to Cuba reached an average annual value of $320 during the 2001-2008 period. U.S. agricultural and food exports to Cuba reached their peak in 2008, representing 33% of the Island's total agricultural and food imports.

Table 1. U.S. Agricultural Exports to Cuba by Commodity or Product, Millions USD.

Year	Total	Poultry & Products	Oilseeds & Products	Grains & Feeds	Dairy & Products	Horticultural Products	Cotton, Linters & Waste	Livestock & Meats	Sugar & Tropical Products
2001	4,574	1,959	0	2,327	288	0	0	0	0
2002	139,814	23,713	61,952	51,879	336	1,067	0	721	146
2003	247,571	37,755	113,010	92,220	341	2,760	572	652	261
2004	383,870	62,192	89,421	186,733	28,951	10,218	2,922	1,999	1,085
2005	346,044	58,563	80,406	148,970	30,284	11,286	1,593	10,129	565
2006	320,847	44,480	89,609	128,392	13,156	23,858	395	15,408	149
2007	431,187	78,079	114,620	224,127	711	4,677	664	8,181	128
2008	685,453	139,431	141,170	369,367	15,665	4,727	1,855	13,198	40
2009	525,259	144,565	135,215	218,004	2,946	9,683	562	13,432	852
2010	349,303	108,919	83,692	127,049	2,645	9,812	0	16,070	1,116
2011	352,781	100,162	69,843	150,666	3,965	12,253	4,038	10,248	1,606
2012	459,477	160,494	104,128	171,449	5,632	4,974	3,116	9,495	189
2013	350,150	146,188	108,740	82,681	2,473	996	0	9,072	0
2014	286,428	147,787	97,906	37,639	1,415	367	0	1,314	0
2015	148,818	77,758	65,437	4,944	412	267	0	0	0

Source: U.S Department of Agriculture (USDA), Global Agricultural Trade System (GATS), 2016.

The decline in the total value of U.S. agricultural exports to Cuba after 2008 can be attributed to several economic, political, and strategic factors.   In 2007, Cuba's State-owned agricultural and food importing agency, ALIMPORT, informed the U.S. government that it would substantially reduce U.S. imports due to a lack of effort by U.S-based companies in obtaining changes in U.S. policies and regulations pertaining to agricultural exports to the Island (Economic Eye on Cuba, December 2015). U.S. agricultural and food exports to Cuba during the since 2008 have also been hindered by the Cuban economy's limited ability to generate the foreign exchange receipts necessary to pay for higher volumes of U.S. agricultural and food products in cash.

The direct financial support (in the form of favorable terms of credit, subsidies, etc.) offered by Cuba's principal trading partners such as: Venezuela, China, Brazil, and Vietnam, as well as Canada, the European Union (E.U.), and Mexico, have also contributed to the decline of U.S. agricultural and food exports to the Cuba since 2008 (Economic Eye on Cuba, 2015). By providing Cuba with direct financial support, these countries have been able to influence the decisions of the Cuban government in terms of sourcing essential agricultural and food imports. U.S. agricultural exports to Cuba since 2008 have also been impacted by the Cuban government's decision to give preference to purchases (and imports) from State-owned enterprises (SOEs) from countries with closer diplomatic and economic ties with the island (Economic Eye on Cuba, 2015).

In terms of specific commodities or product categories, that the rankings (as percentages of the total) of U.S. agricultural exports to Cuba have fluctuated notably since 2001. As Table 1 indicates, between 2004 and 2012, grains and feeds represented the largest category, in terms of value, followed by poultry,

oilseeds, livestock and meats, dairy products, horticultural products, sugar, tropical products, and seeds. Corn, wheat, and rice accounted for the bulk of U.S. grains and feeds exports to Cuba during the 2001-2008 period. While corn exports have increased substantially since 2001, wheat and rice exports have declined since 2008. U.S. rice exports to Cuba have basically disappeared since 2008 due to increased competition from Vietnam, which has replaced the United States as Cuba's principal rice supplier. Increased wheat imports from Canada and the EU have displaced U.S. wheat exports since 2010.

In the poultry category, broiler meat and turkey exports to Cuba have grown significantly since 2001. U.S. exports represent an estimated 80% of total Cuban poultry imports, and poultry and poultry products (mainly broiler meat) accounted for 52.2% of the total value of U.S. agricultural and food exports in 2015 (Table 1). The relative importance of U.S. poultry and poultry products as a share of Cuba's agricultural imports can be primarily attributed to three principal factors: (1) increases in the demand for poultry as a principal source of protein, (2) the competitive advantage enjoyed by U.S. producers, and (3) the inability of Cuban producers to meet national demand. Increases in household incomes associated with the expansion of self-employment in the non-State sector since 2010 has also contributed to higher demand for agricultural and food imports.

U.S. exports of oilseeds, particularly soybean cake and meals, as well as soybeans, have also increased notably since 2001. Soybean patties, *picadillo de soya*, have emerged as one of the principal sources of protein distributed to the Cuban population (at subsidized prices) through the State rationing system since 2002. In 2002, U.S soybean exports to Cuba were valued at $62 million, accounting for 44% of the total value of U.S agricultural exports to the Island.   While its share of the total value of U.S. agricultural exports to Cuba remained unchanged at 44% , the value of soybean exports increased 5.5% to $65.4 million in 2015 (Table 1).

As Table 1 illustrates, the value of U.S exports of dairy and dairy products to Cuba has increased significantly since 2001; their share of the total value of U.S. agricultural exports to the Island has experienced notable variations, particularly between 2004 and 2008. Exports of non-fat dry milk accounted for a large share of total U.S. dairy exports to Cuba during this period. Exports of non-fat dry milk represented 92% of U.S dairy exports to Cuba in 2004, 98% in 2005, 95% in 2006, 0% in 2007, 85% in 2008, 0% in 2009, and 18% in 2010, the last year in which Cuba imported non-fat dry milk from the United States (Table 1).

U.S. exports of livestock and meats to Cuba have also increased significantly since 2001. Livestock and meats exports accounted for a significant share of the total value of U.S. agricultural exports to Cuba during the 2004-2013 period, but have declined since 2014 (Table 1). Historically, pork has dominated this category. Pork exports represented 73.7% of the total value of U.S. livestock and meats exports to Cuba in 2002; this figure reached its peak of 92% in 2011 and 2012, primarily due to pent-up demand, insufficient domestic production, and higher world prices. By 2013, the value of pork exports to Cuba as a percentage of the total value of U.S. agricultural and food exports declined to 54%, and by 2014, and 2015 U.S pork

exports had basically disappeared as domestic production recovered and imports from other countries increased.

PROSPECTS FOR NEW YORK STATE

Agriculture plays an important role in the economy of New York State (NYS). Farmland occupies close to 25% of the land area of NYS, and its direct and indirect contributions to the economy of NYS include improved quality of life, access to locally-grown fresh food, the preservation of open spaces, and improvements to local communities through farmers' markets, state fairs, and related activities (DiNapoli, 2015). Agriculture's direct contribution to the NYS economy was estimated at approximately $5.4 billion (in terms of commodity sales) in 2012, representing an increase of 22% from 2007 (DiNapoli, 2015). When other related activities (e.g. support and processing industries) are added, agriculture's estimated contribution to the NYS economy increased to an estimated $37.6 billion in 2012 (DiNapoli, 2015).

Table 2. Agriculture in NY State, Selected Historical Indicators

All Farms	2012	2007	Change	% Chg.
Farms (number)	35,537	36,252	**-715**	**-2.0%**
Land in farms (acres)	7,183,576	7,174,743	**8,833**	**0.1%**
Average size of farm (acres)	202	197	**5**	**2.5%**
Milk cows (farms)	5,427	5,683	**-256**	**-4.5%**
Mik cows (heads)	610,712	626,455	**-15,743**	**-2.5%**
Corn for grain (farms)	5,226	4,243	**983**	**23.2%**
Corn for grain (acres planted)	677,266	551,629	**125,637**	**22.8%**
Corn for grain (bushels)	87,677,512	71,454,280	**16,223,232**	**22.7%**
Wheat for grain (farms)	1,029	1,058	**-29**	**-2.7%**
Wheat for grain (acres planted)	86,068	84,955	**1,113**	**1.3%**
Wheat for grain (bushels)	5,323,226	4,422,712	**900,514**	**20.4%**
Soybeans (farms)	2,384	1,347	**1,037**	**77.0%**
Soybeans (acres planted)	310,104	199,775	**110,329**	**55.2%**
Soybeans (bushels)	13,078,638	7,456,657	**5,621,981**	**75.4%**

Source: U.S. Department of Agriculture (USDA), 2012.

As Table 2 indicates, in 2012, the average farm size in NYS was 202 acres, compared to 197 acres in 2007. Despite increasing slightly (2.5%) during this period, the average farm size in NYS remained significantly lower than the national average of 407 acres, and more than 50% of all farms in NYS are 100 acres or less (DiNapoli, 2015). Table 2 also includes selected data for commodities that represent an important share of NYS's total agricultural output, and for which NYS could potentially emerge as regional supplier to Cuba. These include: dairy products (for which livestock data is presented), corn, wheat, and soybeans.

As can be observed in Table 2, the number of farms dedicated to milk cows, and the number of milk cow heads declined slightly between 2007 and 2012. However, according to the 2015 State of Agriculture Report, published by the U.S. Department of Agriculture (USDA), in 2015 NYS produced 14.1 billion pounds (lb.) of milk, valued at $2.57 billion, placing NYS among the top-three dairy producers in the U.S. The top dairy producing states, California, Wisconsin, Idaho, and Pennsylvania, along with NYS account for approximately 50% of total dairy production in the U.S.

Table 2 shows that between 2007 and 2012, the number of farms, the area planted, and total output of corn in NYS increased by more than 20%. Wheat production also increased by around 20%, even though the number of farms declined 2.7%, and the area planted grew by just 1.3% during the same period. In the case of soybeans, another significant agricultural import for Cuba, and an important commodity for NYS, the number of farms in NYS increased by 77%, the area planted increased by 55%, and output grew by 75% between 2007 and 2012 (Table 2).   Clearly, in addition to dairy products, corn (for grain), wheat (for grain), and soybeans are significant agricultural commodities in NYS. They are also among the top U.S. agricultural exports to Cuba during specific time intervals since the approval of the TSRA in 2000.

However, intense competition and the competitive advantage enjoyed by the top corn, wheat, and soybean producing states in the U.S. are likely to constrain the ability of NYS to gain share in the Cuban market, even under normalized trade relations. In the case of corn (for grain), even under a scenario of normalized trade relations between the U.S. and Cuba, NYS would likely face stiff competition from top corn-producing Midwestern states (e.g. Iowa, Illinois, Nebraska, Minnesota, and Indiana), which account for approximately 60% of total U.S. corn production. With regards to wheat (for grain), a similar scenario is likely to emerge; due to geographical factors, and productive specialization, the top U.S. producing states (e.g. Kansas, North Dakota, Montana, Washington, and South Dakota), which account for nearly 50% of total U.S. wheat output, are likely to dominate the market for wheat exports to Cuba, thereby limiting NYS's ability to expand its share of the (potential) Cuban market.

Similarly, with respect to soybeans, Midwestern states such as Illinois, Iowa, Minnesota, and Indiana enjoy economies of scale, state of the art productive facilities, as well as advanced transportation networks and port facilities, which provide them with a strong competitive advantage in the production, processing, shipping, and marketing of soybeans (and related byproducts).   These factors limit the ability of NYS to compete for a higher share of the Cuban market for soybeans (and related byproducts) imported from the U.S.

However, dairy products are one product category in which NYS could potentially emerge as a leading exporter to Cuba under a scenario of normalized trade relations. Dairy farming plays an important role in the economy of NYS. This sector generated an estimated $2.3 billion in revenue, and supported more than 20,000 workers, as well as enterprises that provide support services in 2007 (DiNapoli, 2010). NYS is the third largest dairy producer in the U.S., and dairy farming generates more than 50% of the state's agricultural income (DiNapoli, 2010).   The state's dairy industry is primarily concentrated in northern counties such as St. Lawrence, Lewis, Yates, and Steuben counties (DiNapoli, 2010). While the number

of dairy farms has declined in recent years, total dairy output has moved in the opposite direction (DiNapoli, 2010), positioning NYS among the top dairy producers in the U.S. The majority of NYS dairy exports are destined for the Canadian market, given its geographical proximity. However, Canada has recently introduced import restrictions that are likely to hamper NYS dairy exports to our Northern neighbor, highlighting the state's need to find new destinations for its dairy exports. Under a scenario of normalized traded relations, Cuba could potentially emerge as an important destination for NYS dairy exports.

Even though the U.S. has not exported dairy products to Cuba since 2011, given its global competitiveness and geographical proximity to the Island, U.S dairy-producing states (such as NYS) could potentially emerge as major suppliers in the near future (under a scenario of normalized traded relations). Dairy products account for approximately 15% of Cuba's total agricultural imports by value (U.S. Trade Commission [USITC], 2016); the Island's dairy imports primarily consist of powder milk and fluid milk, and are mainly driven by insufficient domestic production and growing demand from the tourism sector, and higher household incomes as Cuba continues to gradually transition towards a mixed economic model.

Cuban milk production has fluctuated in recent decades, particularly after the dissolution of the Socialist Bloc and the disintegration of the Soviet Union in the early 1990s. In the decade before the economic crisis of the 1990s, Cuban milk production peaked at around 250 million gallons; by 2005 milk output had fallen to 113 million gallons (or 45.2%), produced by an estimated 380,000 dairy cows (USITC, 2016). In 2007, the Cuban government introduced moderate price reforms to stimulate milk production; as a result, output increased by more than 100% during the 2005-2011 period (USITC, 2016). However, Cuban milk production has declined significantly since 2013 due to the loss of 19,000 cows from the dairy herd (USITC, 2016).

The dairy sector has been one of the principal areas of the Cuban economy targeted for the government's import substitution program. However, despite receiving prioritized attention by the government, Cuba's dairy sector faces several challenges and prohibitions that limit its ability to satisfy domestic demand. The most significant include: State imposed prohibitions against foreign direct investment (FDI) and the "concentration of wealth," restrictions on private property rights, a dilapidated production, transportation, and cold storage infrastructure, the inexistence of input markets where producers can procure essential inputs at prices that correspond with their real purchasing power, rigid price controls, shortages of cattle feed, and aging and highly deteriorated milking equipment. Due to the inability of Cuban dairy producers to satisfy domestic demand, Cuba is highly dependent on dairy imports.

As Table 3 indicates, Cuban imports of powder milk, condensed milk, and evaporated milk increased by 237% between 2009 and 2014. The value of these imports increased 625%, from $30.5 million to $221.3 million during the same period. Canada was Cuba's principal supplier of powder milk, condensed milk, and evaporated milk in 2009, accounting for 55.7% of the total (Table 3). By 2014, the European Union (E.U.) and New Zealand replaced Canada as the leading dairy exporters to Cuba. The E.U. and New Zealand accounted for 38.8% and 24.7% of Cuba's total imports of milk powder, condensed milk, and evaporated milk in 2014 (Table 3).

Table 3: Cuba: Selected Dairy Imports by Supplier, 2009 - 2014, *1000 Metric Tons (Mt)*

	2009	2010	2011	2012	2013	2014	Chg.	% Chg.
European Union (E.U)	1.5	5.2	7.5	18.5	14.0	19.5	18.0	1200.0%
New Zealand	1.1	12.6	15.2	4.6	11.8	12.4	11.3	1027.3%
Canada	8.3	12.2	12.2	8.2	4.0	5.1	-3.2	-38.6%
Argentina	1.0	1.6	1.8	2.1	3.5	2.5	1.5	150.0%
Brazil	1.0	0.8	1.3	0.0	0.0	2.0	1.0	100.0%
Mexico	0.050	0.050	0.050	0.050	0.050	1.3	1.3	2500.0%
Uruguay	0.6	3.3	4.5	4.5	11.1	1.1	0.5	83.3%
United States	**0.050**	**0.050**	**0.050**	**0.000**	**0.000**	**0.0**	**-0.1**	**-100.0%**
Other	1.5	5.5	4.3	4.2	6.0	6.2	4.7	313.3%
Total*	**14.9**	**41.7**	**46.9**	**42.1**	**50.4**	**50.2**	**35.3**	236.9%

Source: U.S. International Trade Commission (USITC), 2016; author's calculations.

   *Totals do not add up due to the exclusion of selected data.

Even though the U.S. has not exported dairy products to Cuba since 2011, U.S. dairy exports to the Island are likely to increase under a scenario of normalized trade relations. This would represent an attractive opportunity for dairy producer in NYS. Cuban demand for dairy products will likely outpace domestic production as the Island continues to "update" its economic model, and move towards normalized trade relations with the U.S. Most of this growth is expected to be generated by increased demand from the growing tourism sector, and higher household income as a larger share of the Cuban labor force transitions from the shrinking State sector to the emerging non-State sector.

Increased Cuban demand for fluid milk, in particular, represents a potential opportunity for NYS dairy producers to gain market share under a scenario of normalized trade relations. Even though the water content of fluid milk contributes to its relatively high transportation costs, the U.S enjoys a relative advantage due to its close geographical proximity to Cuba, advanced transport and shipping systems, modern infrastructure, and existing marketing and distribution systems. If the U.S. embargo is lifted, most U.S. fluid milk exports to Cuba are likely to be shipped out of the Southeast; however, given the expected increase in Cuban demand, this could create new export opportunities for other milk producing regions, such as NYS.

Presently, despite recent changes in U.S. policies with regards to Cuba, the prospects for increased U.S. market share of Cuban agricultural imports are limited by several factors. Restrictions on credit financing for U.S. exporters limit their ability to obtain financing to expand their sales of agricultural products to Cuba. Existing regulations limit the ability of U.S. producers and exporters to Cuba to participate in government support programs (e.g. the Market Support Program and other technical and financial assistance programs offered by the U.S. Department of Agriculture, and other branches of the U.S. government), direct payments to farmers or agricultural producers, price supports through government purchases, subsidies for crop insurance, and export subsidies. Existing prohibitions on U.S. tourism to

Cuba have a constraining effect on Cuba's demand for agricultural imports, thereby, reducing the potential size of the market (and hence the market share of U.S. agricultural producers). Finally, the general ban on U.S. merchandise imports from Cuba limits the ability of Cuban producers to earn hard currency to purchase U.S. agricultural products and agricultural inputs.

Cuba's economy also faces several internal barriers that limit its ability to (substantially) increase agricultural imports from the U.S in the absence of radical policy changes. The most significant include: (1) its limited ability to earn foreign exchange receipts to pay for agricultural imports (in cash), (2) existing regulations requiring all U.S. agricultural imports to be processed through State-run ALIMPORT, (3) the relatively-low (real) purchasing power of Cuban households and individuals, and (4) existing limitations on Foreign Direct Investment (FDI) in Cuba's agricultural sector, (5) excessive regulations, (6) price controls, and (7) State-imposed restrictions on private property and the accumulation of wealth.

Despite these barriers (and to partially counter their distortionary effects), there several policy measures can be implemented on the U.S. side, which could contribute to the expansion of agricultural exports to Cuba. An import initial step should be the elimination of existing restrictions on U.S. travel and tourism to Cuba. Given the geographic proximity between both countries, the relatively-high quality of U.S. agricultural products, and the comparative advantage enjoyed by U.S. producers, increased U.S. tourism to Cuba is likely to contribute to higher Cuban demand for U.S. agricultural imports. The authorization and expansion of direct banking and financial services between U.S. and Cuban institutions, and the provision of credit financing for U.S. exporters doing business in Cuba is another important step towards the normalization of agricultural trade.   To influence Cuban demand for U.S. agricultural products and inputs, Cuban merchandise and service exports to the U.S. should be allowed, contingent on changes in Cuban regulations that would allow non-State producers to export directly to the U.S, enter joint ventures with foreign firms, and grant them with full property rights. This should provide export-oriented Cuban enterprises, production cooperatives, and privately-owned small and medium enterprises (SMEs) with opportunities to successfully insert themselves into global supply chains, and enter the U.S. market and earn the necessary hard currency to finance their purchases of U.S. capital goods, finished products, and services – including agricultural inputs, technology, and technical support services, etc.

Normalized bilateral trade relations would offer several important benefits for U.S. agricultural exporters wishing to increase their share of the Cuban market. The U.S. enjoys a clear geographical advantage compared to other competing suppliers of agricultural goods. Increases in U.S. tourists and visitors to Cuba, as well as increases in Cuban household incomes due to the expansion of the non-State sector, could potentially increase the demand for U.S. agricultural products such as: dairy products, pork, poultry, rice, grains, meat products, and processed foods, etc.

As the Cuban economy continues to decentralize, the non-State sector's share of the economy is expected to increase. The expansion non-State sector will result in higher household income, particularly for those who decide to enter the emerging non-State sector attracted by higher income prospects and by greater autonomy from the State (Kornai, 2008). Cuba's transition to a mixed economy, in which the non-

State sector will invariably play a greater role, will increase the country's demand for imported food, agricultural products, and essential agricultural inputs such as fertilizers, equipment, and machinery. The expansion of international tourism, including American visitors in the not too distant future, will be a primary driver of Cuba's demand for food and agricultural imports. Cuba's transition from the classical socialist model to a mixed economy will provide U.S. agricultural producers with opportunities to expand their share in the Cuban market.

REFERENCES

American Society of International Law. (2001). Reform of U.S. sanctions relating to agriculture and medicine. *The American Journal of International Law, 95* (2), 413-414.

DiNapoli, T. (2010). *New York's Dairy Industry in Crisis*. Available online: https://www.osc.state.ny.us/localgov/pubs/research/snapshot/0310snapshot.pdf

DiNapoli, T. (2015). *The Importance of Agriculture to the New York State Economy.* Available online: http://www.osc.state.ny.us/reports/importance_agriculture_ny.pdf

Economic Eye on Cuba. December 2015. Available online: http://www.cubatrade.org/

Kornai, J. (2008). *From Socialism to Capitalism*. Budapest: Central European University Press.

U.S. Department of Agriculture. (2015). *2015 State Agriculture Overview*. Available online: https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=NEW%20YORK

U.S. International Trade Commission (2016). *Overview of Cuban Imports of Goods and Services and Effects of U.S. Restrictions*. Available online: https://www.usitc.gov/publications/332/pub4597.pdf

Halo Effect: Stock Returns to Firms with Closely Matching Tickers as IPO's

Vijay Kadiyala[*]

ABSTRACT

I investigate whether stock prices of publicly traded companies with ticker symbols that are a close match with tickers of upcoming IPOs benefit from a 'halo effect' in the days leading up to the IPO. For each of 663 IPOs between January 2008 and June 2014, I identify five firms with closely matching ticker symbols. Using a variety of statistical techniques, I confirm the presence of a statistically significant 'halo effect' with matching firms earning an average excess return of 3.8% in the 15-day pre-IPO period ending on the day of the IPO. Firms whose tickers match internet IPOs earn a much higher 1-day pre-IPO return of 6.4%. Finally, I find that the 'halo effect' is not a temporary phenomenon; matching firms continue to earn an average excess return of 1.9% in the 15-day post-IPO period.

INTRODUCTION

When Twitter went public in an initial public offering (IPO) on November 6th, it was the most anticipated IPO in 2013 since Facebook's IPO a year ago in 2012. Two organizations called CNBC and Mashwork collected data on the extent of chatter on social media on and during the period leading up to Twitter's IPO. They found there were about 182,000 mentions of the IPO on the internet, which translated roughly to 2.11 posts per second on the subject.[1] An unknown company called Tweeter Home Entertainment Group got caught up in this media storm. When Twitter revealed its filing for an IPO on October 3, 2013, Tweeter Electronics' stock jumped up 523%. The reason for the increase was that Tweeter's ticker symbol is TWTRQ, which is remarkably similar to TWTR, Twitter's ticker symbol! The Q at the end of Tweeter's ticker indicates that the company is in bankruptcy court and that its shares trade on pink sheets.   The company benefited briefly from having a ticker symbol that was virtually identical to that of a popular social media company that was going to have an IPO.

In this paper, I investigate whether the Tweeter incident is an isolated one, or whether such mistaken identities are prevalent in the stock market. The issue is of importance in economics and finance because if such mistaken identity is prevalent, it suggests that investors are not always hard-nosed. They can be confused, and subject to mistaken identity, even when at most other times, they are rational. The larger question is whether these bouts of confusion affect stock prices, and if so, is it a temporary phenomenon, or does it have longer term implications for the concerned stocks. I focus on the particular phenomenon underlying the Tweeter incident, namely, whether stock prices of publicly traded companies with ticker symbols that are a close match with tickers of upcoming IPOs benefit from a 'halo effect' in the days leading up to the IPO. If they do benefit from this effect, does it reverse after the IPO, or is the effect permanent?

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I collect data on 663 IPOs between January 2008 and June 2014. For each IPO with more than one character in their ticker symbol, I identify five firms with closely matching ticker symbols. Using ordinary least squares regressions (OLS), I confirm the presence of a statistically significant 'halo effect'. Matching firms earn average excess returns of 3.8% in the the 15-day pre-IPO period ending on the day of the IPO. I find that the buzz surrounding popular IPOs helps explain the 'halo effect'; matching firms whose tickers resemble those of IPOs in the internet and computer sectors earn on average 6.4% in the 15-day pre-IPO period. To put this return in perspective, the overall stock market has generated an annual return of between 10-11% annually on average over the last 80 odd years.[2] I find that the 'halo effect' is not a temporary phenomenon. My results show that matching firms continue to earn an average excess return of 1.9% in the 15-day post-IPO period. It appears from my evidence that greater investor attention that matching firms receive is a permanent benefit for these firms.

The rest of this paper is organized as follows: In section 2, I lay out the theory behind the 'halo effect'. In section 3, I develop the testable hypotheses. In section 4, I describe the data used in the tests of the hypotheses. In section 5, I describe the results, and in section 6, I present my conclusions.

THEORY

Companies attract media attention when they are the subject of a story or an event that is expected to be of interest to a wide audience. Sometimes, the news is positive, as when, Netflix entered into an exclusive deal with Disney to stream Disney movies on its service. At other times, the news is negative, as when it was disclosed that the yoga pants sold by Lululemon were transparent! Whether the news is good or bad, several studies in the finance literature have shown that stock prices of the companies receiving the media attention react very strongly. In the case of Netflix, the stock price increased by 14% when the news was released. In the case of Lululemon, the stock price decreased by 2.8%. Media attention affects the stock price because it focuses investors' interest in the stock. Barber and Odean (2008) find that individual investors buy stocks that grab their attention. A study by Xing, Anderson and Hu (2016) builds on this and suggests that ticker symbols affect stock valuations. Stocks with ticker symbols that are more likable and easier to pronounce have a valuation that is 1.3% higher than stocks with less likable ticker symbols. The authors offer two likely explanations for the higher valuation: i) Investors trade stocks with likable tickers more often, thereby contributing to higher liquidity in those stocks and ii) they are also likely to overvalue these stocks beyond their fundamental value. The corollary is also true as shown by Hirshleifer, Lim and Teoh (2009) who find that when investors are distracted by extraneous news, the market reaction to relevant information contained in an earnings announcement is weaker. Dellavigna and Pollet (2009) find that earnings announcements made on Fridays, when investor inattention is more likely, are associated with a 15% smaller price reaction than announcements made on other days.

Several studies have shown that stock prices respond to media attention even when no material information is revealed about a company, but instead the information is of a cosmetic or superficial nature. For instance, the mere name of a publicly traded company does not convey anything about the future profitability of the business, or about its industry ranking relative to its competitors, or any other pertinent

information about the fundamentals of the business. Yet, Bae and Wang (2011) show that stocks that are listed on one of the U.S. stock exchanges that have 'China', or 'Chinese' included in their company names earn much higher returns than companies without those words in their names.   They find this superior performance for the 'China-name' stocks during the period between September 2006 and October 2007, when the Chinese stock market as a whole earned very high returns.   They conclude that investors were attracted to the surging Chinese stock market, and this heightened attention benefited all 'China-name' stocks. Similar evidence is documented by Cooper (2001), who find that during the internet stock market boom from 1998-March 2001, stocks with '.com' in their names experienced a bigger stock price appreciation than stocks without '.com' in their names.   The media buzz around internet stocks drew investor attention to these stocks. In both cases, investors were responding to cosmetic information that had no direct relation to the fundamentals of the company.

I rely on this previous evidence to examine whether firms whose ticker symbols closely match those of firms going public through an IPO benefit from higher investor attention. Firms going public through an IPO generally receive coverage in news blogs and in media. As I pointed out in the introduction, the Twitter IPO received a lot of coverage on the internet. All this media attention is likely to attract investor interest to the IPO.   Investors will search for more information about the stock. When conventional sources such as financial websites fail to turn up information about the stock, simply because it has not commenced trading, investors turn to other sources. Drake, Roulstone and Thornock (2012) show that investors demand more information from the internet by performing a google search when the stock is illiquid. Often, they will conduct the search using the ticker symbol, rather than the company name. Confusion can arise when using ticker symbols, as happened to Tweeter Home Entertainment as described in the Introduction. I investigate the effect of this confusion and of the overall heightened investor attention on stock prices of firms with a closely matching ticker symbol as the upcoming IPO.

My research builds on earlier evidence in Rashes (2001) who examines in-depth the confusion that arose between two companies with closely matching ticker symbols. There was a lot of confusion between MCI, a large telecommunications company, which traded under the ticker symbol MCIC before it merged with Worldcom, and Massmutual Corporate Investors, a closed-end mutual fund, which traded under the ticker symbol, MCI. He finds that between November 1996 and November 1997, there was significant co-movement between the stock prices of the two companies even though the two had very little in common. My study is a significant improvement over that of Rashes (2001) for several reasons: i) he only presents a few case studies in addition to the MCI-MCIC example, ii) does not conduct a formal empirical study of this confusion phenomenon, and, iii) focuses only on co-movement of two stocks with similar ticker symbols, without studying the price effects arising from such confusion.

HYPOTHESIS

Investors' attention is drawn to the upcoming IPO by the media coverage of the company. Since the company is not yet public, traditional sources of information such as the company's Annual Report are not available publicly. Investors then turn to the internet to gather more information. Most financial internet

sites prompt the user to enter the company's ticker symbol to download information on a particular company. The investor may look-up the IPO's ticker symbol after supplying the website with the name of the company. Upon entering the ticker symbol, the investor may find that there is no information on the company, because it has not begun trading as yet. Unaware that the company has not yet commenced trading, the investor becomes convinced that he has entered the wrong ticker symbol. Here, the 'autofill' function that is a feature on most internet websites acts to confuse the investor. After the investor has typed in the first character of the ticker symbol, the 'autofill' function will automatically fill in the rest of the ticker symbol, prompting the user with a list of tickers that match the IPO's on the first character. Since the investor has never traded the IPO's stock before, and is convinced that he had made a mistake when he first entered the correct ticker symbol, he is likely to be tricked into clicking on one of the ticker symbols that is prompted by the website. Having picked this ticker symbol, he may continue to be deluded into thinking that the erroneous ticker symbol is in fact, the correct symbol for the company that has attracted all the media coverage. Having formed an optimistic expectation about the company on the heels of the media coverage, the investor may proceed to buy shares in the company with the incorrect ticker symbol. If there are a sufficient number of such confused investors, the stock prices of the companies whose ticker symbols closely match those of the IPO will increase from the buying activity of all these investors. A similar phenomenon is described by Barber and Odean (2006) who test and confirm the hypothesis that individual investors are net buyers, but not net sellers, of attention-grabbing stocks, which results from the difficulty that investors have searching the thousands of stocks they can potentially buy.

My first prediction about the 'halo effect' generated by this confusion is stated as a testable hypothesis below:

HA: Stock prices of companies whose ticker symbols closely match those of an upcoming IPO will increase in the two-week period leading up to the IPO.

I predict that greater investor attention brought about by the confusion regarding ticker symbols is a permanent benefit to the matching company. Bushee and Miller (2005) show that increased attention benefits stocks in the long-run by encouraging more stock analysts employed at large Wall Street banks to cover the stock for their clients. Greater coverage is likely to highlight positive developments in the company, which may have been previously ignored by investors. The testable hypothesis that comes out of this discussion is stated below:

HB: The increase in the stock price of companies whose ticker symbols closely match those of an upcoming IPO is not reversed in the period following the IPO.

My third hypothesis is related to the buzz surrounding the IPO. When Facebook went public in May 2012, there was extensive media coverage of the IPO that started as soon as Facebook filed its registration statements with the SEC. When there is greater buzz about an IPO, there is greater retail investor interest in the stock. Investors who are attracted by this buzz might mistakenly buy shares in firms whose ticker symbols closely match that of the IPO, rather than the IPO itself. The stock prices of these matching firms will jump in response to the buying pressure. The testable hypothesis is stated below:

HC: The increase in the stock price of matching companies is higher when there is greater buzz surrounding the IPO.

My last hypothesis is related to the closeness of the match between ticker symbols. My original hypothesis above is predicated on the idea that investors are confused into believing that the company with the closely matching ticker is in fact the IPO receiving media coverage. It is quite likely that the extent of this confusion is greater when there is a closer match between the two ticker symbols. Stated as my third hypothesis:

HD: The closer the match between the ticker symbol of the company and that of the IPO, the higher the stock price appreciation of the matching company during the IPO period.

I use a variety of statistical techniques to test the hypotheses, as described in the sections that follow.

IPO DATA

I got data on firms that went public between January 2008 and June 2014 from IPO Central maintained by Hoover's Online. Hoover's Online is a subsidiary of Dun & Bradstreet, which offers information on companies and businesses. There were 663 IPOs in total during this period on the database. For each IPO, Hoover's reports: i) the name of the firm, ii) ticker symbol, iii) IPO date, iv) shares outstanding, v) shares offered, vi) offer amount, vii) offer price, viii) price at open of trading on the first day, ix) price at close of trading on the first day, and x) the SIC code. The SIC code is a four-digit code which identifies the industry to which the IPO belongs.

For each IPO, I obtained additional data from Bloomberg, a platform that delivers data, news and analytics about the markets and companies worldwide. I accessed Bloomberg through my public library. I first checked that the offer price data reported by Bloomberg and by Hoover's matched, which they did for all the IPOs in the sample. For each IPO, I calculated the return on the first day of trading as:

daily return = (closing price on 1st trading day-offer price) / offer price.   (1)

In words, the stock return is the increase in the value of $1.00 invested in the stock on the previous day. I similarly calculated the return on the second day of trading by substituting the closing price on the 2nd trading day and the closing price on the 1st trading day in equation (1).

Table 1 lists the characteristics of the IPOs. I eliminated 47 firms from the sample due to a lack of data on Bloomberg to calculate a first day return. Thus the number of IPOs included in this table is 617. The average size of the offering is $305 million, which puts the average IPO in the second decile of all firms that are traded on the NYSE or Nasdaq. In other words, IPOs, as expected, are considered to be small firms. Less than half the total shares outstanding were offered on average in the IPO. The mean and median percent offered are 38.39% and 27.97% respectively. The average return on the first day the IPO is listed and commences trading on a stock exchange is 12.81%, while the median is less than half that at 5.33%. The second-day returns are modest with a mean of 0.59% and a median of only 0.29%. It appears that investors who may have been closed out to the IPO were able to buy shares in the IPO on the first day it is listed. Hence the IPOs experience an increase in price on the first day, earning much smaller returns on

the second day.   With regard to the industry distribution of IPOs, the largest number were in the manufacturing industry (213) with business services coming in second (175).   The latter category includes social media, and other internet related businesses.

Table 1: Characteristics of IPOs

	Mean	Median	Quartile 1	Quartile 3	Standard deviation
Offer price ($)	15.27	14	11.00	19.00	7.00
Offer size ($ millions)	305	120	72.0	233.7	1179
% of shares offered	38.39	27.97	19.31%	45.13%	28.11%
First-day return	12.81%	5.33%	-1.10%	21.94%	29.15%
Second-day return	0.59%	0.29%	-1.46%	2.23%	4.92%

Panel A: The table has the characteristics of IPOs from January 2008 to June 2014.

Distribution by year and Industry.

	2008	2009	2010	2011	2012	2013	2014	Total
Construction	0	0	1	0	1	2	1	5
Finance	2	9	22	10	18	28	12	101
Manufacturing	8	10	40	29	35	52	39	213
Food &Mining	2	2	7	12	7	4	2	36
Retail	0	4	9	5	14	15	8	55
Services	6	16	29	29	29	41	24	174
Utility	4	2	10	7	7	15	3	48
Others	0	3	10	8	7	2	1	31
Total	22	46	128	100	118	159	89	1

Panel B: The SIC codes for each industry are: Food & mining 1000-1499, construction 1500-1799, manufacturing 2000-3999, utility 4000-4999, wholesale and retail trade 5000-5999, finance, insurance and real estate 6000-6799, business services 7000-9000, others > 9000.

IDENTIFICATION OF MATCHING FIRMS

For every IPO on the list, I run a search on Yahoo Finance for all the companies that are publicly traded on American stock markets, whose name is phonetically similar to that of the IPO. To automate the task, I

enter the starting letter of the IPO's proposed ticker symbol into the 'quote lookup' box on Yahoo. Yahoo prompts me with a list of tickers with that starting letter. I scroll through that list to identify: i) tickers which have the same number of letters as in the IPO's, and ii) end in a similar syllable as the IPO's. For each IPO, I select five matching tickers.   There were 32 IPOs with 2-character tickers, 152 IPOs with 3-character tickers, and 445 IPOs with 4-character tickers. There were 7 IPOs for which I could not find matching tickers, of which 5 were IPOs with only 1-character in their ticker symbol. There were two firms with only 3 matches. Thus the total number of matching firms was 3276, which after matching with the IPO data with valid first day returns, was further reduced to 3041.

For the matching tickers, I collect daily stock returns calculated as in equation (1) with daily closing prices from Bloomberg over a 30-day period, roughly two weeks prior to, and two weeks after the IPO. Thus, day 0 is the IPO date, day -1 is the one day prior to the IPO date, and day +1 is the one day after the IPO. I chose a two-week period around the IPO to make sure that the stock market was aware of the firm's plans to go public. Under the JOBS Act, the SEC permits the IPO's registration statement, called a form S-1, to be made public only 21 days prior to the IPO. Many other companies have also adopted the 21-day practice. A second reason is the evidence in Drake, Roulstone, and Thornock (2012) that internet searches about a company begin to increase about two weeks prior to an earnings announcement. It appears that investors are busy going about their daily lives, and only sit up and begin to take notice of a stock two weeks prior to an important event related to that stock. Da, Engelberg and Gao (2011) also find that searches related to IPO stocks increase by almost 20% during the week of the IPO. I chose a 15-day post-IPO period to maintain symmetry between the pre-IPO and the post-IPO periods.

It is necessary in any study of stock prices to control for the effect of the overall stock market because stock prices respond to what is happening to the overall market. I use the S&P 500 index to capture the reaction of the stock market. I collect daily returns to the S&P 500 index over the 30-day period from Bloomberg. For each day, I subtract from the return to the matching firm the S&P 500 return on that day. The difference is the excess return to the matching firm that cannot be explained by market movements. There were several observations where the daily return calculated using equation (1) was above 200%. I eliminated these outliers to avoid skewing the mean statistics. Thus, I was left with between 2264-2269 observations on any given day. Panel A of Table 2 has the mean daily returns to the matching firms, the mean returns to the S&P 500 index, and the excess return, or the difference between the two sets of returns, on each of the 30 days. The table shows that the set of matching firms earned some of the highest excess returns on day -1, - and +1. Although mean excess returns are generally positive during the pre-IPO period, there are some days (day -5 and -2) with negative excess returns. The scientific test for whether the means are different from zero is called the Student's T-test. The T-test is a ratio which combines the mean with an estimate of the spread or the dispersion in excess returns across all matching firms. The equation is as follows:

t-ratio = $mean\ excess\ return\ /\ (standard\ deviation\ of\ exce\mathbf{e}ss\ returns * \sqrt{no\ of\ observations})$ (2)

In order to test whether the t-ratio is large enough that the mean excess return could not have been generated by chance, it is necessary to specify a confidence level. I chose a confidence level of 5%, which means that only five times out of 100 would an excess return larger than zero be generated by pure chance. At a confidence level of 5%, the mean excess return is statistically significant if the t-ratio is greater than or equal to 1.96. The t-ratios for excess returns to matching firms are reported in the last column in Table 2. The t-ratios on 7 of the 30 days are above 1.96 indicating that mean excess returns on these days are statistically significant.

In Panel B of Table 2, I consolidate daily returns into three distinct periods: i) a pre-IPO period covering days -14 to -1, ii) IPO period covering day 0, and day +1, and, iii) post-IPO period covering days +2 to +15. The first hypothesis predicts that investors are confused into believing that the matching ticker is the actual ticker symbol of the company going public. They buy shares in the company with the matching ticker, leading to an increase in its stock price. There is support for the hypothesis in Panel B of Table 2: the cumulative mean return to matching firms in the pre-IPO period is 3.375%, and that during the 2-day IPO period is 0.783%. The corresponding t-ratios are 5.76 and 2.86, indicating that the stock price reactions of matching firms in the pre- and IPO periods are significantly positive.

The second hypothesis can also be tested using the statistics reported in Panel B of Table 2. The hypothesis predicts that higher stock prices of matching firms will not be reversed in the post-IPO period. The table shows that the mean post-IPO return of 1.466% is considerably smaller than the return in the pre-IPO, but with a t-ratio of 3.05, it is significantly different from zero. I test whether the cumulative excess returns in the three periods are significantly different from each other. Whereas the t-statistic in equation (2) applies to the mean of a single random variable, the F-test can be used to compare means of several random variables. It is calculated as:

  F-test statistic = Between-group variability / within-group variability   (3)

The F-statistic takes on a bigger value when the between-group variance is large relative to the within-group variance, which is unlikely to happen if the population means for the three periods are all equal. The F-test reported at the bottom of Panel B of Table 2 is 6.36, with a p-value of 0.011. The p-value indicates that there is only a 1.1% probability that the F-statistic can be larger than 0.

Table 2: Panel A: Daily excess returns to matching firms in the 30-day period surrounding the IPO

Day	Daily returns (%)	Excess returns (%)	t-stat for excess returns
-14	0.58	0.37	1.64
-13	0.43	0.40	1.91
-12	0.32	0.34	2.54
-11	0.19	0.15	1.24
-10	0.08	0.02	0.14
-9	0.48	0.38	1.53
-8	0.28	0.22	1.04
-7	0.62	0.62	2.52
-6	0.24	0.20	1.00
-5	-0.13	-0.17	-1.67
-4	0.12	0.09	0.68
-3	0.14	0.24	0.86
-2	-0.06	-0.17	-0.41
-1	0.56	0.56	2.24
0	0.43	0.44	1.72
1	0.41	0.33	2.04
2	0.15	0.14	1.22
3	-0.22	-0.26	-2.16
4	0.17	0.10	0.67
5	0.00	-0.09	-0.02
6	-0.10	-0.07	-0.36
7	0.43	0.42	2.05
8	0.22	0.21	1.23
9	0.01	0.00	-0.03
10	-0.07	-0.07	-0.67
11	-0.01	-0.03	-0.15
12	-0.06	-0.02	-0.08
13	0.06	0.07	0.37
14	0.62	0.54	2.70
15	0.11	0.07	0.41

Table 2 (continued): Cumulative excess returns in the pre-IPO, IPO and post-IPO periods

	Mean cumulative excess returns	Median cumulative excess returns	t-statistic for mean
Pre-IPO period	3.375%	-0.195%	5.76
IPO period	0.783%	-0.122%	2.86
Post-IPO period	1.466%	-0.171%	3.05
F-test for equality of returns (p-value)	6.36 (0.011)		

In Figure 1, I graph the cumulative mean daily returns to the matched firms over the 30-day period. I calculate daily excess returns for each matching firm over each of the 30 days surrounding the IPO. I cumulate these excess returns and plot these in Figure 1. The graph has a steep upward slope in the pre-period, reaching its peak on day +1. After day +1, returns dip till day +6, after which they continue to increase, albeit at a slower pace. The figure illustrates that if there is any halo effect, stock returns to matched firms bear out the effect in the days leading up to the IPO. Once the IPO is completed, the halo effect seems to dissipate.
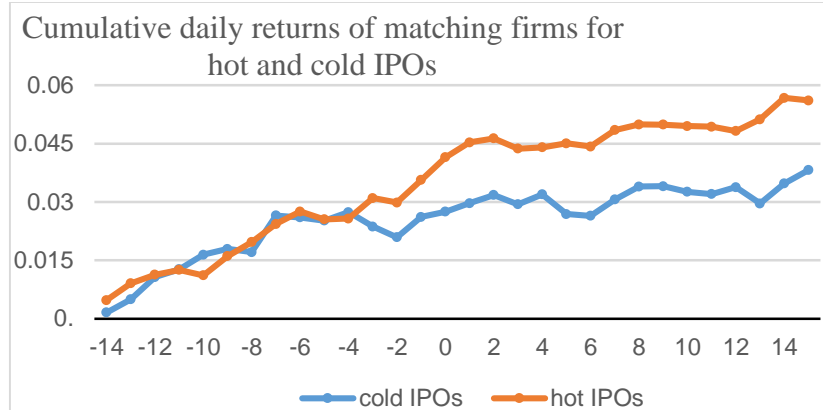
TESTS OF HYPOTHESIS
Graphs of Cumulative Returns for Various Sorts of the Sample

There is substantial variation in the characteristics of the IPOs in my sample as indicated by Table 1. First, the IPOs are drawn from different industries. Second, there is substantial variation in the first and second day returns after the IPOs begin trading on a stock exchange: Hot IPOs experience an increase in stock price on the first day following a listing, cold IPOs experience a decrease. My sample of IPOs has considerable variation in the industry to which the IPO belongs, including the internet and manufacturing sectors. There has been a lot of buzz around internet stocks ever since Facebook came out with its IPO in 2012; there is less interest in IPOs in the manufacturing sector. The third hypothesis in this paper predicts that the 'halo effect' is stronger when there is a bigger buzz surrounding an IPO. I examine whether this hypothesis is supported by the data with informal tests in this section. In the next section, I conduct formal tests.

I cumulate the first- and second-day listing returns in excess of the return to the S&P 500 index, and sort the sample on the basis of those with a positive cumulative excess return, and those with a negative cumulative excess return. I calculate daily excess returns to the matching firms corresponding to these two sets of IPOs, over each of the 30 days surrounding the IPO. I cumulate these excess returns and plot the means in Figure 1. The figure shows that both sets of matching firms earn positive excess returns up to the
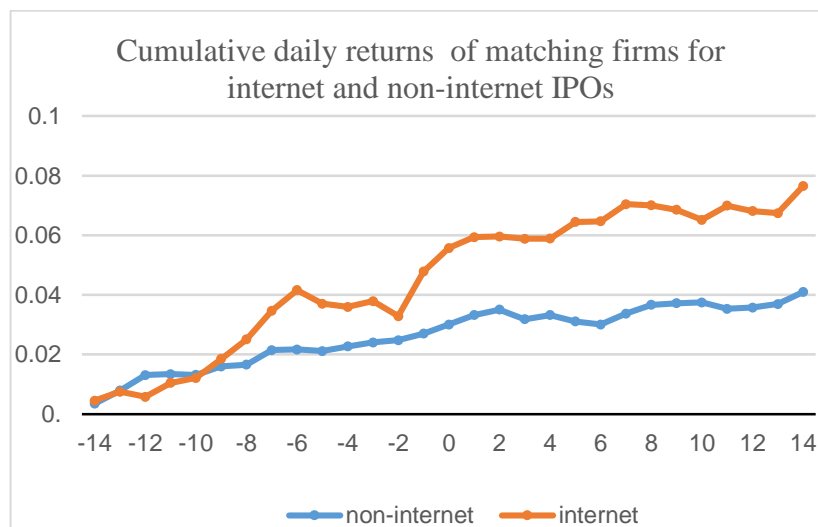
day of the IPO. Beyond the IPO date, it is only the firms corresponding to the hot IPOs that continue to increase in price. Thus, the halo effect persists beyond the IPO date for the hot IPOs, but not for the cold IPOs.

Figure 2

Cumulative daily returns of matching firms for hot and cold IPOs
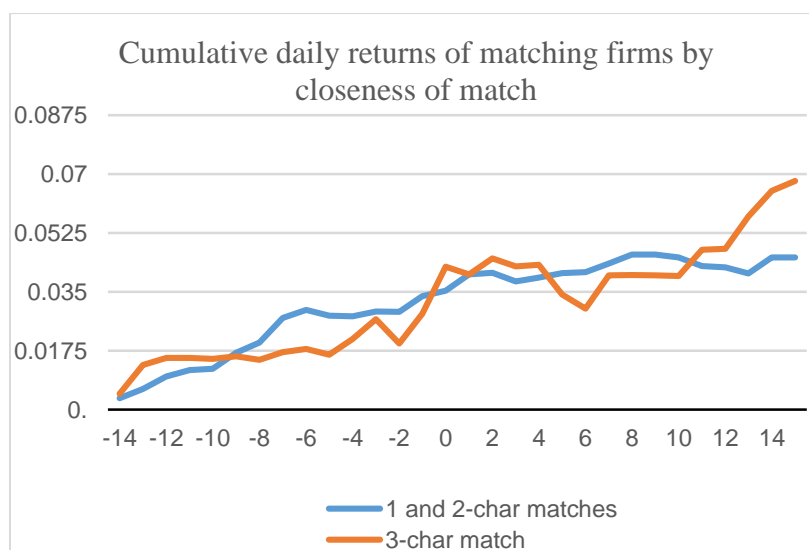
cold IPOs ●——● hot IPOs

I next separate the sample on the basis of the industry to which the IPO belongs. Specifically, I sort on the basis of whether the IPOs came from the internet and related computer software and hardware industries (SIC code between 7000 and 8999, or SIC codes between 3500 and 3700), or from other industries. I calculate mean excess returns for each group of matching firms on each of the 30 days surrounding the IPO. I cumulate the daily excess returns and plot the averages in Figure 2. The figure appears to support hypothesis HC; firms whose tickers match internet IPOs increase in price much more than stock prices of firms whose tickers match non-internet IPOs.

Figure 3

Cumulative daily returns of matching firms for internet and non-internet IPOs

non-internet ●——● internet

My final sort is on the basis of the extent of the match between the tickers. The fourth hypothesis in this paper, HD predicts that the 'halo effect' is stronger when there is a closer match between the ticker symbols. Thus, if an IPO has four characters in its ticker symbol, a firm whose ticker symbol matches 3 of the 4 characters in the IPO's ticker symbol is a closer match than a firm with only a 2- or 1-character match. I separate the sample into those with 3-character matches, and those with fewer than 3 character matches. As in Figures 1 and 2, I calculate excess returns to each matching firm on each of the 30 days surrounding the IPO. I cumulate these returns, calculate the mean, and plot these means in Figure 3. Figure 3 shows that there is a difference in the magnitude of the halo effect for the two sets of firms. Those firms with 3-character matches experienced a bigger stock price appreciation in the 30-day period than did firms with fewer than 3-character matches.

Figure 4

Cumulative daily returns of matching firms by closeness of match

Regression Analysis

The evidence presented thus far indicates informal support for all four hypotheses. However, none of the tests conducted thus far can be considered to be definitive. They are not definitive since they do not control for other factors that can affect the stock price reaction of matching firms. Such factors that have explanatory power, but are not the variables identified by the hypotheses, are called exogenous factors. To test whether it is in fact the 'halo effect' that leads to an increase in the stock price of matching firms in the pre-IPO period, I have to control for the exogenous factors. The established technique to do so is the ordinary least squares regression (OLS). In an OLS regression, a line of best fit is estimated between a dependent variable called Y, and an independent variable called X. The approximate mathematical expression for this line is:

$$Y = \alpha + \beta X \qquad\qquad (4)$$

Alpha is the Y-intercept of the line which indicates the predicted value of Y when X=0. Beta is the slope of the line, which is the magnitude of the change in Y for a unit change in X. A positive slope indicates that higher values of the X variable are associated with larger values of the Y variable.   A negative slope indicates the opposite, namely, that higher values of the X variable are associated with lower values of the Y variable.   The t-test statistic calculated using equation (2) determines whether the slope coefficient is significantly different from 0 at the 5% confidence level. In addition to the t-test, a second statistic called the R-square measures how close the data are to the fitted regression line. It is the percentage of the variation in the Y variable that is explained by the linear model. A higher R-square indicates the linear model is a good fit of the data.

The OLS regression in equation (4) can easily be extended to test multiple hypotheses with additional X variables:

$$Y = \quad \alpha + \beta_1 X_1 + \beta_2 X_2 \qquad\qquad\qquad\qquad (5)$$

Equation (5) can be used to test a variety of hypotheses by letting variables X1 and X2 represent two different factors that could affect the dependent variable.

To test the hypotheses HA through HD, I estimate two separate sets of regressions for pre-IPO and post-IPO returns. For the pre-IPO period regressions, I cumulate daily returns to each matching firm from day -14 through day 0, the IPO date, and use these returns as the dependent variable.   In the first specification, I include only one X variable, namely, the cumulative 15-day return to the S&P 500 index. This specification tests whether controlling for the return to the S&P 500 index, the matching firm earns excess positive returns. If it does, the intercept α should be positive and be statistically significant at the 5% level (t-value of 1.96 or above). Results from the estimation of the regression with 2268 observations are reported in Table 3. The intercept is positive (0.038) and is statistically significant, which supports hypothesis HA. The magnitude of the intercept suggests that matching firms enjoy a bump of 3.8% in the 15-day IPO and pre-IPO periods. The slope coefficient of 0.879 indicates that matching firms have below average 'beta' risk. 'Beta' risk is the sensitivity of a stock to changes in the overall market; a beta of 1.0 indicates that the stock has average risk, a beta < 1.0 indicates below average risk, and a beta > 1.0 indicates above average risk. The R-square indicates that only 0.62% of the variation in the 15-day return is attributed to the linear model.

In the second specification, I test hypothesis HC by using various proxies for the buzz created by the IPO. The idea is that when there is buzz around an IPO, there is a bigger halo effect that helps matching firms. Since buzz is a descriptive term, I have to use proxy variables to measure the extent of the buzz. Professor Jay Ritter has conducted extensive research into IPOs. He attributes the listing return to the buzz generated by the IPO.   Based on this research, my first choice for a proxy is the listing return to the IPO. I cumulate the returns to the IPO on the first and second listing days in excess of the return to the S&P 500 index on those two days, and add it to the regression as an independent variable. The results in Table 3 show that the coefficient on the IPO listing return is positive (0.041) and is statistically significant, which supports hypothesis HC. The R-square has increased to 0.79% indicating that a greater proportion

of the variation in matching firms' returns is explained by the linear model. I use a second proxy variable to capture the buzz surrounding the IPO, which is a dummy variable for whether the IPO is in the internet and computer sectors. The SIC codes for these sectors are 7000-8999, and for computer firms, it is 3500-3700. The dummy variable takes a value 0 if the IPO belongs to any other SIC category. Table 4 shows that the internet dummy has explanatory power for the returns to matching firms. The coefficient on the internet dummy is positive (0.039) and is statistically significant. The intercept has decreased in magnitude to 0.025, but continues to remain significant, which indicates that the average matching firm continues to benefit from the halo effect, but those firms whose tickers match those of IPOs in the internet space, enjoy a bigger return in the pre-IPO period.   Summing the intercept and the internet dummy coefficient indicates that matching firms enjoy a run-up of 6.4% (0.025+0.039) in the 15-days leading up to the IPO. To put the magnitude of this return in perspective, the overall stock market has generated an annual return of between 10-11% annually on average over the last 80 odd years.[3] The matching firms earn roughly half of this annualized return in the fifteen days leading up to the IPO!

I test hypothesis HD by regressing the 15-day pre-IPO return to matching firms on a dummy variable that takes a value 1 if the matching firms' ticker is a 3-character match to the IPO's ticker. The idea here is that closer the match between the tickers, greater is the confusion in the minds of investors, and greater is the halo effect. The results in Table 3 do not indicate support for this hypothesis since the coefficient on the 3-character dummy is positive (0.018), but is not statistically significant (t-value of 1.20).   In the final specification in Table 3, I estimate the regressions with all independent variables included. The idea is to test which effect persists after controlling for other effects. It is possible that the IPO listing return, the internet dummy, and the 3-character dummy are all correlated with each other. Estimating a regression with all the variables included will test the independent explanatory power of each variable. The results show that the intercept, and the internet dummy continue to be positive and statistically significant. The IPO listing return and the 3-character dummy are not statistically significant anymore, indicating that their influence on matching firm returns is subsumed by the internet dummy and the S&P 500 return. The R-squares for this specification is the highest at 1.06% indicating that all the variables combined explain more of the variation in matching firm returns than other linear models.

In the second set of regressions, I use the 15-day cumulative daily return to matching firms in the post-IPO period (day 1 through day 15) as the dependent variable. I estimate the same set of specifications as in Table 3. The results are in Table 4. In the first specification, the intercept is positive (0.019) and is statistically significant. The evidence supports hypothesis HB, which predicts that the halo effect is not reversed in the post-IPO period. A comparison of the magnitudes of the intercepts in Tables 3 and 4 indicate that the halo effect has been halved in the post-IPO period. The magnitude of the intercept in Table 4 is only 1.9%, half that of the intercept in Table 3. Other effects are no longer significant. The effects of the buzz surrounding the IPO do not contribute significantly to matching firm returns in the post-IPO period. The coefficients on the internet dummy, and on IPO listing returns, are both statistically insignificant (t-values < 1.96). The coefficient on the 3-character dummy is marginally significant at the 10% confidence

level (t-value=1.64), but becomes statistically insignificant in the 5th specification when all the independent variables are included in the regression.

CONCLUSIONS

This simple study illustrates the effect of psychology and investor behavior on stock returns. My results show that beta risk is important, but is not a complete explanation of the returns to a set of firms selected solely on the basis that their ticker symbol closes matches that of an upcoming IPO. Investor attention drawn to these stocks because of their resemblance to an upcoming IPO creates a permanent positive effect on the returns. This effect, which I term the 'halo effect' is higher in the pre-IPO period, and is systematically higher when there is greater buzz around the IPO. The 'halo effect' is permanent, in that it is not reversed in the post-IPO period. Positive news generated by matching firms attracts greater coverage of the company by the investment community. Yet, due to the 'ostrich' effect documented by Karlsson, Loewenstein and Seppi (2005), investors downplay any negative news that comes out. The unique contribution of my study is that the 'halo effect' has no basis in the fundamentals of the stock, but has its roots in the confusion surrounding an IPO. Yet, it has a powerful effect on stock return.

ENDNOTES

1. Twitter's IPO around the web: 2.11 posts per second, split between lovers/haters, Nov 14, 2013, Lauren Dugan, www.adweek.com.
2. Ibbotson 2014 Stocks, Bonds, Bills and Inflation Yearbook calculates the annualized return from 1926-2013.
3. Ibbotson 2014 Stocks, Bonds, Bills and Inflation Yearbook calculates the annualized return from 1926-2013.

REFERENCES

Bae, K. and Wang, W., 2012, What's in a "China" Name? A test of Investor Attention Hypothesis, F*inancial Management*, 41, 429-455.

Cooper, M.J., O. Dimitrov, and P.R.Rau, 2001, A Rose.com by any other name, *Journal of Finance*, 56, 2371-2387.

Xing, X., Anderson, R. and Hu, Y., 2016, What's a name worth? The impact of a likeable stock ticker symbol on firm value, *Journal of Financial Markets*, July 2016.

Rashes, M.S., 2001, Massively confused investors making conspicuously ignorant choices, *Journal of Finance*, 56, 1911-1927.

Drake. M., D. Roulstone, J. Thornock, 2012, Investor Information Demand: Evidence from Google searches around earnings announcements, *Journal of Accounting Research*, 50(4), 1001-1040.

Hirshleifer, D., Lim, S., and Teoh, S., " Driven to distraction: Extraneous events and underreaction to earnings news." *Journal of Finance* 5 (2009): 2289-2325.

Barber, B., and Odean, T., 2008, All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors, *Review of Financial Studies,* 21, 785-818.

Da, Z., Engelberg, J., and Gao, P., 2011, In search of attention, *Journal of Finance*, 66(5), 1461-1499.

Bushee, B., and Miller, G., 2005, Investor Relations, Firm Visibility and Investor Following, *Working Paper, Wharton School, University of Pennsylvania.*

Ritter, J., 1991, The long-run performance of initial public offerings, *Journal of Finance*, 46, 3-27.

Dellavigna, S., and J.M. Pollet, 2009, Investor inattention and Friday earnings announcements, *Journal of Finance*, 64(2), 709-749.

Karlsson, N., Loewenstein, G., and D. Seppi, 2005, The 'Ostrich Effect': Selective Attention to Information about Investments, *Journal of Risk and Uncertainty,* 38, 95-115.

APPENDIX

Table 3: OLS regressions for the cumulative return in the pre-IPO and IPO periods*

	(i)	(ii)	(iii)	(iv)	(v)
	coefficient	coefficient	coefficient	coefficient	coefficient
Intercept	0.038 (6.19)	0.025 (3.20)	0.035 (4.94)	0.033 (4.73)	0.018 (2.13)
S&P 500 index return	0.879 (3.88)	0.887 (3.92)	0.878 (3.88)	0.912 (3.98)	0.916 (4.00)
Internet dummy		0.039 (3.06)			0.032 (2.46)
3-character dummy			0.018 (1.20)		0.020 (1.36)
IPO listing returns				0.041 (1.97)	0.030 (1.41)
R-square	0.62%	0.99%	0.64%	0.79%	1.06%

*The dependent variable is the cumulative daily return to matching firms in the 15-day post-IPO period. The S&P 500 index return is the cumulative daily return to the S&P 500 index in the same 15-day period. Internet dummy is a variable equal to 1 if the IPO corresponding to the matching firm is in an industry with an SIC code between 7000 and 8999, or between 3500 and 3700, and is 0 otherwise. The 3-character dummy is equal to 1 if the matching firm's ticker is a 3-character match with the IPO's ticker. IPO listing return is the sum of excess returns to the IPO on the first and second listing days. T-ratios for coefficients are reported in parentheses below the coefficients.

Table 4:OLS regressions for the cumulative 15-day post-IPO return*

	(i)	(ii)	(iii)	(iv)	(v)
	coefficient	coefficient	coefficient	coefficient	coefficient
Intercept	0.019 (3.67)	0.016 (2.59)	0.014 (2.47)	0.018 (3.23)	0.013 (1.79)
S&P 500 index return	0.734 (4.41)	0.733 (4.41)	0.736 (4.43)	0.741 (4.39)	0.742 (4.39)
Internet dummy		0.006 (0.60)			0.003 (0.34)
3-character dummy			0.020 (1.64)		0.019 (1.58)
IPO listing returns				0.008 (0.44)	0.007 (0.40)
R-square	0.81%	0.79%	0.89%	0.78%	0.81%

*The dependent variable is the cumulative daily return to matching firms in the 15-day post-IPO period. The S&P 500 index return is the cumulative daily return to the S&P 500 index in the same 15-day period. Internet dummy is a variable equal to 1 if the IPO corresponding to the matching firm is in an industry with an SIC code between 7000 and 8999, or between 3500 and 3700, and is 0 otherwise. The 3-character dummy is equal to 1 if the matching firm's ticker is a 3-character match with the IPO's ticker. IPO listing return is the sum of excess returns to the IPO on the first and second listing days. T-ratios for coefficients are reported in parentheses below the coefficients.

The Economic Impacts of Recreational Fishing in Long Island: A Computable General Equilibrium Analysis[1]

Sheng Li, Richard Vogel, and Nanda Viswanathan[*]

ABSTRACT

Recreational fishing, is an important component in Long Island's coastal economic development, and annually contributes over $0.4 billion in direct impacts to Long Island's economy. The pass-through effects linked with multi-sectors have pushed regional growth in most offshore communities. Using a computable general equilibrium (CGE) model, this study focuses on Long Island's coastal recreational fishing on both county and community levels. Three general scenarios are evaluated including; 1) a 10 percent increase in recreational fishing trips; 2) a 40 percent decrease in marine fuel prices; and 3) both shocks simultaneously. The results of the analysis show a significant positive impact on endogenous output, employment, factor income, tax, and household income as result of increasing trip demand for trips and lower factor prices. Specifically, more fishing trips lead to significant impacts on directly related sector with only moderate pass-through impacts on the regional economy. The effects of lower fuel prices tend to be relatively large in percentage terms for non-recreational fishing sectors compared with recreational fishing-related sectors. The findings also suggest that presence of geographical heteroscedasticity across the communities in the region.

INTRODUCTION

Recreational fishing is a popular leisure activity on Long Island and has become increasingly important in the past decades for many marine species (Morales-Nin, 2005; Coleman et al. 2004; (Bell 1997; McConnell, Strand, and Blake-Hedges 1995). The high value of the recreation is commonly recognized in the coastal communities, and does bring a significant number of visitors and consequently high levels of fishing and economic efforts. In some species, e.g. striped bass, porgy, efforts may be greater than those in the commercial fishing (Cowx 2002; Pitcher and Hollingworth 2002).The associated direct, indirect, and induced impacts on output, employment, and tax revenues generated from recreational fishing on Long Island are greater than those of by the commercial sectors (Pawson, et al. 2008; Cooke and Cowx 2004).

However, research on the economic, social, and ecological impacts of recreational or sports fishing has largely lagged behind similar studies on commercial fisheries (Pitcher and Hollingworth 2002). Lacking sufficient evidence to support the possible impact of recreational fishing, federal laws and agencies focused primarily on the commercial fisheries but not on recreational fishing. Possible strategies such as whether increased importance and investment in the recreational sector, and the balance between the recreational and commercial sectors remains unclear (Ihde et al. 2011; Lewin et al. 2006). The current federal system to control commercial fisheries exploitation might be inappropriate for managing recreational fishing (Commission on Saltwater Recreational Fisheries, 2014). In

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practice, the recreational fishing communities, as agencies, play significant roles to lead building and maintaining the recreational fishing in a healthy system.

Most of existing studies in evaluating the regional economic impacts of fisheries usually input-output (IO) model, assume price is fixed (Seung and Waters 2009). The advantage of this model is its can easy to estimate the economic contributions in related industries and impacts from exogenous shocks and they can be directly examined in the given economy (Miller and Blair 2009). However, a critical limitation of this model is its inability to consider the possible substitution effects in the factor market and household consumption. Another major restriction of the IO model is its lack of constraints on the supply side, such as in the labor market, and government funding (Eiswerth et al. 2005; Cicas et al. 2007; Miller and Blair 2009).

In this study, we apply a regional computable general equilibrium (CGE) model to investigate the community level effects of shocks on Long Island. This model is based on general equilibrium assumption, and determined relative prices endogenously, thereby accommodating substitution in production and consumption (Stenberg and Siriwardana 2009). Moreover, microeconomic theories and constraints in both demand and supply sides are respected in different markets. In practice, regional CGE models have been slower to develop because of a shortage of the necessary data at the local level (McGregor et al. 2010; Pouliakas et al. 2014; Andre et al. 2012). As more collected dataset are available in regions, such as the data of social accounting matrix (SAM) from IMPLAN, or some Input-Output (IO) matrix generated from community level data, CGE modeling has been more widely used at the regional level (Wu and Xiao 2014; Stenberg and Siriwardana 2009; Dyck and Sumaila 2010).

Comparatively few studies using the CGE framework have been applied to fisheries. Houston et al. (1997) use a static CGE model to estimate the regional economic impacts associated with different policies for reducing groundfish harvest in coastal Oregon. Similarly, Floros, et al. (2003) develop a standard CGE model for Italian fisheries. Waters and Seung (2010) evaluate the effects of supply-side and demand-side shocks for Alaska fisheries by applying a CGE model. Dyck and Sumaila (2010) use this model in a global fishery, which detects the economic impact of ocean fish populations. Very few studies use CGE modeling specifically focused on recreational fishing. Instead, recreational/sports fishing is usually estimated as a part of recreation activities, tourism, or marine ecosystem. For example, Finnoff and Tschirhart (2008) generate a CGE model to evaluate the marine ecosystem by integrating the dynamic economic and ecological system in a general equilibrium model. Both commercial fishing and recreational fishing sectors are treated as import sectors of ecosystem estimating in the model.

In this study, by applying a regional computable general equilibrium (CGE) model, we analyze three general scenarios including 1) a 10% increasing recreational fishing trips, 2) 40% decreasing in marine fuel prices. 3) Both shocks simultaneously. The hypothesis of an increase in recreational fishing trips is based on recent trends in the region. The second scenario reflects fuel and energy market prices since 2014. The marine fuel price change would be expected to have significant impacts on Long Island's recreational fishing since boat fishing (owner, rental or charter boat) is prevalent in this area. The primary SAM data are generated from IMPLAN (2014 data) and disaggregated sectors related to recreational fishing, such as food and beverage stores, general and consumer goods rental, and reservation services. This can effectively avoid the overestimation in the IO model (Leung and Pooley 2001).

RECREATIONAL FISHING IN LONG ISLAND

Recreational fishing on Long Island has been thriving since 1998, and the proportion of recreational and sports fishing increased continuously over the last two decades. Recreational fishing generated $316 million dollars in expenditures in Long Island as a whole in 2012 (NMSF 2014) and led to economic impacts estimated at $381 million in total output, close to $242 million in value added, $151 million in income, and total employment of 2,959 people. It peaked in 2007 when recreational fishing in the state contributed up to 1 billion in outputs, almost 6,000 people employed, and $0.5 billion of value added.

Table 1. Economic Impacts of Recreational Fishing Expenditures (millions of dollars), New York, 2012

	2006	2007	2008	2009	2010	2011	2012
Employment Impacts (1,000)	5.37	6.49	5.77	4.57	4.46	3.09	2.96
Output Impacts	812.27	979.19	875.45	680.46	667.85	398.88	381.30
Value Added Impacts	424.07	511.31	457.20	358.11	350.16	254.73	241.95
Income Impacts				231.73	227.22	160.03	151.10

Note: Output impacts reflect total dollar sales generated from marine recreational fishing expenditures. Value-added impacts represents the contribution marine recreational fishing makes to gross domestic product. Income impacts represent wages, salaries, benefits, and proprietary income generated from marine recreational fishing. Date source: NOAA Interactive Fisheries Economic Impacts. https://www.st.nmfs.noaa.gov/apex/f?p=160:7:0::NO
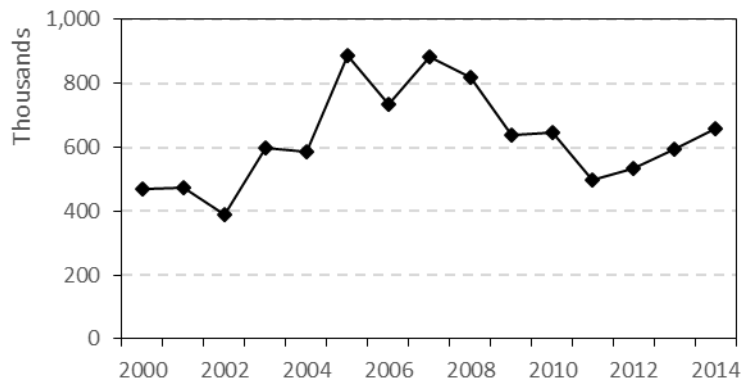

Figure 1 Estimated Coastal Recreational Fishing Trips, Long Island, 2000-2014

Average annually coastal recreational fishing participation by anglers in the Long Island has exceeded over 600,000 trips in recent years. While activity fell between 2008 and 2010, it recovered in 2011 and by 2014 reached it 2004 level. Average trip expenditures by residents on for-hire fishing trips were estimated as $157.83, $59 on private boat trips, and $19.91 for shore trips, compared with $116.37, $38.83, and $44.68 for Non-resident respectively. Total angler expenditures on recreational fishing in Long Island were estimated at $330.3 million in 2011. Trip expenditures were $205.9 million and expenditures on durable goods were $124.4 million. Recreational fishing also generated $78 million tax revenue, including 40.4 in local tax and 37.4 in federal tax. 70% of the total come from business and households.

Table 2. Economic Impacts of Recreational Fishing Expenditures (millions of dollars), Long Island, 2011

TRIP IMPACTS BY FISHING MODE:	EXPENDITURES
FOR-HIRE	**66.3**
PRIVATE BOAT	**115.7**
SHORE	**23.9**
TOTAL DURABLE EQUIPMENT	**124.4**
TOTAL STATE TRIP AND DURABLE EQUIPMENT	**330.3**

Specifically, trip-related expenditures can be divided as tackle, fuel, food & drink, lodge, boat and boat rent, and related recreation activities. Boat (purchase and repair) and boat rent are the largest expenditure on recreational fishing, which accounts for over 30% of spending. Spending on recreation activities (e.g. Charter fees, crew tips and parking fees) is taken over 20% of expenditures. The proportion of spending in Lodge is less than 1% indicating a limited number of overnight trips. Geographically, Montauk and Port Jefferson are the two largest recreational fishing locations in our selected communities which attracted over 50 thousand fishing trips, and related spending is over 2.5 million dollars.

Table 3. Estimate Total Spending and Trips on Recreational Fishing (Thousand dollars) in Selected Communities, Long Island, 2014

	Mastic Beach	**Long Beach-Jones beach**	**Mattituck**	**Montauk**	**Port Jefferson**	**Long Island**
Tackle	212	115	93.4	536.6	555.3	67,900
Gas	116.8	63.4	51.4	295.6	306	37,413
Food & Drink	112.7	61.2	49.7	285.3	295.3	36,105
Lodge	1.4	0.8	0.6	3.6	3.7	456
Boat	326.3	177.1	143.7	825.9	854.7	104,518
Recreation	176.2	95.6	77.6	445.9	461.4	56,424
Total Trips	20,496	11,126	9,030	51,891	53,697	656,649

MODELS

Model specification

The model structure follows closely regional thee CGE model developed by Washington State University (Waters, et al. 1997; Julia-Wise et al. 2002). The model is based on classical economic theory. Particular specifications for this model follow IFPRI's standard computable general equilibrium equations (Lofgren, Harris, and Robinson 2002) (Figure 2). We assume all economic agents including consumers, producers, and institutions, are optimizing their behavior in the economy and traces the impact of shocks through effects on output, prices, sales, employment, income, revenues. The model simulates economic impacts in which quantities and prices adjust and feedback to clear both product and factor markets in response to shocks.

Producers are assumed to maximize profits by optimally allocating the output between the Long Island market and exports (including the rest of the U.S (RUS) and the rest of the world (ROW) using a constant elasticity of transformation (CET) aggregation function. The production function is specified in two-level nested structure. At the top level, a composite of value added and a composite of intermediate inputs are substituted in a Leontief function. At the bottom level, primary factors (Labor, Capital, and other inputs) are assumed to substitute through a Leontief-CES composite value added function under (Winchester et al., 2006). Intermediate is determined by fixed-shares through Leontief function at top level. The Leontief production function ensures "weak separability" between primary factors (labor and capital) and intermediate factors (Holland et al. 2006). The factors demand functions are derived from the first-order conditions of profit maximization taking into account the value-added or prices.

The domestic supply is derived from an Armington CES function, which is used to distribute locally produced goods and imported goods for both firms and households. This model allows for imperfect substitution between state produced goods and goods from import market. Local goods (produced in the Long Island) and imported goods are allowed for substitution firstly, then domestic imports (RUS) and foreign imports (ROW) are allowed to substitute each other. The export supply function is derived as a constant elasticity of transformation (CET) function. The value of exports is specified as a function of the ratio of local level and international export prices (Holland et al. 2006). The regional export is a function of the price of exports to rest of the U.S. and foreign sources. The price of a foreign produced commodity is a function of the world price and the foreign exchange rate. We also assume the foreign exchange rates are fixed.

Factors supply commonly referred to factor market in this model. The capital of factors of production is typically assumed to be fixed within a given period, while labor is assumed mobile across sectors. Firms could move their capital from one industry to another in response to different rental rates in the economy (Alavalapati et al. 1998). Unemployment is possible, and labor supply is assumed perfectly elastic. The rental rates for capital inputs are endogenously determined. Input factor supplies are considered exogenously in the model. Equilibrium in these markets requires factor prices to adjust to ensure that demand equals supply. However, due to imperfect labor markets, there is unemployment; therefore, market clearing for labor is relaxed to allow for unemployment in labor supply. Aggregate demand for each commodity comprises household consumption spending (consumption, investment and intermediate) on domestic and imported goods. Equilibrium in the commodities market requires that demand for commodities equal supply.

Final demand (households, government, and investment) and intermediate demand are composited by mixed commodities from both local-produced and imported. The optimal locally produced commodities and imported commodities are derived using a constant elasticity of substitution (CES) aggregation function (Armington function) to form a composite commodity. Intermediate demand is derived from the Leontief function at the top level of production.

Households are disaggregated into nine categories following IMPLAN and are assumed to maximize utility subject to a budget constraint. Household demand is derived using a linear expenditure function (Stone-Geary utility function) (Stone 1954; Zhang et al. 2005). Income is generated as a result of households supplying factors of production, import tariff revenues transferred to them by their domestic governments, and transfers of other property

and labor income from outside of the local economy (Decaluwe, et al, 2010). Household disposable income is computed net of household residential property taxes and federal income taxes. Household savings are modeled as a constant proportion of household disposable incomes (after-tax income). Total saving is the sum of household savings and foreign savings.

The government account was divided into two accounts: federal, and state and local combined. We treat the State, and local government expenditures as endogenous and driven by state and local tax revenues. Expenditures are a function of the total state and local tax revenue plus intergovernmental transfers. State and local tax revenues are generated from the payroll tax, household direct taxes (residential property taxes), and indirect business taxes (business and occupation tax, sales tax, and business property tax).
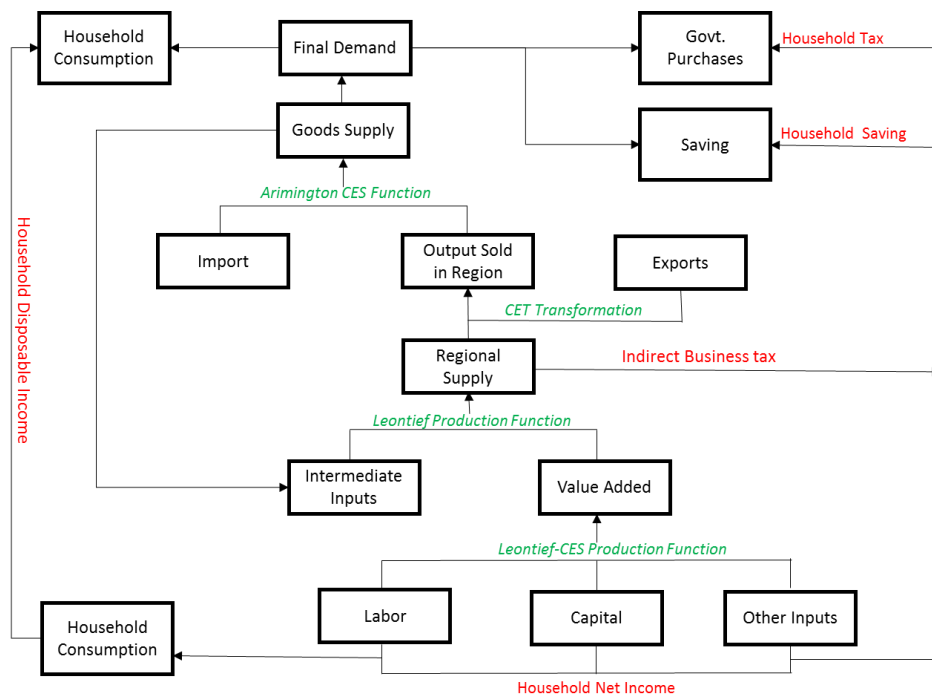

Figure 2. The Structure of Long Island CGE Model

The Prices block is defined as relative to the prices of all factors, goods, and services, including import price, export price, demand price, activity price, and input price. To make them comparable, all the prices are treated as endogenous "weights" that help to solve the conditions of commodity and factor market balance with representing the relative valuations in each industry and market (Waters and Seung 2010).

In this CGE model, different institutions are assumed to operate in various ways and will depend on how the linkages of the macroeconomic system are specified which will impact the "model closure" (Julia-Wise, et al. 2002). Given the situation of the local economy operates in the study area, a Keynesian type of closure best represented Long Island's economy in this study. The Keynesian closure assumes that labor supply was mobile across sectors while capital was assumed fixed in the region but mobile between sectors. Factor prices are institutionally fixed, thus the labor market clears adjusting the level of employment in the region. Investment is fixed and exogenous, and the model balances saving-investment accounts through endogenous saving flows. The regional supply of

labor is assumed to be perfectly elastic, but it might vary in the long run. The local supply of capital is considered to be perfectly inelastic in the short term.

Model calibration

The model was calibrated to Long Island in both County level and community level (Zip code level) using 2014 symmetric Social Accounting Matrix (SAM) tables produced by IMPLAN. 536 IMPLAN industry sectors were aggregated into 15 production sectors. Because of the limitations and inaccuracies associated with using unrevised IMPLAN data for the recreational fishing, we also collect some data from U.S. Fishing Angler Expenditures Survey, 2011 and NOAA's Marine Recreational Information Program (MRIP). Angler Expenditures Survey is a nationwide expenditure survey of marine anglers every five years conducted by NOAA Fisheries; Survey results are used to assess the spending of marine recreational fishing, as well as how marine recreational fishing contributes to the economies of coastal communities and the nation's economy. MRIP is a program conducted by NOAA and reports marine recreational catch and effort through survey and report system. We use those datasets to isolate the economic impacts of recreational fishing from the IMPLAN's sectors.

The Long Island SAM used for the CGE model disaggregate the Long Island's economy into nine general sectors, including Agriculture, Construction, Utilities, Wholesale and Retail Trade, Mining and Quarrying, Processed Food, Manufacturing, Services, and Miscellaneous. Sectors related to the recreational fishing are isolated into six industries as Tackle and Supplies, Retail Food and Beverage Stores, Boat and Boat Rent, Lodge, Recreation Amusement, and Transportation. Overall, the Long Island SAM include a total of 15 aggregated production sectors producing 15 commodities; 3 value-added sectors (labor, capital, and indirect business taxes); 2 government sectors (combined state and local government and federal government); 9 household categories (classified by income level); a savings-investment account; and two accounts for imports and exports to the RUS and ROW.

Some specific parameter values for the model equations needed to be calibrated in the CGE model. Parameters, such as elasticities of substitution (e.g. elasticity of substitution for production, elasticity of substitution between row imports and RUS imports, etc.), transformation (e.g. elasticity of transformation between ROW and RUS for exports etc.), and some demand elasticities (e.g. demand elasticity for capital and labor) are specified based on previous research (Bilgic et al. 2002). Other parameters, such as share parameters (e.g. Armington composite shares) and shift parameters (e.g. CET composite transformation parameter) are determined by solving the given equations by substituting the value of SAM with the base-year data and the exogenous parameters.

SIMULATIONS AND RESULTS

Simulations

We use the CGE model to run three simulations in this study. The first scenario estimates the impact from an increase in the demand for recreational fishing. The reason we select this situation is because we find the recreational fishing in the Long Island has recovered since 2010, and it still has the potential to reach peaks last seen between 2005 and 2008 from efficient marketing and favorable policies and related facilities investment. Thus, we estimate the impact from a 10% increasing recreational fishing trips. Direct impacts are assumed to raise the consumption in related sectors as Table 3.

The second scenario is evaluates the impacts of a steep decrease in fuel prices, which simulates the situation that has occurred since 2014 in which the average marine fuel price fell by 40%. We assume the fuel prices might significantly affect Long Island's recreational fishing industries since fuel is a significant cost factor for the boating community including recreational fishing vessels (head boat or Charter boat). We assumed a 40% reduction in the exogenous fuel price for the marine boat in this case.

The third scenario evaluates the combined impacts of both scenarios simultaneously. Expected results are that output, employment, and tax will show significant growth in the related sectors, corresponding to lower prices.

We use the latest version of GAMS (General Algebraic Modeling System) to solve the CGE model. This solution algorithm can solve both linear and nonlinear programming problems. A solver called the mixed complementarity problem (MCP) is employed to deal with the system model. The model is calibrated using 2014 as the benchmark year. An aggregated model including both Nassau and Suffolk Counties (Long Island) is estimated first. And then we will calculate the impacts of the scenarios for five coastal communities (Figure 2), including Mastic Beach (11967; 11951), Long Beach-Jones Beach (11561; 1558; 11572; 11510), Mattituck (11952), Montauk (11954), and Port Jefferson (11777; 11766).

Figure 3. Distribution of Study Aare in The Long Island

Simulation Results

Simulation results from three scenarios in the whole Long Island are presented from Table 4 to Table 7. The impacts from the simulations are reported as a change from the 2014 baseline values for commodity price, industry output, employment, household income, and government's revenue, and GDP. Table 4 indicated the change from baseline values of commodities price under the three scenarios in Long Island. The commodity prices represent the changes in relative valuations of goods and services at the new equilibrium compared with the baseline (Gavazza, et al. 2014).The initial values of all prices are assumed to be 1 in the baseline of equilibrium. Commodities' price increased slightly as more fishing trips for most of the recreational fishing related sectors, while those impacts are tiny in the nine general sectors (less than 0.01%). Prices in the sector of the boat and boat rent are relatively sensitive to the increasing demand, which increased by 1.21%. Lower fuel price obviously is favorable to most sectors. Composite prices of goods and services in the sectors of transportation, construction, and mining and

quarrying are significantly reduced by 4.3%, 1.5%, and 1.3%. It is surprising that the price of the boat and boat rent fell only 0.13%, which implies that the expenditure share of fuel might be not very high for the fishing boat related sector and the substitution rate for other commodities is small. Results from combined scenarios are moderated by adding up the positive impact from increased demand and negative impacts from the reduction of fuel price. Recreational fishing related sectors are more affected in trips growth, while changed in the fuel price have wide influences on the general sectors.

Table 4. Change from Baseline Values of Commodities Price under Scenarios in Long Island, 2014

Sectors	Increase Trips	Decrease Fuel Price	Combined
Tackle and Supplies	0.89%	-0.06%	0.82%
Retail Food and Beverage Stores	0.19%	-0.14%	0.05%
Lodge	0.00%	-0.01%	-0.01%
Boat and Boat Rent	1.21%	-0.30%	0.46%
Recreation Amusement	0.36%	-0.13%	0.22%
Transportation	0.00%	-4.26%	-4.26%
Agriculture	0.00%	-0.05%	-0.05%
Construction	0.01%	-1.52%	-1.51%
Utilities	0.01%	-0.12%	-0.11%
Wholesale and Retail Trade	0.00%	-0.05%	-0.05%
Mining and Quarrying	0.00%	-1.31%	-1.30%
Processed Food	0.00%	-0.02%	-0.02%
Manufacturing	0.00%	-0.02%	-0.02%
Services	0.01%	-0.05%	-0.04%
Miscellaneous	0.00%	-0.06%	-0.06%

Table 5 listed the change from baseline values of output under the three scenarios in Long Island. As the number of fishing trips increased, significant impacts resulted in tackle and supplies, boat and boat rent and recreation amusement, of 8.6%, 5.8%, and 4.1% respectively. The impacts are more significant in the sectors of transportation (+31%), Mining and Quarrying (+6.9%), and Boat and Boat Rent (+3%) due to the 40% of the reduction in fuel price. We can imply that the demands are relatively elastic in those three sectors. Revenues in those sectors expand as a result of favorable prices. The impacts of a reduction in fuel price bring a small change in the value of the output of industries in Tackle and Supplies, Retail Food and Beverage Stores, and Recreation Amusement. The induced effects from transportation and other sectors were negligible.

Table 5. Value of output (sales) Changes from Baseline Values under Scenarios in County Level, Long Island

Sectors	Increase Trips	Decrease Fuel Price	Combined
Tackle and Supplies	8.61%	0.22%	8.83%
Retail Food and Beverage Stores	1.89%	0.04%	1.93%
Lodge	0.00%	2.18%	2.19%
Boat and Boat Rent	5.78%	2.99%	8.78%
Recreation Amusement	4.10%	0.87%	4.96%
Transportation	0.03%	31.00%	31.04%
Agriculture	0.01%	1.09%	1.10%
Construction	0.06%	-0.69%	-0.64%
Utilities	0.05%	1.25%	1.30%
Wholesale and Retail Trade	0.02%	0.54%	0.56%
Mining and Quarrying	0.05%	6.86%	6.91%
Processed Food	0.01%	1.16%	1.16%
Manufacturing	0.01%	1.60%	1.61%
Services	0.04%	0.40%	0.44%
Miscellaneous	0.09%	0.83%	0.92%

Table 6 provided the changes from baseline values of employment under the three scenarios in Long Island. A greater number of trips led to increased employment in the fishing related sectors. Employment in the labor-intensive industries such as tackle and supplies, boat and boat rent, and recreation amusement increased by 11%, 9%, and 5% respectively. Price declines in fuel are associated with more employment in boat and boat rent, recreation, amusement, and mining and quarrying. The Lodge sector showed almost no change in price, output, and employment as the trips 'changed. This suggests that there are a limited number of overnight fishing trips. Fishing visitors prefer short fishing tours or most of the fishing participators are residents on the Island. This result is consistent with the tourism survey in the Long Island.

The macro-impacts of the simulations are reported in Table 7. Regional GDP is expecting increased by 0.14%, 1.07% and 1.21% in the three scenarios respectively. Government revenues are affected much more significantly by the decline of fuel price than increased fishing trips, which was 0.8% vs. 0.1% in the federal government and 0.1% vs. 0.07%. Household income changes were varied respecting the two shocks. Fishing trips generated more impact skewed to higher income level groups, while lower fuel price benefits appeared to have a greater impact on the Middle-High level income group.

Table 6. Employment Changes from Baseline Values under Scenarios in County Level, Long Island

Sectors	Increase Trips	Decrease Fuel Price	Combined
Tackle and Supplies	10.88%	0.39%	11.29%
Retail Food and Beverage Stores	2.30%	0.25%	2.54%
Lodge	0.01%	3.83%	3.84%
Boat and Boat Rent	8.77%	5.05%	13.93%
Recreation Amusement	5.25%	1.40%	6.66%
Transportation	0.04%	6.20%	6.20%
Agriculture	0.02%	3.41%	3.43%
Construction	0.09%	1.50%	1.58%
Utilities	0.07%	2.48%	2.55%
Wholesale and Retail Trade	0.03%	0.93%	0.96%
Mining and Quarrying	0.08%	16.91%	17.00%
Processed Food	0.01%	1.69%	1.69%
Manufacturing	0.01%	3.00%	3.01%
Services	0.06%	0.86%	0.93%
Miscellaneous	0.11%	1.08%	1.19%

Table 7. Changes from Baseline Values of Governments Revenue, GDP, Household Income under Scenarios in County Level, Long Island

Sectors	Increase Trips	Decrease Fuel Price	Combined
Federal government revenue	0.11%	0.76%	0.87%
State government revenue	0.07%	0.10%	0.16%
GDP	0.14%	1.07%	1.21%
Gross Household Income			
<$10,000	0.01%	0.08%	0.09%
$10,000–$15,000	0.02%	0.13%	0.15%
$15,000–$25,000	0.03%	0.25%	0.28%
$25,000–$35,000	0.05%	0.38%	0.43%
$35,000–$50,000	0.07%	0.54%	0.62%
$50,000–$75,000	0.09%	0.69%	0.78%
$75,000–$100,000	0.10%	0.75%	0.85%
$100,000–$150,000	0.11%	0.78%	0.89%
> $150,000	0.10%	0.75%	0.85%

The three scenarios were also analyzed for five selected areas of Long Island.[2] Five off-shore regions (two on the North Shore and three on the South Shore) are selected to compare the variability across the community. In general, Impacts result from more trips on the fishing related sectors are much larger than those from falling in fuel price; Fluctuations in the North Shore (Port Jefferson and Mattituck) are more significant than those in South Shore (Long beach-Jones beach and Mastic Beach). Montauk, an area well-known for tourism and recreational fishing in the region showed the most significant changes arising from the shocks. For example, with respect to the two simulated shocks GDP increased by 0.51% and 1.84% respectively.

Sectors such as tackle and supplies, boat and boat rent, and recreation amusement are much more sensitive in output and employment but more stable in price with respect to the increased trips. This result occurs primarily as a result of the general equilibrium model in which available substitutes are hard to find for those sectors and elasticities of supply and demand are relatively larger. The macro indexes including federal government revenue, state government revenue, GDP, and gross household income varied slightly as the extra 10% fishing trips due to subtle changes in the proportions from related industries (less than 0.1% in most regions).

CONCLUSIONS

In this study, we have applied the CGE model to examine the effects of shocks in fishing trips and marine fishing price. The endogenous impacts on commodity price, outputs, employment, income distribution and government revenue are measured in both county level and community level. As expect, an increase in the number of trips leads to the commodities' price rising, at least in the short run. But those changes are insignificant because the consumers' expenditure shares in the recreational fishing are small. Effects on output and jobs were generally positive but lower than expected changes. This is chiefly due to substitution effects in both production and consumptions. Impacts due to pass-through in GDP, income, and government revenue were much more moderate. The increase of recreational fishing's share in GDP may be a result of the stagnation of other industries and/or their replacement/ousting by recreational fishing. It is interesting to note that the impact on household income is considerably smaller than that of GDP, implying that recreational fishing primarily stimulates high value added activities, mainly in the service industries.

Impacts from lower fuel prices tended to be relatively large in percentage terms for non-recreational fishing sectors compared with recreational fishing related industries because the average share of revenues expended for fuel by the recreational fishing related industries is lower than for most non-recreational fishing-related industries. Thus, the combined impacts of both shocks are dominated by the effects of the trip increase in recreational fishing-related industries, but dominated by the effects of reduced fuel price in non-recreational fishing-related industries.

The overall GDP changes from the combined shocks are 1.21% in this region. More benefits are absorbed by the higher-income groups. This is chiefly due to the fact that mean household income is higher on Long Island than in many other areas of the country, averaging almost $90 thousand. High-and medium-income households benefit the most from the government channel effects, except in the case when the government directs the revenue from trips expansion. The lowest-income households are not the main beneficiaries, and their income benefits more from the earnings and price channel effects of trips expansion.

The community-level analysis shows apparent heteroscedasticity in both geography and across industries. Impacts on the North Shore of Long Island are usually higher than those on the South Shore. Some regions such as Port Jefferson and Montauk are driven more from marine based activities such as recreational fishing and the induced impacts on other sectors might increase the regional GDP, government revenue and household income by 6%, 4%, and 3% respectively in the combined scenarios. Sectors such as tackle and supplies, boat and boat rent, and recreation amusement are much more sensitive in output and employment but more stable in price respecting to the increased trips.

Recreational fishing generates output, employment, and income in related industries and leads to pass through to the whole economy, including a positive balance of payments, stimulates the supplying sectors, and leads to a generally increased level of economic activity. Our finding indicated this sector is relatively sensitive to more labor-intensive industries; policy makers should give due consideration to the overall economic development when deciding on tourism development strategy. Some fishery-dependent regions and communities could be paid more attention from some favorable policy.

ENDNOTES

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2. Due to space constraints, the full tables of these results are not included here, but are available upon request.

REFERENCES

Alavalapati, Janaki RR, Wiktor L. Adamowicz, and William A. White. 1998. "A Comparison of Economic Impact Assessment Methods: The Case of Forestry Developments in Alberta." *Canadian Journal of Forest Research* 28 (5): 711–19.

Andre, Francisco J., M. Alejandro Cardenete, and M. Carmen Lima. 2012. "Using a CGE Model to Identify the Policy Trade-Off between Unemployment and Inflation: The Efficient Phillips Curve." *Economic Systems Research* 24 (4): 349–69. doi:http://www.tandfonline.com/loi/cesr20.

Bell, Frederick W. 1997. "The Economic Valuation of Saltwater Marsh Supporting Marine Recreational Fishing in the Southeastern United States." *Ecological Economics* 21 (3): 243–54.

Bilgic, Abdulbaki, Stephen King, Aaron Lusby, Dean F. Schreiner, and others. 2002. "Estimates of US Regional Commodity Trade Elasticities of Substitution." *Journal of Regional Analysis and Policy* 32 (2): 31–50.

Cicas, Gyorgyi, Chris T. Hendrickson, Arpad Horvath, and H. Scott Matthews. 2007. "A Regional Version of a US Economic Input-Output Life-Cycle Assessment Model." *The International Journal of Life Cycle Assessment* 12 (6): 365–72.

Cooke, Steven J., and Ian G. Cowx. 2004. "The Role of Recreational Fishing in Global Fish Crises." *BioScience* 54 (9): 857–59.

Cowx, I. G. 2002. "Recreational Fishing." *Handbook of Fish Biology and Fisheries, Volume 2: Fisheries*, 367–90.

Decaluwe, Bernard, Andre Lemelin, and David Bahan. 2010. "Endogenous Labour Supply with Several Occupational Categories in a Bi-Regional Computable General Equilibrium (CGE) Model." *Regional Studies* 44 (10): 1401–14. doi:10.1080/00343401003713324.

Dyck, Andrew J., and U. Rashid Sumaila. 2010. "Economic Impact of Ocean Fish Populations in the Global Fishery." *Journal of Bioeconomics* 12 (3): 227–43.

Eiswerth, Mark E., Tim D. Darden, Wayne S. Johnson, Jeanmarie Agapoff, and Thomas R. Harris. 2005. "Input-Output Modeling, Outdoor Recreation, and the Economic Impacts of Weeds." *Weed Science* 53 (1): 130–37.

Finnoff, David, and John Tschirhart. 2008. "Linking Dynamic Economic and Ecological General Equilibrium Models." *Resource and Energy Economics* 30 (2): 91–114.

Floros, Christos, Pierre Failler, and Pascal Bernard. 2003. "Development of a Simple CGE Model to Fisheries." In *XVth Annual EAFE Conference, Brest*.

http://www.academia.edu/17998466/Development_of_a_simple_CGE_model_to_fisheries

Gavazza, Alessandro, Alessandro Lizzeri, and Nikita Roketskiy. 2014. "A Quantitative Analysis of the Used-Car Market." *The American Economic Review* 104 (11): 3668–3700.

Holland, David, Sanjoy Bhattacharjee, Leroy Stodick, and others. 2006. "Assessing the Economic Impact of Minimum Wage Increases on the Washington Economy: A General Equilibrium Approach." https://ideas.repec.org/p/wsu/wpaper/holland-3.html.

Houston, L., R. Johnson, H. Radtke, E. Walters, and J. Gates. 1997. "The Economic Impacts of Reduced Marine Harvests on Regional Economics." Working paper.

Ihde, Thomas F., Michael J. Wilberg, David A. Loewensteiner, David H. Secor, and Thomas J. Miller. 2011. "The Increasing Importance of Marine Recreational Fishing in the US: Challenges for Management." *Fisheries Research* 108 (2): 268–76.

Julia-Wise, Roxana, Stephen C. Cooke, and David Holland. 2002. "A Computable General Equilibrium Analysis of a Property Tax Limitation Initiative in Idaho." *Land Economics* 78 (2): 207–27.

Leung, PingSun, and Sam Pooley. 2001. "Regional Economic Impacts of Reductions in Fisheries Production: A Supply-Driven Approach." *Marine Resource Economics*, 251–62.

Lewin, Wolf-Christian, Robert Arlinghaus, and Thomas Mehner. 2006. "Documented and Potential Biological Impacts of Recreational Fishing: Insights for Management and Conservation." *Reviews in Fisheries Science* 14 (4): 305–67.

Lofgren, Hans, Rebecca Lee Harris, and Sherman Robinson. 2002. *A Standard Computable General Equilibrium (CGE) Model in GAMS*. Vol. 5. Intl Food Policy Res Inst.

McConnell, Kenneth E., Ivar E. Strand, and Lynne Blake-Hedges. 1995. "Random Utility Models of Recreational Fishing: Catching Fish Using a Poisson Process." *Marine Resource Economics*, 247–61.

McGregor, Peter G., Mark D. Partridge, and Dan S. Rickman. 2010. "Innovations in Regional Computable General Equilibrium (CGE) Modelling." *Regional Studies* 44 (10): 1307–10. doi:10.1080/00343404.2010.530889.

Miller, Ronald E., and Peter D. Blair. 2009. *Input-Output Analysis: Foundations and Extensions*. Cambridge University Press.

Pawson, Michael Gregg, H. Glenn, and G. Padda. 2008. "The Definition of Marine Recreational Fishing in Europe." *Marine Policy* 32 (3): 339–50.

Pitcher, Tony J., and Charles E. Hollingworth. 2002. "Recreational Fisheries." *Ecological, Economic and Social Evaluation. Oxford: Blackwell Science*.

Pouliakas, Konstantinos, Deborah Roberts, Eudokia Balamou, and Dimitris Psaltopoulos. 2014. "Modelling the Effects of Immigration on Regional Economic Performance and Wage Distribution: A Computable General Equilibrium (CGE) Analysis of Three European Union Regions." *Regional Studies* 48 (2): 318–38. doi:10.1080/00343404.2011.653332.

Seung, Chang K., and Edward C. Waters. 2009. "Measuring the Economic Linkage of Alaska Fisheries: A Supply-Driven Social Accounting Matrix (SDSAM) Approach." *Fisheries Research* 97 (1): 17–23.

Stenberg, Luz Centeno, and Mahinda Siriwardana. 2009. *A Computable General Equilibrium Model for Environmental Policy Analysis : The Case of Deforestation in the Philippines*. New York: Nova Science Publishers, Inc.

Stone, Richard. 1954. "Linear Expenditure Systems and Demand Analysis: An Application to the Pattern of British Demand." *The Economic Journal* 64 (255): 511–27.

Waters, Edward C., David W. Holland, and Bruce A. Weber. 1997. "Economic Impacts of a Property Tax Limitation: A Computable General Equilibrium Analysis of Oregon's Measure 5." *Land Economics*, 72–89.

Waters, Edward C., and Chang K. Seung. 2010. "Impacts of Recent Shocks to Alaska Fisheries: A Computable General Equilibrium (CGE) Model Analysis." *Marine Resource Economics* 25 (2): 155–83. doi:http://marineresourceeconomics.com/loi/mare.

Wu, Q. and H. Xiao. 2014. "Dynamic CGE Model and Simulation Analysis on the Impact of Citizenization of Rural Migrant Workers on the Labor and Capital Markets in China." *Discrete Dynamics in Nature and Society* 2014. doi:10.1155/2014/351947.

Zhang, Jian, Janaki RR Alavalapati, Ram K. Shrestha, and Alan W. Hodges. 2005. "Economic Impacts of Closing National Forests for Commercial Timber Production in Florida and Liberty County." *Journal of Forest Economics* 10 (4): 207–23.

How Does the New Changes in International Investment Rules affect Outward FDI of Chinese Enterprises?

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INTRODUCTION

It has been over half a century since 1959 when the first bilateral investment treaty was signed. The bilateral investment treaties (BITs) have always been playing important roles during the revolution of international investment rules. However, current BITs tend to be complex, limited in applicable range, reduplicative and even conflict in terms of contents. The regional investment agreements like TPP, TTIP and other FTAs could make up for the existing inadequacies. Unfortunately, there is still a long way to go to achieve the unified multilateral investment rules from a global prospective.

Early investment rules lie at a core of protecting foreign investors and retaining the right to regulate foreign capital in the host country, which ensure the foreign investment enjoy access to national treatment without weakening any say of the host country in governance. Under these rules, foreign investment enjoys national and most-favored-nation (MFN) treatment while the host country reserves the right to regulate foreign access by using positive list management mode.

The signing of "North American Free Trade Agreement" in 1992 was a key point where international investment rules began to change (Nie, 2014). In this agreement, terms relating to investment mainly came from the template of BITs between US and other countries which pursue the balance between higher level of investment liberalization and protection.

The bilateral investment treaty released by the US government in 2012 could be regarded as the benchmark for a new generation of BIT. The principal terms of the new generation of BIT include: definitions, fields and coverage, national treatment, MFN, minimum standard of treatment, expropriation and compensation, transfer, performance requirements, senior management, and senior management and board of directors, transparency, investment and the environment, investment and labor, information disclosure, financial services, consultations and negotiations, transparency of arbitration proceedings and applicable law. Compared with earlier investment rules, a series of new standards are acquired by the new generation of bilateral investment treaties, such as "competitive neutrality", "government procurement", "environmental standards", "labor rights "," intellectual property" and so on. This new generation of BIT emerges under the new situation of economic globalization, which reflects the need of investors, host governments and home governments in terms of "investment liberalization ", "Investment Promotion" and

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"investment protection", etc. (Nie, 2014).

Early conventions on multilateral investment rules include "State and National State civil convention he Dispute Settlement", "MIGA Convention", "Investment Measures Agreement on Trade-related" (TRIMs), "GATS" (GATS) and the "agreement on Trade-Related intellectual Property Rights" (TRIPs). In recent years, regional talks like TPP and TTIP led by US and Europe aimed at developing a global agreement with higher standard, which include investment-related terms that would have significant influence on future changes in international investment rules. In contrast, multilateral systems, which represented by WTO system, are experiencing hard time and have been gradually marginalized. Instead, a volume of bilateral, plurilateral and regional agreements emerge as replacement which continuously promote further development of international investment rules.

The cores of the new generation of investment rules are higher degree of investment liberalization, higher standard of investment protection, and better investor-State disputes settlement mechanism. In the post financial crisis era, with rapid economic growth rate, emerging economies accelerate the pace and expand the scale of foreign investment. As a result, global cross-border investment flows and structure has undergone significant changes that emerging economies start to compete with developed countries during foreign investment. As the competition getting fiercer, investment dispute cases become more complex and frequent which could hardly be solved under the dispute settlement mechanism in WTO system. Therefore, more attention are paid on issues concern "further liberalization of the market", "improvement of foreign investment protection" and "higher standards of investment freedom".

MAJOR CHANGES IN INTERNATIONAL INVESTMENT RULES

International investment rules continuously evolve as international economy developing, especially after financial crisis in 2008. The changes in international investment rules could be summarized as follow points.

2.1 Adhere to sustainable development principles

Sustainable development has become an important objective in international investment. The concept of sustainable development was first proposed in the report of the World Commission on Environment and Development----"Our Common Future", which aimed to seek interest balance between present and future generations in terms of environment and resource utilization. In 2005, this concept of sustainable development was put forward for the first time in investment rules when Canadian International Institute for Sustainable Development (IISD) proposed the "IISD Model International Agreement on Investment for Sustainable Development". This agreement was designed to pursue sustainable development in developing countries and the least developed countries (LDCs). Then, United Nations Conference on Trade and Development (UNCTAD) released the "2012 World Investment Report" which presented a comprehensive introduction to the Investment Policy Framework for Sustainable Development (IPFSD). The core principles of IPFSD is to "promote sustainable development investments", which means that the primary objective of the investment policy is to promote inclusive growth and sustainable development of investment. Other UNCTAD investment policy guidelines also pointed out to integrate sustainable

development strategies into investment policy so that achieve maximized production capability and international competitiveness. This policy framework not only provides a reference for policy-makers to develop national investment policies, but also offers a basis for future discussion and cooperation among countries in terms of international investment policies. So far, sustainable development principle has become consensus between nations.

2.2 High Standard for the Liberalization of Investment

Investment liberalization has always been advocating globally during the economic integration process. Before the "negative list" and "pre-establishment national treatment" were put forward, "selective released" closed management mode has been adopted. Principle of national treatment is committed to "positive list", which declare explicitly the sectors that enjoy national treatment and other restrictions (Lu and Li, 2012). When it comes to the new generation of investment rules, two breakthrough progresses have been achieved. First, foreign investors could enjoy the national treatment before the foreign access; the second is a "negative list" of forms of regulation. These changes further promote the level of investment liberalization from both time and range dimensions. Compared to the "positive list", "negative list" adopts a "selective closed" open control mode which realized by applying the principles of "national treatment" to all sectors except those have listed out in the list. Therefore, "negative list" management mode could lower the regulatory costs significantly as the contents in "negative list" gradually reduced. "Negative list" management mode could promote the following negotiation reach an agreement about investment liberalization (Lu and Tian, 2014).

2.3 A high level of investment protection requirements

Developing countries and developed countries stand at different positions over the investment protection issues. Late last century, the developed countries which are major exporters of capitals, dominant in foreign investment while developing countries are mostly host countries. Investment in the host country, developed countries strive to safeguard their national interests of investors. These countries put pressure on developing countries during investment admission process in order to intervene in the jurisdiction of overseas investment. Over the last decade, especially after the financial crisis, the economic strength of developing countries rises. As the scale of overseas investment increasing, investment protection requirements of developing countries in the overseas market are also very urgent. Further promote the "high level of investment protection" has become an issue of common concern to all countries (Lu and Li, 2012). However, it should be noted that some developed countries are currently applying double standards on the issue of the relationship between the processing "investment liberalization" and "investment protection". In the international competition, these countries advocate "high degree of investment liberalization" to those countries have no threat to their dominance while promote "investment protection" otherwise.

In addition, it is also a core issue that how to deal with the contradiction between the "the cross-border investment protection treatment of home country "and" foreign capital supervision right of host country". In

terms of this issue, a common practice currently adopted by most countries is to introduce various exceptions, transitional provisions, non-compliance measures and other means to achieve balance. Specifically, the aim of measures like "essential security exceptions", "general exceptional measure", "financial prudential measures exception", "environmental protection" and so on is to expand the regulation scope of host countries. Besides, some countries even exclude the domestic sensitive areas such as bonds, finance, taxation and investment securities etc. from the agreement.

2.4 New changes in the dispute settlement mechanism

New generation of international investment rules introduce the investment dispute settlement mechanisms between investors and the State. WTO multilateral dispute settlement mechanism is only dealing with investment controversial issues between the national government level, and when investment disputes arise between investors and the host country, the investor will need to resort to the host country's justice system, which gives host countries discretion controls over foreign investment. By introducing investment dispute settlement mechanisms, investors may choose directly involve international arbitration institutions in the arbitration in order to get binding arbitration results against host countries. In this way, the new rules could further protect foreign interests and weaken the host country's right to regulate foreign investment as investment disputes could be reasonably classified according to the actual situation and rights and obligations of the dispute parties could be more clarified (Lu *et al*., 2014).

However, from an objective perspective, the introduction of new investor-State dispute settlement mechanism is not so perfect. The current investment agreements have various forms and complex contents which lack of consistency, transparency and continuity, a unified global comprehensive international investment rules has not yet formed even though the rules have always been improved as the economic developing. For this reason, when the international arbitration institutions involved in disputes between investors and host processing, there will be different outcomes and even contrary arbitration for the same investment dispute from different arbitration institution. This could dramatically reduce the investment protection effects of international investment agreements. As a result, some developed countries have begun to no longer use or limit the use of this mechanism.

2.5 New standards toward state-owned enterprises

After the financial crisis, the scale of investment of developing countries keeping expanding as the economic development accelerates. China is a typical representative. In 2000, China formally proposed "going out strategy" in order to adapt to the new situation of economic globalization and participate in a larger, broader and higher level of international economic and technological cooperation and competition, and comprehensively improve the level of opening. From then, the going out pace of Chinese enterprises have been accelerating, foreign direct investment flows have been rose from $ 916 million in 2000 to $102.9 billion (non-financial overseas direct investment flows), the scope foreign investment region has expanded drastically, the investment structure has also been optimized. However, the main force of Chinese foreign investment is still the state-owned enterprises even though foreign investments conducted by the private

enterprises keep climbing in recent years. State-owned enterprises as the mainstay of foreign investment are likely to cause alarm in developed countries, many enterprises "going out" failures are due to this.

Before new rules set up, developed countries led by the US made stringent requirements of foreign investment security review towards Chinese state-owned enterprises, or to set up obstacles by exceptions. Now the new generation of international investment rules proposed new high standards as so called "competitive neutrality "."Competitive neutrality" refers to the business activities that have government support do not enjoy advantages compare to private sector competitors. This rule is meant to control the potential behavior of state-owned enterprises in agreements in order to create an investment environment of fair competition.

2.6 Intellectual property protection, labor rights and environmental policy issues

The new generation of international investment rules system possesses wider range and more multiple levels compared to the earlier rules, which includes not only investment issues, but also intellectual property, competition policy, industrial policy, employment policy, environmental protection and labor rights and so on. This development reflects the objective needs of economic globalization. Among the issues above, intellectual properties rights, labor rights and environmental policy have been gradually become some of the most popular issues. Objectively, the original intention of the development of investment rules is to offer companies a relatively fair and stable investment environment，to keep the competition healthy and orderly and to promote the harmonious development of the home country and the host country. And the essence of intellectual property protection, environmental policy, labor rights and other requirements in the new generation of investment rules is to address external problems in foreign investment practices. Confirmation of the value of intangible assets and the protection of intellectual property rights is to promote companies innovate and participate in global competition. Labor rights and environmental policy requirements are designed to avoid the irrational behavior of enterprises in overseas investment so that enterprises could actively fulfill their social responsibility.

Intellectual property system defined the "exclusive" rights which promote firms engage in knowledge creation and business development. Additionally, the intellectual property system will encourage intellectual property owners bring their new technologies, new products and new services to market and therefore promote the diffusion of technology. Intellectual property protection will improve the investment environment of the host country which could effectively avoid the risk of free access of new products and new technologies by competitors. Better environment would drive more investment in research and development worldwide which eventually become interest in future international competition (Lu and Zhang, 2009). "Environmental Policy" and "labor rights" and other requirements are proposed based on corporate social responsibility. In terms of labor, companies should uphold the freedom of association, accept the rights of the collective bargaining, and eliminate all forms of forced and compulsory labor, child labor and discrimination in employment and occupation. In terms of the environment, companies will face a high standard of environmental policy control and take responsibility corresponding to their own development

capacity, which implies that learning and diffusion of environmentally friendly technologies is the inevitable choice for enterprise.

The effect of new changes in International Investment Rules on Outward FDI of Chinese Enterprises
3.1 The effect of "pre-establishment national treatment" and "negative list" management mode

National treatment rule is a reflection of the WTO non-discrimination rule. It refers to members of the party give each other mutual legal persons and merchant ships in its territory not less favorable treatment than domestic natural persons, legal persons and merchant, including national treatment that multinational companies operating in the territory of the other members of the party in the process of production and management, in the case of mutual equality and non-prejudice. In order to develop their economies or to protect their own business interests, the host country tends to take some restrictive measures against multinational enterprises while encouraging foreign investment. The early rules on foreign investment controls adopt "post-establishment national treatment" and "positive list" mode. When it comes to the new generation of international investment rules, it broadens the definition of investment and brings forward the national treatment before set up stage in order to meet the needs of deepening economic globalization and maximize investment liberalization. This greatly weakens the foreign jurisdiction of the host country and ensures the foreign companies enjoy fair treatment in host country. The intention of "pre-establishment national treatment" and "negative list" management mode is to promote investment liberalization. Chinese enterprises should take advantages of this opportunity to accelerate the "going out" process.

3.2 The effect on the outward FDI of state-owned enterprises

It has been made clear in the new generation of investment rules about the nature of state-owned enterprises. They will enjoy many preferential policies of government subsidies or other benefits due to its specificity. Therefore the state-owned enterprises have been separated out and given special treatment in some of investment agreements. A typical manifestation is the proposal of "competition neutral" principle which requires equal treatment in the government's management of the market. At present, state-owned enterprises is still the main force of China's outward FDI, further promotion of "going out" process will therefore face lots of pressure in current situation. In the future practice of "going out", the state-owned enterprises need to continuously explore and adjust themselves to meet the requirement of the host country (Li and Sang, 2014). They have to positively find out their own way and create a foothold in the new round of international competition.

3.3 The effect of new requirements of intellectual property, labor rights and environment policy

The proposal of "Intellectual property rights" enhances the protection of product competitiveness. Chinese enterprises carrying out transnational operation should pay full attention to the protection of intellectual property rights and create new competitive advantage based on the intellectual properties. With independent intellectual property rights and core brand, competitive advantages can be strengthened so

as to expand overseas market. And labor rights, environmental policy requirements actually reflect the current issue of enterprises' "social responsibility". This problem has been more and more prominent as the rapid expansion of foreign investment scale. Corporate social responsibility issues involve all aspects of the society, including human rights, environment, labor relations, the industrial structure optimization of host country and other fields. Weak consciousness of Domestic corporate social responsibility makes some enterprises cannot well adapt to the investment business norms of the host country in the process of "going out" (Lu *et al*., 2012). Things like worker striking led by violations of the legitimate rights and interests of labors, destruction of local environment and safety accidents happen occasionally, which are detrimental to the international image of Chinese enterprises. As the higher standard came out, Chinese enterprises need to attach more attentions to these issues in order to pursue long-term development of the "going out" strategy.

3.4 The influence of new changes in dispute settlement mechanism

The WTO dispute settlement mechanism maintain the stability of the multilateral trading system by making the trade disputes between WTO members can be resolved properly and reasonably in a multilateral framework, effectively avoiding members adopt unilateral means to deal with the economic disputes, and balancing rights and obligations of members. But as the multilateral dispute settlement mechanism limited to the local government level of each member, the disputes between investors and host countries are unable to be solved. When this kind of disputes occurs, it usually adopts the host country's judicial and administrative procedures which offer host country more foreign regulatory authority (Li and Sang, 2014). The new rules enhance the protection of foreign investment by introducing the investor-State dispute settlement mechanism. As the competition between developing countries and developed countries becoming fiercer, the situation of disputes will become more frequent and complex. As the China's overseas investment increasing and investment countries and regions expanding, there will appear more uncertainty such as complicated political situation in the host country, uncertain economic environment, lack of protection of intellectual property rights, variable labor conditions and technical requirements, and even religious and cultural differences. These will all be the obstacles and difficulties in the host country that our enterprises are going to face. Therefore, In the process of "going out", enterprises should fully understand the new rules of the high standards of investment protection requirements, and take effectively and rapidly measures when dealing with investment dispute so as to safeguard their own rights through legal means.

The countermeasures of Chinese enterprises for the next step of "going out"

The implementation of new rules relates not only to the foreign management mode reform and wider opening of industrial areas, but also relates to the deep-seated problems such as macro-economic management system, open economic system, industrial policy, ownership structure and state-owned enterprise reform. To deal with the new development of international investment rules, we need to actively participate in making new rules and negotiations and striving for more investment facilitation conditions and

investment protection measures. In this way, we can further promote the "going out" strategy.

4.1 Use the rules so as to enter into the fast lane

With the implementation of the new round of national strategy and the construction of "Silk Road Economic Belt and 21st Century Maritime Silk Road", China should continue to encourage and guide orderly investment by Chinese enterprises, which will further enhance the strength of enterprises, and gradually form a bunch of enterprises that have international influence and reach the international advanced level. In this way, outward FDI by Chinese enterprises can enter into the fast lane.

To be specific, Chinese enterprises should first learn the new rules so that they could take the initiative to use rules to safeguard their own interests. Chinese enterprises should actively take advantage of the rights that the new generation of bilateral, plurilateral, regional and international investment agreements empower, such as "negative list", "pre-establishment national treatment", "equal market access "" peer industry access "and other rights. Second, Chinese enterprises that carry out overseas investment should establish risk identification and control system since they may face a wide range of risks such as political, economic, legal, social, cultural, business and so on. In order to avoid and prevent overseas investment risks, these enterprises should control the decision-making process on one hand and conduct a comprehensive assessment of the host country of foreign political, economic and socio-cultural, perform corporate social responsibility and local integration on the other hand. It should be noted that we should rely on the new generation of international investment treaties and take the initiative to make use of WTO multilateral dispute settlement mechanisms as well as dispute settlement mechanisms between investors and host countries to protect the interests of overseas investment once there are problems.

4.2 Heighten the consciousness of corporate social responsibility

Strengthening corporate social responsibility (CSR) reflects the core principles of sustainable development. During the "going out" process, enterprises ought to strengthen their social responsibility in order to enhance productive capacity, promote competitive force and facilitate inclusive growth and sustainable development. High standard of corporate social responsibility is also the requirement of the new rules and sustainable development of "going out" strategy.

In particular, we should firstly facilitate the popularity of CSR-related knowledge and actively promote enterprises to fulfill their social responsibility so as to build soft power of Chinese enterprises. Additionally, we should build the advisory service and evaluation management system to help companies fulfill their social responsibility under different policies and regulations, cultural environment and labor system, and supervise the performance at the same time.

4.3 Enhance self innovation capability and build self-owned brand

Recalling the history of Chinese enterprises participate in international competition, they have to face rebuff almost everywhere since there is no clear awareness of intellectual property. On the one hand,

Chinese enterprises deal with various lawsuits because of the infringement, which is bad for their international image and lead to huge loss of interest; on the other hand, Chinese enterprises have been at the low end of the global value chain due to the lack of exclusive property advantages which lead to mismatch of economic benefit and "world factory" status. Therefore, we need to enhance the self innovation capability of Chinese enterprises and build self-owned brand in order to promote international competition ability.

Firstly, it is necessary to establish own brand of Chinese enterprises and their own intellectual property so as to enhance their competitiveness. They need not only to fully aware of the important role of the brand in exploiting new markets, efficiency improving and competitiveness enhancing, but also to cultivate, use and protect their brand with a clear and workable international brand development strategy. From a certain perspective, Chinese enterprises "going out" is actually corporate brand "going out". During the outward FDI process, they must insist on using their own brand and attaching importance on brand promotion, management and maintenance. On the one hand, strengthening basic work to cultivate brand, such as enhanced R & D capabilities, improve the technological content of products to ensure product quality, increase advertising efforts, and improve after-sales service; on the other hand, pay attention to the trademark registration, quality management system certification, environment system certification, and corporate social responsibility work. From international experience, there are no quick success in brand building, leading international brands are mostly self-nurtured rather than bought from others. Therefore, enterprises should also balance the relationships between own brands and acquired ones.

Secondly, Chinese enterprises need to pay attention to long-term R&D investment in order to enhance the market value. Only take advantage of technology and continuously create high-tech products can Chinese enterprises survive in the highly competitive international market. As R&D is a source of innovation, Chinese enterprises should look at corporate R&D from the global perspective and strategic vision.

4.4 Develop new way of the "going out" of state-owned enterprises

Since the new generation of investment rules treats "state-owned enterprises (SOEs)" separately, the next step of "going out" of SOEs should pay particular attention to creating a good healthy market environment and establishing a good market position in order to lay a good foundation for overseas investment activities.

Primarily, SOEs should improve the international image. They should strictly compliance with host country laws and regulations, respect local religious customs, and blend in local community. Additionally, SOEs should adhere to sustainable development and feedback local community by various ways like creating more employment opportunities for the local area in order to achieve mutual benefit and harmonious development.

Secondly, SOEs need good economic diplomacy to eliminate and correct misunderstandings in the international market. They are often considered to have a certain political intentions or involve in international competition with help from Chinese government because of the special status and nature of

SOEs and therefore suffered a lot of injustice. In order to create a fair and healthy international market environment, the Government should not only improve the transparency of the development plan of SOEs, but also actively carry out public relations and economic diplomacy.

Third, actively comply with competitive neutrality rules. Rather than relying on preferential policies to support SOEs, government should give the state-owned enterprises right guidance and norms in industry, finance, taxation, trade, finance, investment areas. As "weaned child" tends to be healthier, government should promote SOEs to cultivate their market competitiveness and realize healthy growth by making full use of market forces.

Fourth, learn to use combination methods of investments. Following the SOEs, private enterprises have actively expanded the international market in recent years and made some achievements. SOEs could "going out" with private enterprises by promoting trade associations and other civil society organizations. With this combination method, the host country may dilute its special alert status and thus avoiding injustice towards SOEs compared to the situation when SOEs fight alone in overseas market.

REFERENCES

Nie, P. (2014), "The Evolution and Future Trend of International Investment Rules", *Journal of International Economic Cooperation*, vol.2014, No.7, pp.16-20.

Lu, J., Li, F. (2012), "Historical Evolution Characteristics of International Investment Protectionism and Coping Strategies", *Asia-Pacific Economic Review*, vol.2012, No.4, pp.110-114.

Lu, J., Tian, Y. (2014), "The Theoretical Foundation of 'Negative List' Management Mode", *International Business Daily*, 12 May, pp.A07.

Lu, J., Zou, H. and Yang, J. (2014), "The New Generation of Bilateral Investment Treaties, China-US and China-EU BIT Negotiations", *Intertrade*, vol.2014, No.5, pp.18-19.

Lu, J., Zhang, Z. (2009), "Studies of Intellectual Property Problems in 'Going out' Process", *Journal of International Economic Cooperation*, vol.2009, No.7, pp.9-13.

Lu, J., Li, F. and Wen, L. (2012), "Non-policy and Non-legal Obstacles that Outward FDI by Chinese Enterprises Encountered", *China Business Update*, vol.2012, No.9, pp.11-13.

Li, Y., Sang, B. (2014), "The Comparison and Trend of International Investment Rules and Chinese Coping Strategies", *Comparative Economic & Social System*, vol.2014, No.1, pp.176-188.

Has Stagnant Real Income Growth Contributed to An Uneven U.S. Housing Market Recovery Following the Great Recession?

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ABSTRACT

The U.S. housing market recovery following the Great Recession has in many ways been atypical of earlier housing market recoveries. There is evidence that the recovery from 2011 through 2016 has disproportionately occurred among higher income earners, while improvement in the middle and moderate income sectors appears to have occurred later and to have been comparatively less robust. Stagnant growth in real median household income among moderate and middle income households and a weaker rate of new household formation during and immediately following the recession are seen as key variables contributing to an uneven housing market recovery.

INTRODUCTION

A number of variables are typically associated with a broad-based housing market recovery following recessions. As the economy begins to expand, home prices typically rise relative to rents, as buyers begin to take advantage of reduced home prices. As a growing number of households move from renting to purchasing, vacancy rates in rental housing begin to rise and the rate of increase in rents overall tends to stabilize. At the same time, permits for construction of new single family units begin to rebound as demand for homes increases. As the recovery gains strength, an excess demand relative to new inventory puts further upward pressure on prices. Much of what makes this trend possible is the return of robust job growth, along with rising median household incomes and a growing number of new households. As the market nears a peak, rising inflation in housing and throughout the broader economy brings intervention to reduce inflationary pressure by increasing the overall cost of consumer borrowing. Clearly this scenario, in many respects, appears to not characterize the current recovery.

To measure the extent to which the current housing market recovery has differed from previous ones, this study compares the housing market expansions following the three most recent economic recoveries following the business cycle downturns of July 1990 – March 1991, March 2001 – November 2001 and December 2007 – June 2009.[1] The study examines several variables and trends that are widely cited in analyses of the state of the housing market and poses the argument that the nature of the current housing market rebound is notably different from the previous two recoveries. Most notably, the current recovery appears to have been uneven across income levels, a departure from previous recoveries.

It is believed that this trend has been exacerbated by the pronounced lag in robust payroll jobs growth, a slower rate of new household formation, and sluggish real income growth during the recession and in the years immediately following its official end in June 2009. These trends are believed to have significantly suppressed demand for new homes as reflected in data on permits for new single family home construction, while at the same time maintaining stronger than expected demand for rental housing as reflected in

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comparatively low rental vacancy rates. Further, evidence of an uneven housing market recovery is revealed in data on new mortgage originations by borrower income level.

THE CURRENT HOUSING MARKET RECOVERY

2011 is often identified as the turning point for the nation's housing market, (OFHEO, FRBSF) based upon data on recovery of new housing starts and permits for new single family home construction (U.S. Census). OFHEO data also point to a notable upturn in new mortgage originations in 2011 following the sharp declines from 2007 through 2010 (2016).

Clearly, larger issues defined the years leading up to the last recession, including the near collapse of the nation's financial system, widespread lax lending practices with little oversight and evidence of unscrupulous mortgage lending practices while the years immediately following the financial crisis were characterized by a widespread reluctance on the part of lenders to make new home loans regardless of borrowers' credit or ability to pay.

However, by a number of measures, many of the same economic indicators that are typically associated with a broad-based housing market recovery appear to have taken a somewhat different direction since the end of the Great Recession in June 2009. Specifically, from 2011 through 2016, rents have continued to rise even as home prices have increased and vacancy rates in rental housing have shown a significant decline, an indication of continued strong rental demand even as the purchase market has strengthened. At the same time, the rate of growth in new housing starts has been less robust than in previous recoveries, and new household formation grew relatively slowly in the years during and immediately following the official end of the recession. At the same time overall inflation has remained relatively low, robust payroll job growth took nearly five years from the official end of the recession to regain momentum, and the unemployment rate has taken comparatively longer to decline during this recovery. Another indicator of an uneven recovery trend is that as of 2016 housing inventory has exhibited a disproportionate trend, with a greater supply of unsold homes at the higher end of the market and significantly less unsold inventory in the moderate to mid-range of the market. This suggests that the higher end of the market began to peak significantly sooner and that the moderate to middle range began to recover later.

The strength of the housing market recoveries as measured by new single family housing starts following the July 1990 - March 1991 and March 2001 – November 2001 recessions was comparatively and significantly stronger than following the most recent recession. In second quarter 1991, housing starts expanded by 107 thousand and surpassed their pre-recession peak of 271 thousand units in second quarter 1992. From trough to peak, housing starts totaled 11.2 million (U.S. Census Bureau; FRB of St. Louis). Following the end of the 2001 recession, new single family housing starts expanded by 8.5 million from trough to peak. By contrast, in the nearly seven years since the official end of the Great Recession, new housing starts have grown by just 3.2 million through first quarter 2016.
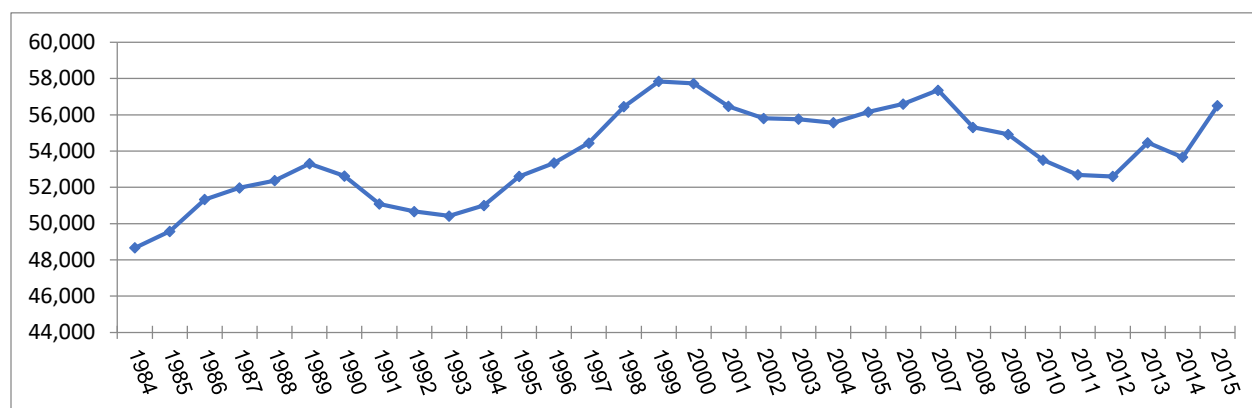
There are also markedly different trends in terms of payroll job growth. In the months following the 1990-91 and 2001 downturns, the national economy continued to shed slightly more than 300 thousand and 500

thousand more jobs, respectively, before realizing net gains. By contrast, the economy lost another 1.2 million jobs in the six months following the official end of the Great Recession (U.S. Bureau of Labor Statistics).

Permits for new single family home construction have exhibited a similar weak recovery pattern. In the nearly seven years since second quarter 2009, new permits increased a total of 1.25 million through first quarter 2016. This number remains far below the cumulative totals in new permits at the peaks in the recovery phases of the 1990-91 and 2001 recessions, when new permits totaled 3.45 million and 2.76 million, respectively from trough to peak (U.S. Census Bureau).

While rReal median household income experienced a net increase of 7 percent from 1990 through 2015, it has still not recovered from the steep declines since its peak in 1999 at $57,843. From 2000 through 2015, the net gain in real median household income was 6.9 percent. Despite its rebound in 2015, the uneven pace of growth, interspersed with periods of notable decline, notably during and following the 2008-09 recession would appear to be a significant factor in the sluggish housing market recovery.

Chart: Real Median Household Income in the U.S.: 1984 - 2015

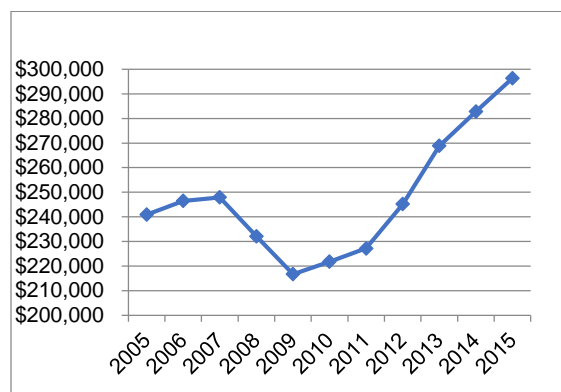Source: Federal Reserve Bank of St. Louis.

Another measure often associated with the strength of a housing market recovery, rental vacancy rates, actually moved higher ***during*** the two previous recoveries than they have been throughout the current recovery. A comparatively larger percentage of people moved out of home ownership during and after the most recent recession and the demand for rental housing has actually *risen, not declined*, during the current housing market recovery (U.S. Census). Vacancy rates in rental housing averaged 7.2 percent during the 1990-91 recession before rising to 7.4 percent following its end; they averaged 8.5 percent during the 2001 downturn and averaged 9.4 percent in the recovery period between 2002 and the start of the downturn in Dec. 2007. By contrast, during the Great Recession, vacancy rates averaged 10.2 percent and declined from 9.8 percent in the quarter following its end to 7.0 percent in first quarter 2016 making this rate significantly lower compared with rates during the previous two recoveries. This suggests a disproportionately higher rental rate during the current recovery.

These trends are further evident in U.S. Census data on the percentage of households in owner occupied and rental occupied housing. Since the end of the recession in 2009 through 2014[1], the share of

rental occupied housing has increased from 34.1 percent to 36.9 percent, while the share of owner-occupied housing has declined from 65.9 percent to 63.1 percent. Even during the stronger recovery phase from 2011 through 2014, renter occupied households continued to rise from 35.4 percent to 36.9 percent and owner-occupied households continued to decline as a percentage of total households (U.S. Bureau of the Census, American Factfinder)
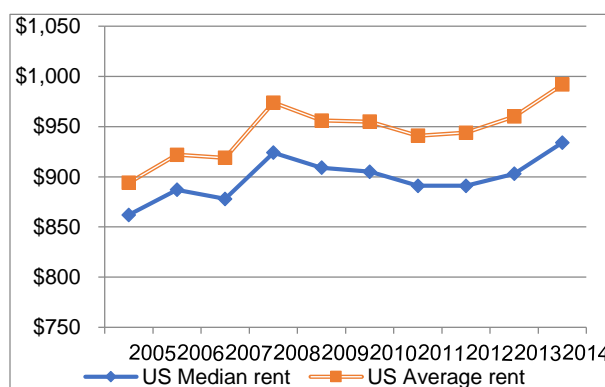
Further, average rents have continued to increase along with home prices throughout the recovery period. Historically, as sales of new and existing homes grow, the demand for rental housing tends to stabilize, with rents rising at a somewhat slower pace than home purchase prices. The increasingly strong demand for rental housing, an indicator of significant numbers of potential home buyers priced out of the market appears to have contributed to rising rental prices in this recovery. This evidence is observable in trends in the rental and new home sales markets during the housing market recovery. (Federal Reserve Bank of St. Louis).

Chart 2: Median Annual Sales Price- New Homes   **Chart 3: Median and U.S. Avg. Rents: 2005 - 2014**

Source: U.S. Census Bureau   Source: U.S. Census, American Community Survey

Also key to new home sales is the growth in new households. Since 2009, new household formation has increased by 3.1 percent. On an annual average basis, it has increased at a slower rate both during the 2008-09 recession and in the years immediately following it. By comparison, the annual rates of growth were greater both during and immediately following the previous two downturns (Congressional Budget Office).

Evidence of an uneven housing market recovery is further revealed in Home Mortgage Disclosure Act data on new mortgage originations for the purchase of owner-occupied housing by borrower income. HMDA data on new loan originations on 1 to 4 family owner occupied housing units from 2007 through 2014 reveal notable differences in the strength of the housing market recovery and the actual start of that recovery in relation to borrower income. The recovery appears to have occurred comparatively later for borrowers earning less than $249,000 annually than for borrowers earning $250,000 and over. Specifically, for borrowers in the $50,000 to $249,000 income range, loan originations did not begin to return to positive year-to- year growth until 2012. By contrast, new originations for borrowers earning $250,000 and over experienced a turnaround from negative to positive growth starting in 2010. At the same time the annual

percentage increase in loan originations during the recovery period appears to be significantly stronger among borrowers earning $250,000 and over. These data point to a delayed and comparatively weaker recovery in the purchase market in the moderate to middle income range (Consumer Financial Protection Bureau).

The stronger recovery at the higher end of the income scale may also be reflected in a disproportionately higher number of all cash transactions, giving buyers the means to purchase without financing, which would not be reflected in the HMDA originations data. This percentage has been greater in the current recovery in contrast to the over leveraging characteristic of the previous boom. Cash sales were estimated to comprise 35 percent of all home sales in March 2015, according to Core Logic (June 2015). While this share was even higher – at 46.5 percent of all purchases in January 2011, the percentage still represented more than a third of all home purchases and is significantly higher than the 25 percent average prior to the housing crisis (Core Logic, 2015). Cash purchases, perhaps also associated with investment purchasers would be expected to be less of an option for most buyers in the moderate to middle income range.

Taken together, both the rental and purchase market trends suggest that indeed, as many metropolitan areas' housing markets have recovered and are booming, a shortage of supply in the mid-range of the home purchase market has contributed to increased demand for rental housing, driving up rents. In these markets, the typical slowing of the rate of growth in rents relative to rising home prices does not appear to be occurring this time around.

In examining housing market strength by purchaser income, housing inventory is also important. At this point in the recovery, an excess supply of homes at the upper end of the purchase market has begun to emerge in contrast to strong demand and lack of supply in the moderate to middle income range. Significant differences in the inventory of months' supply of homes on the market by price range suggest that the upper income market may be nearing a peak with higher inventory levels suggesting an emerging oversupply. As of January 2016, there was a 5.9-month supply of housing in the low-to–middle price tier, compared to a 6.2-month supply in the moderate to mid-price tier and a 9.3-month supply in the high price tier (CoreLogic, 2015).

Consumer borrowing rates and the 30-year mortgage rate have remained at historic lows, as has the overall Consumer Price Index since the official start of the current recovery. Inflation has been disproportionately concentrated in the housing market –in both the purchase and rental markets. From June 2009 through year end 2015, the median sales price of new homes nationally increased 27.3 percent or an average of 4.72 percent per year. By contrast, the Consumer Price Index for rent of primary residence increased from 249.4 in June 2009 to 290.7 as of December 2015, an average increase of 6.9 per year. This suggests that demand for rental housing has remained strong despite continued low borrowing rates.

The sluggish of the recovery in the job market, stagnant real income growth and a slowed rate of new household growth during the recession years of 2008 and 2009 and after have contributed to the delayed ability to purchase, particularly within the moderate to middle income levels. Further, the growth in income

and wealth inequality that has characterized this recovery suggests that the ability to purchase has not recovered or increased evenly across all income levels, which is atypical of past recoveries.

This study investigates the significance of the prolonged return to robust payroll jobs growth, the stagnation of real median household income, median home prices, the Consumer Price Index for the rent of primary residence, and the slowed pace of new household formation in the years following the recession in the emergence of a comparatively weak housing market recovery since the end of the Great Recession.

REVIEW OF LITERATURE

Some recent studies have begun to examine why the current housing market recovery has exhibited different characteristics relative to prior recoveries. They point to a number of features that distinguish the impact of the recession and of the recovery that began in 2011 including divergent trends in house price to rent ratios, housing starts and new household formation.

Glick, Lansing and Molitor (2015) observe that the present recovery has not been fueled by excessive household leverage or mortgage debt-to-income ratios. At the same time, they identify three indicators that have displayed a significantly different pattern in this recovery relative to the years leading up to the 2006 housing market peak. Specifically, while median house prices, housing starts and construction employment all peaked in 2006 just prior to the business cycle peak and housing market decline, these measures have exhibited very different rates of recovery, with housing starts in particular remaining significantly below their previous peak (2015). Further, they point to the divergence of house price-to-rent ratios since the recovery, in stark contrast to the run-up to the last peak (2015).

Paciorek (2016) points to the declining rate of new household formation since 2007 following the housing market collapse and subsequent recession. He finds that from 2007 – 2011 the rate of net household formation slowed by more than half its pre-recession annual rate in the five years preceding the downturn. After controlling for demographic changes such as the aging of the population, he finds that the prolonged weak labor market discouraged new household formation, thus depressing the housing market (2016).

Similarly, Lee and Painter (2013) examined how economic conditions have a direct impact the formation of new households. They cite evidence that during economic downturns, potential household formation may be delayed as younger labor market participants choose to continue residing with parents or sharing living spaces with others. The authors find that both increased unemployment rates and recessionary conditions have a direct impact on reduced new household formation.

Other models predicting the onset of a housing bust assume several trends that have indeed been observed historically in housing market cycles. One such model (Mueller, 1999) identifies four phases of the real estate cycle, characterized by recovery, expansion, hyper supply and recession. In Mueller's account of these phases, one sign of trouble begins to emerge when rent growth begins to decelerate. However, in the current recovery phase, rent growth has continued to *accelerate* as housing supply in the mid-market range has remained tight.

MODEL

To examine the question of whether and to what extent new home purchases are a function of trends often associated with a recovering housing market this analysis examines the significance of several variables over three post-recession recovery periods. These include the change in real median household income, median home prices, the rate of change in new household formation, the CPI on rent of primary residence, non-farm payroll jobs growth, permits for construction of new single family homes, the 30-year mortgage interest rate, and rental vacancy rates. The purpose is to examine the extent to which each of these variables were associated with different outcomes over the three housing market recoveries during March 1991 – March 2001, November 2001 – December 2007, and June 2009 to the present. For the purposes of this analysis, data through December 2015 is used as data for all variables is available through that date.

New home sales functions as an indicator of the extent of housing market recovery[1] and are defined as a function of real median household income, non-farm payroll jobs growth, the rate of growth of new household formation, median home prices, 30-year mortgage interest rate, new permits, rental vacancy rates and the CPI for rent of primary residence.

Variables that are expected to be strongly associated with growth in real median household income include the change in non-farm payroll jobs and the rate of growth of new households. New household formation is believed to be positively associated with demand for new homes. The interest rate on the 30-year mortgage is expected to be negatively correlated with new home sales as lower rates attract new buyers. Further, the consumer price index on rent paid on a primary residence is expected to stimulate demand for new home sales as the costs of renting surpass the cost of purchasing. A rate of growth in this index that exceeds the growth rate in new home prices is expected to be associated with demand for new homes and thus would be reflected in higher rental vacancy rates.

For each recovery period, the following is estimated:

$$y = \beta o + B_o\, \beta 1x1it1 + \beta 2x2it1 + \beta 3x3it1 \cdots \beta kxkit1 + \varepsilon i\ t1$$
$$\gamma = \beta o + \beta 1x1it2 + \beta 2x2it2 + \beta 3x3it2 \ldots \beta kxkit2 + \epsilon it2$$
$$\gamma = \beta o + \beta 1\chi 1i\tau 3 + \beta 2\chi i\tau 3 + \beta 3\chi 3\tau 3 \ldots + \beta \kappa \chi \kappa i\tau 3 + \varepsilon i\tau 3$$

Where *t1* = Recovery phase March 1991 – March 2001,

      t2 = Recovery phase November 1 – December 2007, and

      t3 = Recovery phase June 2009 - present

$\beta 1 = median\ home\ price, (Medhomepr)$

$\beta 2 = 30 - year\ mortgage\ int. rate, (Mortgrate)$

$\beta 3 = \ real\ median\ household\ income\ (RMEDHHINC),$

$\beta 4 = Rate\ of\ change\ in\ new\ households\ (Households),$

$\beta 5 = CPI\ on\ rent\ of\ primary\ residence\ (CPIrentprimeres),$

$\beta 6 = Non - farm\ payroll\ job\ numbers\ (NFPayrollQ),$

$\beta 7 = rental\ vacancy\ rates\ (Rent\ VAC)\ and$

$\beta 8 = permits\ for\ new\ single\ family\ home\ construction$

For each period, correlations were first estimated to determine the extent of significance of these variables. The findings of correlation analyses over each of these three recovery phases reveal some differences.

FINDINGS

Over the March 1991 through March 2001 recovery, all of the specified variables are significant at the 0.01 percent level. As one would expect, each of these variables, with the exception of the 30-year mortgage interest rate, are positively correlated with new home sales. The results appear to confirm an outcome that would be expected in a typically recovery phase. The significance of the variables in the estimation is further confirmed with an adjusted R^2 of 0.936 and an indication of significance in the analysis of variance.

By contrast, the November 2001 – Dec 2007 trough to peak period, appears atypical of what would be expected in a housing market recovery. Real median household income, permits for new single family construction, and the mortgage interest rate were all significant at the 0.01 percent level, while non-farm payroll changes and rental vacancy rates were significant at the 0.05 percent level. However, the rate of change in new households, median home price and the CPI on rent paid on primary residence were not significant at all. Perhaps most notable here is the *negative* correlation between both real median household income and non-farm payroll growth and new home sales. Both of these variables would typically be expected to be *positively* correlated with new home sales and in the prior recovery, this was the case.

Knowing the events that characterized the housing market during this period, the outcome here is not surprising. Knowing the events that characterized the housing market during this period, the outcome here is not surprising. At the same time, rising home prices appeared to be less of an obstacle to purchasing and obtaining home loans. Further, the large number of investment purchases and/or the increase in ownership of multiple properties by many households might partly explain the lack of significance of new household formation. In fact, new household formation shows a slightly negative correlation with new home sales.

The adjusted R^2 of 0.89 suggests these variables were strongly predictive of new home sales. However, given that this period corresponds to the 'housing bubble' the lack of significance of some variables that would typically be associated with a housing recovery, such as median home price and the change in new households, are not.

Finally, during the recovery from June 2009 to the present, there appears to be one finding worth noting that points to a divergence from the 1991 – 2001 period. Rental vacancy rates are strongly *negatively* correlated with new home sales, quite the opposite of the strong *positive* correlation evident from the March 1991 through March 2001. This suggests that the low vacancy rates during the current may be an indicator of a barrier to purchasing despite the rising CPI on rents.

However, some variables that were expected to exhibit a negative impact on new home sales – sluggish real median household income growth and the slowed rate of growth in new household formation - both during and in the two years immediately following the official end of the recession - do not appear to have exerted the drag on purchases that was expected. Indeed, the rate growth of households did begin to rebound as the recovery gained momentum and the significance of that strengthening appears to be reflected in these findings.

CONCLUSIONS AND POSSIBLE DIRECTIONS FOR FURTHER INQUIRY

There are a couple of possible directions for investigating the suspected disproportionate recovery in housing. One would be to take a closer look at these variables at the metropolitan area level. One possibility would be to examine two or more metropolitan areas that illustrate quite different trends in terms of income growth, new household formation and rental vacancy rates. Another possible approach would be to compare groups of metropolitan areas that exhibit very different trends in variables associated with the recovery process that have been discussed here. Discrepancies in home price growth and income gains across MSA's might reveal more about the nature of the current recovery than a national focus.

ENDNOTES

1. These periods are based on the National Bureau of Economic Research procedure of recession dating; www.nber.org/cycles/main.html

REFERNCES

Board of Governors of the Federal Reserve System, Survey of Consumer Finances, retrieved June 23, 2016 from http://www.federalreserve.gov/econresdata/scf/scfindex.htm

Boesel, Molly (May 13, 2015) *Cash Sales Made Up 38 Percent of All Home Sales in February 2015* Core Logic http://www.corelogic.com/blog/authors/molly-boesel/2015/05/cash-sales-made-up-38-percent-of-all-home-sales-in-february-2015.aspx#.V-lqtfRH7io

Congressional Budget Office, *The Distribution of Household Income and Federal Taxes*, 2013, June 8, 2016; retrieved June 23, 2016 from https://www.cbo.gov/publication/51361

Consumer Financial Protection Bureau, *Home Mortgage Disclosure Act Data/OFHEO* http://www.consumerfinance.gov/data-research/hmda/learn-more

Core Logic (March 2015) *The Market Pulse*, vol. 4, no. 76 http://www.corelogic.com/research/the-market-pulse/marketpulse_2014-july.pdf

Core Logic (July 2015) *The Market Pulse*, vol. 3, no. 6 http://www.corelogic.com/research/the-market-pulse/marketpulse_2014-june.pdf

Federal Housing Finance Agency. Change in FHFA State House Price Indexes, https://www.fhfa.gov/DataTools/Tools/Pages/House-Price-Index-(HPI).aspx

 Federal Reserve Bank of St. Louis, Federal Reserve Economic Data, Consumer Price Index for All Urban Consumers: Rent of primary residence, Index 1982-1984=100, Quarterly, Seasonally Adjusted and Real Median Household Income in the U.S.: 1984 – 2015 https://fred.stlouisfed.org

Glick, Reuven, Lansing, Kevin J. and Molitor, Daniel. "What's Different about the Latest Housing Boom?" *FRBSF Economic Letter*, November 16, 2015.

International Monetary Fund, Interest Rates, Discount Rate for United States© [INTDSRUSM193N], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/INTDSRUSM193N, June 23, 2016

Jamrisko, Michelle and Glinski, Nina "This New Indicator Shows There's No Bubble Forming in U.S. Housing: The market will be at its most robust in 14 years, the gauge suggests," *Bloomberg*, March 31, 2015; http://www.bloomberg.com/news/articles/2015-03-31/this-new-indicator-shows-there-s-no-bubble-forming-in-u-s-housing

Kaplan, Greg. "Moving Back Home: Insurance Against Labor Market Risk," *Journal of Political Economy,* vol. 120, no. 31, 2012

Lee, Kwan Ok and Painter, Gary. "What Happens to Household Formation in a Recession?" *Journal of Urban Economics*, vol. 76, 93 – 109, 2013.

National Bureau of Economic Research, U.S. Business Cycle Expansions and Contractions, http://www.nber.org/cycles.html

Nicolais, Teo "How to Use Real Estate Trends to Predict the Next Housing Bubble," retrieved from http://www.dce.harvard.edu/professional/blog/how-use-real-estate-trends-predict-next-housing-bubble

Paciorek, Andrew. "The Long and the Short of Household Formation," *Real Estate Economics*, 2016 V44 1: pp. 7–40 DOI: 10.1111/1540-6229.12085

U.S. Census Bureau, New Residential Sales – Historical Data, https://www.census.gov/construction/nrs/historical_data/index.html

U.S. Census Bureau, Real Median Household Income In the United States, https://www.census.gov/topics/income-poverty/income.html

U. S. Census Bureau, American Community Survey, Median Annual Sales Price, New Homes. http://www.census.gov/housing/hvs/data/histtabs.html

U.S. Census Bureau, American Community Survey, U.S. Median and Average Rents.

U. S. Census Bureau, Housing Vacancies and Home Ownership, Monthly Household Estimates, 1955 to present, http://www.census.gov/housing/hvs/data/histtabs.html

U.S. Bureau of the Census, American Factfinder, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk)

U.S. Department of labor, Bureau of Labor Statistics, All Employees, thousands, total nonfarm, seasonally adjusted. http://data.bls.gov/pdq/SurveyOutputServlet

Determinants of Students' Performance in Principles of Economics: The Case of a Commuting Technical College

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ABSTRACT

This paper examines the determinants of students' performance in Principles of Economics in a four-year public institution in the suburban New York area, where most of the students combine their academic activities with part-time or full-time jobs. Previous research has shown that variables like parents' education, family income, students' competence in English, class attendance, and active employment can have significant effects on students' performance. We conducted a survey to 284 students of Principles of Economics and, after addressing potential endogeneity problems, we show that hours spent studying and student's GPA are the most relevant determinants of student performance.

INTRODUCTION

This paper examines the determinants of student performance in Principles of Economics in Farmingdale State College (FSC), State University of New York, a four-year public institution in the suburban New York area. As many other public colleges in the United States, FSC targets students from a wide variety of economic conditions and cultural backgrounds, the majority of which have grown up in the surrounding areas and commute to campus. The literature on students' performance is extensive, but there are few studies concerned exclusively about the Principles of Economics and, to the best of our knowledge, none of them focuses on commuting technical colleges where most of the students combine their academic activities with part-time jobs.

There is a stereotypical view that commuters are less committed to academic pursuits compared with their counterparts who go away to college and live on campus (Jacoby 2000). The commuter students are distracted by too many competing demands on their time because of work and family commitments. Are commuters' performance lower than the performance of students who live on campus? We find no evidence of a negative effect of commuting or working on students' performance. Instead, we find that the main determinants of performance in Principles of Economics are previous performance (GPA) and time spent studying.

The literature on students' performance has analyzed a number of factors. Roomer (1993) and Durden and Ellis (1985) found that attendance was an important determinant of student academic performance

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economic courses. Variables like parents' education, family income, student's competence in English, active employment and interest in the subject have been found to affect students GPA or performance (Cohn and Cohn, 2000; Plant et al 2005). Especially relevant for this paper is the literature on the effects of time spent studying. Even though we can expect students to improve academic performance by increasing the amount of time they spend on studying activities, there is no consensus in the literature about the relationship between the amount time used studying and academic performance. For instance, Krohn and O'Connor (2005), Nonis and Hudson (2006) and Kara et al (2009) find a negative effect of time spent studying on performance. In contrast, more in line with the findings of this paper, Dolton et al (2003) control for potential endogeneity and finds a positive effect of time spent studying on performance.

We perform an econometric analysis based on a survey conducted at the end of 2015 among 284 students of Principles of Economics at FSC. Students anonymously provided information about their academic, demographic, and economic backgrounds, as well as the use of their time, employment status, household characteristics, attitude towards the topic and expected performance in the course. Time spent studying can be expected to decrease when the student expects to obtain a good grade in the course, creating a problem of endogeneity that can wrongly lead to conclude that more hours of study reduce student's performance. We argue that some variables often used as determinants of students' performance in the literature are, instead, only relevant to determine the time spent studying. Examples of these variables are time spent commuting or working, likability of the course, number of other courses enrolled, etc. There is no clear reason for these variables to directly affect students' grades; but they can plausibly have an effect on time spent studying. In order to correct for potential endogeneity, these variables are used as instruments for time spent studying. This allow us to show that both higher GPAs and more hours of study have a strong positive effect of students' performance in Principles of Economics.

The rest of the paper is structured in the following way. Section 2 presents the data and the econometric strategy. Section 3 develops the empirical results, and section 4 concludes.

DATA AND EMPIRICAL STRATEGY

All the data were obtained from a survey conducted among 284 students of Farmingdale State College (FSC), at the end of the Spring Semester of 2016. Students were asked about their academic, cultural, and economic backgrounds, the use of their time, employment status, household characteristics, attitude towards the topic and expected performance in the course.

The dependent variable is academic performance in Principles of Economics. In order to measure this variable, students were asked about the letter grade that they were expecting to obtain at the end of the course (A, B, C, etc). [1] Since the survey was conducted few days before the final exam, the actual final grade for the class was unknown. Based on their answer, we created two dependent variables. The variable *grade number* takes the value of the numeric range midpoint of each letter grade (95 for A, 85 for B, etc, with 55 assigned to the letter F). A second measure of performance, the variable *grade A*, is a dummy that takes the value 1 if the student expects an A, and 0 otherwise.

Performance is expected to improve with the amount of hours spent studying, which is represented by the *study hours* dummy. This variable takes a value of 1 if the student spends 2 or more hours per week studying for the course, or 0 otherwise. Some papers have found a negative relationship between time spent studying and performance (Krohn and O'Connor 2005; Nonis and Hudson 2006; Kara et al 2009). In this paper we show that this finding results from a failure to properly address the endogeneity problem created by the influence of performance on time spent studying. Students that are doing well in the course may decide to study less and devote more time to other, more pressing, activities. But this does not mean that more studying worsens performance. In order to correct for potential endogeneity bias, we distinguish between explanatory variables that have a direct effect on performance and others that may affect performance indirectly through their effect on time spent studying. Representing the vector of regressors with a direct effect on *grade* by X and the vector of regressors with an indirect effect by B (the instruments for *study hours*), the econometric model to be estimated is given by

(1) $$grade_i = \beta_1 \, (study \; hours_i) + X_i \beta + e_i \, ,$$

where i represents any given student, e is the unobserved error, and *study hours$_i$* is predicted in accordance to the estimated coefficients of the first stage regression,

(2) $$study \; hours_i = X_i \gamma + B_i \delta + v_i \, .$$

Several explanatory variables previously used in the literature are considered, but our analysis departs from this literature by distinguishing the determinants of grades (X) from the determinants of study hours (B). Table 1 presents the summary statistics of all the variables. Three dummy variables control for the majors of the students. One identifies *economic majors*; other *business and sports management majors*, and another *construction and aviation majors*. Academic ability is measured by *GPA* dummies; one takes the value 1 when the GPA is 2.8 or higher, and the other when it is 3.5 or higher. Demographics are controlled for by three dummies, one representing *Hispanics*, the greatest minority on campus; other representing *females*, which corresponds to around 35% of the sample, and other indicates whether *English* is the native language or not. Parents' education is represented by two dummies. *Mother's education* and *father's education* take the value 1 if they have attended college, regardless of whether they completed the college degree or not. The *live on campus* dummy helps to identify the effects of not commuting on academic performance. This is of interest in a college where most students live off campus; note that less than 7% of students in the sample live on campus. Finally, *household income* and *number of members in the household* are expected to have a direct effect on performance, since they represent access to benefits or responsibilities that may determine student's general attitudes and accumulated knowledge and experiences. Other controls considered in all regressions but uninteresting from the perspective of general determinants of performance are *microeconomics* (as opposed to macroeconomics), the *schedule* or time at which the class meets, and the different *instructors* teaching to the students in the sample.

Among the instruments for *study hours* we consider those variables that may affect the time available for studying or the need, or the preferences for studying, but we do not expect to have direct effects on performance. Variables affecting the time available for studying are the *number of courses enrolled*, time

and

spent working or on *labor*, time spent *commuting*, and whether the *bedroom* is shared or not (studying may be easier without distractions). The need for studying more may be reduced with *no absences* or increased if the student considers economics useful. Preferences for economics, in particular enjoying or liking the field, may have a positive effect on the time spent studying.

EMPIRICAL RESULTS

The two variables measuring performance, *grade number* and *grade A*, are initially regressed on *study hours* and the set of direct determinants, the components of X in equations (1) and (2). The basic OLS regression explaining *grade number* is presented in column (1) of Table 2. As found in a number of previous studies, *study hours* appears to have a negative and statistically significant effect (at 5% level) on performance. Students from the construction and aviation majors, with a more intensive math background, seem to perform better in economics. A higher GPA is also related with better performance. Having a GPA of 2.8 or higher increases the expected grade in almost 5 points, while a GPA of 3.5 boosts the expected *grade number* by 8 additional points. Hispanics perform, in average, better than their classmates. Interestingly, living on campus has an adverse effect on performance, while household size also results in a negative, although small, effect on performance.

The sign and significance of *study hours* is counterintuitive and suggests the presence of reverse causation: better performance means that the student requires fewer *study hours* to obtain any given *grade number*. In order to address this problem we instrument *study hours* with variables that are not expected to directly affect the dependent variable, but seem to be relevant determinants of the time spent studying. As mentioned, these variables are the number of courses enrolled, labor, commuting time, shared bedroom, absences, and usefulness and likeability of economics. The two-stage least square (2SLS) regression and the general method of moments (GMM) regressions are shown in columns (2) and (3) of Table 2. In both cases the tests of endogeneity reject the null that *study hours* is exogenous (all p-values equal to 0.001), and the test of overidentifying restrictions (p-value: 0.406) does not reject the null that the instruments are valid. Together, these two tests suggest that endogeneity is indeed a problem, and that the set of instruments is adequate. After correcting for endogeneity *study hours* changes sign and remains statistically significant at the 10% level. The coefficient for *study hours* is sizable; according to both regressions, devoting two or more hours per week to study Principles of Economics increases the expected grade in more than 16 points. Other variables that remain significant after correcting for endogeneity are the two *GPA* variables, and for the case of the GMM regression, the *construction and aviation* and the *live on campus* dummies. In addition, the correction reveals that females expect, in average, grades more than 4 points lower than males.

The use of the alternative measure of performance, *grade A*, largely confirms the main results. *Study hours* is shown to have a positive and significant effect after correcting for endogeneity, the GPA is a consistent predictor of performance, and females seem to expect lower grades than males.

The rest of the econometric analysis focuses on the determinants of *grade number* for different groups of students. The first three regressions of Table 3 show OLS, 2SLS and GMM results for 154 business and sport management majors. Again, *study hours* displays a negative effect when endogeneity is not controlled for (column 1), but its coefficient turns positive and significant at the 10% level when we correct for potential endogeneity (columns 2 and 3). A GPA greater than 3.5 is shown to add around 8 points to the expected grade, and other variables like *father's education* and *live on campus* have a negative effect, but not consistently significant across regressions. The regressions in columns 4, 5 and 6 consider all students in majors different than business and sport management. *Study hours* does not appear having a significant effect; but the dummies *construction/aviation major*, *GPA 2.8*, *GPA 3.5*, and *father's education* have positive and significant effects.

Table 4 presents the regression results obtained for females and males. In general, *study hours* does not appear to be significant after controlling for potential endogeneity. Indeed, for the case of females, the test of endogeneity fails to reject the null that variables are exogenous. All columns show that *GPA* is the single most important predictor of performance. Surprisingly, females taking the economics major expect to perform worse than average. For the case of males, *GPA* and *construction/aviation majors* make positive contributions to performance. It is especially interesting that males living on campus (14 out of 184 in the sample) expect to obtain a grade more than 10 points lower than average. This may be the result of self-selection, but it could also indicate that living in campus does not provided an ideal studying environment. In any case, it seems that males living on campus do not enjoy an advantage with respect to males that live off campus, and that students that need to commute are not outperformed by students that spent less time commuting.

CONCLUSIONS

The empirical analysis presented in this paper uses a relatively small sample of 284 observations. We expect to increase the sample size in order to confirm the results presented in this paper and hopefully obtain additional and more robust results. Still, some important findings deserve to be highlighted. We show that a result repeatedly reported in the previous literature, the negative effect of time spent studying on performance, is obtained when we fail to properly address endogeneity. After correcting for potential endogeneity, the time spent studying has a positive, significant and sizeable effect on students' grades. Another variable important to determine performance is the GPA, which is consistently shown to have a positive and significant effect. In addition, contrary to our initial expectations, working and commuting time do not appear to have negative consequences on performance. This suggests that students are able to anticipate and properly plan for the time requirements of the class.

ENDNOTES

1. A letter grade A is assigned to averages between 90 and 100, a B to averages between 80-89.9, and C to 70-79.9, a D to 60-69.9, and an F to 59.9 and below.

REFERENCES

Cohn, E., and Cohn, S. (2000). Class attendance and performance in Principles of Economics. In *Proceedings of the Business and Economic Statistics Section*. American Statistical Association. (pp. 201–206).

Dolton P., Marcenaro O., and Navarro L. (2003). The effective use of student time: a stochastic frontier production function case study. *Economics of Education Review* 22 (pp. 547 – 60).

Durden, G. C., and Ellis, L. V. (1995). The effects of attendance on student learning in Principles of Economics. *American Economic Review*, 85(2), 343–346 Papers and Proceedings of the Hundredth and Seventh annual meeting of the American Economic Association, Washington, D.C.

Gortner L. A, and Zulauf C.R. (2000). Factors associated with academic time use and academic performance of college students: A recursive approach. *Journal of College Student Development*, 41 (pp. 544 – 556).

Kara, Orhan, Fathollah Bagheri, Thomas Tolin (2009). Factors Affecting Students' Grades in Principles of Economics. *American Journal of Business Education*, 2(7) (pp. 25 – 34).

Krohn, Gregory A. and Catherine M. O'Connor (2005). Student Effort and Performance over the Semester. *The Journal of Economic Education*, 36(1) (pp. 3 – 28).

Nonis, Sarath A. and Gail I. Hudson (2006). Academic Performance of College Students: Influence of Time Spent Studying and Working. *Journal of Education for Business*, 81(3) (pp. 151-159).

Roomer, David (1993). Do students go to class? Should they? *Journal of Economic Perspectives,* 7 (2) (pp. 23 – 28).

Plant E. A, Ericsson L. A., Hill L., Asberg K. (2005). Why study time does not predict grade point average across college students: Implication of deliberate practice for academic performance. *Contemporary Education Psycholog*y 30 (pp. 96 – 116).

Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Frequency value 1
Dependent variables						
Grade number	284	83.451	9.932	55	95	n.a.
Grade A	284	0.306	0.462	0	1	87
Explanatory variables						
Study hours dummy (1 if 2 or more study hours per week)	284	0.511	0.501	0	1	145
Economics major dummy	284	0.042	0.202	0	1	12
Business/Sports Mgmt. majors dummy	284	0.542	0.499	0	1	154
Construction/Aviation majors dummy	284	0.095	0.294	0	1	27
GPA 2.8 dummy (1 if GPA=2.8 or higher)	284	0.806	0.396	0	1	229
GPA 3.5 dummy (1 if GPA=3.5 or higher)	284	0.320	0.467	0	1	91
Hispanic dummy	284	0.187	0.390	0	1	53
Female dummy	284	0.352	0.478	0	1	100
English dummy (1 if native language is English)	284	0.870	0.337	0	1	247
Mother's education dummy (1 if ever attended college)	284	0.680	0.467	0	1	193
Father's education dummy (1 if ever attended college)	284	0.588	0.493	0	1	167
Live on campus dummy	284	0.067	0.250	0	1	19
Household income dummy (1 if > $100,000)	284	0.447	0.498	0	1	127
Household size (number of members)	284	3.507	1.587	0	6.5	n.a.
Additional controls (not displayed)						
Microeconomics dummy	284	0.570	0.496	0	1	162
Schedule dummy (1 if class meets early afternoon)	284	0.641	0.481	0	1	182
Instructor 1 dummy	284	0.218	0.414	0	1	62
Instructor 2 dummy	284	0.190	0.393	0	1	54
Instructor 3 dummy	284	0.113	0.317	0	1	32
Instruments of "Study hours dummy"						
Number of courses enrolled	284	4.634	0.775	2	6	n.a.
Labor dummy (1 if working 6 hours or more per week)	284	0.813	0.390	0	1	231
Commuting 20 dummy (1 if more than 20 mins. per day)	284	0.796	0.404	0	1	226
Commuting 40 dummy (1 if more than 40 mins. per day)	284	0.345	0.476	0	1	98
Bedroom dummy (1 if bedroom is shared)	283	0.180	0.385	0	1	51
No absences dummy (1 if no absences in last 6 classes)	284	0.419	0.494	0	1	119
Usefulness dummy (1 if considers the course useful)	280	0.861	0.347	0	1	241
Likability dummy (1 if likes the course)	283	0.382	0.487	0	1	108

Table 2: Full sample regressions

Dependent variable:	Grade number			Grade A		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**OLS**	**2SLS**	**GMM**	**OLS**	**2SLS**	**GMM**
Study hours dummy (1 if 2 or more study	-2.486**	16.186*	16.603*	-0.064	1.005**	0.962**
hours per week)	(1.072)	(9.269)	(9.180)	(0.050)	(0.480)	(0.455)
Economics major dummy	-1.964	-2.896	-2.536	-0.020	-0.064	-0.021
	(2.948)	(4.776)	(4.782)	(0.122)	(0.228)	(0.219)
Business/Sports Mgmt. dummy	-0.295	1.718	1.875	-0.031	0.082	0.096
	(1.129)	(1.947)	(1.958)	(0.054)	(0.103)	(0.098)
Construction/Aviation dummy	4.572**	4.243	5.299*	0.241***	0.227	0.276**
	(1.946)	(2.803)	(2.767)	(0.090)	(0.141)	(0.133)
GPA 2.8 dummy (1 if GPA=2.8 or higher)	4.970***	5.886**	5.516**	0.099*	0.143	0.144
	(1.639)	(2.437)	(2.347)	(0.055)	(0.102)	(0.099)
GPA 3.5 dummy (1 if GPA=3.5 or higher)	8.066***	7.399***	7.718***	0.427***	0.399***	0.424***
	(1.086)	(1.701)	(1.671)	(0.059)	(0.098)	(0.093)
Hispanic dummy	3.317**	0.681	0.484	0.129*	-0.006	-0.021
	(1.574)	(2.407)	(2.428)	(0.073)	(0.125)	(0.122)
Female dummy	-0.797	-4.357**	-4.305**	-0.028	-0.220*	-0.232**
	(1.139)	(2.133)	(2.094)	(0.056)	(0.119)	(0.114)
English dummy (1 if native language is	2.161	1.383	1.709	0.093	0.057	0.048
English)	(1.830)	(2.488)	(2.487)	(0.084)	(0.132)	(0.128)
Mother's education dummy (1 if attended	0.376	-0.230	-0.483	0.005	-0.016	-0.022
college)	(1.267)	(1.901)	(1.897)	(0.057)	(0.100)	(0.097)
Father's education dummy (1 if attended	1.051	0.104	0.315	0.064	0.012	0.018
college)	(1.199)	(1.736)	(1.706)	(0.053)	(0.093)	(0.089)
Live on campus dummy	-4.181*	-5.559	-6.465*	-0.147	-0.220	-0.281
	(2.525)	(3.716)	(3.643)	(0.106)	(0.184)	(0.172)
Household income dummy (1 if >	-1.339	-1.466	-1.366	-0.090*	-0.106	-0.091
$100,000)	(1.056)	(1.624)	(1.613)	(0.049)	(0.086)	(0.083)
Household size (number of members)	-0.662**	-0.595	-0.547	-0.025*	-0.019	-0.017
	(0.316)	(0.511)	(0.511)	(0.015)	(0.026)	(0.025)
Constant	75.598***	65.773***	65.551***	0.059	-0.527	-0.494
	(3.042)	(6.752)	(6.687)	(0.118)	(0.330)	(0.314)
Observations	284	279	279	284	279	279
R-squared	0.326			0.337		
Tests of endogeneity (Ho: variables are exogenous)						
Robust score or GMM C statistic chi2(1)		10.795	10.337		15.818	13.233
p-value:		0.001	0.001		0.0001	0.0003
Robust regression F(1,255)		11.008			18.784	
p-value:		0.001			0.0000	
Test of overidentifying restrictions:						
Score or Hansen's J chi2(5)		7.225	7.225		5.602	5.602
p-value:		0.406	0.406		0.587	0.587

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses.

Table 3: Business majors versus non-business majors

Dependent variable:			***Grade number***			
	Business/Sports mgmt.			**Other majors**		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**OLS**	**2SLS**	**GMM**	**OLS**	**2SLS**	**GMM**
Study hours dummy (1 if 2 or more study hours per week)	-3.215**	11.177*	10.175*	-1.119	0.194	3.138
	(1.424)	(6.547)	(6.143)	(1.693)	(5.637)	(5.867)
Economics major dummy				-2.419	-3.707	-4.220
				(3.030)	(3.137)	(3.289)
Construction/Aviation dummy				4.721**	4.748**	6.147***
				(2.085)	(2.095)	(2.040)
GPA 2.8 dummy (1 if GPA=2.8 or higher)	5.560**	5.394	4.737	4.797**	5.164**	5.663**
	(2.659)	(3.568)	(3.139)	(2.264)	(2.578)	(2.503)
GPA 3.5 dummy (1 if GPA=3.5 or higher)	8.873***	7.511***	8.048***	7.376***	7.429***	8.671***
	(1.447)	(1.977)	(1.833)	(1.812)	(1.868)	(1.851)
Hispanic dummy	2.717	0.682	0.427	3.731	3.257	2.694
	(2.190)	(3.022)	(2.979)	(2.287)	(2.348)	(2.400)
Female dummy	-0.729	-2.560	-2.655	-0.279	-0.801	-1.157
	(1.490)	(2.058)	(1.784)	(2.045)	(2.202)	(2.284)
English dummy (1 if native language is English)	1.197	-2.217	-1.747	3.459	3.624	3.720
	(3.185)	(4.536)	(4.486)	(2.453)	(2.458)	(2.418)
Mother's education dummy (1 if attended college)	2.667	2.453	1.717	-2.308	-2.612	-3.202*
	(1.869)	(2.335)	(2.210)	(1.639)	(1.736)	(1.702)
Father's education dummy (1 if attended college)	-2.597	-3.939*	-2.965	5.328***	5.087***	4.566***
	(1.622)	(2.184)	(2.021)	(1.670)	(1.667)	(1.633)
Live on campus dummy	-6.264	-8.533	-12.799**	-3.120	-3.543	-1.619
	(4.455)	(6.114)	(5.299)	(2.815)	(2.773)	(2.788)
Household income dummy (1 if > $100,000)	-1.235	-1.121	-0.917	-1.452	-1.762	-1.376
	(1.553)	(1.951)	(1.748)	(1.604)	(1.680)	(1.684)
Household size (number of members)	-0.646	-0.800	-0.462	-0.524	-0.535	-0.536
	(0.436)	(0.637)	(0.550)	(0.521)	(0.575)	(0.595)
Constant	77.032***	75.668***	75.918***	71.520***	70.800***	69.806***
	(4.247)	(4.821)	(4.530)	(4.899)	(7.370)	(7.453)
Observations	154	151	151	130	128	128
R-squared	0.353			0.371	0.375	0.322

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses.

Table 4: Female students versus male students

Dependent variable:	Grade number					
	Females			**Males**		
VARIABLES	(1) OLS	(2) 2SLS	(3) GMM	(4) OLS	(5) 2SLS	(6) GMM
Study hours dummy (1 if 2 or more study hours per week)	-5.680***	2.049	-1.948	-0.953	15.366	17.661
	(1.747)	(7.294)	(6.194)	(1.356)	(11.013)	(11.352)
Economics major dummy	-3.833	-9.219	-11.405**	-2.498	-1.813	-1.262
	(4.929)	(6.321)	(5.000)	(3.438)	(5.367)	(5.550)
Business/Sports Mgmt. dummy	-2.870	-2.098	-2.685	0.786	1.997	2.179
	(2.238)	(2.736)	(2.516)	(1.448)	(2.198)	(2.284)
Construction/Aviation dummy	-1.946	-3.325	-2.121	7.730***	7.805***	8.368***
	(3.804)	(4.841)	(4.292)	(2.011)	(2.833)	(3.009)
GPA 2.8 dummy (1 if GPA=2.8 or higher)	11.031***	11.212**	11.288***	3.659**	4.832**	4.751*
	(3.646)	(4.393)	(3.789)	(1.666)	(2.423)	(2.503)
GPA 3.5 dummy (1 if GPA=3.5 or higher)	7.618***	8.515***	8.658***	7.838***	6.063**	5.965**
	(1.786)	(2.091)	(1.865)	(1.446)	(2.407)	(2.476)
Hispanic dummy	4.882*	3.775	5.050	1.921	-0.580	-0.836
	(2.602)	(3.445)	(3.169)	(1.917)	(2.830)	(2.950)
English dummy (1 if native language is English)	3.997	2.728	3.345	2.396	2.194	2.387
	(2.682)	(3.192)	(2.875)	(2.336)	(2.527)	(2.726)
Mother's education dummy (1 if attended college)	1.220	0.480	-0.266	-0.885	-1.291	-1.408
	(2.211)	(2.429)	(2.051)	(1.510)	(2.232)	(2.394)
Father's education dummy (1 if attended college)	0.236	-0.191	1.656	2.718*	2.171	2.402
	(2.172)	(2.513)	(2.204)	(1.415)	(1.948)	(2.020)
Live on campus dummy	5.714	5.679	7.414	-8.979***	-10.108***	-10.446**
	(4.641)	(5.904)	(5.308)	(2.853)	(3.786)	(4.043)
Household income dummy (1 if > $100,000)	-1.894	-1.056	-2.613	-1.915	-3.231	-3.024
	(1.822)	(2.475)	(2.049)	(1.265)	(2.108)	(2.221)
Household size (number of members)	-0.320	-0.579	0.039	-0.904**	-0.587	-0.607
	(0.558)	(0.711)	(0.583)	(0.395)	(0.680)	(0.718)
Constant	71.501***	66.279***	68.664***	76.514***	67.414***	66.044***
	(6.132)	(7.671)	(6.917)	(3.848)	(8.301)	(8.685)
Observations	100	96	96	184	183	183
R-squared	0.494	0.403	0.473	0.338		
Tests of endogeneity (Ho: variables are exogenous)						
Robust score or GMM C statistic chi2(1)		1.802	0.451		6.140	6.047
p-value:		0.180	0.501		0.013	0.014
Robust regression F(1,255)		1.584			5.757	
p-value:		0.212			0.018	
Test of overidentifying restrictions:						
Score or Hansen's J chi2(5)		8.286	8.286		6.142	6.142
p-value:		0.308	0.308		0.523	0.523

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses.

Exploring Inefficiencies in the U.S. Legal System

Anthony Pappas[*]

ABSTRACT

While economists have analyzed and helped reform Wall Street and the Health care system, less attention has been devoted to the legal system of the United States. Inefficiencies and inconsistencies are explored and solutions proposed with regard to the following areas and others:

A. Expanding the number of Supreme Court justices

B. Court delays have gotten so long that they can be deemed unconstitutional according to a recent lawsuit.

C. Vague laws enacted by Congress result in the Judiciary branch writing laws rather than interpreting them. Without clear legislation, the Judiciary then develops "case law". Confusion and ambiguity can abound.

INTRODUCTION

When the decision to overthrow the Articles of Confederation was decided by the elite group now known as the "Framers of the Constitution" and to replace it by a new Constitution, the members of the Constitutional Convention had to sell their new framework in order for it to be adopted. As laid out in Article 7 of the Constitution: The Ratification of the Conventions of Nine States, shall be sufficient for the Establishment of this Constitution between the States so ratifying the same.

The debates were acrimonious, but very fruitful from the point of understanding the intentions of the framers. While its contemporaneous influence is dubious at best, one of the best collections of arguments in favor of the Constitution is now known as the Federalist Papers. In Federalist No. 78, Alexander Hamilton explains the place of the judiciary in the system of checks and balances in this way:

The Executive not only dispenses the honors, but holds the sword of the community. The legislature not only commands the purse, but prescribes the rules by which the duties and rights of every citizen are to be regulated. The judiciary, on the contrary, has no influence over either the sword or the purse; no direction either of the strength or the wealth of the society; and can take no active resolution whatever. It may truly be said to have neither FORCE nor WILL, but merely judgment; and must ultimately depend upon the aid of the executive arm even for the efficacy of its judgments.

While Hamilton's thinking towards the constraints on the judiciary may be overly optimistic, there is nothing to contravene the substance that the judiciary is a branch unlike the other two. For one, though this has been practically exposed as false, the judiciary likes to fashion itself as impartial and above politics. As such, there is no overt political wheeling and dealing by the judiciary in exchange for actions from the executive or legislative branches. Indeed, the judiciary seems to be incapable of taking any action whatsoever regarding its own operation. Given that the judges are a group of ubermensch supposedly

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capable of policing their own susceptibility to bias, there is no real mechanism of oversight that allows for scrutiny as to whether the judicial branch is able to fulfill its constitutional requirements and whether any changes can be made to rectify any shortcomings that hinders its accomplishing such. There is no Judicial Accountability Office or Judicial Inspector General to serve as a nonpartisan overseer of the effectiveness of the judicial branch in discharging its responsibilities.

The third branch of government is rarely subjected to analytical scrutiny from the standpoint of efficiency. What grade would it receive in terms of providing services, delivering justice, and serving the citizens? While Wall Street and the health care system have been criticized and reforms enacted, nothing comparable has happened to the legal system.

This lack of serious reflection of changes to the judicial branch organization and operation is a serious problem as the judicial branch is one of the primary intermediaries whereby the citizenry (which currently includes the abstract legal entities of corporations) interact with the government, besides voting. As will be discussed below, the judicial branch is responsible for interpreting the opaque, circuitous writing of legislation into real world application. Inefficiencies in the judicial branch can have far reaching economic and social consequences as the citizens are left unaided in their attempt to understand and to comply with the will of the Congress and President.

For example, unable itself to sufficiently address the problem, the judiciary at all levels suffers from more cases than it can handle. If an industry sues the government claiming that it is exempt from a certain regulation, currently, it can be many years before any clarity is obtained. Until that clarity is obtained, everything related to that regulation vis a vis the industry is effectively placed on hold. Indeed, a lawsuit was filed in Manhattan Federal Court on May 11, 2016, because the court delay for people charged with minor infractions was so great that the lawsuit alleges that the Constitution right to a speedy trial was infringed upon. Since the New York State's own speedy trial statute calls for prosecutors to bring misdemeanor cases to trial within 60 to 90 days of arraignment, it seems that the suit should succeed prima facie because the average wait for a jury trial is 827 days in the Bronx and 558 days in Queens.

Furthermore, the judicial system, particularly the Supreme Court, is becoming overburdened by the realization of its apparent powers. It does not hold the sword or the purse, but it does hold the scales by which everything is measured according to the relatively unchanged Constitution that was ratified so many years ago. As such, judicial review has become a new political weapon. People are no longer satisfied with what the case law has established as the general meaning of a law; the people now demand and suppose themselves wholly within their rights to hold the legislative and executive branches to account by demanding that the laws issuing from those two branches are "constitutional".

This explosion of challenges to long established case law and judicial precedents has been energized by the not covert lack of any pretense of objectivism by the justices of SCOTUS and the not covert signaling from certain justices that long established case law and precedents can currently be reconsidered. Indeed, the project to totally rewrite previous case law hangs on a single justice, as evidenced by the Senate

declaring the effective responsibilities of President Obama to nominate judges over after three years into his second term as President.

It cannot be overstated the gravity and weight that the founders placed on the ability to hold political appointees such as Congressmen and Presidents to account by the vote. Rather than serving as a goad to immunize a SCOTUS justice from influence, the lifetime appointment has now been realized as a way to have an unelected official influence important policy for the duration of their lifetime appointment.

So, the judicial system is in the midst of radical cultural change; unable, so far, itself to change. The judicial branch was said by Hamilton to be the vessel and judgement, nothing more and nothing less. Insofar as one believes that an objective reality or interpretation of words can be agreed upon by a group of rational individuals, how does one rectify the current situation? As the ambit of the judicial branch has increased in proportion to the legislation covering the various aspects of civilization in the United States, there has been no commensurate increase in the capacity of the judicial branch to accommodate this increased role.

HISTORICAL NUMBER OF JUSTICES ON THE SUPREME COURT

At the apex of the legal system one finds the Supreme Court of the United States (SCOTUS). Starting with the principles enumerated in Article III of the Constitution, the framework of the court system has evolved over time. The Judiciary Act of 1789 specified one chief justice and five associate justices for the Supreme Court. The Judiciary Act of 1801 was called "an act to provide for the more convenient organization of the courts of the United States." It doubled the number of circuit courts from three to six and reduced the number of justices on the Supreme Court from six to five. Thomas Jefferson and his allies repealed the Judiciary Act of 1801 and the number of Supreme Court justices went back to six with the Judiciary Act of 1802.

The number of justices ranged up to ten in 1863 and was set at nine in 1869 and has remained at that number since then. Under the New Deal administration of President Franklin Delano Roosevelt one sees the last major attempt to change the size of the Supreme Court. In his first term, several of Roosevelt's proposals were struck down as unconstitutional. After his overwhelming reelection in 1936, in 1937 Roosevelt proposed expanding the number of justices up to fifteen. The proposal was quickly criticized as "packing the Supreme Court" and it failed. Thus, in a changing world, the number of Supreme Court justices has been frozen at nine since 1869.

THE SUPREME COURT HAS BECOME INACCESSIBLE

While an inspired citizen might proclaim: "Watch out or I'll take my case all the way to the Supreme Court", the reality is starkly different. SCOTUS is virtually inaccessible to all citizens. Is this what the Founding Fathers intended as they drafted the Constitution?

Permission to take cases to the Supreme Court is obtained largely through writs of certiorari. Roughly 10,000 petitions for a writ are filed annually and about one percent are granted. Understanding that the odds of getting Supreme Court review is minimal, thousands of litigants do not even make the effort.

We have a situation where roughly 80 to 100 cases were typically handled each year in the 19th century by SCOTUS and about the same number is handled today in the 21st century. The population of the U.S. has grown from 4 million in 1800 to about 320 million today. The body of laws, their scope and complexity, have also expanded enormously. Can nine justices in the 21st century handle the potential workload compared with anywhere from 5-10 justices in the 19th century? Does anyone even recognize the problem that justice may be denied to many citizens? Where is the Chief Justice of the Supreme Court who will cry out: "Help! We need more justices to do our job properly."?

Indeed, closer analysis of which cases among the 1% that get a writ of certiorari reveals that other biases and obstacles come into play and the odds for the average litigant or citizen are even less than 1%.

Significant information on this issue is provided in the Reuters Investigative Report titled "The Echo Chamber". The Report concludes that in order to get a case before SCOTUS, the odds are improved if one employs an attorney in an "elite group" of law firms. Hiring a random attorney or filing pro se reduces the odds below 1%. Hiring an attorney from the "elite" as identified in the Report is better since the "elite" get writs at a rate about five times greater than the average, run-of-the-mill lawyer. What are some of the characteristics of the "elite" attorneys? They served as law clerks in SCOTUS or other federal courts, formerly were judges, or served at the highest levels in the U.S. Department of Justice. Who can employ the "elite" to try to take a case to the Supreme Court? Corporations, of course. In addition to legal fees, which may be unaffordable for the average citizen, SCOTUS imposes other procedural obstacles including requiring that writs and briefs be printed in booklet form, which entails additional printing costs.

OPTIMUM NUMBER OF JUSTICES

A baseball team puts nine players on the field. When a season starts, a team can anticipate there will be injuries, disabilities, and other unforeseen circumstances. Therefore, teams have a roster of up to forty players for these eventualities. The recent death of Antonin Scalia has resulted in partisan wrangling over his replacement and the Court has been functioning with eight Justices. In a recent immigration case appealed from a circuit court, the outcome was a 4-4 tie.

A nominal increase in the number of justices to eleven or twelve would allow for deaths, illnesses, and other eventualities. Panels of nine justices would still decide cases with rotation onto the panels from the entire roster. The number of cases reviewed annually by SCOTUS could also increase marginally.

What could be accomplished with a substantive increase in the number of justices to some number like 50? The possibilities become mind-boggling. Of course, raising the number to 50 is not coming close to keeping pace with population increase since 1800. But with 50 justices and nine-member panels, SCOTUS could review almost 600 cases a year rather than 80-100. One can also increase the number of cases reviewed by switching to seven-member panels for each case rather than nine. One could also site SCOTUS in more than one location in a decentralization move. SCOTUS could work out of Denver, San Francisco, or even the "cloud" as oral arguments take place via Skype.

One could also argue that the present-day judicial system has resulted in the apotheosis of individual Supreme Court justices. A single "swing" vote of a justice can be determinative of a significant policy issue and override the desires of both houses of Congress, the President, and the majority of the citizenry. Since Supreme Court justices are like Crown Princes, philosophical idiosyncrasies of an individual Justice in terms of judicial philosophy become important and part of the appointment process. The stature of individual justices will inevitably diminish with a larger overall number. One could also conceive of a Supreme Court with more than one Chief Justice. As indicated, the possibilities become mind-boggling.

VAGUE LAWS CREATE AMBIGUITY AND JUDICIAL "INTERPRETATION"

Under our system of government, the Congress passes the laws and the President either approves them or vetoes them subject to the override of the veto. It then falls to the Judiciary branch to "interpret" the laws. Without clear legislation, the Judiciary then develops "case law" and fills in what the statute should mean. For many, this means the Judiciary is actually usurping the roles of the other two branches.

Let's take the landmark Sherman Anti-Trust Act of 1890. The Sherman Act says something like: Any monopoly or attempt to monopolize shall be deemed a violation of the law. In terms of economic analysis, the law is basically devoid of substantive economic meaning. What is a monopoly? How does one define the market? What percentage of the market constitutes a monopoly? How close to 100% does it have to be? What about substitute products? How are those handled? Students of the anti-trust field can cite numerous cases where the courts have tried to provide some answers to these questions.

How about attempting to monopolize? If a small firm is acquiring another small firm, can't one argue it is trying to monopolize? Well, not if it is Exxon merging with Mobil Oil co. The firms may be trying to become efficient. Or they are becoming a behemoth that is not a total monopoly.

A logician can come up with other anomalies. Case law has developed the concept of a "good" monopoly. Uh-oh, a monopoly is OK if it has developed an innovative, superior product that garners a monopoly of the market. Where does one find this in the Sherman Anti-Trust Act? But then a "good" monopoly becomes "bad" if it exercises the market power derived from being a "good" monopoly.

Certainly, the Legislative and Executive branches bear responsibility for enacting vague laws and not updating them, but from the standpoint of the citizen, the system can be viewed as inefficient and illogical.

Putting aside the prodigious human imagination, an increase in the number of Supreme Court justices and an institution of panels of random judges to hear various cases has the ability to restore some objectivity and standardization to SCOTUS rulings. If the litigants cannot be assured as to the composition of the panel hearing their case, it makes less sense to engage in the expensive process of bringing a case that ultimately needs to be decided by SCOTUS if winning your argument chiefly rests on convincing judges to overlook reason and make a judgement obscured by the cumulonimbus of their "nonexistent" bias. Cases will more likely be brought to SCOTUS where a serious and substantive argument sustains itself in the light of objective scrutiny. Currently, cases can be brought by litigants without any substantive difference from previous cases or rulings, except that the composition of the Court is viewed as favorable to interpret the

reused argument in a different, favorable manner. If one cannot be assured of who exactly will ultimately hear the SCOTUS case, it makes no sense to re-litigate a case unless a compelling, novel legal argument can be put forward. What immediately comes to mind are the various voting rights cases that have flooded the system since SCOTUS eviscerated the Voting Rights Act, contravening the "objective" finding of SCOTUS that racial discrimination suffered extinction sometime in the Anthropocene.

Indeed, Whole Woman's Health vs. Hellerdstedt has heralded the return to the judiciary of the commonsense notion that a legislature conspiring to discriminate obfuscate when explaining its motives. It has been well remarked upon that previously, though lacking any real conviction, legislatures would present speciously false reasons for why a certain law that would abridge the rights of citizens was passed. Previously, the judiciary deferred to the legislatures, i.e., the legislature that enacted discriminatory policies would lie to the court as to the real motivations behind the policy, but the court would accept the legislature's stated intention rather than examining the actual effect. Whole Woman's Health vs. Hellerdstedt marked a change in sentiment. So, as has recently been seen, changes to voting rules enacted by legislatures have been struck down around the country as discriminatory. Who would have thought that barely fifty years since the horrid events that paved the way for the Voting Rights Act and other non-discriminatory measures, the same discriminatory behavior is again being brought before the courts. What changed that invited these changes to voting rules? The laws? Circumstances? No. Only the composition of the nine member SCOTUS changed. The composition of SCOTUS changed such that these legislatures envisioned a favorable hearing of their specious reasons. So why are they being struck down instead? Again, the composition of SCOTUS has changed since the laws were enacted. The judicial system should not function in such a way.

How can remedy be made? As remarked previously on the optimum number of SCOTUS judges, judicial interpretation that changes based on changes to the composition of a judicial panel is not a satisfactory bedrock to lay the foundations of a society of rule of law. Furthermore, with businesses everywhere invoking "uncertainty" in regulatory or tax environments as a burden on business, it would seem wise to have a system that provides greater stability. A significant increase in the number of SCOTUS judges, together with a change in the way cases are assigned and reviewed, can stabilize things and prevent re-litigation of decided law. It is not suggested that stare decisis is inviolable and precedent should not be overturned. But, the recent spate of voting restrictions coming on the heels of the "gutting" of the Voting Rights Act is an unfortunate example of having to re-establish through the courts that restrictions that burden a fundamental right such as voting are to be subject to considerable scrutiny by the courts.

Why would the proposed changes in SCOTUS produce the desired results? Because if it is a given that despite the new number of judges and the random assignment of cases, there should still be a core corpus of case law, it is likely that judges would be less likely to introduce idiosyncratic arguments or that singular idiosyncratic arguments would have an effect. Just like climate scientists as a whole agree that global warming is real because the science and experiments say so and there is no completely opposite interpretation, a large group of justices, even given a select group primus inter pares, will probably tend

towards views of law that all justices can agree on. If one seeks to establish an objective interpretation of statutes, if the number of colleagues one has to convince that such a reading is objective increases, one is more liable to rely on "objective" reason rather than some idiosyncratic argument that is unlikely to be viewed as following strict reason. Indeed, currently all the justices need not agree on why they all come to a certain conclusion about a law. Thus, in a 5-4 split, one justice can give a completely singular interpretation of a law that happens to be the deciding vote in favor of the majority, despite not agreeing with the majority on why the case should be decided as such.

Further, careful thought must be given towards expanding the judiciary to adapt to the increased caseload that it has been experiencing. In the current political environment such change will be hard to effect, but it is necessary; justice demands it. A novel adjustment towards making the trial process more efficient might be empaneling juries to hear multiple cases instead of choosing a new jury for each case. Grand juries can serve as a model for this, except, in this case, the jurors will decide the outcome of trials. Such a change will take a lot of experimentation to have it meet the constitutional requirements, but it deserves examination. As every law school graduate is aware, "justice delayed is justice denied."

REFERENCES

"Constitution of the United States of America: Analysis and Interpretation." *Congress.gov*. Accessed 2016 August 29.

Greenhouse, Linda. "The courts begin to call out lawmakers." *The New York Times*. 2016 August 18.

Greenhouse, Linda. "The facts win out on abortion." *The New York Times*. 2016 June 27.

Hamilton, Alexander. "Federalist No. 78: The judiciary department." *Congress.gov*. Accessed 2016 August 29.

Hasen, Richard L. "Turning the tide on voting rights." *The New York Times*. 2 August 2016.

Lemieux, Scott. "Republicans keep trying to block black votes. That's why fair judges are crucial." *The Guardian*. 2016 August 1.

Pappas, Anthony. "Expand the number of justices on Supreme Court." *Harrison Rising* [Westchester, NY], 2016 May 13, p. 3.

Small, Eddie. "Court delays in the Bronx are unconstitutional, new lawsuit claims." *dnainfo.com*. 2016 May 11.

Stern, Mark Joseph. "Voting rights on the March: Lower courts are emboldened by a 4-4 split and the Supreme Court's abortion ruling to strike down specious voting laws." *Slate*. 2016 August 1.

Wan, William. "Inside the creation of a 'monster' law in N.C.: The GOP's bill evoked state's ugly history of blocking African Americans from voting." *The Washington Post*. 2016 September 2.

Wines, Michael and Alan Blinder. "Federal appeals court strikes down North Carolina voter ID requirement." *The New York Times*. 2016 July 29.

TINY HOMES: BIG CONCERNS

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INTRODUCTION

The past twenty years have seen a marked decline in home ownership in the United States. Currently, home ownership is at a 48-year low of 63.8% according to estimates by the Commerce Department.[1] The reasons why are wide-ranging, from increased debt due to student loans; to delays in getting married, as well as uncertainty about buying a home as an investment."[2] In the group of adults commonly called millennials, or those under the age of 35, is the added factor of difficulty finding jobs that pay enough to afford a home.[3]

Add to this mix, another reason: since 1973, the average square footage of houses has increased by over 1,000 square feet. According to the Census Bureau, the average size of a new home in 2013 was 2,679 square feet and the median size 2,491 square feet. Compare those figures to the 1973 average of 1,660 square feet and it becomes apparent that Americans' appetites for bigger and larger homes is out of control.[4] The growth in square footage translates to a doubling of living space per person.

Concomitant with the growth of square footage is the equally accelerating cost of purchasing a single-family home. As of July 2016, the median cost was $294,600.00 while the average cost was $355,800.00.[5] The national average to build a new home stands at approximately $125.00 per square foot.[6] Add to these figures a thirty-year loan, and the cost of a home with interest exceeds well over a million dollars.

One obvious outcome of the high price of housing is that 31% of adults between the ages of 18 and 34 are still living with their parents. Other plausible explanations also include the fact that this age group is staying in school longer and forming family/household relationships at a later age, usually in their 30's.[7]

Yet, the need for housing has not diminished; it has increased. The 2007-2008 financial crisis has made many homeowners worry about taking on mortgages that may become unaffordable if their mortgage is adjustable or if they lose their job. But the desire to own one's own home, as compared to renting is pervasive. In a 2014 survey conducted by Fannie Mae, it found that "90% of young renters were likely to buy a home at some point in the future" and that 21 percent were renting to prepare financially for homeownership."[8]

Enter the tiny house movement. In contrast to the desire to own thousands of square footage, tiny houses are around 400 square feet, and often built on a trailer and thus moveable. Usually the tiny house is a customized and compact living space at a cost below $100,000.00. This paper examines some of the cost comparisons to build and maintain a standard sized house as opposed to a tiny house. Additionally,

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the tiny house movement recognizes a demand for housing in impoverished areas, among the homeless, and for those seeking to make a smaller ecological footprint.

With the many advantages enumerated, what then are the disadvantages of the tiny housing boom? Interestingly, many communities ban the use of tiny houses. This paper examines some of the multitude of zoning regulations that make tiny house living next to impossible. The economic advantage of the tiny house is contrasted with the limits legal requirements place on their use. Zoning laws may restrict septic; the use of municipal water or a well; the minimum lot size that the house must be located upon; square footage mandates, and occupancy regulations. Each of these components of the zoning laws vary among municipalities, towns, counties and states making the laws a patchwork of varied and often conflicting regulations. The paper concludes with suggestions for how the legal restrictions might be challenged to allow the economic benefits to flow more freely.

THE TINY HOUSE MOVEMENT

Economic Considerations

A tiny house (micro home) is a dwelling structure defined as having a footprint of between 100 and 400 square feet. There are obvious advantages to both buying and owning a house with such a small footprint. First, the cost to purchase and own a tiny house is far lower than the cost and maintenance of a home in the United States. The chart below illustrates the cost in 2007 of owning a typical single-family home to be over $1,000,000.00.[9]

The Costs of Buying a Home Over 30 Years

	2007
Purchase Price (typical single-family home)	$290,000
Down payment	$58,000
Principal	$232,000
Interest @ 6.41%; total = $291,000 (after tax: 33% bracket)	$195,000
Taxes & Insurance ($6,000 / year)	$180,000
Maintenance ($300 / month)	$108,000
Major Repairs & Improvements	$300,000
Total Costs	**$1,073,000**

Note: 6.41% was the average mortgage-interest rate in 2006; the national median home price was $222,000.
Source: Office of Federal Housing Enterprise Oversight

When a homeowner moves to a tiny home, the major benefit is related to lower costs, which means a lower mortgage payment, if any, since some homeowners may be able to buy a tiny home without any mortgage. At one end of the tiny home spectrum are very small homes in the range of 11' x 9' that can be

built for $12,000.00 Larger finished tiny homes are upwards of $70,000.00. The typical finished tiny house includes a bathroom, kitchen, loft and cabinetry in its price, so it is basically furnished and built on a trailer. Additionally, tiny houses are also customized for the buyer, also increasing the pricing. Other costs associated with the tiny house not typically seen with a single-family dwelling are the cost of the trailer and its registration; a composting toilet; generator and solar panels. With a very high end tiny home costing in the range of $100,000.00, in comparison to a full-sized single dwelling, the overall expense is 2/3 less, a significant difference.

Lower mortgage payments are accompanied by significantly lower maintenance expense. Tiny homes are built with sustainability in mind, and so, with the smaller space also comes less to maintain. Furthermore, due to their lower value, it is quite likely that the tax burden of property and school taxes will go down since these taxes are based on assessed value of a property. To a younger person with no children choosing to live in a tiny home it will offer one of the greatest benefits of increased mobility allowing them to switch jobs easily. For an older family with no children, an additional benefit will be fewer possessions. It is usually not a problem to buy insurance coverage for tiny homes as long as they have a foundation and primary source of heat.[10]

Although homeowners may give up the tax advantage of interest paid on mortgages, having no/lower mortgage means a ripple effect across the economy as dollars become unencumbered, allowing consumers to then purchase goods and services otherwise unattainable. It is possible that this discretionary spending will increase revenue for local restaurants, movie theatres and other recreational facilities.

Tiny homes confer benefits to not only the homeowner but also society at large. The reduced energy use associated with a tiny house (914 kilowatts for a tiny home compared to 12733 kilowatts for a standard home)[11] protects the environment and saves valuable resources.

Societal Considerations

Tiny houses can also help to solve societal problems. In neighborhoods with homelessness and vacant lots, tiny houses offer a new neighborhood, often with shared gardens and community space while providing inhabitants privacy and dignity. For example, tiny house communities are being built to house the homeless. One such development arose in Seattle, Washington where 14 tiny homes were built on land that previously would have housed one single-family home. Unlike the tents that the homeless had been occupying, the tiny homes were insulated and regulated to ensure that residents had food and other social services.[12]

Other similar neighborhoods have been springing up in disparate communities across the country each with its own unique style of housing and community.[13] Tiny houses are also excellent tools for meeting the needs of communities suffering from sudden devastation, such as a hurricane, as they can be mobilized and transported easily.

Disadvantages of the Tiny House Movement

Tiny homes do generate many benefits to individual homeowners. However, if a significant majority embraced this lifestyle, the total impact on the community could easily offset the advantages enjoyed by individual homeowners. In most towns, property and school taxes are based on the assessed value of a property. It has been accepted that young families without children and the elderly with empty nests live in traditional homes that in turn subsidize schools and local services. Most view this subsidy as an obligation to bear for supporting education of the future generations. If the trend towards building tiny homes continues to gather momentum, tax rates may have to go higher to finance local school districts.

In addition, property taxes are routinely used for local road construction and maintenance, salary and benefits paid to local police and firefighters and maintaining parks and recreational facilities. These may also have to follow suit just like the school taxes. Since this movement is new, hard data is difficult to find. At this time, one can just try to make an educated forecast about the impact on the local economy.

The list of adverse effects on the local economy can be exhaustive. Homeowners of tiny homes may not need the services of landscapers or lawn mowing companies. Local branches of stores like Home Depot may also suffer a decline in their sales. In cases where winters are colder services of snow removal may not be needed either. Similarly, demand for plumbers and electricians may go down. All of these non-uses of customary labor could result in lost income streams for workers in those communities where the tiny house movement is more prevalent.

One of the biggest obstacles faced by the tiny house movement isn't concerned with cost or societal benefits, but rather with significant legal hindrances in the form of zoning laws.

Zoning regulations exist on state levels. Local zoning laws are then established at the town, village and county level. Since each municipality develops its own rules, there is no consistency across the United States, or predictability, of what zoning regulations would apply to a given situation. Zoning is typically concerned with whether or not a house must connect to septic, municipal water or a well; the minimum lot size that the house must be located upon; minimum square footage of the house, and occupancy regulations. As a result, zoning laws basically cover where a tiny house can be set down and occupied. Zoning should not be confused with building codes which set forth the minimum standards for how the house is built.

It is common for a municipality to require a minimum square footage for a house. Most tiny houses do not meet the minimum requirement, and therefore, they cannot be set down on most land and occupied. Not being able to permanently build a tiny house on a private piece of land due to zoning laws is perhaps the biggest obstacle to the tiny house movement. As a result, some owners make their tiny homes mobile by putting them on a chassis with wheels. They drive them around much like a recreational vehicle, staying in similar parks or private campgrounds for limited periods of time and then move again. National parks allow visitors to stay for a maximum of two weeks.

There are a number of places that are liberal, however, in their zoning laws. For example, Pulaski County, Kentucky allows a tiny house on wheels on one's own land. Aiken County, South Carolina also allows a tiny house on wheels as long as the lot is at least 2 acres in size and 50 feet from the road. Spur, Texas allows tiny houses on wheels on their own land as long as they are outside city limits. Other communities allow tiny houses to be located on property if there is a main house and the tiny house is a caregiver cottage; or a guest house; or a backyard cottage.[14]

There are also places that allow backyard parking, RV parking and tiny house communities. One website, Lillypadder, lists such communities. One example is "The Sanctuary, Minnesota" which describes itself as 80 privately owned acres with temporary space and limited amenities. Numerous communities are also springing up that offer "spaces" for tiny houses on a monthly rental basis, as well as other communities that sell permanent lots. Examples of these communities follow:

- *Arizona: LuxTiny Community in Pinetop-Lakeside is on 6 acres not far from Scott's Reservoir, Rainbow Lake and Show Low Lake. There will be 45 spaces for rent for $329-$359 per month.*

- *Colorado: Whispering Aspen Village in Fairplay is the start of a tiny house village sponsored by tiny house RV manufacturers. Lots cost $29,900 to $39,900.*

- *Georgia: Green Bridge Farm in Guyton, GA is a sustainable community that accepts tiny houses. A twenty-year-old organic farm is the centerpiece of the shared community space on this otherwise wooded acreage. One-acre lots are for sale for $30,000 and $40,000. Smaller lots are available for rent for $300 per month plus electricity.*

International communities are also starting to appear in Canada, New Zealand and the United Kingdom.

CONCLUSION

The tiny house movement is in its infancy, making future predictions about its viability difficult. All indications are that the movement has a strong economic incentive; that is, increased housing prices and declining employment opportunities, making less expensive housing a high demand commodity. The economic reality is that people under the age of 35 are mostly unable to purchase a single family home and that rent is also increasing at a steady clip. The tiny house will become a viable alternative to a cadre that is interested in more sustainable way of life and who cannot afford a $350,000.00 home. But for the movement to continue growing, changes must occur in zoning regulations that currently limit placing a tiny house on a private plot of land. It is likely that as more people become interested in purchasing tiny houses, pressure will be placed on lawmakers to ease restrictions and allow placement of these structures on private lots, despite their small footprint. With growing communities of tiny houses, more people will be able to afford housing that is both sustainable and ecologically beneficial to society as a whole. Who knows? Over time, tiny houses may become more valuable per square foot than larger homes as the tiny house movement grows.

ENDNOTES

1. Kusisto, L., "The U.S. Homeownership Rate Falls Again, Nearing a 48-Year Low", *The Wall Street Journal http://blogs.wsj.com/economics/2016/04/28/u-s-homeownership-rate-falls-again-nearing-a-48-year-low/*

2. *Id.*

3. Peralta, K. "Homeownership for Millennials Declines to New Lows," *U.S. News and World Report* (04/30/2014) *http://www.usnews.com/news/articles/2014/04/30/homeownership-for-millennials-declines-to-historic-lows*

4. Perry, Mark J., "*Today's New Homes are 1,000 Square Feet Larger Than in 1973, and the Living Space Per Person Has Doubled Over Last 40 Years*," AEIdeas (02/26/2014) https://www.aei.org/publication/todays-new-homes-are-1000-square-feet-larger-than-in-1973-and-the-living-space-per-person-has-doubled-over-last-40-years/

5. U.S. Census Bureau, "Median and Average Sales Prices of New Homes Sold in United States," @ *https://www.census.gov/construction/nrs/pdf/uspricemon.pdf*

6. *http://www.fixr.com/costs/build-single-family-house*

7. "New Report Finds a Major Shift Underway in Housing Demand," The Conference Board. (01/27/2016) *https://www.conference-board.org/press/pressdetail.cfm?pressid=6670*

8. Dietz, R. "A Suburban Place to Call Their Own," *U.S. News & World Report* (04/08/2015) *http://www.usnews.com/opinion/economic-intelligence/2015/04/08/millennials-still-want-to-own-a-home-in-the-suburbs*

9. Landes, L. "The Cost of Buying a Home Over 30 Years," *Consumerism Commentary http://www.consumerismcommentary.com/the-cost-of-buying-a-home-over-30-years/*

10. *Jonathan Totten, Allstate Insurance Agency, Owego, NY*

11. *http://www.aarp.org/livable-communities/housing/info-2015/tiny-houses-are-becoming-a-big-deal.print.html*

12. "This Village of Tiny Houses is Giving Seattle's Homeless a Place to Live," *https://www.fastcoexist.com/3055771/change-generation/this-village-of-tiny-houses-is-giving-seattles-homeless-a-place-to-live*

13. "Tiny Houses for the Homeless: An Affordable Solution Catches On," Charter for Compassion. *http://www.charterforcompassion.org/index.php/problem-solving/tiny-houses-for-the-homeless-an-affordable-solution-catches-on*

14. Tiny House Community @http://tinyhousecommunity.com/places.htm

Optimal Choices of Public-Private Partnerships: A Case Study of Wastewater Treatment Management in China

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ABSTRACT

This paper examines how the government chooses its optimal choices in the condition of risk sharing when it introduce a market mechanism---Public-Private Partnerships---into the public service supplies. Due to the insufficient investment in China's public sewerage infrastructure system, it was largely inadequate in meeting the growing demands for wastewater treatment. The poor infrastructure and growing demand has made China one of the most active markets for PPPs. A model is built up in this study and a successful case is illustrated after that. The paper found that with the increase of risk, the government will levy more taxes on the wastewater discharge plants and input more stable subsidies into the treatment plants. However, the government has more fiscal surplus if the risk increases.

1. INTRODUCTION

Public-Private Partnership is an important mode in the process of public service marketization reform and has been widely adopted in the world.

Since there is no standard global definition of precisely what the term "Public-Private Partnership (PPPs)" means. World Bank Group defines it as a formal contractual relationship: a long-term contractual arrangement between a public entity or authority and a private entity for providing a public asset or service in which the private party bears significant risk and management responsibility.[1]

In the White Paper of U.S. Department of the Treasury[2], it says that PPPs bring private sector capital and management expertise to the challenges of modernizing and more efficiently managing such as infrastructure assets. Under a PPP project, a government contracts with a private firm to design, finance, construct, operate, and maintain (or any subset of those roles) an infrastructure asset on behalf of the public sector.

The above descriptions can be seen in many institutional reports or academic journals, and PPPs have not yet formed a complete and coherent statement. However, from those definitions and explanations, we can find some common features: the first is the cooperation between the public sector and the private sector, which is the basic keyword in the premise of each concept; the second is the provision of public

goods or services, which is the main purpose of the cooperation; the third is the sharing of benefits, which means that both parties achieve an all-win result. The fourth is the risk allocation in the long-term partnership.

PPPs take a wide range of forms varying in the extent of involvement of and risk taken by the government and the private sector. According to Chinese government's regulations, there are in fact various types of cooperation between the public and the private, including Build-Operate-Transfer (BOT), Build-Transfer (BT), Build-Own-Operate-Transfer (BOOT), Build-Own-Operate (BOO) and etc..

In the field of wastewater treatment projects, the core idea of PPPs is that the losses caused by the act of pollution should be borne by the polluter, that is, the polluter should bear the full cost of controlling pollution and compensation for environmental damage, rather than part of the cost. The most common mode in wastewater treatment project is the BOT, which is reflecting the fact that most projects involve modifications or rehabilitation of existing facilities.

As an environmental economic instrument, the Pollution Charge System (PCS) has been widely implemented from 1979 in China. Since 1979, several laws in China called for the collection of sewage charges. The polluters should pay the pollutant discharge fees to the government. China began to deregulate the water sector in the 1990s, permitting private and foreign investment in water supply and sewage treatment infrastructure. However, the policy effect is not satisfactory because the pollution in China has not been effectively controlled and the environment is still continuously deteriorated. In 2015, the Chinese government carried on the reform of changing pollution charges into environmental taxes.

Due to the reduction of the local governments' revenues and the increase of the demand pressure on public goods, the introduction of private sectors become one of the government's options. In this research, we provide an optimal choices of PPPs model to explain how the government chooses its optimal option in the condition of risk sharing. Then we illustrate a successful PPPs case in the field of China's wastewater treatment.

This is followed by a literature review in Section 2. Section 3 explains the model and methodology employed in this study. A case study is described in Section 4. The conclusion is provided in the last section.

2.   LITERATURE REVIEW

Since British government put forward the concept of PPPs in 1990s, the theoretical research has gradually transferred from the cooperation between government and market into the long-term partnerships. New public management theory, transaction cost theory and new public service theory describe the role of the government in the partnership from the perspective of market competition, transaction cost management and citizen participation accordingly (David & Peter, 1998; Williamson, 1985; Robert & Janet, 2000).

According to the market-based approaches delivering public services, the relationship between government and the market is usually divided into three types: government involvement, government management and complete break (John & Albert, 2006).[3]

government involvement | government management | complete break

Low -> High

The Extent of Private Sector Participation.

Especially in the government-management type, the government and private sector maintain a peer-like relationship. The private sectors negotiate with the government about the contract instead of following the orders of the latter.

One of the ways to attract more investment from the private sector is to institutionalize a financial subsidy of the regional governments for private investors, which will hedge long-term financial risks. It is noted that most of the public utility services such as wastewater treatment do not usually generate sufficient revenues in the operation. It is usual for the government to provide financial subsidies as economic incentives for private sectors to be engaged in public utility projects.

In the perspective of public governance, the development of PPPs in China can be briefly divided into four stages : Exploration Period (from mid-1980s to end of 1990s); Promotion Period (from early 2000s to 2008); Stagnation Period (from 2008 to 2014); New Development Period (from 2014 to present.).

According to the Ministry of Environmental Protection, industrial wastewater discharges in 2014 were reported to be 20.53 billion tons.[4] As industrial water demands grow, so will pollutant discharge and therefore the need for treatment. The 2030 Water Resources Group predicts that annual growth of 3 to 7% in industrial water demand will mean similar growth in the need for treatment (whether water is to be discharged or recycled).[5]

In order to overcome such challenge, the Chinese government has striven to improve urban water services, especially in the field of wastewater treatment, by putting up a large sum of investment. The most common mode for wastewater projects in China is the BOT mode.

The BOT form of the concession, one of PPPs' modes, has been used to develop wastewater treatment management in numerous countries. A private firm bears the cost of building a project and then operates it for a certain period of time before finally transferring it to the government at no cost. "This is the fundamental attraction of BOT. It not only takes spending off the government's balance sheet but also brings in the commercial skills of the private sector both in identifying viable projects and in running them efficiently when they are built" (Walker & Smith, 1995, p. 16). Under BOT mode, the private sector or operator generally obtains its revenues through a fee charged to the government rather than tariffs charged to consumers. In other words, government adopting this mode has the advantage of delivering new infrastructure assets on

time and on budget. It can also mobilize new sources of capital to accelerate the development of projects, and introduce innovation and technology transfer from the private sector.

Due to the insufficient investment in the country's public sewerage infrastructure system, it was largely inadequate in meeting the growing demands for wastewater treatment. The poor infrastructure and growing demand has made China one of the most active markets for PPPs.

3. MODEL

In this section, we set up a model to analyze the optimal choices for the supervision authority, wastewater discharge plants（WDPs）and wastewater treatment plants (WTPs) when they join into the Public-Private Partnership.

3.1 GOVERNMENT

The government acting as the supervision authority enforces wastewater treatment regulation. It can be achieved in two ways: one is to levy different kinds of wastewater treatment tax to WDPs, which will increase the marginal cost of pollution-emission and reduce the product of the whole economy; the other is to transfer the tax to the WTPs as subsides. In that situation the government has function and constraints as below

$$\underset{\tau,P}{Max}\, \tau Y - T$$

$$s.t.\ P \leq \overline{P} \qquad (1)$$

Y is the output of WDPs' products. In this framework, since there is no consumer surplus, and the producer surplus equals the aggregate product, the welfare is the aggregate product. $\overline{P}$ is the pollution level the government regulates.

3.2 WASTEWATER-DIGCHARGE PLANTS

WDPs produce all products in this economy. In the process of production, they also discharge wastewater into the environment. The externality of pollution does not prevent the WDPs from emitting one certain amount of pollution without any payment (cost). In other words, WDPs use the clean environment as one production factor without payment. We assume the product market and factor market are competitive, and the aim of WDPs is to maximize their profits. The problem for pollution firms can be shown as below

$$\underset{K,L}{Max}(1-\tau)\cdot Y(K,L) - rK - wL \qquad (2)$$

Because of the externality of pollution, WDPs don't care about how much wastewater they discharge. They just care about how many production factors they should input in the process of profit-maximum. To guarantee the existence and uniqueness of the equilibrium, the production function $Y(K,L)$ is a constant

return on scale. Pollution can be thought as a by-product of WDPs or one production factor; thus, the pollution should be linear to production as below

$$P' = \gamma \cdot Y$$

(3)

And Y is a Cobb–Douglas production function as $Y = K^{\alpha} L^{1-\alpha}$.

3.3 WASTERWATER TREATMENT PLANTS

WTPs receive subsidies from the government and use them to control the pollution within the scope that the government requires. The reduction of pollution can be regarded as WTPs' production which requires the labor and capital from competitive factor market. WTPs can maximize their profit function as below

$$\underset{K',L'}{Max} T - rK' - wL'$$

(4)

$$s.t. \ P \le \overline{P}$$

$(P - \overline{P})$ is the pollution reduction. Meanwhile, it acts as the function of the constant return on scale. Since more pollution reduction requires more costs assumed by WTPs, WDPs have no incentive to reduce more pollution than $(P' - \overline{P})$ when they make agreements with government under the condition of receiving the fixed subsidies T. Thus the above problem can be shown as below

$$\underset{K',L'}{Max} T - (P' - \overline{P})(K', L')$$

(5)

We assume that $(P' - \overline{P})'_i(i) > 0$ and $(P' - \overline{P})''_i(i) < 0$. Based on the equation (3), we define $\overline{P} = \overline{\gamma} \cdot Y$, the coefficient $\overline{\gamma}$ can be thought as one proportion of the aggregate product of WDPs. The function of pollution reduction is $(\gamma - \overline{\gamma}) \cdot Y(K, L)$. Consequently, the aggregate capital ($\overline{K}$) and labor ($\overline{L}$) in the economy are $\overline{K} = K + K'$ and $\overline{L} = L + L'$, and $L = L' / (\gamma - \overline{\gamma})$

3.4 CONSUMPTION

$$\underset{C,L}{Max} \sum \beta^i U(C, \overline{L})$$

$$K_{t+1} = (1 - \tau) \cdot (wL + rK_t) - C + K_t$$

(6)

$$\overline{L} = L + L'$$

The utility function is $U(C,L) = LnC - B \cdot \overline{L}$.

3.5 OPTIMIZATION

The first order conditions of WDPs are:

$$(1-\tau) \cdot Y_K^{'}(K,L) = r \tag{7}$$

$$(1-\tau) \cdot Y_L^{'}(K,L) = w \tag{8}$$

According to the constant return on scale and condition of competitive factor market, WDPs have zero profits. In equilibrium, WTPs' profits are also zero. If WTPs have positive profits, new WTPs can enter into the section and will decrease the marginal output of production factors. On the other hand, if WTPs' profits are negative, some of them will leave the market, which leads to increase the marginal output. Both effects will reduce WTPs' profits to zero.

We can setup the Lagrangian operator to solve the government problem as below,

$$\underset{\tau,\overline{P}}{L} = (\tau \cdot Y - P + \overline{P}) - \lambda[\gamma \cdot (rK + wL)/(1-\tau) - \overline{P}] \tag{9}$$

We obtain the optimal tax rate for WDPs:

$$\tau^* = 1 - \gamma^{1/2} \tag{10}$$

The intertemporal first order condition of consumption:

$$1 = E[\beta \cdot (1+r) \cdot U_{C,t+1}^{'}(C,\overline{L}) / U_{C,t}^{'}(C,\overline{L})] \tag{11}$$

And the static first order condition is

$$w = E[U_t^{'}(L) / U_t^{'}(C)] \tag{12}$$

In this economy, the variables of steady state growth rate is zero, so $U_{C,t+1}^{'}(C,\overline{L}) / U_{C,t}^{'}(C,\overline{L}) = 1$. To guarantee the uniqueness of equilibrium, there is a necessary condition as below.

$$C = (1-\tau) \cdot (1-\alpha) \cdot Y \tag{13}$$

The steady states of all variables are shown as below.

$$r = 1/\beta - 1 \tag{14}$$

$$w = (\alpha\gamma/r)^{\frac{1}{1-\alpha}} \cdot r \cdot \frac{(1-\alpha)}{\alpha} \tag{15}$$

$$C^* = (\alpha\gamma/r)^{\frac{1}{1-\alpha}} \cdot r \frac{(1-\alpha)B}{\alpha(1+\gamma-\overline{\gamma})} \tag{16}$$

$$Y^* = (\alpha\gamma/r)^{\frac{1}{1-\alpha}} \cdot r/(\alpha \cdot B \cdot \gamma \cdot (1+\gamma-\bar{\gamma})) \qquad (17)$$

$$K^* = (\alpha\gamma/r)^{\frac{1}{1-\alpha}}/(r \cdot B \cdot (1+\gamma-\bar{\gamma})) \qquad (18)$$

$$L^* = 1/B, \quad L^{'} = 1/[B \cdot (\gamma-\bar{\gamma})] \qquad (19)$$

$$\bar{L} = \frac{(1+\gamma-\bar{\gamma})}{B \cdot (\gamma-\bar{\gamma})} \qquad (20)$$

Comparative Static Analysis

$$dC^*/d(\gamma-\bar{\gamma}) < 0, \quad dY^*/d(\gamma-\bar{\gamma}) < 0, \quad dL/d(\gamma-\bar{\gamma}) < 0$$
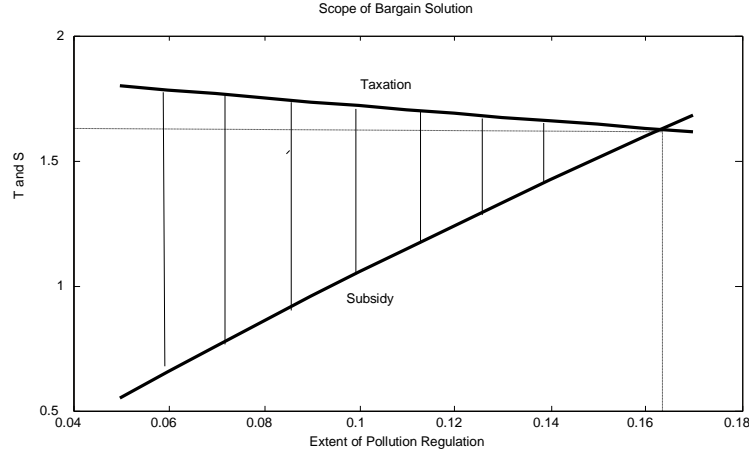
3.6 EXTENSION

The above analysis shows, the government has taxes $\tau \cdot Y^*(K,L)$, collected from WDPs and transfers T to WTPs which require the $\tau \cdot Y^*(K,L) \geq T$. That means the government can obtain the surplus gain, $\tau \cdot Y^*(K,L) - T$, through its fiscal behavior. This surplus gain is within one certain scope. The negotiation and bargain solution between the government and WTPs should lie in the scope

If total tax the government collects is $\tau \cdot Y^*(K,L)$, we can easily obtain $d\tau Y^*/d(\gamma-\bar{\gamma}) < 0$, which is decreasing the function of $(\gamma-\bar{\gamma})$. The government will obtain few taxes from WDPs if it wants to have more strict environmental standards. The comparative static analysis on subsidies and the pollution standards regulated by government $(\gamma-\bar{\gamma})$ shows $dT/d(\gamma-\bar{\gamma}) = d(\gamma-\bar{\gamma})Y^*/d(\gamma-\bar{\gamma}) > 0$, which means that the government has to pay more subsidies to WTDs if he wants to have one more strict environmental standard. According to the comparative static analysis and the condition of $\tau \cdot Y^*(K,L) \geq T$, there is a threshold value to the government's environmental standard $(\gamma-\bar{\gamma})$, and the value can be obtained through the solution of the $\tau \cdot Y^*(K,L) = T$. Thus we can have the threshold value as below:

$$(1-\gamma^{1/2}) = (\gamma-\bar{\gamma}) \qquad (21)$$

We use the coefficients to stimulate the scope of bargain solution and the threshold value as below:

Scope of Bargain Solution

The economy we analyze above is risk free. If there are some risks in the economy that WTPs have to confront, the government has to transfer more subsidies as incentive to WTPs and the scope of the bargain solution will change.

Under the risk condition (in here, we define the risk as the failure probability of PPPs projects), the public and private project having $\int_{\Omega} \omega \cdot dP(\omega)$ probability to succeed. If WTPs make an agreement with the government and receive subsidies, then they will face the problem as below:

$$\underset{K',L'}{Max}[T - (\gamma - \bar{\gamma})Y(K,L)] \cdot \int_{\Omega} \omega \cdot dP(\omega) - (\gamma + G - \bar{\gamma})Y(K,L)\int_{\Omega'} \omega \cdot dP(\omega) \tag{22}$$

A is a complete set, $\Omega \cap \Omega' = \varnothing$, $\Omega, \Omega' \in A$, $\Omega \cup \Omega' = A$. $G \cdot Y(K,L)$ is the penalty for WTPs paying to the government when the project fails. The government's problem is as below:

$$\underset{\tau,P}{Max}(\tau Y - T) \cdot \int_{\Omega} \omega \cdot dP(\omega) + G \cdot Y(K,L)\int_{\Omega'} \omega \cdot dP(\omega)$$

$$s.t. \ P\int_{\Omega} \omega \cdot dP(\omega) \le \bar{P} \tag{23}$$

The equilibrium solution in risk economy as below,

$$\tau^* = 1 - (\gamma \int_{\Omega} \omega \cdot dP(\omega))^{1/2} \tag{24}$$
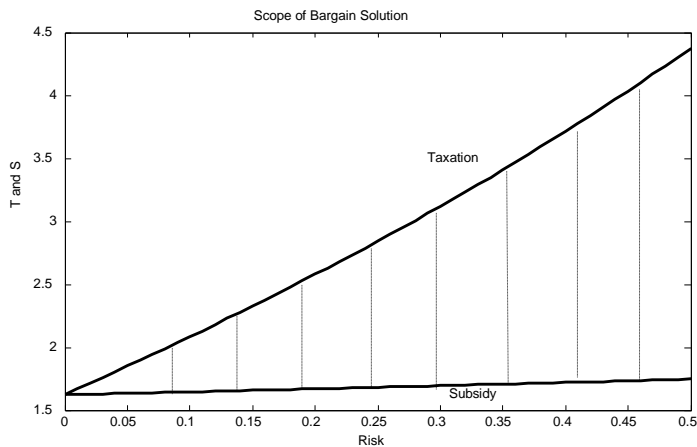
$$C^* = (\alpha\gamma / r)^{\frac{1}{1-\alpha}} \cdot r \frac{(1-\alpha)B}{\alpha(1 + (\gamma - \bar{\gamma})\int_{\Omega} \omega \cdot dP(\omega))} \tag{25}$$

$$Y^* = (\alpha\gamma / r)^{\frac{1}{1-\alpha}} \cdot r /[\alpha \cdot B \cdot \gamma \cdot (1 + (\gamma - \bar{\gamma})\int_{\Omega} \omega \cdot dP(\omega)] \tag{26}$$

$$K^* = (\alpha\gamma / r)^{\frac{1}{1-\alpha}} / [r \cdot B \cdot (1 + (\gamma - \overline{\gamma}) \int_{\Omega} \omega \cdot dP(\omega)] \tag{27}$$

$$L^* = 1 / B \,, \quad L' = 1 / [B \cdot (\gamma - \overline{\gamma}) \int_{\Omega} \omega \cdot dP(\omega)] \tag{28}$$

$$\overline{L} = \frac{1 + (\gamma - \overline{\gamma}) \int_{\Omega} \omega \cdot dP(\omega)}{B \cdot (\gamma - \overline{\gamma}) \int_{\Omega} \omega \cdot dP(\omega)} \tag{29}$$

The above chart shows how the government chooses its optimal option in the condition of risk sharing. In the point of risk zero, we assume that the government invests all taxes into the private WTPs. Obviously, with the increase of risk, the government will levy more taxes on the wastewater discharge plants and input more stable subsidies into the treatment plants. However, the government has more fiscal surplus if the risk increases. The chart shows one sub-optimal allocation in which economy has risk. In the future research, we hope to show a mechanism to get the optimal allocation in risk sharing economy.

4. A CASE STUDY OF SUCCESSFUL PPPs

In 1980s, China started the introduction of PPPs Mode and real practice of continuous exploration and innovation; there have been some relatively successful typical cases. However, most PPPs projects were based on bottom-up spontaneous exploration. They only confined to the project level and lacked institutional arrangements and theoretical guidance. Under the circumstances, in 2015, with the relevant departments and regional governments' recommendations, 13 PPPs infrastructure projects were elected by China's National Development and Reform Commission (NDRC) as the exemplary cases for interested parties' references. The Yangjiaxi Wastewater Treatment Factory Project in Hunan province was one of the cases operating successfully in wastewater treatment projects under PPPs mode.

In order to strengthen the construction of urban environmental infrastructure, protect the regional ecological environment and promote the economic development, the regional government decided to introduce a wastewater treatment project under BOT mode. It authorized the construction of the Yongding District Wastewater Treatment Factory project headquarter office to be responsible for the implementation of this project. The short-term wastewater treatment capacity of this project is 40,000m³ per day, the long-term capacity is 80,000 m³ per day, and the total investment is 67 million yuan.

The regional government set up a coordination group called the headquarter office of construction, which included 4 related bureaus of regional government. The office selected Hunan Shouchuang Investment Co., Ltd. (HSI) as the sole investor of this project by open tendering. The public bidding began in June, 2008. The latter then founded a project company for finance, construction, operation and facility maintenance.

The concession agreement on the BOT project between the company and the headquarter office set provisions on construction, operation and maintenance, as well as both parties' rights and obligations, breach clauses of contract and responsibilities for compensation. Negotiation on concession agreement was concluded in July.

This company provided wastewater treatment services within the 30-year concession period in exchange for treatment charges which are considered as government subsidies in the above model, then handed the intact facilities over to the regional government without reserve after the expiration of the concession period.

Due to the uncertain amount of wastewater to be treated within the operational period, a basic water amount was designed for this project, aimed at sharing this risk effectively with the government and social investment. In the case of water shortage, the government should pay the basic wastewater treatment charges in line with the basic water amount, and pay for the excess by 60% if the wastewater treatment factory treats more wastewater than the basic water amount. The project should be adjusted every two years according to the fluctuation in labor and electricity costs. The government should execute necessary procedures for examination and approval, and give a reply within a certain period of time.

The project was implemented with the main goal of improving the quality and efficiency of wastewater treatment services by means of social capital infusion, as well as advanced techniques and managerial experience, to deepen the reform of wastewater treatment marketization. Currently, this goal has been achieved.

5. CONCLUSION

The PPPs help the government to transfer the function from the main service provider to participate in the market microstructure. The Chinese government recently released a few notices of role-transfer from public goods providers to the projects regulators.

Still, there is an insufficient set of legal instruments retarding the further development of PPPs projects in China. A list of laws and regulations promulgated by different ministries and bureaus has been created to promote PPPs projects. It is crucial for the Chinese government to consider enactment of special guidelines for private investors in order to keep such momentum of the contribution. The complex structure of management reflects the fragmentation of responsibilities. It is maintained that some innovation has been introduced, but more time is needed to achieve some degree of institutional and regulatory reform in China. Since PPPs projects (including BOT ones) usually last over 20–30 years, it is essential for regional governments to provide investors with consistent policies and regulatory programs. For the implementation of a PPPs project, an open and transparent policy environment needs to be set up, and a coordination mechanism needs to be established to normalize the operation.

ENDNOTES

1. http://PPPs.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships

2 The White Paper was authored by Elaine Buckberg, Owen Kearney, and Neal Stolleman in April, 2015.

3. John and Albert questioned why the government was only allowed to use the traditional tools to provide public services.

4. Report on the State of the Environment in China 2014

5. ADB article on Sustainable Urban Development in the People's Republic of China, November, 2010. (www.adb.org/urbandev)

REFERENCES

Cooper, D.F., Grey, S., Raymond, G., Walker, P.. 2005. *Project Risk Management Guidelines: Managing Risk in Large Projects and Complex Procurements*. John Wiley & Sons, Ltd., England

Seungho Lee. 2010. Development of Public-Private Partnership (PPPs) Projects in the Chinese Water Sector. *Water Resources Management*. July 2010, Volume 24, Issue 9, pp 1925–1945.

Walker, C., Smith, A. (Eds.). 1995. Privatized Infrastructure: the Build Operate Transfer Approach. Thomas Telford, London, UK.

World Bank Group.http://PPPs.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships

John M. Kamensky, Albert Morales. *Competition, Choice, and Incentives in Government Programs.* Rowman & Littlefield Publishers, 2006. P9, P27-29, P73.

Report on the State of the Environment in China 2014. http://chinawaterrisk.org/resources/analysis-reviews/2014-state-of-environment-report-review/

ADB article on Sustainable Urban Development in the People's Republic of China, November, 2010. www.adb.org/urbandev

Elaine Buckberg, Owen Kearney, and Neal Stolleman. 2015. The White Paper: Expanding The Market for
    Infrastructure Public-Private Partnerships.