TRANSPORTATION AND PUBLIC UTILITIES GROUP

SESSIONS AT 2021 WESTERN ECONOMICS ASSOCIATION INTERNATIONAL - ANNUAL MEETINGS

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Virtual

Corresponding / presenting author in **bold**.

TPUG Session 1: Maritime Trade, Infrastructure and Effects

Chair: Wesley Wilson, University of Oregon

1. Port City Exports and Employment Growth: An IV and Inconsequential Units Approach to Quantify Local Trade Effects.
   Felix Friedt, Macalester College

   Abstract: Plagued by the endogenous, joint determination of local economic growth, capital expenditure, and trade the previous literature has produced a controversial set of estimates concerning the effects of infrastructure investment and exports on the regional economy. In this study, we combine the instrumental variables (IV) and inconsequential unit approaches to identify the causal effect of local sea- and airborne exports on port cities' economic development. Leveraging exogenous (`inconsequential') variation in out-of-state export origins and destinations to instrument for in-state export activity facilitated through the same U.S. port of exit, we find a robust and significant positive effect of locally handled exports on port city employment. The trade effects are similar for exports facilitated by seaports and airports when these are the only available infrastructures, but in cities with both types of ports the local export effects on port-city employment are: 1) non-complementary; 2) notably smaller; and 3) primarily driven by exports facilitated by local seaports.

2. Who Pays the Piper? Assessing the Incidence for Pass-through of Environmental Taxes In a Maritime Shipping Lab Experiment.
   Benny Mantin, U. of Luxembourg, Luxembourg Centre for Logistics and Supply Chain Management and **James Nolan**, University of Saskatchewan, Dept. of Agricultural and Resource Economics

   Abstract: Considering the importance of being able to develop policies to mitigate environmental externalities, the existence and degree of pass-through associated with externality taxation or pricing has been postulated to be strongly linked to the degree of market power possessed by the firm(s) being charged. The actual magnitude of this effect is poorly understood. We develop a detailed economic experiment that emulates the relationship between a monopoly carrier and a set of shippers. Experimentation also allows us to assess the effects of parameter variation across key determinants of environmental pass-through relevant to maritime shipping. We find that in this high market power situation, some limited pass through of the imposed environmental tax occurs, but its magnitude is far less than predicted. The latter may be a consequence of beliefs about individual fairness that can occur in experimental situations.
   Discussants: Felix Friedt, James Nolan

TPUG Session 2: Growth, Deregulation, Innovation and Congestion in Air Markets

Chair: Andreas Knorr, German University of Administrative Sciences Speyer

1. Empirical Investigation of Deregulation and the Airline Industry in the U.S.
   Byung Woo Kim KNUT, Korea

   Abstract: From our tentative review of empirical evidence for the change of economic variables around 1978 deregulation of airlines, we can infer something had changed slightly. We can summarize several implications. First, deregulation of airline industry in 1978 was associated with the change of AC curves. The exact causality is ambiguous. Second, deregulation was associated with the increase of output of airline firms in level and relative to MES of AC curves. Third, deregulation was associated with the change in profit-maximization behavior of airline firms with regard to cost-minimization choice.

2. Rethinking the Allocation of Slots at Congested Airports: A property rights prospective.
   Andreas Knorr, German University of Administrative Sciences Speyer and Alexander Eisenkopf, Zeppelin University Friedrichshafen

   Abstract: Air transport services cannot be provided without complementary ground and air-side infrastructures. In particular, capacity limitations of an airport's runway system create a major supply-side bottleneck for the delivery or air transport services. The right to use an airport's runway systems is contingent upon the availability of an airport slot which, on flight safety grounds, precisely defines the time period in which the aircraft movement (take-off or landing) is allowed to occur at the respective airport. Whenever slot demand exceed supply, an allocation procedure is required. However, worldwide, no market mechanism exists for the primary allocation of airport slots. Instead, allocation is based upon administrative procedures in accordance with the international guidelines of the International Air Transport Association's (IATA) Worldwide Airports Slot Group. The basic principle of slot allocation is the first come, first served rule. As long as airlines do use the slots allotted to them regularly (so-called 'use-it-or-lose-it-rule'), these will be automatically reallocated to them in the next scheduling period (so-called 'grandfathering'), creating a very effective entry barrier for newcomers to the respective airport. Only very few countries, e.g. the UK, permit airlines to resell excess slots on the secondary market. Evidence from these secondary markets –especially for slots at London's Heathrow Airport – clearly shows that the current slot allocation system has produced substantial scarcity rents to the benefit of the incumbent airlines at slot-constrained airports.
   The existing literature has focused on the potential anticompetitive effects and antitrust implications of alternative allocation schemes for capacity-constrained airports, in particular 'grandfathering' and secondary markets for slots. Our paper contributes to this literature by adding a property rights perspective to the analysis. Our starting point is that airlines are not legal (though nevertheless de facto) owners of airport slots (which are just a right-to-use which is temporarily conferred to them by a government agency). However, our analysis will not just address the antitrust implications of the existing slot allocation regime(s). In addition, we will assess, in a comparative manner, the potential effects on competition of reassigning (de facto) slot ownership from the incumbent airlines to the operators of congested, slot-constrained airport.

3. Analysis of Domestic Passenger Airfare in the U.S. Airline Industry.
   Neela Manage, Florida Atlantic University

   Abstract: The airline industry in the United States has gone through major structural changes in recent years. The objective of this paper is to empirically investigate the relationship between domestic passenger airfare of major U.S. airlines and factors such as origin-destination distance, number of passengers, market share of the airline, and quality variables. The econometric estimation utilizes quarterly data for several carriers for each of the top 1000 routes from 2000:Q1 to 2019:Q4.

4. The Great Aviation Patent Spike of 1910.
   Peter B. Meyer, U.S. Bureau of Labor Statistics

   Abstract: This paper shows new data on aeronautics and aircraft patents and publications in the 1880-1916 period and how these patents reflect the technological and industrial environment. At the beginning of this period, aeronautical research is done largely by scientists and hobbyists, not by firms, until a successful airplane design is established. A startup industry begins in 1908, followed by the World War I period when revenues came mainly from the military. The data here cover most of the aeronautics patents and publications globally throughout this period of great change. Numbers of patents and publications rise and fall together across France, Britain, the U.S., and Germany, which were the countries with the most filings. There was an enormous increase in aeronautics patents from 1906 to 1910, followed by a decline after 1911. This spike seems to have been driven by individual inventors entering the field not by experienced inventors with patents nor by airplane manufacturers. Airplane firms took on more ownership of patents during World War I.

Discussants: Peter Meyer, Neela Manage, ByungWoo Kim, Andreas Knorr

TPUG Session 3: Transportation Infrastructure

Chair: Momen Mousa, Louisiana State University

1. Jumbo Jets Lights of the Cities.
   Yuichiro Yoshida, Hiroshima University, Daiki Kawasaki, Hiroshima University and Gaku Ito, Hiroshima University.

   Abstract: This research estimate the impact of Jumbo jet also known as Boeing 747-100 (B747-100) on nightlights around the airports worldwide. We use fuzzy regression discontinuity design (RDD) with runway lengths just before 747 design was decided in 1965 as a running variable and its minimum required runway length as the cutoff. Treatment variable is whether an airport accommodated B747 in 1978. Outcome is nightlight brightness around the 625 world airports. We find that the treatment effect is significant, implying that the jumbo jet lights up the cities.

2. Evaluation and Cost Analysis of Cement-Stabilized Full Depth Reclamation of Asphalt Pavements in Hot and Humid Climates.

Momen R. Mousa, Louisiana State University, **Daniel Game** Louisiana State University and Marwa Hassan, Louisiana State University

Abstract: Cement-Stabilized Full Depth Reclamation (CSFDR) is a common rehabilitation method used by state agencies. Yet, several gaps exist in the literature regarding the field performance and cost-effectiveness of this treatment specifically in hot and humid climates. Therefore, the objectives of this study were to (a) assess the short-term and long-term field performance as well as the cost-effectiveness of CSFDR in Louisiana, and (b) develop simple regression models to predict the short- and long-term performance of CSFDR in hot and humid climates. To achieve this objective, 122 CSFDR and 141 mill and overlay projects were identified and collected from LaDOTD pavement management system (PMS) database. The field performance and cost-effectiveness of these projects were evaluated in terms of alligator cracks, rutting, random cracks and roughness. The results indicated that CSFDR projects outperformed mill and overlay projects in terms of alligator cracks, rutting and roughness. Considering pavement performance, CSFDR had significantly higher expected service life (in terms of time and traffic) than mill and overlay projects. However, it was observed that the development of shrinkage cracks is one of the key challenges with CSFDR. Furthermore, the cost-effectiveness analysis did not provide strong evidence that FSDR is more-cost effective than mill and overlay; hence, it is recommended that CSFDR should only be selected for projects when base failures exist. A simple regression model was developed with an acceptable accuracy to predict the service life of CSFDR treatment based on the project conditions. This model could be utilized by state agencies in hot and humid climate to plan for future maintenance and rehabilitation strategies.

3. Cost-Effective Restriping Strategies for Pavement Markings in Hot and Humid Climates.
   Momen R. Mousa, Louisiana State University and Marwa Hassan, Louisiana State University

Abstract: Meanwhile, previous studies showed substantial variability in the paint service life throughout the United States ranging between 0.25 and 6.2 years. Shortcomings in modeling the retroreflectivity of waterborne paints appear to significantly contribute to these variations as several studies predicted these values using degradation curves with a coefficient of determination (R2) as low as 0.1. Therefore, the objective of this study was to develop new cost-effective restriping strategies using 4-inch (15-mil thickness) and 6-inch (25-mil thickness) wide waterborne paints when applied on asphalt pavements in hot and humid climates. To achieve this objective, National Transportation Product Evaluation Program (NTPEP) data were collected and analyzed to evaluate the field performance of waterborne paints commonly used in Southern United States and to develop a decision-making model that may be used by transportation agencies to predict when to restripe their roadways. Results indicated that 4-inch wide standard paints exhibited service life between zero and four years depending on the line color, traffic and initial retroreflectivity, while 6-inch wide high-build paints had a service life of at least three years. Based on a life-cycle cost analysis, it was concluded that LaDOTD could restripe their district roads every three years instead of the current two-year period using the same product (4-inch or 6-inch wide) saving about $4.3 or $1.9 million, respectively, every year when restriping a 5,000-mile network.

Discussants: Daniel Game, Momen Mousa, Yuichiro Yoshida, Mostafa Elseifi

TPUG Session 4: Coal, Electricity and Energy

Chair: Sara Guffey

1. Environmental Policy and Market Concentration in the United States Coal Industry.
   Sara Guffey, West Virginia University and Shuichiro Nishioka, West Virginia University

   Abstract: Income inequality in the United States has expanded over the last several decades. Recent economic literature attributes this trend to increased market concentration by large and productive corporations (De Loecker et al, 2020; Autor et al, 2020). To better understand how and why the coal industry experienced the same concentration trend, we examine the EIA's transaction-level data (2008-2018) from Appalachian coal mines and combine it with hand-compiled mine parent company information. We find that while there are around 800 coal operating companies reported in the data, most of the operating companies are owned by a handful of corporations and individuals. Furthermore, over the period when the Obama administration tightened environmental regulations, mines owned by smaller firms were more likely to discontinue production. Our results suggest that this selective sorting is responsible for the increased market concentration of the coal industry.

2. Reducing Carbon Emissions: Progressivity of Carbon Fee vs Regressivity of Regulations.
   Paul Bernstein, NERA Economic Consulting, Makena Coffman, University of Hawaii at Manoa, Sumner J. La Croix, University of Hawaii at Manoa, Maja Schjervheim University of Hawaii, Sherilyn Hayashida, University of Hawaii

   Abstract: Regulators in the U.S. have overwhelming relied on command-and-control approaches to reduce emissions of greenhouse gases (GHG). This is in part due to public and political push-back against market-based mechanisms. Critics often cite concerns about negative impacts to lower-income households, but Metcalf (2019) argues that carbon taxation is progressive in comparison to other blunt regulatory approaches. Whereas the distributional impacts of carbon taxation are well-understood, there are few studies that dissect the distributional impacts of regulatory policy. Existing studies that show command-and-control regulations to have regressive outcomes (Davis and Knittel, 2019; Borenstein and Davis, 2016) are usually assessed independent of other carbon-reduction policies. The choice of how to reduce emissions has large implications for income inequality, especially with respect to the lowest- income households. This study contributes to this literature by comparing the distributional impacts of a Renewable Portfolio Standard (RPS) to carbon taxation using Hawaii as an illustrative case. Hawaii's ocean boundaries do not allow electricity to pass over state lines and this makes it easier to create a tractable economic system represented in a computable general equilibrium (CGE) model.

3. Do Peer Effects Impact Residential Solar PV Adoption?
   Christelle Khalaf, University of Wyoming, Gilbert Michaud, Ohio University, Athens

   Abstract: The literature on the determinants of residential solar energy investment has identified strong policy incentives and solar irradiation metrics as key drivers on why and where adoption takes place (Carley, 2009; Michaud & Pitt, 2019). However, latent factors such as social spillovers or peer effects might also play a significant role in spurring adoption, similar to what has been documented in a multitude of decision studies, ranging from new cell phone purchases (e.g.,

Bailey et al., 2019) to paternity leave uptake (e.g., Gordon et al., 2014), among others. In this paper, we add to the limited literature on the impact of peer effects on solar energy adoption (Bollinger & Gillingham, 2012; Graziano et al., 2019; Noll et al., 2014) by using Solarize programs as stimuli in driving residential deployment in Arlington County, Virginia. These Solarize programs are typically preceded by community educational workshops and other activities to mobilize interested adopters in an area, with certain households signing contracts and achieving cost reductions through the group purchasing mechanism. We identify household adopters of solar energy from these Solarize campaigns in Arlington County from 2014–2019, and then supplement this proprietary data with information on simultaneous and subsequent solar energy adopters. Since Solarize programs offer incentives (e.g., discounted pricing, easily accessible information on tax incentives and financing, and convenient access to qualified local solar installers) to those who participate, but otherwise have no direct impacts on their neighbors, we aim to provide a valuation of the role of peer effects on solar energy adoption of those neighbors. We compare results from a regression discontinuity design and a spatially lagged model. The higher comprehension of how this diffusion process expedites solar adoption has direct implications for designing efficient incentives.

Discussants: Christelle Khalaf, Sara Guffey, Paul Bernstein

TPUG Session 5: Automobiles and Travel 1

Chair: Hanna Hoover, University of Michigan, Ann Arbor

1. Nudges as Norms: Evidence from the NYC Taxi Cab Industry.
   Hanna Hoover, University of Michigan, Ann Arbor

   Abstract: Defaults have been shown to influence consumer decisions in a variety of contexts. However, it is unknown how consumers will react to a change in the presented default, in comparison to their introduction in the decision environment. There exists theoretical and empirical reasons to believe that consumers react differentially to changes rather than to levels. To answer this question, this research explores how changes in tip suggestions influence consumer behavior in a setting where consumers can use a suggested default or manually enter a tip amount. Using both timing of the payment screen installations and variation across taxis in the technology vendor, I identify how a five percentage point increase in the default tip percentages influence consumer tipping behavior. I find that higher tip suggestions result in an increase in tip amounts of approximately $0.57 per fare which translates to an increase in a cab drivers hourly wage by 5.35 percent. Furthermore, I demonstrate that passengers interpret the tip suggestions as indirect endorsement or information on the social norm on how much to tip. I discuss the policy implications of these results and how they are particularly relevant for low-wage workers in economies increasingly dominated by the service industry.

2. Nudging and Driving: An Analysis of Dynamic Message Signs in Virginia.
   Alexander Cardazzi, West Virginia University.

   Abstract: Traffic safety represents an important nationwide transportation issue. Car crash fatalities accounted for 1.4% of all deaths in the United States in 2017. Therefore, maintaining

safe roads is a top priority for all transportation departments. One tool used by transportation departments is Dynamic Message Signs (DMS). DMS convey traffic conditions and other information to motorists to increase attentiveness, reduce harmful behavior, and caution drivers of upcoming incidents. Previous research (Hall and Madsen, 2020) has found DMS can in fact increase the number of crashes on a highway by distracting drivers. I exploit plausibly exogenous variation in the message text displayed by Virginia's Department of Transportation's (VDOT) DMS to explain detailed speed and crash data along Virginia's Federal-Aid Highway System. DMS can display messages that 1) have one or more "slides" or "panels", 2) vary in length, and 3) vary in purpose such as a specific safety campaign slogan or generic travel times. Using a difference-in-differences methodology, I estimate the causal impact of these three dimensions of DMS messages on both traffic speed and number of crashes on highways in Virginia from 2017 through 2019.

3. Socioeconomic Impacts of Development-Induced Displacement and Resettlement: Case Study of the Da Nang - Quang Ngai Expressway, Vietnam.
Ghulam Dastgir Kham, Hiroshima University, Yuichiro Yoshida, Hiroshima University, Nguyen Thi Kieu Oanh, Hiroshima University.

Abstract: This research measures the impact of displacement due to the construction of Da Nang - Quang Ngai Expressway, Vietnam on households social and economic characteristics. We use fuzzy regression discontinuity design (RDD) with distance from a house to median of this expressway as a running variable and distance from construction boundary of expressway to median as the cutoff (35m). Treatment variable is whether a household relocates or not. Outcomes are income, expenditure, living condition, and social ties of households. The Da Nang - Quang Ngai Expressway goes through 12 districts of 3 provinces (Da Nang, Quang Nam and Quang Ngai). We choose randomly 1 district in each province to conduct a door-to-door survey with sample size 1750 households (about 650 treated and 1100 untreated). We expect to find out whether the road -induced displacement has made households better off or are impoverished and based on the results, the study will provide policy implications and recommendations for future development project.

4. Measuring the Willingness to Pay for Visiting Roadside Rest Areas (Mishi-no-Eki) in Japan and Exploring Factors Affecting Visitors' Willingness to Visit.
Amanollah Ataeey, Ministry of Urban Development and Land, Afghanistan, and Junyi Zhang, Hiroshima University.

Abstract: The Construction of highways and huge transport infrastructure brought social and economic benefits. However, these benefits are mainly going to urban areas and big cities. Smaller communities along the highways have not always received enough benefit from highway construction. The Japanese government in 1991 initiated Michi-no-Eki, which is providing economic and social activities for residents. In this study, we tried to estimate the demand function and factors affecting visitors' willingness to visit Mishi-no-Eki using individual travel cost method joint with Structure Equation Model (SEM) from a sample of 930 visitors. The estimated results show that respondents hold 6397.95 Japanese Yen surplus per visit. Meanwhile, SEM

results indicated that the local attachment and physical images were estimated to have the most significant correlation with respondents' visiting behavior.

Discussants: Alexander Cardazzi, Hanna Hoover, Hotak Nematullah, Ghulam Dastgir Kham

TPUG Session 6: Trade and Transportation

Chair: Felix Friedt, Macalester College

1. Search Frictions and Efficiency in Decentralized Transport Markets.
   Theodore Papageorgiou, Boston College, Giulia Brancaccio, Cornell University, Myrto Kalouptsidi, Harvard University, Nicola Rosaia, Harvard University

   Abstract: We explore efficiency and optimal policy in decentralized transport markets, such as taxis, trucks and bulk shipping. We show that in these markets, search frictions distort the transportation network and the dynamic allocation of carriers over space. We identify the sources of externalities, derive explicit and intuitive conditions for efficiency and show how they translate into efficient pricing rules or optimal taxes and subsidies for the planner who cannot set prices directly. Using data from dry bulk shipping, we find sizeable social loss and spatial misallocation of carriers. Optimal policy restores efficiency by favoring locations that are central in the trade network and might be preferable to centralization.

2. Highway Infrastructure and Firm Productivity.
   Saurabh Gupta, University of Oregon

   Abstract: Transport infrastructure is often conjectured to bring about specific benefits to the firms and industry. For firms, it increases market access, provides better alternatives for intermediate inputs, reduces trade costs, and helps improve overall firm productivity. For the industry, it increases market competition and reduces market power to induce more innovation and growth. In this paper, I test this conjecture at the intensive and extensive margin using firm-level data from a low-income country. I use a quasi-natural experimental method to test whether the introduction of a large national highway infrastructure project in India, the Golden Quadrilateral Project, has led to firm and industry-level productivity growth. To account for the effect on market power, I also record changes in intra-industry market-share reallocations. The econometric analysis covers data representative at the state level, over a period of twelve years 1998-2010. After accounting for population changes, literacy rate, availability of power, and other highway construction projects in a given state during the period of my study, my research provides evidence that investment in transport infrastructure showed no significant economic gains for firms or industry.

3. A Study of Grain and Soybean Export Flows: Uncovering their Determinants and Implications for the Future
   Tobias Sytsma Rand Corporation and **Wesley W. Wilson**, University of Oregon

Abstract: Ports are a critical feature in the logistics of international trade. In this paper, we develop and estimate a choice model in which importers of products choose the port(s) from which they receive imports from the US. This choice is made based on port level import prices and port attributes. We estimate the parameters of the model using data on global imports of US agricultural commodities between 2003 and 2017, US port attributes, and shipping costs. We use the results to calculate own- and cross-price elasticities for prices and port attributes as well as the willingness of importers to pay for improvement in port attributes.

Discussants: Felix Friedt, Theodore Papageorgiou, Saurabh Gupta

TPUG Session 7: Automobiles and Travel 2

Chair: Akshaya Jha, Carnegie Mellon University

1. Efficiency and Equity Impacts of Urban Transportation Policies with Equilibrium Sorting.
   Panle Jia Barwick, Cornell University, **Shanjun Li**, Cornell University, Andrew Waxman, University of Texas at Austin, Jing Wu, Tsinghua University, and Tianli Xia, Cornell University

   Abstract: We develop and estimate an equilibrium model of residential sorting with endogenous traffic congestion to evaluate the efficiency and equity impacts of urban transportation policies. Leveraging fine-scale data on household travel and housing transactions with home and job locations in Beijing, we jointly estimate residential location and travel mode choices and recover households' preference for the ease of work commute and other attributes of residential locations. Counterfactual simulations show that while different policies can attain the same level of congestion reduction, their impacts on residential sorting and social welfare are drastically different. First, a driving restriction intensifies income-stratified urban structure where high-income households live closer to subway and jobs. Distance-based congestion pricing reduces the spatial separation between residence and workplace across income levels, while subway expansion does the opposite. Second, residential sorting strengthens the effectiveness of congestion pricing in improving traffic conditions but undermines that of the driving restriction and subway expansion. Third, the driving restriction is welfare reducing as it leads to large distortions on travel choices. Congestion pricing improves welfare but is regressive, highlighting the need to recycle revenue to address the associated equity concern. Finally, congestion pricing and subway expansion exhibit complementarity and deliver the largest congestion relief and efficiency gain when combined. Revenues from congestion pricing can fully cover the capital and operating costs of the subway expansion.

2. Vehicle Owners' Corrective Behavior In Automobile Recalls in the US.
   Yong-Kyun Bae, Pusan National University.

   Abstract: In this paper we study vehicle owner behavior in response to automobile recalls in the US by examining recall data on recall correction rates. We seek to address three fundamental questions. First, do recall notification letters effectively lead to vehicle owners' corrective behavior? Second, do vehicle owners correctly evaluate the risks of their defective vehicles upon

recall issuance? Third, can we identify vehicle owners' behavioral differences in dealing with risks they face? We find that recall notification letters play an important role in raising correction rates, and that delivering them to the owners in a timely manner is vital to improve road safety. We find evidence that vehicle owners respond to riskier defects more actively. Heterogeneous vehicle owners behave differently: some owners immediately return their vehicles to get remedied and fixed, regardless of the risks their vehicles have, while others tend to procrastinate their corrective actions and respond to recalls only when the defects are risky.

3. Effects of Low Emission Zones on Air Quality, New Vehicle Registrations and Infant Mortality: Evidence from Japan.
   Shuhei Nishitateno, Kwansei Gakuin University and Paul J. Burke, Australian National University

   Abstract: This paper documents how a Diesel Vehicle Driving Restriction (DVDR) implemented in metropolitan areas in Japan improved air quality, and exploits this policy-induced reduction in pollution to estimate the causal effects of air pollution on infant mortality. We find that the DVDR led to a reduction in the mean annual suspended particulate matter (SPM) concentration of about 10% in designated areas on average over the years of implementation. Evidence suggests that the elasticity of infant mortality per 1,000 births with respect to SPM concentration is about 0.9. Together, we conclude that the DVDR saved about 2,800 infant lives in designated municipalities over the period 2003–2017. Our results are robust to variations in specification and sample.

4. Externalities of Policy-Induced Scrappage: The Case of Automotive Regulations.
   Connor R. Forsythe, Carnegie Mellon University, **Akshaya Jha**, Carnegie Mellon University, Jeremy J. Michalek, Carnegie Mellon University and Kate S. Whitefoot, Carnegie Mellon University

   Abstract: Determining the efficacy of transportation policies such as fuel economy standards and fuel taxes relies on understanding how the scrappage of used vehicles impacts total vehicle miles travelled (VMT). This paper provides the first estimates of the impact of scrappage on VMT by using variation in fleet size generated by the staggered removal of state-wide safety inspection programs across the U.S. from 1970 to 2017. Results from our first-stage difference-in-differences framework indicate that the removal of safety inspections causes a roughly 3% increase in vehicle registrations. Using a two-stage least-squares regression, we provide evidence that the elasticity of VMT with respect to fleet size is much smaller than one. Most prior work assumes that this elasticity is one, which results in substantial over-estimates of the benefits of externality-correcting transportation policy.

Discussants: Shuhei Nishitateno, Akshaya Jha, Yong-Kyun Bae, Shanjun Li