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SOUND OF FREEDOM TRILOGY:  
RESPONDING TO THE RISE IN HUMAN SEX TRAFFICKING  
FACILITATED BY DIGITAL PLATFORMS

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*Thesis Defense*

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*Submitted in partial fulfillment of the requirements for the degree of  
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## DEDICATION AND ACKNOWLEDGEMENTS

Six years ago as I threw off the bowline and set sail on my PhD journey, I anticipated the voyage ahead to be long, and perhaps stormy and lonely. Sure enough, I might not be entirely off base with my prediction. But as I am writing and getting close to the finish line of this race, I realize how pessimistically biased my initial outlook was and how much I've underestimated the joy and richness this experience could bring. The pains are real, but the joys are more. The past few years of doctoral study turns out to be a sweet and rewarding journey of "exploring, dreaming and discovering", both externally and internally, the pleasure and fulfillment I experienced through which have been some of the greatest delights of my life. And thankfully, the sail is never a solo endeavor. When I look back, it is hard not to realize the debt of gratitude I owe to so many. It is impossible to list them all here, but I will try regardless. Here are a few lines of thanks to the ones who deserve way more than words can convey.

First and foremost, I would like to thank my advisor, Prof. Michael Smith. Thank you, Mike, for encouraging me to embark on the journey towards a PhD, and years of remarkably patient guidance and unwavering support. You always envision me not as who I am today, but as who I could become, encouraging me to pursue the fire in my heart and supporting my decision on taking a non-standard path of research. Thank you for giving me the opportunity to study a timely question in public policy and IS, walking together with me on this adventure and constantly reminding me that research is ultimately a search for truth, for trustworthy knowledge. I count my days in Pittsburgh amongst the happiest time of my life, and I attribute that to the fortune of mine of having you as my advisor, who is always cheerful and tries to make sure I enjoy the process. Your wisdom in approaching research, coaching and mentoring, along with your faith, your genuine care for students has an enormous impact on me, academically, personally and spiritually, which I will always be thankful for. I am also deeply grateful for having the opportunity to learn from and work with Prof. Brett Danaher throughout my entire PhD. Thank you, Brett, for devoting your time to guide me through the intricacies of econometric models and the technical details in causal inference. You're always open to discussing my blue-sky thinking, letting me try different ideas I wanted to pursue, and giving me grace when many of them didn't work out or my assumptions simply failed to hold. To you, I owe my improvement in analytical rigor and my love for economic theory. Our weekly meetings have been a delightful highlight of my PhD journey, filled with countless jokes and fun moments that often culminated in you having to put up with my irrepressible laughter. From you, I learn there is never a distinction between fun and hard work, and if I'm willing to, I could transform the daily grind of work into a source of joy. I am extremely grateful to my another phenomenal committee member and my mentor, Prof. George Chen. Thank you, George, for kindly accepting to sit on my thesis committee, venturing beyond your primary field of expertise to advise a student whose research revolves around economic analysis. I'm thankful to have had the possibility to meet and learn from you, both directly and indirectly, through multiple avenues. Whether it's been through working under your supervision,

reading your enlightening research notes, chatting on Slack about research, career, or universe in general, or simply being a casual participant in your research cafe, each interaction has been invaluable. I am indebted to you for the skills I developed during the last two years of my PhD, from the grasp of training a non-parametric prediction model to the understanding of various statistical assumptions underpinning double machine learning estimators. You helped me see the constraints in my toolbox, inspiring me to learn new skills and concepts, while also empathizing with me who is a complete newbie to the area that you are so well versed with. Things you've taught me will be with me in the critical moments down the road, whether it's Randy Pausch's quote that "experience is what you get when you didn't get what you want, and that is often the most valuable thing you have to offer," or the reminder to not let my ego, even if I'm unaware of it, stand in the way of my learning. I will always be grateful to my three extraordinary committee members, who taught me humility throughout this journey, helped me navigate my disappointments from the job market, and inspired me to dedicate my passion and career to the betterment of humanity rather than simply chasing worldly success.

I would also like to express my sincere gratitude to the many faculty members at Carnegie Mellon whom I've had the privilege to know and learn from. It's not easy to do justice in adequately acknowledging every one of them from whom I've benefited immensely through our conversations. To Prof. Yan Huang, I couldn't ask for a better person to learn structural modelling techniques from. Thank you, Yan, for being a great listener when I shared my job market struggles and for giving me valuable advice on my career. To Profs. Brian Kovak and Daniel Nagin, your care for my work and your insightful suggestions have been a catalyst in shaping my research journey. Thank you for providing constructive feedback on my presentations and research proposals, and also for allowing me the opportunities to teach alongside you. To Profs. Ananya Sen and Woody Zhu, I would love to thank you for sharing your experience generously and uplifting my spirits with cheers when I was immersed in my sorrows. Heartfelt thanks to all faculty members who offer support of different forms during my PhD, including Profs. Uttara Ananthakrishnan, Eli Ben-Michael, Gordon Burtch, Avinash Collis, Jonathan Caulkins, Pedro Ferreira, Andy Garin, Martin Gaynor, Amelia Haviland, Akshaya Jha, Felix Koenig, David Krackhardt, Beibei Li, Edson Severnini, Lowell Taylor, Holly Wiberg, staff members including Kristen Yeager, Michelle Wirtz and Emily Marshall and all amazing students who come and contribute to the fond memories of this final chapter of my student era and see me through to the end.

In the summer of 2021, I took my first bike ride to Point State Park Fountain and since then cycling has been an integral part of my life that helps me unwind and recharge. Special thanks to Rhonda for introducing such a fun activity into my life and making sure I got to enjoy the wild air beyond work. You and Mike make Pittsburgh feel so home to me. To Bea, Anne, Sarah, Charity, Susan, Joanne, and all beautiful & strong ladies in the Babes on Bike team, thank you for welcoming me into the extremely vibrant biking group. Memories from the hills of our city remain vivid and still come with a bit of sweat. I'm grateful for our times shared together in the sunshine and the beauty this planet has to offer. I would love to thank my dear friends in and outside Pittsburgh – Xiaohan, Ludi, Youjia, Meichen & Fanxin, Krystal, Shuyan & Ying-Kai, Meicheng, Keri, TeTe & YuYu, Eugene, Songn & Meiyu, Rhonda, Molly, Lucca, Kathy, Sau-Fong & Yum-Tong, Thanh, Alex, Zhenhua, Xiaochen, Wenjia, Matteo, Mi, Amanda, Ashlee, Yi-Yun, Xiaobin, Lingwei, Jose, Julie, Celia, Yang, Vida, Liping, Duncan, Liangping, Grace and many others who hold a special place in my heart. Each of you decorates my life – whether through being there during my struggles, sharing incredibly interesting conversations over good food, coffee, wine, or beer, or through your love, support, and the happy moments we've lived together.

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The final paragraph is for dear Jesus. Thank you for every good gift and showers of blessings granted to me without my asking. Thank you also for not, or not yet, granting the desire of my heart, and for your rod and your staff that comfort me when I walked through the darkest valley. I can run the race set before me with joy, because you ran an infinitely harder race, with joy, for me.

This dissertation is dedicated to all who love justice and liberty.



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