Opcional

Candidato a Doctor. Cesar Renteria Marin

[redacted]

[redacted]

Candidato a Doctor en Administración & Políticas Publicas por la Universidad Estatal de Nueva York en Albany. Me especializo en el desarrollo e implementación de tecnologías de información en organizaciones, y particularmente inteligencia artificial para la toma de decisiones y plataformas para la participación ciudadana. He trabajado como investigador asociado en el Centro de Investigación y Docencia Económica en temas de telecomunicaciones, para el Center for Technology in Government en Nueva York y para el Columbia Institute for Tele-Information. He trabajado como funcionario público en la Dirección de Evaluación de la Subsecretaria de Planeación del gobierno del Estado de Jalisco. He sido consultor para el Banco Interamericano de Desarrollo, Banco de Desarrollo de América Latina, Instituto Federal de Telecomunicaciones, Secretaria de Comunicaciones y Transporte, entre otros. He publicado artículos de investigación en revistas y conferencias académicas internacionales especializadas en tecnologías de información en gobierno.

Perfil de puesto **Dirección de Inteligencia de Datos**	**Perfil profesional y experiencia**
Escolaridad: Nivel de estudios mínimo requerido, maestría.	Formación académica: • Licenciatura en Mercadotecnia, Universidad de Guadalajara (2007) • Maestría en Administración y Políticas Públicas, CIDE (2011) • Candidato a Doctor, State University of New York (2019)
Campos de formación académica: Licenciatura en: • Ciencias de la información • Tecnologías de información • Ciencias de la comunicación • Gestión documental • Inteligencia artificial	• Doctorado en Administración Publica, con especialización en tecnologías de información en organizaciones. • Maestría en Administración Publica. • Licenciatura en Mercadotecnia.

• Ingeniería industrial • Mercadotecnia digital • Administración Maestría en alguna de las áreas mencionadas en los puntos anteriores	• Asesoría especializada en sistemas de información georreferenciada para la organización New York Deserves Better. • Consultor para la evaluación de la estrategia digital y los portales web de los Emiratos Árabes Unidos. • Estancia de investigación en el Insight Center for Data Analytics del National University of Ireland, Galway (2017). Durante la estancia se trabajo sobre el uso de inteligencia artificial para el análisis de políticas publicas, que derivo en la publicación “A systematic literature review of the relationships between policy analysis and information technologies” • Publicaciones académicas en temas de data analytics, policy informatics, crowdsourcing, y modelos de evaluación de sistemas de gobierno electrónico. • Instructor en estadística y software (R, Python, Stata y Latex) a nivel posgrado en la Universidad Estatal de Nueva York. • Autor del software importinegi en el repositorio CRAN para su uso en R.
Formación adicional deseable: • Archivo y gestión documental (físico y digital) • Data Ware House, fundamentos • Minería de datos, fundamentos • Tableros de control • Redes sociales, posicionamiento y marcas • Inteligencia artificial, fundamentos • I+D • Mercadotecnia digital	• Instructor en estadística y software (R, Python, Stata y Latex) a nivel posgrado en la Universidad Estatal de Nueva York. • Fundamentos de inteligencia artificial, text análisis, minería de datos, remote sensing y análisis espacial como parte de la curricula académica del programa de doctorado. • Formación especializada en estadística como parte de la curricula académica del programa de doctorado • Consultoria para el desarrollo de un Observatorio de Ecosistema Digital para el Banco de Desarrollo de America Latina (CAF). La consultoría implico el desarrollo de un sistema de monitoreo y medicion del ecosistema digital de cada país de America Latina.

Experiencia requerida: Tres años en puestos directivos o de mando medio superior en el sector público • Áreas de inteligencia de datos o institucional • Creación de nuevo conocimiento e informes estratégicos • Gestión de documentos y archivos para la mejora en la toma de decisiones en la organización • Creación, posicionamiento de marcas, estrategias de posicionamiento en redes sociales y marketing digital Cinco años en áreas de estrategias, toma de decisiones o inteligencia institucional.	Experiencia laboral: **Tiempo laborado:** 1-7-2013 al 16-8-2013 **Lugar:** Subsecretaria de Planeación. **Adscripción:** Dirección de Evaluación. **Puesto Desempeñado:** Director. **Tiempo laborado:** 1-12-2011 al 31-6-2013 y del 1-9-2013 al 31-5-2015 **Lugar:** Centro de Investigación y Docencia Económicas. **Adscripción:** Departamento de Administración Publica. **Puesto Desempeñado:** Profesor Asociado. **Tiempo laborado:** 1-9-2015 al 31-5-2019 **Lugar:** State University of New York. **Adscripción:** Departamento de Administración Publica. **Puesto Desempeñado:** Instructor.
Competencias técnicas indispensables: • Dominio del inglés, nivel alto • Gestión de proyectos • Gestión documental • Habilidades de I+D • Marketing digital • Redes sociales, uso experto • Alta capacidad de comunicación presencial y escrita en formatos diversos (papers, notas, reportes, estudios a profundidad, etc). • Nivel avanzado en ofimática • Edición e impresión de materiales	• Curse un programa de doctorado en inglés. • Presentación en siete conferencias internacionales arbitradas y seis conferencias nacionales no arbitradas • Ocho artículos de investigación arbitrados publicados en revistas y conferencias internacionales. • Cuatro capítulos de libro publicados en editoriales de prestigio, nacional e internacional. • Dos reportes de investigación internacionales.
Competencias de gestión requeridas: • Visión estratégica • Orientación a resultados • Análisis y resolución de problemas • Trabajo en equipo • Organización • Comunicación efectiva • Dominio de estrés • Seguimiento normativo y procesos	• Investigador principal en dos proyectos de investigación con financiamiento internacional • Parte del equipo de investigación en cinco proyectos de investigación con financiamiento nacional e internacional. • Consultor principal para tres proyectos internacionales (incluyendo el BID) y uno nacional (SEDESOL). • Equipo de consultoría en 17 proyectos de consultoría internacionales (incluyendo el BID,

	CAF y DIRSI) y nacionales (incluyendo Instituto Federal de Telecomunicaciones, Secretaria de Comunicaciones y Transporte, y Secretaria de Planeación Jalisco). • Presidente de Red de Esfuerzos para el Desarrollo Social Local, A.C. del 2011 al 2017. Asociación civil dedicada a la producción y difusión de conocimientos sobre la política social local y al fortalecimiento de capacidades institucionales de las organizaciones de la sociedad civil.
Requisitos específicos • Disponibilidad de horario y para viajar • Dedicación laboral exclusiva en los días y horarios laborales	Si No X ___ X ___
Otros: Reconocimiento Digital Governance Junior Scholar Award, Section on Science and Technology in Government, American Society for Public Administration (ASPA), 2019.	

Se eliminan los datos 1 (correo electrónico personal) 2 (teléfono personal) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

1 [redacted]

Estados Unidos Mexicanos

Acta de Nacimiento

Datos de la Persona Registrada

CESAR	RENTERIA	MARIN
Nombre(s):	Primer Apellido:	Segundo Apellido:

2 [redacted]

Se eliminan los datos 1 (Identificador electrónico, CURP, Entidad de Registro, Municipio de Registro, no. de Oficialía, Fecha de Registro, no. de Libro, no. de acta) 2 (Sexo, Fecha de Nacimiento, Lugar de Nacimiento de la Persona Registrada; Nombres, Apellidos, Nacionalidad de los Padres de la persona registrada) 3 (Código QR). Por ser considerados un dato personal identificable. Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo

Anotaciones Marginales:	Certificación:
Sin anotaciones marginales.	Se extiende la presente copia certificada, con fundamento en los artículos 2, 6, 7, 120 y 121 fracciones I, II, III, IV, VI, VII, inciso a) de la Ley del Registro Civil de Jalisco; 4, fracción II y 6 de su Reglamento del Estado de Jalisco; y 9 de la Ley de Firma Electrónica Avanzada para el Estado de Jalisco y sus Municipios. La Firma Electrónica con la que cuenta es vigente a la fecha de expedición; tiene validez jurídica y probatoria de acuerdo a las disposiciones legales en la materia. A los 25 días del mes de Julio de 2019. Doy fe.

Firma Electrónica:

Uk VN Qz g1 MD kx ME hK Q0 5S Uz A1 fE NF U0 FS fF JF TI RF Uk IB fE 1B Uk IO fD Ex ND Ew MD Aw MD Ex OT g2 MD Ax Mj cw fE 18 MT Ag ZG Ug c2 Vw dG Il bW Jy ZS Bk ZS Ax OT g1 fE pB TE IT Q0 98 bn Vs bH xu dW xs

Código QR

3 [redacted]

Código de Verificación

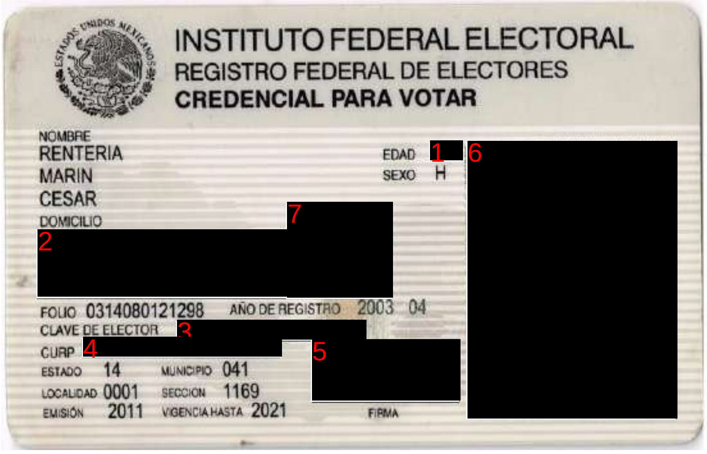
11410000011986001270

[redacted]

DIRECTOR GENERAL DEL REGISTRO CIVIL DE JALISCO

MTRO. ENRIQUE CARDENAS HUEZO

La presente copia certificada del acta de nacimiento es un extracto del acta que se encuentra en los archivos del Registro Civil correspondiente, la cual se ha expedido con base en las disposiciones jurídicas aplicables, cuyos datos pueden ser verificados en la página https://www.registrocivil.gob.mx/ActaMex/ConsultaFolio.jsp ,capturando el Identificador Electrónico que se encuentra en la parte superior derecha del acta, para su consulta en dispositivos móviles, descarga una aplicación para lectura del código QR.



INSTITUTO FEDERAL ELECTORAL
REGISTRO FEDERAL DE ELECTORES
CREDENCIAL PARA VOTAR

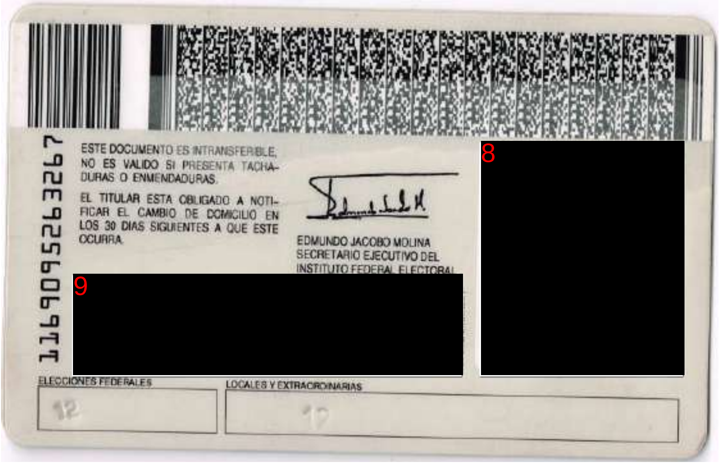
NOMBRE
RENTERIA
MARIN
CESAR

EDAD [redacted] 1
SEXO H

[redacted] 6

DOMICILIO
[redacted] 2
[redacted] 7

FOLIO 0314080121298 AÑO DE REGISTRO 2003 04
CLAVE DE ELECTOR [redacted] 3
CURP [redacted] 4
[redacted] 5
ESTADO 14 MUNICIPIO 041
LOCALIDAD 0001 SECCION 1169
EMISIÓN 2011 VIGENCIA HASTA 2021
FIRMA



1169095263267

ESTE DOCUMENTO ES INTRANSFERIBLE, NO ES VALIDO SI PRESENTA TACHADURAS O ENMENDADURAS.

EL TITULAR ESTA OBLIGADO A NOTIFICAR EL CAMBIO DE DOMICILIO EN LOS 30 DIAS SIGUIENTES A QUE ESTE OCURRA.

EDMUNDO JACOBO MOLINA
SECRETARIO EJECUTIVO DEL
INSTITUTO FEDERAL ELECTORAL

[redacted] 8

[redacted] 9

ELECCIONES FEDERALES
12

LOCALES Y EXTRAORDINARIAS
12

Se eliminan los datos 1(edad) 2(domicilio) 3(clave de elector) 4(CURP) 5, 9(firma) 6, 7(fotografía) 8(huella). Por ser considerados un dato personal identificable. Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

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1 [redacted]

UNIVERSIDAD DE GUADALAJARA

La Universidad de Guadalajara

Otorga a

César Rentería Marín

El título de

Licenciado en Mercadotecnia

En virtud de que terminó en forma debida los estudios que la ley señala; que fue aprobado en la modalidad de titulación correspondiente, y de que cumplió con todos los demás requisitos legales, para que pueda ejercer libremente la citada profesión, sin más limitaciones que las establecidas por la ley.

" Piensa y Trabaja "

Guadalajara, Jal., México, a 17 de Noviembre de 2005.

El Rector General

Dr. Marco Antonio Cortés Guardado

El Secretario General

Lic. José Alfredo Peña Ramos

080625

CIDE

EL CENTRO DE INVESTIGACIÓN Y DOCENCIA ECONÓMICAS

En su carácter de Centro Público de Investigación y de acuerdo con las facultades que le concede el Decreto Presidencial publicado en el Diario Oficial el 5 de junio de 2002

otorga a

1 [redacted]

César Rentería Marín

el Grado de

Maestro en Administración y Políticas Públicas

2 [redacted]

Firma del Interesado

Se eliminan los datos 1 (foto), 2 (firma) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

En virtud de haber concluido íntegramente los estudios correspondientes y satisfecho los requisitos necesarios el 6 de septiembre de 2011, según constancias archivadas en este Centro.

México, D. F., a 19 de septiembre de 2011

Dr. Enrique Cabrero Mendoza
Director General

Dr. David Arellano Gault
Secretario Académico

Número de Grado

79

EL PRESENTE GRADO FUE EXPEDIDO A FAVOR DE:

César Rentería Marín

quien cursó los estudios de:

Maestría en Administración y Políticas Públicas

Concluyó el plan de estudios el día

10 de junio de 2011

Obtuvo el Grado el 6 de septiembre de 2011

quedando registrado en el libro No. 1 Foja No. 79

México, D. F., a 19 de septiembre de 2011

Lic. Laura Fabiola Guillén Rodríguez
Directora de Administración Escolar

SECRETARÍA DE EDUCACIÓN PÚBLICA
DIRECCIÓN GENERAL DE PROFESIONES

REVISADO Y CONFRONTADO

REGISTRADO A FOJAS 312
DEL LIBRO A-307
BAJO EL NÚMERO 18
CÉDULA No 6076515

MÉXICO, D. F., A 22 DE ABRIL DE 2013

EL REGISTRADOR

ANALISIA ALCARAZ MUJICA

No 639,351

S. E. P.
DIRECCIÓN GENERAL DE PROFESIONES
DEPARTAMENTO DE REGISTRO
Y EXPEDICIÓN DE CÉDULAS

CÉDULA 6352692

SEP

DGP

México D.F. 30 de Marzo del 2010

1 [redacted]

FIRMA DEL TITULAR 2 [redacted]

SECRETARÍA DE EDUCACIÓN PÚBLICA
DIRECCIÓN GENERAL DE PROFESIONES

CÉDULA 6352692

EN VIRTUD DE QUE

CESAR
RENTERIA
MARIN

CURP: 3 [redacted]

CUMPLIÓ CON LOS REQUISITOS EXIGIDOS POR LA LEY REGLAMENTARIA DEL ARTÍCULO 5o. CONSTITUCIONAL RELATIVO AL EJERCICIO DE LAS PROFESIONES EN EL DISTRITO FEDERAL Y SU REGLAMENTO. SE LE EXPIDE

EN EDUCACIÓN DE TIPO SUPERIOR LA

CÉDULA

PERSONAL CON EFECTOS DE PATENTE PARA EJERCER PROFESIONALMENTE EN EL NIVEL DE

LICENCIATURA EN MERCADOTECNIA

VÍCTOR EVERARDO BELTRÁN CORONA
DIRECTOR GENERAL DE PROFESIONES

Se eliminan los datos 1 (foto) 2 (firma) y 3 (CURP) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

CÉDULA 8075615

México D.F. 22 de Abril del 2013

1 [redacted]

FIRMA DEL TITULAR

2 [redacted]

SECRETARÍA DE EDUCACIÓN PÚBLICA
DIRECCIÓN GENERAL DE PROFESIONES

CÉDULA 8075615

EN VIRTUD DE QUE

CÉSAR
RENTERÍA
MARÍN

CURP: 3 [redacted]

CUMPLIÓ CON LOS REQUISITOS EXIGIDOS POR LA LEY REGLAMENTARIA DEL ARTÍCULO 5o. CONSTITUCIONAL RELATIVO AL EJERCICIO DE LAS PROFESIONES EN EL DISTRITO FEDERAL Y SU REGLAMENTO, SE LE EXPIDE

EN EDUCACIÓN DE TIPO SUPERIOR LA

CÉDULA

PERSONAL CON EFECTOS DE PATENTE PARA EJERCER PROFESIONALMENTE EN EL NIVEL DE

MAESTRÍA EN ADMINISTRACIÓN Y POLÍTICAS PÚBLICAS

JAIME HUGO TALANCÓN ESCOBEDO
DIRECTOR GENERAL DE PROFESIONES

Se eliminan los datos 1 (foto) 2 (firma) y 3 (CURP) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Contraloría
del Estado
GOBIERNO DE JALISCO

Carta de no Sanción Administrativa

Fecha de expedición: 25 de Julio del 2019 a las 14:01:46 horas.
Número de Folio: CEJ/DGJ/JYJ1MK4K-66JSA3265RQ
Dirección General Jurídica.

Nombre(s): CESAR
Primer Apellido: RENTERIA
Segundo Apellido: MARIN

Con fundamento a lo establecido en los artículos 10 fracción XVII y 12 fracción VII del Reglamento Interior de la Contraloría del Estado, una vez revisado el registro de sanciones administrativas aplicadas por la Contraloría del Estado, se hace constar la inexistencia de sanción administrativa en su contra.

Esta constancia tiene validez oficial de una semana a partir del día de impresión.

Mtro. Fernando Radillo Martínez Sandoval
Director General Jurídico.

Av. Ignacio L. Vallarta Núm.1252, Colonia Americana.
Guadalajara, Jalisco, México. C.P: 44160.
Tel:(33) 4739-0104 y (33) 4739-0121.

Notas:
En el entendido que pueden existir otras sanciones administrativas aplicadas por Ente Público distinto a la Contraloría del Estado, en términos de la abrogada Ley de Responsabilidades de los Servidores Públicos del Estado de Jalisco, mediante decreto 26435/LXI/17, aprobado por el H. Congreso del Estado de Jalisco en sesión del 14 de Septiembre del 2017, publicada en el Periódico Oficial del "Estado de Jalisco", el 26 de Septiembre del 2017.

Se eliminan los datos 1 (foto) 2 (no. de identificación) 3 (huella) 4 (firma) Por ser considerados un dato personal identificable. Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Jalisco
GOBIERNO DEL ESTADO

Instituto Jalisciense de Ciencias Forenses
SCIENTIA LUX IUSTITIAE

JCF0312883
Folio No.

Dirección General
Archivo de Identificación Criminalístico

F 097845

1 [redacted]

Apellido paterno:
RENTERIA

Apellido materno:
MARIN

Nombre(s):
CESAR

Se identificó con:
Credencial Elector

No. de identificación:
2 [redacted]

3 [redacted]

Huella índice derecho

A QUIEN CORRESPONDA:

La persona cuya fotografía y huella dactilar aparecen en este documento, solicitó CONSTANCIA DE NO ANTECEDENTES, a nombre de:

CESAR RENTERIA MARIN.

Realizada la confrontación procedente, quien responde al nombre de referencia, no registra antecedentes en los archivos criminalísticos correspondientes a esta dependencia.

Se extiende la presente para los fines que convengan. Este documento no debe tomarse como medio de identificación de la persona a la que corresponde dicha fotografía.

Atentamente

Guadalajara Centro, Jalisco a 29 JULIO 2019

ING. GUSTAVO QUEZADA ESPARZA
Director General del Instituto
Jalisciense de Ciencias Forenses

GOBIERNO DE JALISCO
PODER EJECUTIVO
INSTITUTO JALISCIENSE DE CIENCIAS FORENSES
Constancia de no Antecedentes

4 [redacted]

Área de Identificación y Control

Esta constancia ampara la ausencia de registro(s) de antecedentes penales en el Estado de Jalisco hasta la fecha de su expedición, y sólo de aquellos que hayan sido cancelados y/o solicitados por las autoridades competentes.

Se recomienda actualizar este documento cada 90 días a partir de la fecha de expedición.
Costo del formato $ 65.00 (sesenta y cinco pesos 00/100 M.N) conforme a la ley
Ingresos del Gobierno del Estado para el ejercicio fiscal 2019
Dudas sobre la autenticidad de la presente constancia, comunicarse al tel.(33)30309491

IJCF-1

Este documento no tiene validez oficial si presenta tachaduras, raspaduras o enmendaduras, así como si no lleva la firma autógrafa y sello de autorizar.

[redacted]

August 6, 2019

Secretaría Técnica
Sistema Estatal Anticorrupción del Estado de Jalisco

To whom it may concern,

I write to offer my enthusiastic recommendation for César Rentería. I am an Associate Professor in the Department of Political Science at the University at Albany, State University of New York (UAlbany), and I have known César for about four years. During that time, he has worked for me as a graduate teaching assistant (TA) in a graduate course on quantitative methods for three years, he has worked informally as a research assistant on a collaborative research transparency project, we started collaborating on scholarship together, and I am a member of his dissertation committee. In each of these capacities, César has performed at high levels and well above the average doctoral student I have encountered at the University at Albany. The following paragraphs provide additional detail.

I first met César in Fall 2016 when another faculty member and I hired César to be the TA in both of our courses on graduate research methods. My course was ”Quantitative Methods” (RPOS 517), which is the core doctoral requirement for quantitative methods training in the political science department; the other course was ”Advanced Quantitative Analysis” (RPAD 705), the core doctoral requirement for quantitative methods training in the public administration department (taught during this time by Prof. Shawn Bushway). Thus, for three consecutive years, César was the only teaching assistant in the core methods courses required of doctoral students in two separate departments. Prof. Bushway and I were trying to coordinate the content of our courses during this time, so we wanted to have the same TA, but we kept César throughout these six semesters because he was simply excellent. In my own class, he understood the material well, he helped generate new material (e.g., problem sets, solutions, class organization), he was an outstanding resource both inside class and outside of class, and student evaluations consistently emphasized what a positive, helpful asset he was to the course. One student wrote, “Having a T.A. as knowledgeable and available as Cesar was an absolute blessing for this course” (emphasis in original).

His positive impact on students is worth emphasizing. In each of three semesters from Spring 2017 to Spring 2019, he was willing to make several adjustments, including shifting his office hours to accommodate student preferences, meeting with students individually, and providing feedback online (via email and university’s learning management system, Blackboard) on multiple occasions. Further, at one point about midway through one of these semester, César recognized that it would be helpful to students if he changed his office hours – which had been attended only by 2 out of 10 students and only on 1 occasion each – to more of an informal lab session. This simple re-framing from “office hours” to “lab” attracted the attention of 4 students, all of whom attended César’s office hours (i.e., “lab”) for the full 3 hours and stayed beyond that time. Notably, César also stayed late, remaining to help his fellow graduate students beyond the formal end of his office hours. Indeed, in what is highly unusual for any instructor or teaching instructor, I have received at least two individualized emails from students thanking César for his effort in helping them learn the material. I have also received multiple unwritten, verbal comments from students, including students other than those who wrote emails, expressing gratitude for Cesar’s assistance in understanding the material. Additionally, I made an effort to teach computing tools in class across a range of environments (Stata, R, Python) and advocating research transparency and reproducibility. César is skilled across these areas and improved the quality of the course content and also helped advocate for the importance of computing tools and reproducibility/transparency with students. In short, he was an excellent TA. If I could hire him again, I would.

Due in part to his competence with a wide range of computing tools, including statistics software (especially R and Stata), text processing software (LaTeX, markdown), and integra-

[redacted]

e eliminan los atos 1 (nombre nsitutcion), 2 (dirección) Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

tion tools for research notebooks and dynamic documents (e.g., MarkDoc in Stata, Sweave and knitr in R, Jupyter platform), I recruited César to work on a reproducibility-oriented project in collaboration with Project TIER (Teaching Integrity in Empirical Research). In a two-day workshop in May 2018, a small group of faculty and invited graduate students (led by César) worked in small teams to develop classroom exercises that would both (1) cover key statistics content, and (2) include best practices in research transparency and reproducibility. Again, his work was excellent.

Building on that workshop in 2018 and again on his TA work in Spring 2019, César and I have recently started discussing how to convert lessons learned over last three years of teaching research methods into scholarship on teaching and learning. We are currently developing one piece on principles and trade-offs in teaching reproducibility across three statistics platforms (Python, R, and Stata), and we have considered a longer, book-length treatment of methods instruction.

Lastly, I also know César as a member of his dissertation committee. César has advanced to candidacy (i.e., he is formally a Ph.D. candidate in the Department of Public Administration), and he is preparing a dissertation on decentralized mechanisms for coordinating citizen participation. He is scheduled to defend his prospectus in September 2019, and I am confident he will complete the dissertation over the course of next year. His work promises valuable conceptual, theoretical, and empirical insights, and I fully expect him to publish its contents.

In sum, César has been an excellent TA and collaborator, I have sought him out as a coauthor, and he is developing compelling scholarship of his own in the form of his dissertation. He possesses strong quantitative research skills, is competent in a wide range of computing tools relevant for computational social science research, and has a good work ethic. Among doctoral students at UAlbany, he has some of the best quantitative and computing skills I have encountered. For all of the reasons noted above, I strongly recommend César to you. Please do not hesitate to contact me if you need any additional information.

Sincerely,

1 [redacted]

2 [redacted]

Associate Professor

3 [redacted]

Se eliminan los datos 1 (firma), 2 (nombre), 3 (correo electrónico personal) Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

2nd August 2019

TO WHOM IT MAY CONCERN

REFERENCE LETTER FOR MR. CESAR RENTERIA

I am writing in support of Mr. Cesar Renteria's application whom I have known since July 2017 when he visited my lab at the Insight Centre for Data Analytics, National University of Ireland Galway, Republic of Ireland. At that time, he was in the early stages of his doctoral programme at the Rockefeller College of Public Affairs & Policy at SUNY, University at Albany. Since then, we have kept in touch and I have followed his academic and research progress through his different publications and through emails.

During his research visit my lab, we discussed a number of topics related to his thesis and interest. From these discussions, my interactions with him and the quality of his writings, I can confidently attest to Cesar's brilliance and strong research potentials. Another testimony of Cesar's research ability is the best paper awards and nominations he has received to his credit since July 2017 when we first met.

In the area of Information and Communication Technology (ICT) and Governance, Cesar has an impressive practice and policy background which clearly comes through in his presentation and argumentations. Specifically, I found his clear understanding of ICT-enabled governance policy issues very impressive.

Socially, I find Cesar to be very amiable and willing to help others around him. He showed a great sense of gratitude for whatever attention or service he received from colleagues. In fact, some of the colleagues he met at my lab have kept contact with him till date.

I am very confident that Cesar will be a great asset to whatever organisation engages his service and expertise and thus recommend his application most favourably to you.

Thank you,

1 [redacted]

2 [redacted]

Senior Research Fellow and Unit Leader (E-Government)

3 [redacted]

4 [redacted]

(s) gboyegaojo, 5 [redacted]

Se eliminan los datos 1 (firma), 2 (nombre), 3 (institución), 4 (dirección) 5 (teléfono personal) Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

[redacted]

[redacted]

Aguascalientes al 6 de Agosto de 2019

A la Secretaria Ejecutiva

del Sistema Estatal Anticorrupción en Jalisco

Asunto: Carta de Recomendación para César Rentería Marín

Por medio de la presente le saludo y hago constar mi más alta recomendación del candidato a Doctor, Cesar Renteria Marin, quien postula para el puesto de Dirección de Inteligencia de Datos del Sistema Estatal Anticorrupción. Conozco a César desde el año 2010 en la que juntos coincidimos como estudiantes en el Centro de Investigación y Docencia Económica. Cesar cursaba la maestría en Política y Administración Pública. Ahora Cesar regresa del doctorado con mucho más conocimiento en la materia y con habilidades de investigación que a lo largo de sus estudio ha refinado en áreas afines al puesto por el que ahora postula.

Además de colegas en estudios, Cesar y yo trabajamos en varios proyectos de política pública. Desde entonces Cesar tenía interés en el uso de datos (minería, inteligencia artificial, etc.) para su aplicación en políticas. Conozco bien su talento por el trabajo que juntos desarrollamos para diseñar por ejemplo un indice de vulnerabilidad de seguridad alimentaria en la que Cesar de manera habilidosa trajo información de diversas fuentes y la sistematizó para crear indicadores en tiempo real que permitieran conocer la experiencia de las personas que padecen de este mal público. Este sistema de información consistía en un prototipo con la finalidad de atender este problema de manera más oportuna. Estoy muy seguro que Cesar regresa ahora con mucho mayor conocimiento en este tipo de aspectos y que serán de gran utilidad para el trabajo del Sistema Estatal Anticorrupción en Jalisco.

Dicho lo anterior, Cesar es una persona muy inteligente y con habilidades sociales de las que estoy convencido contribuirá enormemente y con gran valor para las labores del Sistema Estatal Anticorrupción.

Sin otro particular, reciba un cordial saludo.

A[redacted]

[redacted]

Profesor-Investigador
Centro de Investigación y Docencia Económicas.

Se eliminan los datos 1 (firma), 2 (nombre), 3 (institución), 4 (dirección), 5 (teléfono particular), 6 (página de internet) Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

[redacted]

[redacted]

[redacted]

Dr. David Arellano Gault

Director de la División de Administración Pública

Centro de Investigación y Docencia Económicas, A.C.

Estimado Dr. Arellano:

A través de esta carta, quiero manifestarle mi deseo de renunciar al puesto de trabajo como Profesor-Investigador Asociado, que he ejercido durante los últimos 2 años. Dicha decisión corresponde a motivos estrictamente profesionales.

Por tal razón, es importante informarle que a partir del viernes 30 de junio de 2013 me desvincularé de la empresa. Hasta la fecha dejaré todas mis labores en orden.

Quiero agradecerle la oportunidad que me dio al confiar en mí para este puesto en el que crecí profesionalmente y personalmente. Igualmente a mis compañeros de trabajo y deseo siempre lo mejor para esta institución.

Cordialmente,

1 [redacted]

César Rentería Marín

Se eliminan los datos 1 (Firma) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Se eliminan los datos 1 (RFC), 2 (Firma) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

DEPENDENCIA : *SECRETARIA DE PLANEACION, ADMINISTRACION Y FINANZ* **U.P.** 16 **CODIGO** 071601C004740000000001
LIQUIDACION A **RENTERIA MARIN CESAR** R.F.C. [redacted] **ID PLAZA** 18300
QUIEN DEJA DE PERTENECER AL PERSONAL DE GOBIERNO DEL ESTADO DESDE EL DIA 16/08/2013
QUIEN INGRESO : 16/06/2013 **BUENO POR :** $ 17,483.00
RECIBI DEL GOBIERNO DEL ESTADO. LA CANTIDAD DE :
(DIECISIETE MIL CUATROCIENTOS OCHENTA Y TRES PESOS 00/100 M.N.)

IMPORTE QUE RESULTA POR CONCEPTO DEL FINIQUITO POR: **PARTES PROPORCIONALES**
EN VIRTUD DE QUE CON ESTA FECHA DOY POR TERMINADA LA RELACION DE TRABAJO, QUEDANDO TOTALMENTE SALDADAS TODAS LAS PRESTACIONES A QUE TUVE DERECHO Y DERIVADAS DE MI NOMBRAMIENTO, DEJANDO CONSTANCIA QUE SIEMPRE RECIBI PUNTUALMENTE LOS SALARIOS Y PRESTACIONES DEVENGADAS; ASIMISMO RECIBO LAS CANTIDADES CORRESPONDIENTES AL SIGUIENTE DESGLOSE:

PERCEPCIONES

00 DIAS DEL 16/08/2013 AL 16/08/2013 SUELDO A RAZON DE : 34,487.00 MENSUAL	0.00
AGUINALDO, PARTE PROPORCIONAL A 73 DIAS QUE TRABAJO EN LA DIRECCION DE GESTION PARA EL DESARROLLO REGIONAL DURANTE 2013 Y PUESTO DE DIRECTOR DE AREA DE GESTION P/EL DESARROLLO REGIONAL SOBRE LA BASE DE CINCUENTA DIAS. 11,655.33 MENOS LO ANTICIPADO EN MARZO Y DICIEMBRE 0.00	11,655.00
QUINQUENIO DE ANTIGÜEDAD PARTE PROPORCIONAL DE 0.00 MENSUALES	0.00
PRIMA POR VACACIONES, PARTE PROPORCIONAL A 73 DIAS DEL ULTIMO PERIODO ANUAL	1,166.00
OTRAS (10)	
01.-SUBSIDIO DE DESPENSA 1,680.00 MENSUALES	0.00
02.-AYUDA PARA GASTOS DE TRANSPORTE 1,191.00 MENSUALES	0.00
03.-PAGO DE VACACIONES NO DISFRUTADAS. PARTE PROPORCIONAL DE 20 DIAS POR PERIODO NO PRESCRITO. DIAS DISFRUTADOS 0 EN EL PRESENTE AÑO	4,662.00
04.- ADEUDO DE VACACIONES CORRESPONDIENTES AL EJERCICIO 2012 0	0.00
HABER POR RETIRO ANTIGÜEDAD= 0 AÑOS	
LIQUIDACIÓN POR JUBILACION O PENSION	0.00
CONVENIO POR SEPARACION	0.00
TOTAL DE PERCEPCIONES EXENTAS AL EMPLEADO DE PARTES PROPORCIONALES	12,626.00
TOTAL DE PERCEPCIONES EXENTAS AL EMPLEADO POR SEPARACION O JUBILACION 90veces SMG 64.76	0.00
TOTAL DE PERCEPCIONES GRAVABLES AL EMPLEADO DE PARTES PROPORCIONALES	4,857.00
TOTAL DE PERCEPCIONES GRAVABLES AL EMPLEADO POR SEPARACION O JUBILACION	0.00
TOTAL DE PERCEPCIONES	17,483.00

DEDUCCIONES

IMPUESTO SOBRE PRODUCTOS DEL TRABAJO RETENIDO AL EMPLEADO DE PARTES PROPORCIONALES	0.00
IMPUESTO SOBRE PRODUCTOS DEL TRABAJO RETENIDO AL EMPLEADO POR SEPARACION O JUBILACION	0.00
RETENCION DEL FONDO DE PENSIONES A CARGO DEL TRABAJADOR	0.00
PAGO INDEBIDO POR ANTICIPO DE AGUINALDO	0.00
PAGO INDEBIDO POR INCIDENCIAS	0.00
PAGO DAÑO PATRIMONIAL	0.00
PAGO INDEBIDO CONFORME AL ARTICULO 44 L.S.P.E.J.M (LICENCIAS MEDICAS)	0.00
PAGO INDEBIDO POR DIAS NO DEVENGADOS	0.00
TOTAL DE DEDUCCIONES	0.00
FINIQUITO A FAVOR	17,483.00

TAMBIEN MANIFIESTO QUE DURANTE ESTE TIEMPO NO SUFRI RIESGO NI ENFERMEDAD PROFESIONAL EN LA PRESTACIÓN DE MIS SERVICIOS EN LA **SECRETARIA DE PLANEACION, ADMINISTRACION Y FINANZAS**

EN CONSECUENCIA, NADA TENGO QUE RECLAMAR AL GOBIERNO DEL ESTADO DE JALISCO CON QUIEN DOY POR TERMINADA LA RELACIÓN DE TRABAJO, QUEDANDO TOTALMENTE SALDADA CUALQUIER CANTIDAD QUE SE ME ADEUDARA, REPRESENTANDO ESTE DOCUMENTO EL MÁS AMPLIO FINIQUITO QUE EN DERECHO CORRESPONDA.

agosto 16, 2013

RECIBI: [redacted]

RENTERIA MARIN CESAR

LIC. PAOLA FLORES ANAYA
DIRECTORA DE RECURSOS HUMANOS

UNIVERSITY AT ALBANY
State University of New York

Department of Public Administration & Policy

May 15, 2015

Mr. César Rentería Marín
Gobernador Vicente Eguia 14 Int. 16
San Miguel Chapultepec
Mexico City, FC 11850

Dear César,

We are delighted that you will be entering our PhD program in Public Administration and Policy this fall 2015 and would like to offer you a position as a graduate assistant for the 2015-16 academic year. Below, we have outlined for you the terms of the assistantship, including a statement on the nature of your responsibilities.

Your appointment as a graduate assistant would be for the 2015-16 academic year and would include a stipend of $17,000 for the period. In return, you would be expected to work approximately 18-20 hours per week beginning with the first day of classes and extending through finals week. Your assignment would be assisting with masters or undergraduate level course in the Department of Public Administration and Policy, or acting as Research Assistant to a faculty member in the Department. Your assistantship will also include full time tuition (12-19 credits) at the non-resident tuition rate.

In order to maintain the assistantship for the Spring semester and be eligible for reappointment in future semesters, you must maintain a satisfactory academic record, be enrolled as a full-time student, and satisfactorily complete your assistantship duties. Your assistantship award is for four academic years. Due to the nature of the University's budget, reappointment in future semesters is contingent upon the availability of University funding.

The Communications Workers of America Local 1104/ Graduate Student Employees Union represents graduate and teaching assistants at the University at Albany for the purposes of collective negotiations. As a member of the GSEU bargaining unit, you may be eligible for a health insurance plan providing an annual coverage of up to $350,000 per year. The State contributes 90% toward individual coverage premiums and 75% toward dependent coverage premiums. Details may be accessed through the Office of Human Resources Management's web site http://hr.albany.edu.

1 [redacted]

To advise us of your intentions, please sign this letter indicating your acceptance or declination of this offer and return it to me as soon as possible but no later than 5:00 pm EST on Sunday, May 17.

By signing you acknowledge as a condition of the assistantship that you will not take any additional work either on or off campus during the academic year. Please do not hesitate to contact me should you have any questions. We look forward to hearing from you soon.

Sincerely,

R. Karl Rethemeyer, PhD
Chair, Department of Public Administration and Policy

Milne Hall
135 Western Ave
Albany, NY 12222
518-442-5280

Se eliminan los datos 1 (Firma) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

___✓___ I accept the assistantship as stipulated in this letter.

______ I decline the assistantship as stipulated in this letter.

Signature [redacted] Date 5/15/2015

Se eliminan los datos 1 (Firma) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

UNIVERSITY AT ALBANY
State University of New York

Department of Public Administration and Policy
Rockefeller College of Public Affairs and Policy

April 7, 2016

Cesar Renteria
37 S Lake Ave, Basement
Albany, NY 12203

Dear Cesar,

We are delighted that you will be returning to our PhD program in Public Administration this fall 2016 and would like to offer you a position as a graduate assistant for the 2016-17 academic year. Below, we have outlined for you the terms of the assistantship, including a statement on the nature of your responsibilities.

Your appointment as a graduate assistant will be for the academic year and will include a full tuition scholarship and a stipend of $17,000 for the period, payable in bimonthly installments through the academic year. In return, you would be expected to work approximately 20 hours per week beginning with the first day of classes and extending through finals week. We see graduate assistantships as an important part of your training in the profession. We are finalizing assistantship assignments; you will receive an email in the next couple of weeks with more details.

In order to maintain the assistantship for the spring semester and be eligible for reappointment in future semesters, you must maintain a satisfactory academic record, be enrolled as a full-time student, and satisfactorily complete your assistantship duties. Due to the nature of the University's budget, reappointment in future semesters is contingent upon the availability of University funding.

The Communications Workers of America Local 1104/ Graduate Student Employees Union represents graduate and teaching assistants at the University at Albany for the purposes of collective negotiations. As a member of the GSEU bargaining unit, you may be eligible to enroll in Health Insurance through the Student Employee Health Plan (SEPH). Details may be accessed through the Office of Human Resources Management's website: http://www.albany.edu/hr/GATA_SEHP.php.

To advise us of your intentions, please sign the duplicate copy of this letter indicating your acceptance or declination of this offer and return it to me as soon as possible but no later than April 29, 2016. By signing you acknowledge as a condition of the assistantship that you will not take any additional work either on or off campus. Please do not hesitate to contact me should you have any questions. We look forward to hearing from you soon.

Sincerely,

Victor Asal, PhD
Chair, Department of Public Administration and Policy

_________ I accept the assistantship as stipulated in this letter.

_________ I decline the assistantship as stipulated in this letter.

Signature ________________________________ Date ____________________

UNIVERSITY AT ALBANY
State University of New York

Department of Public Administration and Policy
Rockefeller College of Public Affairs and Policy

April 7, 2016

Cesar Renteria
37 S Lake Ave, Basement
Albany, NY 12203

Dear Cesar,

With this letter, I am delighted to confirm that you have been awarded a full tuition scholarship (12-19 credits per semester). As an international student your tuition scholarship award will be provided at the out-of-state rate. In order to receive this award, you must complete the enclosed Tuition Scholarship Award Form and return it to me as soon as possible but no later than April 29, 2016. Please be aware that acceptance of this tuition scholarship award may affect your eligibility for financial aid.

I look forward to hearing from you soon.

Sincerely,

Victor Asal, PhD
Chair, Department of Public Administration and Policy

Milne Hall
135 Western Avenue
Albany, NY 12203

UPON COMPLETION SUBMIT
TO SCHOOL OR DEPARTMENT
SPONSORING AWARD

UNIVERSITY
AT ALBANY
State University of New York

YEAR/TERM REQUESTED:
☒ Academic Year 2016-17
☐ Fall ☐ Spring
☐ Summer

TUITION SCHOLARSHIP AWARD FORM

LAST NAME: Renteria	**STUDENT ID#:** 1 [redacted]
FIRST NAME: Cesar	**EMAIL ADDRESS**:
MAILING ADDRESS:	**TELEPHONE:**
	GRADUATE PROGRAM: Public Admin. and Policy
	DEGREE SOUGHT: PhD

RESIDENCY ☐**NYS** ☐**U.S. [Non-NYS]** ☒**Non-U.S.**

If you have not applied for and been granted NYS residency and this is your second year of study, you will be billed for the difference between the in-State tuition rate and the out-of-State tuition rate. You may apply for a waiver to this requirement through your department chair. Residency applications are available in the Office of Student Accounts.

WILL YOU HAVE AN ASSISTANTSHIP OR FELLOWSHIP DURING THE TERM OF THIS TUITION AWARD? ☒Yes ☐No

IF YES, WHAT WILL BE THE TERM OF THE APPOINTMENT? ☒Acad Yr ☐Fall Only ☐Spring Only

POSITION TITLE	FUNDING SOURCE			STIPEND
☒Assistantship	☒University	☐Research Foundation	☐Other (describe)	**$17,000**
☐Fellowship	☐University	☐Research Foundation	☐Other (describe)	**$**

PLEASE SPECIFY THE APPOINTING DEPARTMENT (OR OFFICE): Public Admin. and Policy

I UNDERSTAND THAT IF I AM A CITIZEN OF THE U.S., I MUST SEEK TO ESTABLISH NYS RESIDENCY NO LATER THAN THE COMPLETION OF MY FIRST YEAR OF STUDY.

APPLICANT'S SIGNATURE _______________ DATE _______________

DEPARTMENT SIGNATURE _______________ DATE _______________

DEPARTMENTAL AUTHORIZATION: ☐**In State Rate or** ☒**Out of State Rate**

LEVEL OF SUPPORT:

☒**Fall**	**$ Level or Number of Credits** 12 Credits	**Account No.**
☒**Spring**	**$ Level or Number of Credits** 12 Credits	**Account No.**

Se eliminan los datos 1 (ID de estudiante) Por ser considerados un dato personal identificable. Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

UNIVERSITY AT ALBANY
State University of New York

Graduate/Teaching Assistant, Resident Assistant, and Fellowship Appointment Request Form HRM-4

Use this form for all GA/TA/RA/Fellow appointments, rehires, changes in status, and terminations.
Allow at least two weeks prior to the effective date for processing.
Please attach a completed New Employee Information Form (EMP-1) for all new hires.

STUDENT/EMPLOYEE INFORMATION

Last Name Renteria	**First Name** Cesar	**MI**	**Student ID** [redacted]
Funding Account 77002-78	**Department** Public Administration		**Check Drop Location** 770078
Supervisor Shawn Bushway	**Work Phone Number** 2-3248		**Total Stipend** (for the period) 17,000
ACTION: ☐ New Hire ☐ Change of Status ☒ Rehire ☐ Termination	**Campus Work Address** Milne 107		**Appointment Start Date** 08/29/2016

APPOINTMENT TYPE & DURATION

Student Status ☐ Master's ☒ Doctoral	**Assistantship** ☐ Graduate ☒ Teaching	**Assistantship Obligation:** ☐ Half Assistantship (9-10 hours/week) ☒ Full Assistantship (18-20 hours/week) ☐ Other ___________________________	**Resident Assistant** ☐ Resident Assistant I ☐ Senior RA ☐ Resident Assistant II ☐ Housing Mgr	**Fellowship** ☐ No ☐ Yes

☒ Academic Year (full semesters) ☐ Fall Only (full semester) ☐ Spring Only (full semester) ☐ 12 months (RA only) ☐ Other: (RA or contact HR) from __________ to __________

CHANGE OF STATUS/TERMINATION

Old Status	**New Status**	**Effective Date(s)**
Termination Reason:	**Last day of work:**	

APPROVALS

Funding APPROVAL	Signature of person responsible for funding account Name/Title Date
Department APPROVAL	Signature of Department Approval Name/Title Date
Recipient ACCEPTANCE	Signature of Student/Employee Date
OHRM APPROVAL	Signature of OHRM Date

This appointment becomes effective when signed by the department, the recipient, and the Office of Human Resources Management

TOEFL CERTIFICATION

International Student Graduate Teaching Assistant Certification: The appointee has achieved the required score (e.g. TOEFL score of 100 or above on the IBT Internet-based test) on an authorized test of English proficiency and is competent to conduct classroom or laboratory discussions.

Signature of Department Chair, certifying English language proficiency Date

SUNY ID	Line #	Position	BIW Rate	FTE%	Payroll Start and End Dates (BOB)	PR #

Assistantship Guidelines are located on the Graduate Education website: www.albany.edu/graduate/index.php

Se eliminan los datos 1 (ID de estudiante) Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Revised 5/2015

UNIVERSITY AT ALBANY
State University of New York

Department of Public Administration and Policy
Rockefeller College of Public Affairs and Policy

March 28, 2017

Cesar Renteria
Milne 107
135 Western Ave
Albany, NY 12222

Dear Cesar,

We are delighted that you will be returning to our PhD program in Public Administration this fall 2017 and would like to offer you a position as a graduate assistant for the 2017-18 academic year. Below, we have outlined for you the terms of the assistantship, including a statement on the nature of your responsibilities.

Your appointment as a graduate assistant will be for the academic year and will include a full tuition scholarship and a stipend of $18,041 for the period, payable in bimonthly installments through the academic year. In return, you would be expected to work approximately 20 hours per week beginning with the first day of classes and extending through finals week. We see graduate assistantships as an important part of your training in the profession. We are finalizing assistantship assignments; you will receive an email in the next couple of weeks with more details.

In order to maintain the assistantship for the spring semester and be eligible for reappointment in future semesters, you must maintain a satisfactory academic record, be enrolled as a full-time student, and satisfactorily complete your assistantship duties. Due to the nature of the University's budget, reappointment in future semesters is contingent upon the availability of University funding.

The Communications Workers of America Local 1104/ Graduate Student Employees Union represents graduate and teaching assistants at the University at Albany for the purposes of collective negotiations. As a member of the GSEU bargaining unit, you may be eligible to enroll in Health Insurance through the Student Employee Health Plan (SEPH). Details may be accessed through the Office of Human Resources Management's website: http://www.albany.edu/hr/GATA_SEHP.php.

To advise us of your intentions, please sign the duplicate copy of this letter indicating your acceptance or declination of this offer and return it to me as soon as possible but no later than April 28, 2017. By signing you acknowledge as a condition of the assistantship that you will not take any additional work either on or off campus. Please do not hesitate to contact me should you have any questions. We look forward to hearing from you soon.

Sincerely,

Ellen V Rubin

Dr. Ellen Rubin, PhD
PhD Program Director, Department of Public Administration and Policy

_________ I accept the assistantship as stipulated in this letter.

_________ I decline the assistantship as stipulated in this letter.

Signature ______________________________ Date ________________

UNIVERSITY AT ALBANY
State University of New York

Department of Public Administration and Policy
Rockefeller College of Public Affairs and Policy

March 28, 2017

Cesar Renteria
Milne 107
135 Western Ave
Albany, NY 12222

Dear Cesar,

With this letter, I am delighted to confirm that you have been awarded a full tuition scholarship (12-19 credits per semester) at the in-state graduate tuition rate. In order to receive this award, you must complete the enclosed Tuition Scholarship Award Form and return it to me as soon as possible but no later than April 28, 2017. Please be aware that acceptance of this tuition scholarship award may affect your eligibility for financial aid.

I look forward to hearing from you soon.

Sincerely,

Ellen V Rubin

Dr. Ellen Rubin, PhD
PhD Program Director, Department of Public Administration and Policy

Milne Hall
135 Western Avenue
Albany, NY 12203

Se eliminan los datos 1 (ID de estudiante) Por ser considerados un dato personal identificable. Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

UPON COMPLETION SUBMIT
TO SCHOOL OR DEPARTMENT
SPONSORING AWARD

UNIVERSITY
AT ALBANY
State University of New York

YEAR/TERM REQUESTED:
☒ Academic Year 2017-18
☐ Fall ☐ Spring
☐ Summer

TUITION SCHOLARSHIP AWARD FORM

LAST NAME: Renteria	**STUDENT ID#:** 1 [redacted]
FIRST NAME: Cesar	**EMAIL ADDRESS:**
MAILING ADDRESS:	**TELEPHONE:**
	GRADUATE PROGRAM: Public Admin. and Policy
	DEGREE SOUGHT: PhD

RESIDENCY ☒NYS ☐U.S. [Non-NYS] ☐Non-U.S.

If you have not applied for and been granted NYS residency and this is your second year of study, you will be billed for the difference between the in-State tuition rate and the out-of-State tuition rate. You may apply for a waiver to this requirement through your department chair. Residency applications are available in the Office of Student Accounts.

WILL YOU HAVE AN ASSISTANTSHIP OR FELLOWSHIP DURING THE TERM OF THIS TUITION AWARD? ☒Yes ☐No

IF YES, WHAT WILL BE THE TERM OF THE APPOINTMENT? ☒Acad Yr ☐Fall Only ☐Spring Only

POSITION TITLE	FUNDING SOURCE			STIPEND
☒Assistantship	☒University	☐Research Foundation	☐Other (describe)	**$18,041**
☐Fellowship	☐University	☐Research Foundation	☐Other (describe)	**$**

PLEASE SPECIFY THE APPOINTING DEPARTMENT (OR OFFICE): Public Admin. and Policy

I UNDERSTAND THAT IF I AM A CITIZEN OF THE U.S., I MUST SEEK TO ESTABLISH NYS RESIDENCY NO LATER THAN THE COMPLETION OF MY FIRST YEAR OF STUDY.

APPLICANT'S SIGNATURE DATE

DEPARTMENT SIGNATURE DATE

DEPARTMENTAL AUTHORIZATION: ☒**In State Rate or** ☐**Out of State Rate**

LEVEL OF SUPPORT:
☒**Fall** **$ Level or Number of Credits** 12 Credits **Account No.**
☒**Spring** **$ Level or Number of Credits** 12 Credits **Account No.**

UNIVERSITY AT ALBANY
State University of New York

Student Employment Transaction Form HRM-4

Last Name Renteria	**First Name** Cesar	**MI**	**Student ID** 1 [redacted]	**Visa/Status** (if applicable)

Please check the appropriate action below:

☐ New Hire (new employee forms required)
☐ Rehire (new employee forms required for breaks of a year or more)
☐ Change of Status
☐ Termination

PP	Retro	Date	Trans	Info	APV

Shaded area for HR purposes

Use this form for all **GA/TA/RA/Fellow** appointments, rehires, changes in status, and terminations.
Do not use this form for Student Assisant transactions. Allow at least two weeks prior to the effective date for processing.
Please attach a completed New Employee Information Form (EMP-1) for all new hires.

APPOINTMENT INFORMATION

Funding Account 77002-78	**Check Drop Location**	**Department** Public Administration	**Supervisor** Dr. Ellen Rubin
Campus Work Address	**Work Phone Number**	**Total Stipend** (for the period) $18,041	**Appointment Start Date** 8/28/17

Student Status
☐ Master's
☒ Doctoral

Assistantship Obligation:
☐ Half Assistantship (9-10 hours/week)
☒ Full Assistantship (18-20 hours/week)
☐ Other ____________

Resident Assistant
☐ Resident Assistant I
☐ Resident Assistant II
☐ Senior RA
☐ Housing Mgr

Fellowship
☐ No
☐ Yes

☒ Academic Year (full semesters)
☐ Fall Only (full semester)
☐ Spring Only (full semester)
☐ 12 months (RA only)
☐ Other: (RA or contact HR) from ________ to ________

Primary Duty: ☑ Teaching ☐ Research ☐ Administrative

CHANGE OF STATUS/TERMINATION

Old Status	**New Status**	**Effective Date(s)**

☐ **Termination** ☐ **Cancellation** ☐ **Resignation (attach letter)** **Last day of work:**

APPROVALS

Funding APPROVAL
Signature of person responsible for funding account Name/Title Date

Department APPROVAL
Signature of Department Approval Name/Title Date

Recipient ACCEPTANCE
Signature of Student/Employee Date

OHRM APPROVAL
Signature of OHRM Date

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TOEFL CERTIFICATION

International Student Graduate Teaching Assistant Certification: The appointee has achieved the required score (e.g. TOEFL score of 100 or above on the IBT Internet-based test) on an authorized test of English proficiency and is competent to conduct classroom or laboratory discussions.

Signature of Department Chair, certifying English language proficiency Date

SUNY ID	Title	Line #	Position	BIW Rate	FTE%

Assistantship Guidelines are located on the Graduate Education website: www.albany.edu/graduate/index.php

12/2016

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Cesar Renteria

Curriculum Vitae

August 6, 2019

Department of Public Administration & Policy
University at Albany
135 Western Avenue
Albany, NY 12203

+52 551-684-0378 ☎
`crenteria@albany.edu` ✉
`crenteriam.github.io`

appointments

Junior Assistant Professor. Centro de Investigación y Docencia Económicas (CIDE), Public Administration Department, 2011-2015.

Research Internship. National University of Ireland, Galway, 2017. Columbia University, 2016.

education

Ph.D., Public Administration & Policy, University at Albany (expected 2020)

M.Sc., Public Administration & Policy, CIDE, 2011.

Dissertation: *Incidence of NGOs in Public Policy: Case Study of Mexico's 2011 Migration Law*.

Best Thesis Award, Second Place. Public Administration Department, CIDE. 2011.

B.A. Marketing, Universidad de Guadalajara, 2007.

publications

Journal Articles

Cesar Renteria. How transformational mobile banking optimizes household expenditures: A case study from rural communities in mexico. *Information Technologies & International Development*, 11(3):pp–39, 2015

Chapters in Edited Volumes

Judith Mariscal and César Renteria. Digital inclusion and broadband: the challenges to achieve a second-generation e-government. In *Information and Telecommunication Technologies in Public Administration: Concepts, Approaches, Applications and Results*, pages 381–406. INFOTEC, 2017

Judith Mariscal and César Renteria. The telecommunications' reform and the states. In *The Reform and the States. The responsibility of States in the success of the structural changes*, pages 47–56. IMCO, 2017

Judith Mariscal, Lucia Gamboa, and Cesar Renteria. The democratization of internet access through mobile adoption in latin america. In *The Routledge companion to mobile media*, pages 104–113. 2014

Judith Mariscal and César Renteria. Implementation of information and communications technologies for financial inclusion in programs to alleviate poverty in brazil, colombia and mexico. In *E-Government Success around the World: Cases, Empirical Studies, and Practical Recommendations*, pages 105–130. IGI Global, 2013

Refereed Conference Proceedings

Cesar Renteria, Ramon Gil-Garcia, and Theresa Pardo. Toward an enabler-based digital government maturity framework: A preliminary proposal based on theories of change.

In *12th International Conference on Theory and Practice of Electronic Governance (ICEGOV2019)*, page N.D. ACM, 2019

- *Nominated for Best Research Paper Award.*

Edgar Ruvalcaba and Cesar Renteria. Contrasting the perceptions about citizenparticipation between organized civil society andgovernment with an open government approach:the case of the state of jalisco, mexico. In *International Conference on eDemocracy & eGovernment*, page N.D. IEEE, 2019

Cesar Renteria. Measuring the digital divide from an elementary microeconomics point of view. In *Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance*, pages 588–592. ACM, 2018

Cesar Renteria and J Ramon Gil-Garcia. A systematic literature review of the relationships between policy analysis and information technologies: Understanding and integrating multiple conceptualizations. In *International Conference on Electronic Participation*, pages 112–124. Springer, 2017

Raul L Katz, Fernando Martin Callorda, and César Rentería Marín. Evaluación del impacto económico de las telecomunicaciones en argentina (2004-2015) (evaluation of the economic impact of telecommunications in argentina (2004-2015)). 2016

César Rentería Marín. Impacto de banca móvil en el gasto familiar en zonas rurales: Evaluación de impacto de una intervención del estado en la sierra de méxico (impact of mobile banking in household spending in rural areas: Assessing the impact of an state intervention in the mountains of mexico). 2014

J Ramon Gil-Garcia, Cesar Renteria, and Luis F Luna-Reyes. Enacting collaborative electronic government: Empirical evidence and lessons for developing countries. In *2014 47th Hawaii International Conference on System Sciences (HICSS)*, pages 2253–2262. IEEE, 2014

Research Reports

César Rentería. Plataformas de crowdfunding en américa latina. 2016

Judith Mariscal, Cesar Renteria, and Rosalina Arteaga. Management lessons in e-health: the case of the nuevo leon telemedicine system. 1(1), 2014

César Rentería Marín. Impacto de banca móvil en el gasto familiar en zonas rurales: Evaluación de impacto de una intervención del estado en la sierra de méxico (impact of mobile banking in household spending in rural areas: Assessing the impact of an state intervention in the mountains of mexico). 2014

Manuscripts in Progress

Renteria, Cesar. "Generational Differences in the Effect of Trust in Government on Political Participation: Evidence from Emerging Economies.

refereed conferences

Measuring the Digital Divide from an Elementary Microeconomics Point of View. In Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance (ICEGOV '18), Galway, Ireland, April 4-6, 2018. ACM.

"Diseño de Plataformas de Crowdsourcing de Gobierno." First Conacyt Grant Holders Meeting in North America, organized by the Mexican Council for Science and Technology. Washington, DC, March 16th 2018.

"A Systematic Literature Review of the Relationships between Policy Analysis and Information Technologies: Understanding and Integrating Multiple Conceptualizations." Proceedings of the IFIP EGOV-EPART 2017 Conference, 2017, Saint Petersburg, Russia, September 4-7th, 2017.

The impact of mobile money in household's expenditure in rural zones: an impact evaluation of a Government intervention in the Mexican mountain range. Proceedings of the 8th CPR-LATAM Conference 2014, Bogota, Colombia, May 30th 2014.

invited conferences

"Does Trust in Government Boost or Slump Citizen Participation? Evidence of Generational Differences from Emerging Economies" In Institutions & Societies: Graduate Conference, Rockefeller College Graduate Association of Political Science (GAPS) and Students of Educational Administration for Change (SEAChange). Albany, NY, February 22th 2019.

"How Transformational Mobile Banking Optimizes Household Expenditures: A Case Study from Rural Communities in Mexico." In Institutions & Societies: Graduate Conference, Rockefeller College Graduate Association of Political Science (GAPS) and Students of Educational Administration for Change (SEAChange). Albany, NY, February 26th 2016.

"Methodologies for the Evaluation of Telemedicine Systems." Regional Congress of Telemedicine in the Americas 2014, Centro Nacional de Excelencia Tecnológica en Salud (CENETEC). Monterrey, September 5th 2014.

"Analysis of the Operation Rules of Jalisco State's Policies in 2013." Subsecretaría de Planeación (Jalisco State government). Guadajalara, January 23th 2014.

Sessions "NGO's funding strategies for Immaterial Cultural Heritage Projects." In diploma "[In Spanish] Creation, Shelter, Conservation and Diffusion of History and Oral Tradition Documents" by [In Spanish] National School of Anthropology and History. Mexico City, September 26th 2013.

Sessions "NGO's", "Social Accountability", and "Models of Civic Evaluation of Government Performance." In diploma "[In Spanish] Diploma in Transparency and Accountability" by [In Spanish] Jalisco Institute of Transparency and Public Information (ITEI). Puerto Vallarta, Jalisco, September 20 and 21th 2013.

"The impact of the Telecomm-Telegrafos' program 'Mobile Payments'." Seminar "Charlas del Rol e Impacto de las Redes Digitales en Nuestras Vidas." Mexico City, November 20th 2013.

software

Cesar Renteria [aut, cre]. R Package *importinegi*. Search, extract and format data from INEGI. Version 1.0.0. License: CC0.

Cesar Renteria [aut, cre]. R Package *textminecongreso*. Text Mining of Mexican Congress's legislative work. Version 0.0.9 (Under Development, To be Released September 1st, 2019). License: CC0.

teaching

Teaching Assistant:

2017-2019. Graduate – Quantitative Research Methods, University at Albany.
2017-2018. Workflow and Research Transparency series: Introduction to Stata, R, Python and Latex. University at Albany.
2016-2018. Ph.D. – Advanced Quantitative Analysis, University at Albany.
2016. Undergrad. – Introduction to Public Administration, University at Albany.
2015. Undergrad. – Introduction to Public Administration, University at Albany.
2013-2014. Graduate – Econometrics, CIDE.

awards and honors

Runner-up Winner of the Digital Governance Junior Scholar Award, Section on Science and Technology in Government, American Society for Public Administration (ASPA), 2019.

Steve Jackson Excellence in Graduate Student Teaching Award, Rockefeller College of Public Affairs & Policy, University at Albany, 2019.

Foreign Studies Scholarship, Mexico's National Council of Science Technology, 2016-2020.

Graduate Assistantship, Rockefeller College of Public Affairs & Policy, University at Albany, 2015-2019.

Fifth Research Grant for Young Researchers Amy Mahan, DIRSI and International Development Research Center (IDRC), November 2012.

Best Thesis Award, Runner-Up. Department of Public Administration, CIDE, September 2011.

Academic Excellence Scholarship, Mexico's National Council of Science Technology, 2009-2011.

grants

Principal Investigator:

"The Crowdfunding Platforms in Latin America." Funder: DIRSI. Amount: US $4,500. Date: April, 2015. Details: Study of the development of Latin American crowdfunding platforms.

"Impact evaluation of mobile banking pilot Project 'Mobile Money Payments' in Santiago Nuyoó, Oaxaca." Funder: DIRSI and International Development Research Center (IDRC). Amount: US $5,000. Date: September, 2012. Details: Obtained from the award "Fifth Research Grant for Young Researchers 'Amy Mahan'."

Research Team:

Information Networks and Social Inclusion for Women and the Youth in Latin America Funded by the International Development Research Center (IDRC) Lima, Perú (2014-2016). Description: Latin American research over the adoption of ICT in the base of the pyramid.

ICT adoption in Talea de Castro, Oaxaca. San Miguel Talea de Castro, Oaxaca (2014).

Impact evaluation of program Mobile Money Payments from Public Entity "Telecomm-Telégrafos" (Proposal phase). Mexico City (2012-2013). Description: design of impact evaluation (randomized trial) for the pilot program, which main goal is to test a mobile banking policy in communities less than 2,500 inhabitants (without previous access to financial neither telecom services) in Mexico. Pilot is planned to be implemented in 30 treatment and 30 control communities in 2014 with a total investment of 90 million USD.

Successful Cases in mhealth and ehealth in Latin America. Funded by International Telecommunications Union. Mexico City (2013). Description: monitoring and analysis of successful cases of e-health in Latin America.

Impact estimation of broadband in well-being in Mexico. Research funded by IDRC. Mexico City (2013). Description: design of an econometric model to test impact of broadband in well-being from the human development approach.

Research Assistant:

Making Technology Work: implementing ICT4D innovation through participatory research-driven designs. DIRSI IDRC. Mexico City (2012-2013). Description: Research in ICT-based social intervention projects in rural communities in Mexico. Project was part of a Latin American series of researches aiming to identify social benefits of connectivity among rural communities.

consulting

Principal Consultant:

Geographic and Time Series Analysis of 311 Calls in New York City (2011-2006). Client: New York Deserves Better, NYC, 2016.

Design of a Methodology for the Evaluation of Programs' Operational Rules. Client: Jalisco State Ministry of Planning. Guadalajara, Jalisco, 2013. Details: methodology design for the evaluation of the quality of the state's program rules of operation and a proposal of guidelines for their improvement.

Second Evaluation of the Japanese Trust Fund. Client: Inter-American Development Bank Office of Evaluation and Oversight and the Government of Japan. Mexico City, 2013. Details: external consultant hired by IDB to evaluate development projects in Mexico funded by Japanese Trust Fund.

Exploration of best practices of NGOs advocated to food security and policy proposal, for Ministry of Social Development. Client: Ministry of Social Development. Mexico City, 2011. Details: Agreement CIDE-SEDESOL Details: CIDE's Professional Practices Consultancy Program.

Consulting Team:

Building a 2030 Digital Government Roadmap for the United Arab Emirates. An Assessment and Roadmap. Client: Telecommunications Regulatory Authority (United Arab Emirates). Albany, New York, 2018. Details: development and implementation of e-government readiness survey, and maturity model of e-government strategies.

Development of a Digital Ecosystem Observatory in Latin America and the Caribbean. Client: Development Bank of Latin America (CAF). NYC-Mexico City-Buenos Aires, 2016. Details: development of a digital economy index for CAF as well as the institutional design of a digital economy observatory.

The Broadband Effect: Enhancing market-based solutions to the base of the pyramid – Barared case study (methodology design). Client: Inter-American Development Bank (IADB). Mexico City-Buenos Aires, 2015. Details: impact evaluation design of the business model "Barared."

Specialized study in urbanism and other topics related with the infrastructure deployment for broadcast and broadband equipment. Client: Federal Telecommunications Institute. Mexico City, 2015.

Diagnostic study of Food Insecurity problem in Jalisco State. Agency: Policy Lab, S.C. Client: Jalisco State Ministry of Social Development. Guadalajara, Jalisco, 2015.

Global Consistency Evaluation Model for the Government's Agenda of the Jalisco State Government. Agency: Policy Lab, S.C. Client: State Ministry of Planning. Guadalajara, Jalisco, 2015.

Study for the definition of a technical and economic model for the infrastructure sharing for broadband network deployments. Client: Development Bank of Latin America (CAF). Mexico City-Buenos Aires-Madrid, 2014. Details: joint consultancy with Analysys Mason.

Specialized Advisory to Determine Specific Obligations to Economic Agents with Substantial Market Power in the Relevant Market of Mobile Telephony Service in México. Client: Federal Telecommunications Commission. Mexico City, 2012.

Specialized Advisory to Assess the Economic Impact in the Mobile Services Industry in Mexico after Emission of Specific Obligations to Economic Agents with Substantial Market Power in the Relevant Market of Minorist Mobile Services. Client: Federal Telecommunications Commission Mexico City, 2012.

Investment projects in social basic infrastructure for Municipality of Tuxcueca, Jalisco. Client: Tuxcueca Municipal Government. Guadalajara, Jalisco, 2012-2013. Details: Local diagnostic of basic social needs; demand-supply interaction analysis of public services. Advisory in the definition of strategic public infrastructure for development.

Public Opinion Survey "Nayarit 2011. Todas las voces, todas las miradas", for diverse Political Parties in Nayarit State. Client: diverse political parties. Valle de Banderas, Nayarit, 2010-2011. Details: design and analysis of a series of five public opinion surveys.

Assistant:

Study of connectivity in basic education schools engaged with program State Networks of Education, Health Government. Client: Public Education Ministry. Mexico City, 2012.

Study of Demand of Transmission Capacity of Transport Service. Client: Communications and Transport Ministry. Mexico City, 2012.

Advisory for the publication of "Acciones para el fortalecimiento de la Banda Ancha y las Tecnologías de la Comunicación y la Información" (National Broadband Plan). Client: Communications and Transport Ministry. Mexico City, 2012.

Study of the Public Television Mexican Market. Client: Federal Telecommunications Commission Mexico City, 2011.

Benchmarking in regulation, supervision and evaluation of performance in National Systems of Social Security. Client: National Council for Protection in Social Security. Mexico City, 2011.

Study of Multimodal movement demand in the Metropolitan Area of Guadalajara. Agency: Instituto de Mercadotecnia y Opinión (IMO). Client: Jalisco Ministry of Transport. Guadalajara, Jalisco, 2007. Details: coordinated the collection and coding teams that surveyed the daily commuting behavior from more than 19 thousand inhabitants surveyed.

service to the profession

Journal Refereeing:

Public Management Review, Urban Affairs Review, Information Technologies International Development, Journal of Theoretical and Applied Electronic Commerce Research, Latin American Policy, Gestión y Política Pública, Bienestar y Política Social/Well-being and Social Policy.

Conference Refereeing:

CPR-LATAM (formerly known as ACORN-REDECOM), Hawaii International Conference on System Sciences (HICSS).

Other Refereeing:

(1) NGOs' grant applications to the national program "Programa de Coinversión Social 2014" by the National Institute of Social Development (INDESOL); (2) Premio Gobierno y Gestión Local (Local Government Management Award) 2012. CIDE.

civic engagement

Red de Esfuerzos para el Desarrollo Social Local A.C. (non-profit organization)

President, 2011-2014; Founder & Associate, 2011-2017. Activities: production and diffusion of knowledge about local development policies; advisory to NGOs in institutional design and management.

Other: donor, Casa del Migrante en Tijuana, A.C. (2019 to date).

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THE DEMOCRATIZATION OF INTERNET ACCESS THROUGH MOBILE ADOPTION IN LATIN AMERICA

Judith Mariscal, Lucía Gamboa, and César Rentería Marín

During the last few years, governments around the world have embarked on the implementation of ambitious broadband programs that seek to accelerate the deployment of new generation networks in their countries. These programs, or national broadband plans, are being led by the belief that broadband contributes to economic growth and social inclusion. Although, the diffusion of broadband technologies is a fairly recent phenomena, there is a growing body of literature that support this belief through empirical data that shows broadband adoption increases productivity,[1] job creation,[2] and gross domestic product (GDP).[3]

Through its ability to carry large volumes of data and deliver advanced applications—that have the potential of enhancing benefits in other sectors such as education, health, government, and citizen participation—broadband embodies the promises of the information revolution. However, to seize these opportunities, public policies must incorporate an understanding of the elements that promote broadband adoption. This chapter seeks to contribute to this understanding by identifying some of these elements. The central argument is that public policies need to pay special attention to the diffusion of mobile broadband. We argue that mobile broadband will play a significant role in making available the benefits of broadband to a great majority of the population in Latin America; it will serve as the primary means of democratizing information and communication technologies (ICTs). The steady decline in the price of terminal devices along with the digital literacy that already exists in the use of mobile devices, and their ubiquity, even in the lower income sectors of the population, makes this platform the preferred type of Internet connection in the region. Indeed, mobile broadband adoption is replicating at an even faster pace the trend that was seen in the dramatic

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expansion of mobile telephony around fifteen years ago. However, the general adoption of mobile broadband in Latin America needs a suitable regulatory framework that promotes spectrum auctions and eliminates barriers to entry into the ICT market that are prevalent in most of the Latin American countries.

This chapter is divided into six sections: first, a brief introduction to the existing literature on mobile broadband in developing countries is provided, followed by a general overview of the state of the mobile sector in Latin America in the second section. The third section analyses spectrum allocation and its importance in increasing the supply of mobile broadband and improving market's efficiency and quality. The fourth section discusses how eliminating barriers to entry promotes an efficient market structure and fosters competition. Finally, in the last two sections we address the question of whether mobile broadband will, in fact, democratize Internet access, and conclude that several elements must be present in order to ensure that Latin American countries can reap the benefits of democratization of ICT access through mobile broadband.

Literature Review

There are numerous studies that have provided an understanding of the causes and impacts of the dramatic spread in the use of mobile telephony in developing countries.[4] From the supply-side perspective, studies find that market mechanisms such as pre-paid and calling party pays have significantly contributed to mobile expansion in developing countries.[5]

Another key variable identified with mobile network deployment is competition; the higher degree of competition in the mobile sector relative to the fixed sector played an important role in the growth of mobiles around the world.[6] This is a result, to a significant degree, of the fact that mobile services were initiated in a more liberalized market than fixed services.

From an institutional perspective, Andonova compares mobile deployment with Internet penetration in developing countries through an econometric exercise that includes variables which try to capture the quality of institutional factors—that is, political rights and liberties.[7] Internet and fixed penetration are highly correlated with institutional efficiency, which suggests that the digital divide is the result of an institutional divide. However, she finds that mobile deployment is less dependent on a solid institutional environment than is Internet infrastructure.

Recently, there have been numerous studies that find a positive impact of broadband on productivity and job creation. For example, Katz finds that an increase of 8 percent in broadband penetration in twelve Latin American countries could produce an increase of 8 percent in employment rate.[8] Several studies find that the impact of broadband on economic growth is positive, although the actual magnitude varies; a 10 percent increase in broadband penetration can increase GDP in a range of 0.24 percent to 1.4 percent.[9] Studies of the effect of mobile broadband are scarce as yet given the relative novelty of mobile broadband. However, a recent GSMA report[10] finds that a doubling of mobile data use leads to an increase of 0.5 percentage points in GDP and a 10 percent increase from second-generation (2G) to third-generation (3G) penetration generates a 0.15 percent increase in GDP.

The State of the Mobile Sector in Latin America

The fast evolution of mobile technologies as well as innovative business models has led to an unprecedented growth in adoption of voice services all over the world. According to the International Telecommunications Union, there are currently 6.8 billion mobile-cellular subscriptions in the world, which closely approaches the world population of 7.1 billion. In Latin America, mobile telephony has shown a higher growth rate than the world average; for the first quarter of 2013, Latin America averaged 116 subscriptions per 100 inhabitants, while the world average was 92.[11] Almost all countries in the region have a penetration above 100 subscriptions per 100 inhabitants, with outstanding rates on the one hand, such as in Chile, Uruguay, and El Salvador with 155, 144, and 143, respectively; and on the other hand countries lagging behind like Colombia, Bolivia, and Mexico (with 95, 90, and 88, respectively).

With the population almost covered and the advent of innovative mobile technologies, the mobile sector is experiencing a growth in mobile broadband adoption mainly through the so-called 3G technologies (Figure 9.1).[12] Mobile broadband adoption is replicating at an even faster pace than that of mobile telephony, which promises to reach higher levels of 3G network coverage and lower prices of connection and use in a fairly short period compared with fixed broadband. Moreover, mobile broadband quality is growing at faster pace than fixed; even fourth-generation (4G) technologies may surpass the penetration and quality of fixed broadband in the short run, since it can reach download speeds from 100Mbps up to 1Gbps and upload speeds of 50Mbps.[13] If this turns out to be true, mobile broadband will play a significant role in making available the benefits of the Internet to a great majority of the population in Latin America; it will serve as the primary mean of democratizing access and use of ICTs.

However, although growth rates are high in Latin America, mobile broadband penetration is still in an incipient phase. 3G technologies were introduced throughout the region in 2005 and, for the following year, it accounted for 0.38 percent of total mobile subscriptions; in the first quarter of 2013 mobile broadband accounted for 24 percent of mobile subscriptions (Figure 9.2). Not surprisingly, the countries with the highest penetration rates in mobile telephony like Chile, Uruguay, Argentina, and Brazil have the highest mobile broadband penetration rates.

Mobile broadband provides a unique opportunity to bring Internet access to the majority of the population at affordable prices. This platform offers four main benefits:

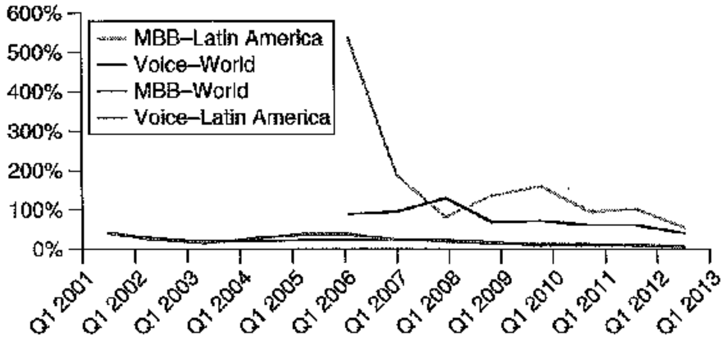

Figure 9.1 Growth rate comparison between mobile telephony subscriptions and mobile broadband subscriptions (2001–2013)

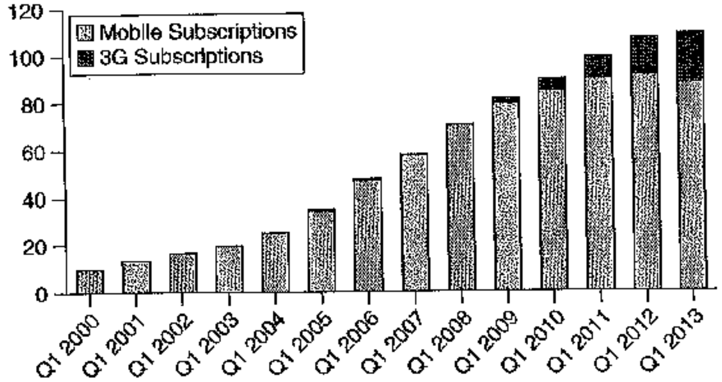

Figure 9.2 Growth in mobile telephony and 3G subscriptions in Latin America (2000–2013) (subscriptions per 100 inhabitants)

1. Internet connection is available to the user to communicate anywhere.
2. Additionally, mobile coverage allows users to stay communicated permanently.
3. Network access fixed costs are reduced to the handset acquisition cost while service costs can be covered on a pay-as-you-go basis.
4. Diminishes the need for digital skills as the great majority of the population already own and know how to use the mobile device.

These benefits promise to make access available to the entire population as coverage increases and handset and service costs decline; however, they must to be accompanied by social coverage in unprofitable areas not serviced by the market. In terms of Internet democratization, individual and collective spillovers are expected such as the increase of individual capabilities,[14] greater cohesion and social inclusion and an increase in business productivity and in the economy as a whole.[15] Internet, as a general purpose technology,[16] highlights the importance of designing policies to promote its adoption, promoting competition, and lowering barriers to entry.

The challenge for governments consists of promoting mobile broadband growth to capitalize on development opportunities. The current state of mobile broadband in Latin America is still marginal despite its high growth rate; public policies oriented to promote its growth are required. Diverse mechanisms are available to promote mobile broadband growth. For example, in Argentina and Brazil, the State is directly intervening in Internet deployment, while in other countries in the region—for example Chile, Mexico, and Colombia—the State is promoting investment mechanisms like public private partnerships (PPP).[17] Before any active State funding on infrastructure investment is implemented, there is a fundamental need to promote competition through two strategic means: spectrum concessions and legislation in favor of competition.

Spectrum Allocation

Spectrum allocation is perhaps the most essential factor in making Internet access possible. This is associated with greater social benefits. For example, Hazlett and Muñoz found that by increasing mobile spectrum allocation by 20 MHz in Latin America, the social value may increase by US$53 per capita.[18] In addition, spectrum allocation is highly correlated with lower prices and lower market concentration. In Latin America, the Herfindahl-Hirschman Index (HHI)[19] has decreased more in countries where spectrum release was higher.[20]

Spectrum is not only necessary to broaden the supply of mobile broadband and improve the market's efficiency, but also to maintain its quality. Since almost every mobile operator in Latin American countries now has spectrum concessions to supply mobile broadband, a major consequence of insufficient spectrum is that as the number of simultaneous users increases, the average broadband speed they experience will decrease.

In Latin America, governments have limited their spectrum auctions, making only modest allocations of bandwidth available to operators. During the first decade of the twenty-first century, Paraguay had the most spectrum available with 170 MHz, while the rest of the countries lagged behind: Colombia had 100 MHz available, Brazil 110 MHz, Mexico 120 MHz, Costa Rica 93 MHz, and Peru 80 MHz. Spectrum allocations in the first decade of the century were few and it wasn't until 2010 that spectrum allocation started to gain momentum as in that year more than 300 MHz were assigned in the region.[21] Colombia assigned 50 MHz in the band of 2.6 GHz; Brazil auctioned 20 MHz in the bands of 1.9/2.1 GHz and leftover bands from previous auctions to a total of 105 MHz; Mexico auctioned a total of 90 and 30 MHz in the bands of 1.7/2.1 GHz and 1.9 GHz, respectively; Costa Rica assigned 110 MHz in the bands of 850, 1,800 and 2.1 MHz; and Peru auctioned 24 MHz in the band of 1.9 MHz.[22]

In 2011 and 2012, additional assignments were made: Brazil assigned 240 MHz in the 2.6 GHz band; Colombia assigned 25 MHz and later on 50 MHz in the 1.9 GHz band; Ecuador 30 and 40 MHz in the bands of 700 MHz and 2.1 GHz, respectively; and most recently, in March 2012, Uruguay auctioned 70 MHz in the band of 1.9 GHz and 60 in the 1.7/2.1 GHz band. Despite these important additions, Latin America still falls behind in relation to other regions,[23] and countries may not be able to satisfy the expected growth in broadband-enabled phones if additional spectrum is not liberated.

The latter allocations, given the characteristics of the bands, account mainly for improving 3G and 4G connections in urban areas; in other words, their main goal is to improve the market's efficiency and service quality in urban areas, most of them already covered by fixed or mobile broadband services. But one of the major social and economic outputs in spectrum allocations may come specifically from the 700 MHz band, the so-called digital dividend.[24] This band allows operators to offer 3G and 4G mobile broadband in a wider area, which is especially useful in reaching rural areas not currently covered or with few competitors.

As Figure 9.3 shows there is an important relationship between spectrum allocation and mobile penetration, which is why additional spectrum is essential for achieving a democratization effect. Brazil shows the highest mobile broadband penetration with 36 percent and also the most licensed spectrum in the region. However, the countries with less than 200 MHz available show different penetration rates, ranging from Paraguay's low of 6 percent compared to Argentina's 25.8 percent. This may suggest that there are additional explanatory factors such as adequate legislation.

Evidence from Latin America shows that assigning the band of 700 MHz for mobile broadband can contribute between US$8.296 million and US$10.815 million and could reduce the investment required to satisfy the growing data traffic demand. Additionally, its range is significantly greater—10 km radius compared with less than 5 km ranges at

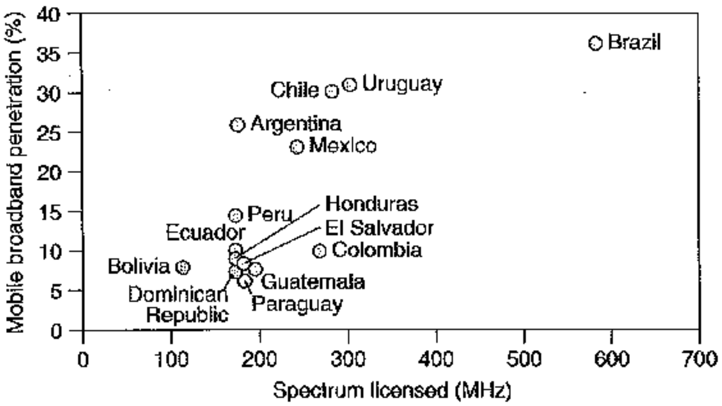

Figure 9.3 Mobile penetration rate vs. spectrum licensed per country in Latin America (Q1 2013)

other frequencies—and could cover approximately 20.1 million people currently without mobile services, equivalent to 4.8 percent of the population in Latin America living in remote areas.[25] For example, Katz and Flores-Roux estimate that by allocating the 700 MHz band, Mexico, Colombia, and Peru could considerably increase their coverage, going from 39 percent, 52 percent, and 65 percent population covered with 3G, to 94 percent, 90 percent and 89 percent, respectively.

Nevertheless, the leverage of the 700 MHz band relies upon the transition to digital television (or the analog blackout). Historically, this band has been dedicated to streaming analog TV signals, but with the transition to digital TV signals, this band would be able to be dedicated to mobile broadband services.

This process takes a long time and currently few countries in the world have experienced the analog blackout; however, the majority of countries in Latin America have made plans to liberate the band of 700 MHz.[26] Currently planned analog blackouts in the region range from 2015 in Uruguay and Mexico to 2022 in Paraguay. When completed, the timing and efficiency of each country to reassign the liberated spectrum will determine the extent to which the benefits of mobile broadband are leveraged.

In fact, in Latin America the presence of TV signals in that band is scarce in most countries.[27] This may represent, compared with developed countries, a form of "leapfrogging" to leveraging the band of 700 MHz, since it remains mostly unused. Given this, some governments have begun to take the initial steps for spectrum reallocation. Peru established a twelve-month term to reallocate broadcasting services operating in the 700 MHz band and a public consult on the matter has been completed. In Uruguay, a presidential decree, signed in 2011, determined the liberation of the 700 MHz band to offer international mobile telecommunications (IMT) and the 638–698 MHz band to provide digital television services on national territory. In Colombia, the Telecommunications Ministry (*Ministerio de las Tecnologías de Información y Comunicaciones*) announced that the digital dividend would be assigned during 2013. Mexico concluded a public consult on the reallocation of the band of 700 MHz for telecommunication services in 2010 and its recent Telecommunications Reform includes steps towards its assignment. Argentina established the utilization of the spectrum derived from the digital dividend as a priority within its national broadband plan, *Argentina Conectada*, and, finally, in 2013 Brazil's regulatory body ANATEL moved forward the discussion on the 700 MHz spectrum for mobile telephony and decided to put the proposal to public consultation.

Appropriate Legislation in Favor of Competition: Eliminating Barriers to Entry

Spectrum allocation is not the only factor to further mobile broadband penetration. Other factors like infrastructure deployment and appropriate legislation are essential factors to ensure democratization of Internet access. Eliminating barriers to entry will attract the interest of investors to provide broadband services, which would result in a more competitive market. Although there are several strategies to lower entry barriers, we focus on a few that are yet unaccomplished in most of Latin America.

The institutional framework must foster competition and investment. It is important to create efficient and strong regulatory entities able to impose sanctions over anti-competitive behaviors and to procure an efficient market structure. It is important for the regulation process to allow for asymmetric regulation. This figure is a strong tool to correct severe distortions in the structure of the markets, allowing opportunities for new operators to compete with incumbent entities. Rules need to be clear and processes should occur in a transparent and inclusive way, where all stakeholders are considered in the decision-making process. These features will promote investment certainty to firms and could lead to forms of cooperation between relevant actors.

As discussed above, government intervention in deploying infrastructure can take different forms. Aside from the debate about the role of the State in deploying broadband, we consider that government should establish non-strategic passive assets to accelerate the deployment of infrastructure and foster more competition. Specifically, we refer to assets such as rights of way, ducts, towers, and non-strategic governmental buildings.

Will Mobile Broadband Democratize Internet Access?

Both stabilization of fixed broadband penetration and growth of mobile broadband—including the enhanced capacity of 4G technologies—make clear that, within a couple of years, the Internet access debate will be based on mobile connections, rather than fixed. Mobile broadband has become the main channel to connect to Internet, surpassing fixed in 2008 in the Organization of Economic Co-operation and Development (OECD) countries' average and, in 2010, in Latin American countries. Higher penetration and coverage reduced sunk costs (both on device acquisition and monthly fee) and better connection quality makes clear that the answer to the quest for Internet democratization in Latin America is mobile broadband.

Therefore, the reach of democratization may rely mainly on improving coverage (making available 3G and 4G connections to the whole population) and making this service affordable. Forecasting expected penetrations shows that Latin America could reach levels similar to OECD countries, with a regional average of 40 percent by 2015 (Figure 9.4). Similarly, a reduction in HHI rates would bring better price outcomes. Figure 9.4 shows that reducing market concentration has been a consistent tendency over the last ten years in Latin America and will continue during the next two years.

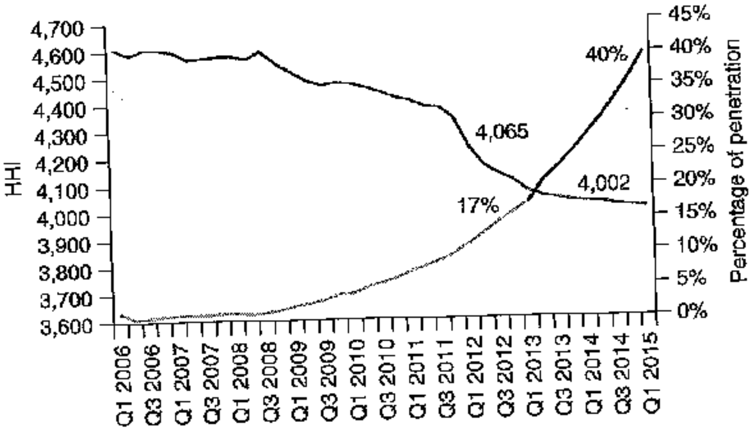

Figure 9.4 3G penetration and HHI forecasting in Latin America by 2015

We emphasize that these outputs can be fast-tracked by more spectrum availability, lower barriers to entry, and a stronger competition environment. In terms of market competition, regulatory entities play a fundamental role. According to regulation literature, strong regulators must be autonomous[28] and collegial[29] in decisions.[30] Empirical evidence suggests that this institutional design may have a positive effect on the market structure. The average HHI of countries that adopted autonomous regulators and a collegial structure (before 1996) is consistently lower than the average HHI of countries that adopted it later (averaging in 2011), with a large gap of 3,513 points (4,095 and 7,608, respectively) in 2000, reducing during the following decade, but not becoming equal (3,939 versus 4,644, respectively in 2013).

Conclusion

The mobile sector is experiencing a growth in mobile broadband adoption at an even faster pace than that of mobile telephony; this promises higher network coverage and lower prices. However, mobile broadband penetration in Latin America is still in an incipient phase.

The evidence identified in this chapter shows that in order to achieve a democratization of Internet access through mobile adoption in Latin America several elements must be present. Spectrum allocation is a key element to increase the supply of mobile broadband, to improve market efficiency, and maintain its quality. Governments in Latin America are planning to liberate the band of 700 MHz and must complete their analog blackouts. Infrastructure deployment and appropriate legislation are other essential factors to ensure democratization of Internet access. Eliminating barriers to entry and reducing market concentration, thus creating a more competitive environment, are key steps for regulatory policies to address to promote mobile broadband growth and capitalize on development opportunities.

However, overcoming supply-side obstacles to improve market efficiency is only the beginning. The demand side has further obstacles in democratizing Internet than those associated with the expansion of the market. A considerable proportion of population does not have the required digital skills to adopt the Internet and other ITCs.

Governments must target policies that guarantee the development of digital skills; otherwise Internet may become available, but not effectively democratized.

Notes

1 Mélisande Cardona, Tobias Kretschmer, and Thomas Strobel, "ICT and Productivity: Conclusions from the Empirical Literature," *Information Economics and Policy* 25, no. 3 (2013): 109–125.

2 Raul L. Katz, "Banda Ancha, Digitalización y Desarrollo," in *Banda ancha en América Latina: Más Allá de la Conectividad*, ed. Valeria Jordán, Hernán Galperín, and Wilson Peres (CEPAL-DIRSI, 2013), 107–130.

3 Nina Czernich, Oliver Falck, Tobias Kretschmer, and Ludger Woessmann, "Broadband Infrastructure and Economic Growth," *The Economic Journal* 101, no. 552 (2011): 505–532.

4 Jonathon Donner, "Research Approaches to Mobile Use in the Developing World: A Review of the Literature," *The Information Society: An International Journal* 24, no. 3 (2007): 140–159; Richard Duncombe, *Mobile Phones for Agricultural and Rural Development: A Literatura Review and Future Research Directions* (Manchester: Working Paper 50 Centre for Development Informatics, 2012); World Bank, *Information and Communications for Development 2012: Maximizing Mobile* (Washington, DC: World Bank, 2012).

5 James Hodge, "Tariff Structures and Access Substitution of Mobile: Cellular for Fixed Line in South Africa," *Telecommunications Policy* 29, no. 7 (2005): 493–505; Judith Mariscal and Carla Marisa Bonina, *Mobile Communications in Mexico: A First Look at Usage Patterns and Social Implication* (Ciudad de México: CIDE, DTAP 184, 2007); Steve Esselaar, Christoph Stork, Ali Ndiwalana, and Mariama Deen-Swarray, "ICT Usage and Its Impact on Profitability of SMEs in 13 African Countries," *Information Technology and International Development* 4, no. 1 (2007): 87–100.

6 Ben Petrazzini, and Theodore Clark, *Costs and Benefits of Telecommunications Liberalization in Developing Countries* (Hong Kong: Working Paper, Hong Kong University, 1996); Scott Wallsten, "An Econometric Analysis of Telecom Competition, Privatization and Regulation in Africa and Latin America," *The Journal of Industrial Economics* 69, no. 1 (2001): 1–19.

7 Veneta Andonova, "Mobile Phones, the Internet and the Institutional Environment," *Telecommunications Policy* 30, no. 1 (2006): 29–45.

8 Raúl Katz, "The Contribution of Broadband to Economic Development," in *Fast-Tracking the Digital Revolution: Broadband for Latin American and the Caribbean*, ed. Valeria Jordán, Hernán Galperín, and Wilson Peres (CEPAL-DIRSI, 2011), 49–80.

9 Katz, "The Contribution of Broadband to Economic Development."

10 GSMA, "Mobile Money for the Unbanked," October 23, 2012, http://www.gsma.com/mobilefordevelopment/the-gsma-publishes-mmu-2012-annual-report

11 Wireless Intelligence, *Wireless Intelligence*, 2013, http:www.wirelessintelligence.com

12 3G technologies have higher capacity and enhanced network functionalities, which allow advanced services and applications, including multimedia, and comprise Global System for Mobile Communications (GSM), Enhanced Data for GSM Evolution (EDGE), Universal Mobile Telecommunications System (UMTS), Wideband Code Division Multiple Access (WCDMA), Code Division Multiple Access 2000 (CDMA2000), and Evolution-Data Only (EV-DO) technologies.

13 Valeria Jordán and Omar de León, "Broadband and the Digital Revolution," in *Fast-Tracking the Digital Revolution: Broadband for Latin American and the Caribbean*, ed. Valeria Jordán, Hernán Galperín, and Wilson Peres (CEPAL-DIRSI, 2011), 13–20. Wired technologies such as cable modem and copper pair (xDLS) are not theoretically able to reach 4G rates; therefore, the wired technology able to reach higher speeds is fiber optic in its Fiber to the Home and Fiber to the Building modes.

14 People's capabilities have to do with their ability to transform ICTs into actual or realized functions.

15 Further discussion on benefits can be found in ITU, *Impact of Broadband*. See Katz, "Banda Ancha, Digitalización y Desarrollo," for the contribution of broadband to economic development. For discussion on increase of social cohesion, see: Devinder Thapa and Maung Sein, "ICT, Social Capital and Development: The Case of a Mountain Region in Nepal," *Proceedings of Third Annual SIG GlobDev Workshop*, December 12, 2010, Saint Louis, U.S.A.; Kenneth Pigg and Laura Crank, "Building Community Social Capital: The Potential and Promise of Information and Communications Technologies," *The Journal of Community Informatics* 1, no. 1 (2004): 58–73. For debates on increase of individual capacities, see Dorothea Kleine, *Technologies of Choice? ICTs, Development and the Capabilities Approach* (Cambridge, MA: MIT Press, 2013); and Mathias Hatakka and Rahul De', "Development, Capabilities and Technology: An Evaluative Framework," *Proceedings of the 11th International Conference on Social Implications of Computers in Developing Countries*, Kathmandu, Nepal, 2011.

16 General purpose technologies are characterized by their permeability as a factor of production in various

sectors, and their potential for technical improvements and innovative complementarities, increasing the productivity of research and development efforts. Therefore, as they spread across the economy, they can lead to widespread productivity gains, producing an aggregated effect which affects the overall growth of the economy. See Elhanan Helpman and Manuel Trajtenberg, "Diffusion of General Purpose Technologies," in *General Purpose Technologies and Economic Development*, ed. Elhanan Helpman (Cambridge, MA: MIT Press, 1998), 85–119.

17 Hernan Galperin, Judith Mariscal, and María Fernanda Viecens, "One Goal, Different Strategies: An Analysis of National Broadband Plans in Latin America," *Info* 15, no. 3 (2013): 25–36.

18 Thomas W. Hazlett and Roberto E. Muñoz, "Spectrum Allocation in Latin America: An Economic Analysis," *Information Economics and Policy*, 21, no. 4 (2009): 261–278.

19 The Herfindahl-Hirschman Index is a standard measure to assess the level of competition in a market. The Index is calculated with firms' market shares and ranges from 10,000 where there is only one firm in the market or approximating to zero where there is theoretically perfect competition. As a reference, the U.S. Department of Justice will regard a markets as "highly concentrated" if the HHI is higher than 2,500.

20 Hazlett and Muñoz, "Spectrum Allocation in Latin America."

21 Raúl Katz and Ernesto Flores-Roux, *Beneficios Económicos del Dividendo Digital para América Latina* (New York: Telecom Advistoy Services, LLC, 2011).

22 Katz and Flores-Roux, *Beneficios Económicos del Dividendo Digital.*

23 The region will have licensed the equivalent of about two-thirds of the spectrum available in developed countries. See Katz and Flores-Roux, *Beneficios Económicos del Dividendo Digital.*

24 The "digital dividend" refers to the amount of spectrum that will be freed up in the switchover from analogue to digital terrestrial television. Digital television uses the spectrum six times more efficiently than analogue television does, which makes it possible to reassign spectrum to other services without compromising open television: European Union, "Delivering the Digital Dividend," 2010, http://ec.europa.eu/digital-agenda/en/delivering-digital-dividend

25 Katz and Flores-Roux, *Beneficios Económicos del Dividendo Digital.*

26 Countries are (end of analog blackout in parenthesis): Argentina (2019), Bolivia (2020), Brazil (2018), Chile (2017), Colombia (2019), Costa Rica (2018), Ecuador (2020), El Salvador (2018), México (2015), Paraguay (2022), Peru (2020), Uruguay (2015) and Venezuela (2019).

27 Katz & Flores-Roux, *Beneficios Económicos del Dividendo Digital.*

28 Wallsten, "An Econometric Analysis of Telecom Competition"; Carsten Fink, Aaditya Mattoo, and Randeep Rathindran, *An Assessment of Telecommunications Reform in Developing Countries*, World Bank Policy Research Working Paper 2909 (Washington, DC: World Bank, 2002; http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-2909).

29 Collegial bodies provide checks, balances, and collegial support for decision-makers and decisions can be more thoroughly debated and considered. They also can lead to less cohesion and consistency than single regulators and are somewhat less susceptible to "capture" by regulated companies.

30 Luis H. Gutiérrez, "Regulatory Governance in the Latin American Telecommunications Sector," *Utilities Policy* 11, no. 4 (2003): 225–240.

Research Article

How Transformational Mobile Banking Optimizes Household Expenditures: A Case Study from Rural Communities in Mexico

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Abstract

This article presents the results of a quasiexperimental impact evaluation of a mobile banking pilot project led by the Mexican government in a context that portrays the financial inclusion challenges in Mexico and Latin America: highly dispersed populations in rural communities that lack access to a financial system and telecommunication services. The research questions that drive this study are: Do mobile banking and mobile telephony have an impact on households' expenditures? Specifically, what categories of expenditure are affected? The propensity score matching methodology was used to assess the impact on households' expenditures by category (e.g., education, transport, energy, communications, etc.). Results show that mobile banking can reduce spending on communications and public transport, and the main benefits in terms of spending come from the reduction of people's local commuting expenses. Likewise, evidence indicates that a major share of spending reduction is transformed into savings in bank accounts. Finally, the case study presents relevant lessons for mobile banking policy alternatives to promote financial and digital inclusion in rural communities.

Introduction

With the burgeoning research in the information and communication technologies for development (ICT4D) community, it seems that an assessment of the performance or impact of ICT-based initiatives on development is taking a central role in academic debate. Most of the existing literature falls in the category of what Walsham (2013) termed *implementation studies,* meaning the study of a particular technology or a particular context. Empirical evidence is still needed for decision makers at the strategic policy level (Duncombe & Boateng, 2009; Walsham, 2013). Research studies that contribute to ICT-based policy formulation or evaluation will improve ICT's position on the public agenda as valuable tools for improving developmental policies or for innovating in policymaking. An accumulation of empirical evidence on the effect of ICT4D initiatives will contribute to moving on from a current myriad of pilot projects around the world to the proliferation of far-reaching public policies.

In particular, the mobile banking field has witnessed an explosive growth worldwide in terms of live platforms. According to GSMA, in 2014 there were 233 existing and 112 incoming platforms. Notwithstanding, mobile banking is not as widespread in developing countries as might be expected (Shaikh & Karjaluoto, 2014). According to Diniz, Porto de Albuquerque, and Cernev (2011), this situation may be due to, among other factors, the fact that successful cases are not clearly understood and because of the dearth of assessments of the potential social and economic effects. An important community of researchers and practitioners is engaged in understanding the key factors of successful cases, especially researching the determinants of adoption (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008; Diniz et al., 2011; Duncombe & Boateng, 2009; Pena, 2012; Shaikh & Karjaluoto, 2014). To date, few studies have contributed to the assessment of the socioeconomic effects of mobile banking.

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Assessing whether an ICT4D initiative contributes to development depends fundamentally on what developmental approach is considered. As documented by Donner (2008) and Duncombe (2011), the benefits observed from not only mobile banking but also the broader uses of ICTs are primarily monetary and they lead, in a broader scope, to a better market coordination. Most of the ICT4D studies realize transaction cost reductions as one of the top benefits, rather than increased earnings (Donner, 2008; Duncombe, 2011). However, further understanding of this reduction is yet to evolve. Many questions exist on which categories of expenditures reflect this reduction. For example, do reduced transaction costs only mean a reduction in traveling costs? Are various expenditure categories reduced? Additionally, there is little understanding about what happens with a reduction of transaction costs; for instance, does this reduction bolster savings? Or is this money spent in other categories such as food consumption? This research seeks to understand which expenditure categories are reduced after the use of mobile banking and mobile telephony services in a rural community. The questions that drive this research are: What expenses are reduced after the joint implementation of mobile banking and mobile telephony services in a rural community? If there are efficiency gains, how is this money spent? Of course, the absence of effect in any expenditure category means that, in fact, the platform had no impact on transaction costs, contrary to what has been found in other studies.

This case study is a transformational mobile banking pilot project implemented by Telecomm, a Mexican state-owned firm established to provide telephony and banking services in rural communities lacking access to either service. Telecomm designed a business model to achieve financial inclusion without incurring monetary losses (as mandated by law) and selected mobile banking to be the key element for its business model.

This case study belongs to the microeconomics stream and contributes empirical evidence on the impact of mobile banking and mobile telephony on household budgets in rural communities. This study also explores mobile banking as a potential policy tool for digital and financial inclusion. With data collected in Santiago Nuyoó, the municipality where the pilot was conducted, impact was estimated with the quasiexperimental method propensity score matching (PSM). Results show statistically significant efficiency gains in two of the eight main expenditure categories in rural and remote Mexican communities.

Impact Assessment of ICT4D: State of the Art

It is difficult to discuss evaluation solely on the mobile banking branch, since there are few studies that have evaluated the outputs, outcomes, or broader impact of mobile banking. As the most recent literature reviews show, there is more emphasis on understanding the determinants of mobile banking adoption (Diniz et al., 2011; Shaikh & Karjaluoto, 2014). Departing from the limitation of mobile banking evaluations, in this section we show the state of the art in assessing the socioeconomic effects of ICT4D.

Establishing a consensual understanding about evaluation methodologies in the ICT4D community is a work in progress. As remarked by Richard Heeks (2010) and Chrisanthi Avgerou (2010), the development of this community has been driven by scholars from the information systems field, rather than those from the developmental studies field. As a consequence, assessments are loosely based on developmental impacts or outcomes (Duncombe, 2011; Vincent & Cull, 2013). Yet there is no generalized methodology for ICT4D evaluation, as can be observed in analytical compilations from Duncombe (2011) and Heeks and Molla (2009).

With this scenario, the ICT4D impact research has progressed under the umbrella of three main domains of developmental studies: developmental economics, microeconomics, and people-centered frameworks. From the developmental economics perspective many studies have measured the impact of mobile or broadband penetration on traditional development-related indicators such as economic growth, employment rate, and productivity. Outcomes vary depending on the context of each study, but the majority of studies have found a positive impact in such indicators (Gallego & Gutiérrez, 2013; Katz, 2012). For instance, a 10% augmentation in broadband penetration may cause a GDP growth of 0.08% in Brazil (Katz, 2012), but 1.53% in European countries (Czernich, Falck, Kretschmer, & Woessmann, 2011). Based on data from Chile, a study by Raul Katz (2011) shows that an augmentation of 10% in broadband penetration would improve the employment rate by 0.018%. Waverman, Meschi, and Fuss (2005) demonstrated that for an increase of 1% in broadband penetration, the productivity rate would increase by 0.13%.

Other studies have addressed the impact from microeconomics, especially SME outcomes. In his literature review on the impact of mobiles in SMEs, Donner (2008) remarked that positive outcomes included an increased flow of information about prices and an expansion of interaction with clients. Duncombe (2011) found that the main benefits observed were better market coordination, greater and timelier information flow, as well as reduction of transaction costs and price dispersion. However, arguably the strongest evidence is found in the studies on SMEs and entrepreneurs (Chew, Levy, & Ilavarasan, 2011; Donner, 2008; Donner & Escobari, 2010; Duncombe, 2011). For instance, classic studies by Jensen (2007) and Abraham (2007) in India and Aker (2008) in Niger have shown that mobiles contribute to rectifying information asymmetries and creating more efficient markets.

Another branch of impact studies are the people-centered approaches that are receiving attention. However, this stream currently places more importance on the definition and measurement of concepts, rather than the evaluation of projects (Hatakka & Lagsten, 2012; Heffernan, Lin, & Thomson, 2012; Kleine, 2013; Zheng, 2009).[1]

In quantitative ITC4D evaluation, the application of rigorous quantitative tests for causality in order to properly demonstrate impact is still a major challenge. Few studies have addressed this challenge, and they have struggled with the problem of the counterfactual. Among other challenges, the studies lacked properly designed treated groups and control groups or the results of the control groups may have been contaminated by the treatment's spillover effects or by a reverse causation (Duncombe, 2011). Looking at those shortcomings, the conditional independence assumption is a compelling component that should be included in evaluations so as to have a better understanding of causal relationships among variables. In the domain of developmental studies, impact evaluation literature has established a set of methods that has been well accepted for policy evaluations (Baker, 2000; Gertler, Martinez, Premand, Rawlings, & Vermeersch, 2011; Khandker, Koolwal, & Samad, 2010). So far, impact evaluation methods have been widely used to inform policy decision making. To assess whether a positive cause-effect relationship exists between mobile banking and efficiency gains in household expenditures and to avoid the evaluation problems outlined above, this study used a quasiexperimental evaluation for the case study described in the following section.

Case Study

Compared to other countries, Mexico faces a financial inclusion gap. According to the Global Financial Inclusion Database (Demirguc-Kunt, Klapper, Singer & Van Oudheusden, 2015), 62% of the world's adult population has a bank account, and 27% have saved money in a financial institution. In Mexico, those numbers are 39% and 14%, respectively (Demirguc-Kunt et al., 2015). The most critical cases are rural communities: According to the 2010 national census, only 1.6% of the population living in communities of fewer than 2,500 inhabitants had access to financial services.

Population dispersion in Mexico is one of several challenges that impede efforts at financial inclusion. According to the census, approximately 32 million people live in rural communities.[2] Furthermore, these remote rural communities represent a higher percentage of people living in poverty (84%) than the rest of the country.

There is some expectation that mobile and branchless banking could improve financial inclusion, and recently Mexico has been enacting regulatory reforms to encourage the deployment of these financial inclusion models. Mobile banking seems to be particularly useful, considering that 59% of the rural population has access to mobile telephony networks.

This evaluation is based on a pilot program entitled Mobile Money Payments carried out by Telecomm. The goal of the pilot was to test a business model that would allow Telecomm to offer financial services in towns with fewer than 5,000 inhabitants who lacked those services.

The pilot program began in February 2011, aiming to provide financial and telephony services. Mobile banking was offered in January 2012, following the installation of a base transceiver station (BTS) that allowed

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[1] *Detailed discussion of this topic is beyond the scope of this article, although Kleine (2013) and Hatakka and Lagsten (2012) have proposed different operationalizations of Sen's capabilities approach, while studies by Sundén and Wicander (2007) and Duncombe (2006) are based on the livelihoods approach.*

[2] *Defined as communities with fewer than 5,000 inhabitants.*

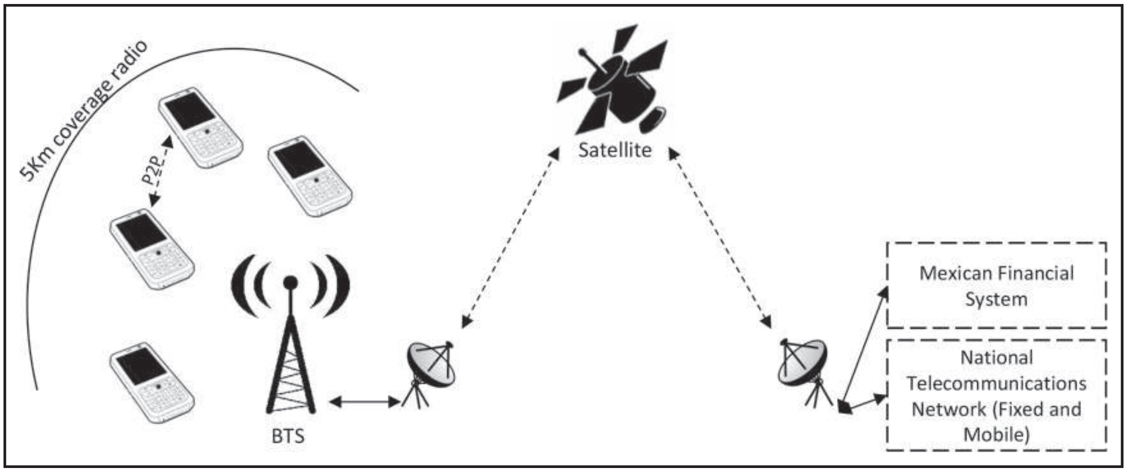

Figure 1. Pilot telecommunications system.

local mobile services and mobile banking transactions by switching transmission between the BTS and a satellite to complete outbound communication (see Figure 1).[3] This system was preferred as it supported low-cost mobile handsets, although its drawback is that given the satellite's scarce transmission capacity, the system does not allow outbound voice calls to a network other than the local BTS.

After the BTS was in operation, Telecomm was able to launch both the mobile banking and mobile telephony services. Financial inclusion via mobile banking started with a public offering of a free mobile handset for residents of the BTS-covered zones, on the condition that the resident own or open a bank account.[4] According to the business model, the costs (installation, operation, free handsets) would be recovered through fees charged for every financial transaction and a steady monthly payment of US$7.75[5] for a mobile telephony subscription (the service consists of unlimited local voice calls and SMS). Notwithstanding, the pilot program does not provide a complete range of services. In telephony, users cannot connect outside of their local network. Regarding financial services, the pilot program offers basic services: savings accounts, people-to-people (P2P) and government-to-people (G2P) payments, remittances handling, and cash in/cash out. It does not offer microcredits, microinsurance, or similar services. Telecomm started to charge for the telephony service on a monthly basis in May 2013, sixteen months after installing the BTS and initiating the mobile banking service.

The project was implemented in four towns in the municipality of Santiago Nuyoó,[6] with 945 inhabitants, predominantly indigenous, with high rates of poverty and limited availability of public services. Of the municipality's population, 86% live on a daily income of less than US$9.51; sixty-five percent of households have dirt floors; 22% of adults are illiterate. Prior to Telecomm's intervention, Santiago Nuyoó residents had neither financial nor telecommunication services. Tlaxiaco, the nearest city with financial and telecommunication services, is 52 kilometers away.

Evolution of Mobile Banking Adoption

Since the start of the pilot program, 316 of the 396 adults who live in the four towns (that is, 80% of adults) acquired a mobile handset and opened a bank account. Before Telecomm's intervention, there were 30 account holders in the zone covered by the network; this number expanded to 150 account holders after

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[3] Outbound communication for financial transactions must comply with Mexican Financial System regulations, which do not allow any transaction without being immediately registered through its digital system.

[4] Telecomm has collaboration agreements with seven major banks in Mexico. However, only one bank had a mobile banking platform at the point of implementation; therefore, only account holders of this bank were able to do mobile banking.

[5] During the study period, a U.S. dollar was equivalent to 12.9 Mexican pesos (MXN).

[6] The towns are Santiago Nuyoó, Tierra Azul, Plan de Zaragoza, and Yucuhiti.

opening the Telecomm office. This figure rose to 316 with the advent of mobile payments; that is, 53% of the bank accounts were opened after the introduction of mobile banking.

One interpretation of this behavior is that many beneficiaries may have opened an account looking only to acquire a cellphone. Nevertheless, a study by the Consultative Group to Assist the Poor (CGAP) performed in Santiago Nuyoó shows that users did not seem to be solely interested in cellphones since the average percentage of active mobile banking accounts (during February and August 2012) was 33% (CGAP, 2012), while at the international level, in traditional mobile banking platforms (where normally there are no cellphones given for free), active accounts averaged 30% (Pénicaud & Katakam, 2014).[7]

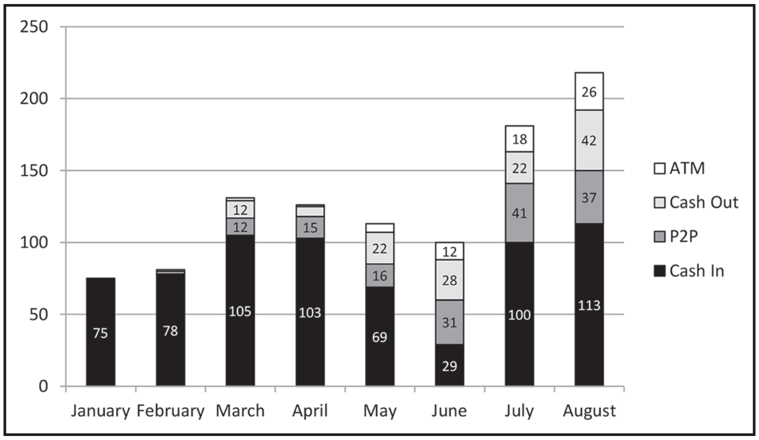

Figure 2. Number of transactions made in Santiago Nuyoó by type in first eight months of 2012.

Source: CGAP, 2012.

After the start of mobile banking, the financial transaction pattern has evolved from traditional cash payments only to a combined use based on mobile payments and ATM use (see Figure 2). Until August 2012, forty-seven percent of active account holders were considered savers. Their average savings increased from US$7.59 to US$11.60 after the second quarter of 2012.

Research Method and Data Source

The main challenge in designing an evaluation is addressing the inability of observing and measuring the counterfactual. This means we could not concurrently observe the outcomes from a treated household and the outcomes from the same household which had not been treated. This is expressed in Equation 1. The challenge of the counterfactual is normally solved with a randomized controlled trial (RCT), where treatment group and control group selection is completely random and without selection biases (Baker, 2000; Behrman, Gallardo-García, Parker, Todd, & Velez-Grajales, 2010; Khandker et al., 2010; Todd, 2007). This helps ensure that a counterfactual is properly chosen (as expressed in Equation 2). If this requirement is met, impact can be assessed with methodological robustness by distinguishing the treatment effect in the treatment group minus no treatment effect in the control group (see Equation 3).

1. $E(\Delta D = 1) = E(Y_1 - Y_0 | X, D = 1)$
2. $E(Y_0 | X, D = 1) = \mathrm{E}(Y_0 | X, D = 0)$
3. $\text{Impact} = E(Y_1 | X, D = 1) - E(Y_0 | X, D = 0)$

Where:

Y_1 is the expected outcome from a household being treated.

Y_0 is the expected outcome from the same household, which had not been treated.

X is the set of variables that determines a household's probability of being selected for the pilot project.

$D = 1$ is a household that is part of treatment group.

$D = 0$ is a household that is part of control group.

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[7] *In their international comparison, Pénicaud and Katakam defined* active accounts *as users who performed at least one transaction within the last 90 days. CGAP in Santiago Nuyoó defined* active accounts *as users who performed at least one transaction within the last 30 days.*

Apart from random selection, RCT requires data collection at a baseline stage and at following stages in both treated and control households. The first requirement was not met in this study since the pilot project started before a baseline could be collected and because the program design allowed for autoselection bias by the beneficiaries as handsets were available to everyone who wanted one. Given those constraints, a quasi-experimental method was the appropriate alternative for selecting counterfactuals, and the most appropriate technique for this study was propensity score matching (PSM), as this allowed for synthetic counterfactual selection (Baker, 2000; Khandker et al., 2010). The PSM is based on the selection of a set of sociodemographic characteristics (e.g., a household's type of floor, roof materials, equipment, services available, etc.), usually from a data set different than that of the treated group, but where both have the same variables and can be completely comparable. This allows the construction of a synthetic control group from households not among the treated group, but equally measured so counterfactuals could be selected from this synthetic group based on the households that were the most similar possible than the surveyed households, considering a set of sociodemographic characteristics.[8]

It is understood that quasiexperimental methods lack the robustness of an RCT, but for the PSM this method is considered to have a strong statistical robustness as long as its two assumptions are satisfied (Khandker et al., 2010; Todd, 2007):

Assumption 1. Conditional independence of the outcomes regarding *D.* Potential outcomes are orthogonal to treatment once it is conditioned by a set of observed variables (*Z*).

4. $Y_1, Y_0 \perp D | Z$

Where:

Z is the set of variables that determines the possibility of a household being selected for the pilot program

Assumption 2. Common support region. For individuals of both treatment and control groups with the same Z values, there is a positive and nonperfect probability of participating in the program.

5. $0 < \Pr(D = 1 | Z) < 1$

These assumptions allow for each treated household to have a control peer that was found within the common support region, with the same conditional characteristics (*Z*). Therefore, once the matching was computed for each treated household, the outcome ($Y_0 | X, D = 0$) could substitute the result ($Y_0 | X, D = 1$), as in an RCT. Matching estimation requires the careful selection of a set of conditional variables *Z,* given that as the number of variables increases, the possibility of finding a peer for each treated household is reduced. On the other hand, the fewer the number of *Z* variables, the more imprecise the outcomes tend to be. However, the calculation of a probability score (instead of a precise matching among all *Z* variables) allows us to introduce more variables to better match the treated group (Dehejia, 2005; Khandker et al., 2010).

Information from the treatment group was gathered through a survey that shared exactly the same variables and structure with the control's data source. The survey design for the treated households was a replica of the National Survey on Income and Expenditure (ENIGH, its Spanish acronym) carried out by the National Bureau of Statistics and Geography (INEGI, its Spanish acronym) at the national level.[9] The survey had a simple random sample of 100 beneficiary households out of 150 in total; all were chosen from the first wave of handsets delivered in January 2012.[10] Prior to the selection, a beneficiaries' depuration was done to avoid double

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[8] *For an extended review of the PSM technique, see Dehejia (2005), Dehejia and Wahba (2002), Jalan and Ravallion (2003), Rosenbaum and Rubin (1985), and Todd (2007).*

[9] *However, the survey for the treatment group only used the section regarding the expenditure questions, omitting all sections about income that are part of the ENIGH (Instituto Nacional, 2013).*

[10] *Six months later (in June 2012) more beneficiaries were introduced on a one-by-one basis, amounting to 316 adults. The number of beneficiaries may be higher than number of households for four reasons: (1) the number of households has increased from the 2010 census to the 2013 census, although precise data is unknown; (2) in some households more than one adult acquired the service so there was double-counting; (3) some persons from noncovered localities managed to obtain a handset; and (4) some persons who acquired the handset emigrated.*

Table 1. Types of Expenditures and Research Hypotheses.

Type of Expenditure and Description	Research Hypothesis
Homecare: Expenditures for goods and services for homecare	No effect
Personal care: Expenditures for goods or services for cleaning and personal care	No effect
Education: Expenditures for education-purposed goods or services	No effect
Recreation: Expenditures for amusement-purposed goods or services	No effect
Communications: Expenditures for mobile and fixed phone calls as well as public telephony services	Expenditure reduction
Vehicle's fuel: Expenditures for fuel, oil, maintenance, parking, and other vehicle services	Expenditure reduction
Energy: Expenditures for electricity and fuel for household purposes	No effect
Public transportation: Expenditures for local and regional public transportation services	Expenditure reduction

surveying households in which there was more than one adult with mobile service. Only the early beneficiaries were selected as this allowed a delimited and homogenous period during which people joined the pilot program and had a relatively matured process of adopting the mobile banking into their lives.

The survey was implemented during three days in June 2012 in the four BTS-covered towns. Survey responses accounted for monthly expenditures by households in May 2012; the vast majority of respondents were heads of household. Local residents were hired as pollsters and were given four hours of training by an INEGI professional trainer. The pollsters returned 78 completed questionnaires, resulting in an attrition of participants for several reasons.[11]

To define the synthetic control group, INEGI's latest ENIGH was used. This database includes 8,939 surveyed households and over 100 variables covering sociodemographics, income, and expenditures. The data collection process for ENIGH 2012 (INEGI, 2013) occurred in May and June 2012, concurrent with the information-gathering period of the study's survey in Santiago Nuyoó. Additionally, no observations in the ENIGH 2012 database were gathered in Santiago Nuyoó or neighboring towns, nor were other mobile banking pilot programs implemented in other areas of the country in that period; therefore, there was no possibility of finding treated households in the control database.

Thirty-one sociodemographic variables were chosen to satisfy Assumption 1 (see Table 2). The selected variables are based on characteristics that cannot be changed by the possibility of being treated (or not) in the pilot program; for instance, the dwelling's age, construction materials, number of bedrooms, etc. Other household characteristics were added to identify potential autoselection biases, such as possession of electronic equipment (PC, radio, TV, etc.).

Impact was assessed for eight expenditure categories. A research hypothesis posited that a reduction in expenses would be expected only in three variables (see Table 1): communication, public transportation, vehicle fuel.

Survey Analysis

A comparative analysis of survey results for the treated group and statistics from the 2010 Santiago Nuyoó census was necessary to find any potential autoselection bias in independent variables and to assess the survey's quality. Basic sociodemographic descriptive statistics showed no significant differences between the observed survey data and the Santiago Nuyoó census. In the survey, the average number of inhabitants per household was 4.2, while the census found an average of 3.7; average schooling years in the survey were 6.2

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[11] The main reasons were that families emigrated, were temporarily out of town, or it was not possible to find adults at home after several interviewer visits.

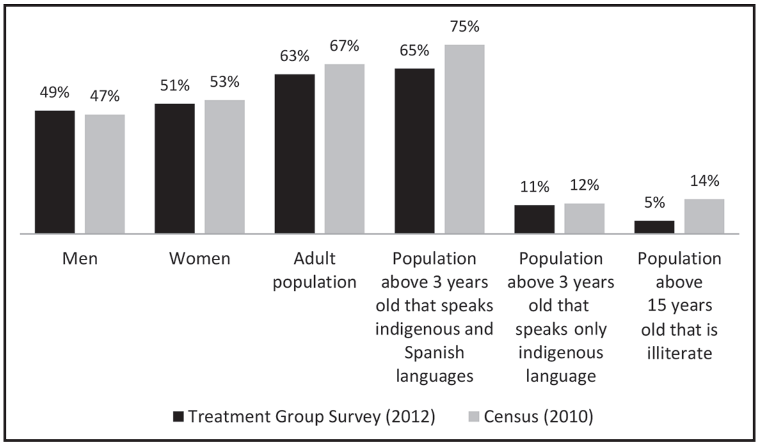

Figure 3. Sociodemographic characteristics of population in Santiago Nuyoó.

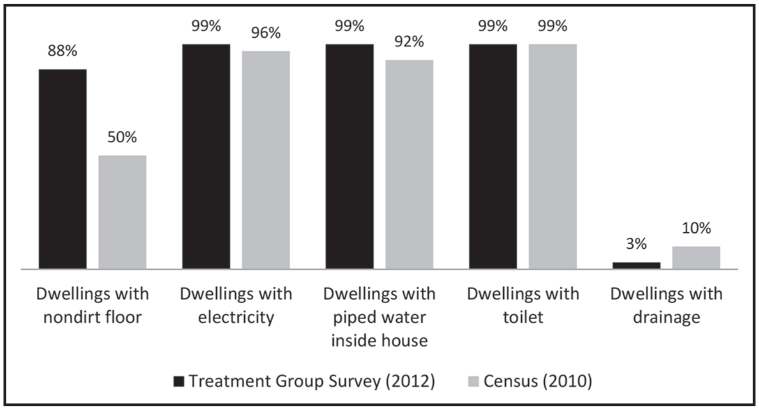

Figure 4. Household characteristics of Santiago Nuyoó.

while the census reported 6.5. Figure 3 shows that the proportion of men and women are similar in both data sets as well as the percentages of adults and indigenous people. However, the survey has a considerably lower percentage of illiterate people than the census, indicative of an autoselection bias.

Regarding household characteristics, in both data sets the percentages of houses with electricity and lavatory are similar (see Figure 4). Nevertheless, the treatment group has a higher percentage of households with a nondirt floor than do census households, but a lower percentage of households with sewage systems.

In terms of ICT access, there was a clear difference between the survey and census households. Seventy-seven percent of treatment households had a television, versus 46% reported in the census. In the treatment group, 96% of households reported having a mobile phone,[12] while in the census no households with a cellular phone were reported in 2010 (which confirms the absence of service prior to Telecomm's intervention).

Propensity Score-Matching Modeling and Robustness Tests

In computing the matching, four models were considered, each corresponding to a different strategy to identify the best possible counterfactuals. The models' reasoning are described next:

Model 1. Includes all 31 sociodemographic variables selected to perform the matching. Thus, this model is a minimum standard and, as such, other models are expected to perform better than Model 1.

Model 2. Includes all the variables that could be more affected by the region's geographic and social conditions. This construction departs from the hypotheses positing that Santiago Nuyoó's geographic characteristics differ from the rest of the country as it is deep in the mountains and households share certain habits regardless of income. For instance, both rich and poor households cook with wood, which in other contexts might be characteristic of poverty.

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[12] This data should have represented 100%, but there was a small percentage that temporarily lacked mobile phones for reasons such as equipment loss or breakdown.

Model 3. Includes variables that explain household conditions related to the families' economic situation. This model is related to the variations among houses with differing levels of income and independent of the geographic context.

Model 4. A version of Model 2, but applied to a subset of ENIGH 2012 households in towns of fewer than 2,500 inhabitants. The process of applying a subset aims to optimize the probability of selecting individuals living in areas similar to Santiago Nuyoó.

A logistic regression helped determine which model had the highest association level between the dependent dichotomous variable (treated/controls) and the set of independent variables. According to the results, Model 2 best suited the data, so this model was used (see Table 2).

In the analysis of common support region, Model 2 obtained better results than the other models. Additionally, the fact that the ENIGH database (INEGI, 2013) contains a large number of observations allowed us to find a great quantity of possible counterfactuals in the first eight balancing blocks, according to their score (see Table 3).

Results

The results of Model 2 show that the pilot program has only one observed variable that was affected: public transportation. However, there is also a reduction in communication expenditures, but those gains were reassigned to pay the monthly subscription for Telecomm's mobile service, which accounts for US$7.75. In public transportation, the pilot program led to statistically significant savings of US$10.54/month. It was found through survey qualitative analysis and the fieldwork that these savings led to a decrease in commuting frequency when the purpose of the travel was to obtain information. This fact indicates that if the program could add outbound calls, expenditures for public transportation to the nearest city would be reduced. In communications, putting aside the monthly mobile subscription fee, there is a statistically significant savings of US$10.15 per month (see Table 4). These findings imply that the cost of Telecomm's services are not an additional spending burden on consumers, since savings gained through using the service are roughly equal to the monthly subscription fees.

One constraint of this pilot program is that Telecomm offers only local telephony service. Prior to this program, there was no local telephony service, so previous spending on local calls was zero; no expenditures could be saved compared with the previous condition. Thus, lack of access to toll calls still represents a lost opportunity for beneficiaries to optimize their expenditures, since even after the pilot 19% of the families used public telephony services (via satellite) for toll calls. This service costs US$0.38/minute, and families spend an average of US$3.95/month on this service, which represents 1.5% of their monthly budget. Another 5% of beneficiaries had an additional mobile handset from a commercial mobile operator, which they used in travels to the nearest city, costing them an average of US$22.09/ month (mainly to purchase prepaid minutes), equivalent to 7.8% of their budget. Given those facts, it is probable that if mobile telephony services included outbound calls, expenditures on communication would decrease.

As shown in Table 4, expenses in homecare, education, fuel, and energy were unaltered. However, other relevant expenses such as food, clothing, rent, and savings were not measured. The unmeasured saving require special consideration, since according to the literature, any improvement in spending efficiency would allow families to improve their saving capability, especially after policies that reduce the costs of entering the formal financial system. In fact, there is indicative but inconclusive evidence that a major share of the efficiency gains have been channeled into greater savings. According to CGAP, 47% of new mobile banking accounts are considered savers, with a monthly average saving of US$5.19 (CGAP, 2012). These new account holders had no prior bank account, so a simple transfer of savings can be discarded as a possible explanation. Other possible explanations are that increased savings may be attributed to a hypothetical increase of about 2% in the average household's income during the period of intervention or that beneficiaries reduced expenditures in unmeasured areas. If those alternative reasons do not explain the increased savings, then the pilot program would explain the increased savings.

Table 2. Logistic Regression Models to Estimate Propensity Scores.

Variables[1]	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Wall materials	−0.374**	−0.0949		−0.114*
		(0.0583)		(0.0672)
Roof materials	−0.158*	−0.0613**		−0.0620**
	(0.0833)	(0.0266)		(0.0278)
Floor materials	−0.252	−0.324*		−0.324
	(0.499)	(0.173)		(0.202)
Dwelling age	−0.0563***		−0.0245***	
	(0.0171)		(0.00613)	
Kitchen used as bedroom	1.170			
	(0.724)			
Number of bedrooms	0.577		0.309***	
	(0.372)		(0.118)	
Number of rooms	−0.175		0.0766	
	(0.291)		(0.0880)	
Clean water availability	0.557	0.457***		0.443***
	(0.534)	(0.167)		(0.140)
Frequency of water availability	−0.121	−0.133*		−0.124
	(0.195)	(0.0743)		(0.0764)
Shared lavatory	−0.568			
	(0.551)			
Means of lavatory water supply	−1.024**	−0.0356		−0.105
	(0.502)	(0.135)		(0.134)
Public sewer connection	1.117***	0.516***		0.468***
	(0.280)	(0.0660)		(0.0693)
Number of spotlights	−0.147		−0.0847**	
	(0.107)		(0.0392)	
Most frequently used fuel for cooking	2.713**			
	(1.074)			
Stove with chimney	−0.950***		−0.434***	
	(0.281)		(0.0959)	
Means of garbage disposal	0.405***			
	(0.148)			
Sink	−0.253		0.119	
	(0.574)		(0.228)	
Shower unit inside the building	−1.118**		−0.653***	
	(0.481)		(0.209)	
Water tank on roof	1.117*		0.784***	
	(0.624)		(0.248)	
Water tank	0.457		0.157	
	(1.151)		(0.427)	
Water tank for hand-washing	1.202***		0.635***	
	(0.376)		(0.145)	
Boiler	−0.711		−0.352	
	(0.683)		(0.264)	
Gas tank	−0.653		−0.684	
	(1.157)		(0.475)	
Number of household inhabitants	−0.0819		−0.0589	
	(0.107)		(0.0368)	
Fixed (landline) telephony	−1.231**	−0.0762		
	(0.609)	(0.200)		

Table 2. (Continued).

Variables[1]	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Mobile telephony	−3.223*** (0.774)	−1.810*** (0.260)		−1.900*** (0.267)
Paid TV	−1.592*** (0.421)			
Internet	0.477 (1.082)			
Connection to public service electricity		−0.672** (0.296)		−0.669** (0.306)
Lavatory inside house			−0.922** (0.400)	
Constant	4.997 (4.003)	0.552 (0.869)	0.125 (1.428)	1.196 (0.878)
Observations	803	7,796	1,919	2,447
Pseudo R^2	0.7046	0.4716	0.1956	0.3873
Treated	37	74	52	76
Controls	56	1,583	1,641	987
Balancing condition	Yes	Yes	No	Yes

Note: Standard errors in parentheses.
****$p < 0.01$; **$p < 0.05$; *$p < 0.1$*
[1]A full definition of variables can be found in INEGI (2013).

Table 3. Common Support Region for Model 2.

Blocks according to lower edge score	**Control**	**Treatment**	**Total**
0.0023914	1,256	13	1,269
0.025	122	6	128
0.05	42	5	47
0.1	66	7	73
0.2	87	28	115
0.4	10	15	25
Total	1,583	74	1,657

Conclusions

Among beneficiaries, this pilot program triggered a reassignment of resources with positive outcomes. The study showed efficiency improvements in public transportation and communications categories of households' monthly expenditures; therefore, this study empirically supports the argument that a combined set of mobile banking and mobile telephony contributes to households' improved well-being.

However, the study did not demonstrate conclusively where this efficiency improvement was transferred. The evidence is conclusive that these efficiency improvements in public transportation and communications were not transferred into any of the remaining six measured expenditure categories. Evidence from CGAP on savings behavior from Santiago Nuyoó beneficiaries showed that after the pilot program, people increased their savings, suggesting that a share of the efficiency gains was transferred into savings, if they could not be explained by an increase in household income during program implementation or by a significant expenditure reduction in an unmeasured category. The introduction of local mobile telephony allows people to reduce

Table 4. Differences in Expenditures Among Treatment and Control Groups Under Model 2, by Type.

	Homecare	**Education**	**Communications**	**Communications (without Telecomm subscription)**	**Fuel**	**Energy**	**Public transportation**
Expenditures of treatment group	20.54	39.14	20.23	12.63	18.8	21.24	13.17
Expenditures of control group	20	33.41	22.86	22.86	19.92	22.63	23.72
Differences (in US$)	0.54	5.65	−2.63	−10.15	−1.08	−18	−10.54
Standard error (in US$)	3.17	10	4.65	4.41	4.65	3.48	3.72
Observations	7,792	7,792	7,792	7,792	7,791	7,792	7,792
z-value*	0.17	0.57	−0.56	−2.28	−0.23	−0.39	−2.79
p-value	0.862	0.572	0.573	0.023	0.820	0.694	0.005

Note: Standard errors and z-value estimations are based on the bootstrapping method.

travel expenses as they could reduce travel time related to acquiring information or making payments. Travel can represent the loss of a half or an entire working day so there are additional savings, according to the ways in which someone values his or her time.

The municipality of Santiago Nuyoó is representative of areas of Mexico that fall into the access gap of the digital divide and that, given the huge costs associated with providing telecommunications services, it is unlikely that in the future these communities could be served by telecommunication and banking firms. The positive reaction in the demand for these services communicates the success of this pilot program in terms of adoption; observable by the high frequency of use of mobile banking and by people's willingness to pay monthly mobile subscription fees for the service at prices that represent, on average, 2.7% of their budget.

It is important to remark that this study's outcomes are not particular to mobile banking intervention, but a combination of mobile banking and mobile telecommunications services. Thus, these results can only be generalized regarding the introduction of these services in rural communities. Moreover, this experience suggests that mobile banking models should look forward to strategies that could increase their *transformational* capability. For this to occur, a fundamental issue is how to proactively reduce the telecommunications access gap rather than rely solely on existing penetration levels. Considering current governments' involvement in broadband deployment around the world (regardless of political vision), further research may contribute to information on whether government engagement is a plausible alternative to improving the *transformational* capability of a mobile banking platform. ■

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Las plataformas de crowdfunding en América Latina

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Abril 2016

> LAS PLATAFORMAS DE CROWDFUNDING EN AMÉRICA LATINA.

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César Rentería

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Contenidos

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Resumen

El presente documento es un analisis descriptivo del sector de crowdfunding – financiamiento mediante una multitud de donantes por medio de Internet - en América Latina. Su objetivo es conocer el tamaño, las caracteríticas y la dinámica de las plataformas latinoamericanas de crowdfunding. Para ello, se realizó una encuesta a los operadores de dichas plataformas, entrevistas con administradores de plataformas y un análisis de los datos publicados en los portales web de las plataformas sobre la dinámica de las campañas y los inversionistas.

El sector en América Latina ha tenido un crecimiento importante desde 2009 a la fecha. Los países que cuentan con un sector más desarrollado son Brasil, México y Chile. Se encontró que la internacionalización de los portales es todavía limitada y, por lo tanto, las plataformas lationamericans tienen aún la mayoría de *fundraisers* en el mismo país en donde operan.

El análisis de datos ofrece una información detallada sobre los rasgos distintivos de cada uno de los cuatro modelos de crowdfunding analizados (donaciones, recompensas, deuda y acciones). El análisis de las entrevistas realizadas informa sobre los detalles de los modelos de negocio y la forma en que las plataformas lationamericanas capitalizan oportunidades y enfrentan retos inherentes a la dinámica de este tipo de plataformas. Finalmente, se describen los principales avances y retos en distintos países de América Latina en la promoción de este sector.

1. INTRODUCCIÓN

El crowdfunding (término acuñado por Michael Sullivan en 2006) es un proceso de capitalización financiera basada en plataformas de Internet (Beaulieu, Sarker, & Sarker, 2015). En general, este mercado emergente de capitalización se divide en cuatro tipos de financiamiento: donaciones, inversión por recompensas, préstamos sobre tasas de interés e inversión en acciones. Las características de estas plataformas están despertando gran interés como un mecanismo alternativo para ampliar la inclusión financiera en países en desarrollo. En América Latina, el sector se está desarrollando principalmente en Brasil, México y Chile. Sin embargo, existe poca información sobre cuál es el tamaño y cuáles son las características del sector en América Latina.

Este documento es un estudio exploratorio sobre las plataformas de crowdfunding en América Latina para conocer sus características. Se entiende por plataformas de crowdfundig en América Latina a las plataformas fundadas y administradas en uno de sus países. Se excluyeron del análisis plataformas que operan en la región pero no fueron fundadas en ella y que además operan en distintas regiones del mundo.

El estudio se realizó en varias etapas. Primero, se realizó un mapeo general de las plataformas latinoamericanas e internacionales de crowdfunding que operan en América Latina y se examinaron las bases de datos públicas disponibles en estos portales. El análisis de esas bases de datos provee un entendimiento de los patrones generales de las transacciones y del auditorio. Posteriormente, se realizó una encuesta a las plataformas latinoamericanas de crowdfunding para conocer su tamaño y modelo de negocio. Finalmente, se realizaron entrevistas a profundidad a administradores de plataformas para conocer mejor las dinámicas sociales del sector.

El documento se divide de la siguiente manera. En la primera sección se realiza una revisión de literatura sobre el estado del arte del crowdfunding, donde se abordan tres principales ramas de estudio: 1) el efecto del crowdfunding en la inclusión financiera y el desarrollo económico, 2) los factores de éxito de los proyectos financiados, y 3) el proceso de toma de decisiones y los incentivos que llevan a los inversionistas a financiar proyectos. En la segunda sección se da un vistazo general a las plataformas de crowdfunding latinoamericanas e internacionales para conocer sus principales características. En la tercera sección se describen los modelos de negocio observados en América Latina. Finalmente, en la cuarta sección se describen los principales patrones de transacción entre inversionistas y emprendedores, en los que se observan las preferencias en el financiamiento de proyectos.

2. DEFINICIONES Y ESTUDIOS RECIENTES DE CROWDFUNDING

Las plataformas de financiamiento colectivo, denominadas crowdfunding, han emergido en años recientes como una alternativa para que las personas accedan a financiamiento para sus proyectos. A diferencia de los mecanismos de financiamiento tradicionales, el crowdfunding se caracteriza por ser un mercado abierto a todo mundo, tanto en la solicitud de financiamiento como en la inversión.

El crowdfunding está fuertemente asociado con el micro-financiamiento; aunque no existe una restricción a la cantidad que se requiere financiar, en la práctica, la mayoría de las solicitudes de financiamiento son de pequeña escala (Bouncken, Komorek, & Kraus, 2015). El monto promedio de las solicitudes varía mucho, dependiendo del tipo de plataforma. Por ejemplo, Beaulieu et al. (2015) observaron que las plataformas de acciones tienen solicitudes promedio de USD $1,177,000, mientras que las de donación tienen solicitudes promedio de USD $3,373 (ver Tabla 1).

Tabla 1. Promedios de financiamiento por tipo de plataforma de crowdfunding (en USD)

Modelo	Meta promedio	Meta mínima	Meta máxima	Contribución individual promedio
Acciones	$5,000,000	$150,000	$1,177,000	NA
Deuda	$30,000	$7,000	$17,907	NA
Recompensas	$38,000	$600	$9,831	$71
Donaciones	$9,622	$702	$3,373	$111

Fuente: (Beaulieu et al., 2015, p. 37)

Definiciones

El término de crowdfunding tiene sus raíces en las donaciones caritativas, pero ahora se utiliza para inversiones con diferentes motivaciones a través de plataformas de Internet (Aitamurto, 2011; Castelluccio, 2012; Gaggioli, 2013). Esto comenzó en Estados Unidos cuando un músico de Boston, Brian Camelio, lanzó ArtistShare en 2003 (Freedman & Nutting, 2015). ArtistShare fue un sitio web donde los músicos podían buscar donaciones de sus seguidores para producir sus discos; a partir de esto, otras plataformas imitaron el concepto para incorporarlo a otras actividades creativas (p. ej. filmes, fotografía, etc.), así como otro tipo de actividades como causas sociales y de emprendimiento de negocios (Freedman & Nutting, 2015).

Este fenómeno ha despertado el interés de la academia por el crowdfunding, principalmente por sus potenciales implicaciones en la inclusión financiera y en el desarrollo económico (Beaulieu et al., 2015).

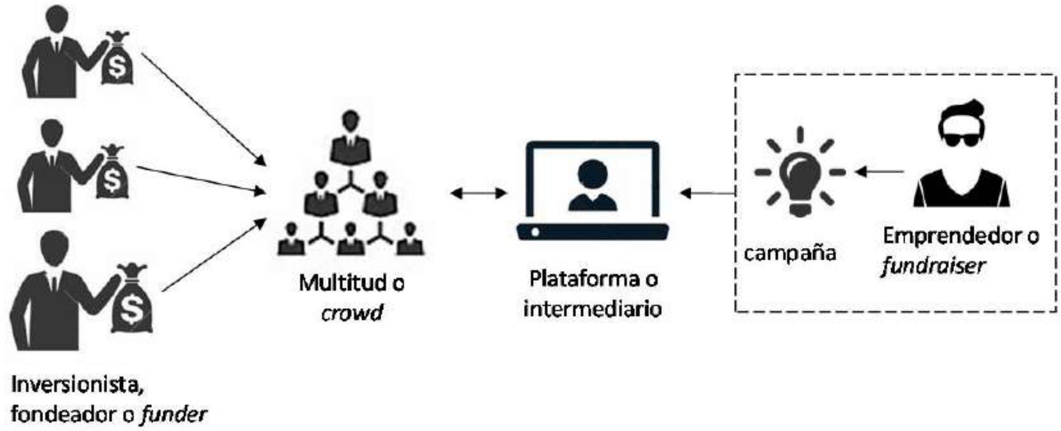
Ethan Mollick definió el crowdfunding como “el esfuerzo de individuos y grupos emprendedores (culturales, sociales y empresariales) para financiar sus proyectos a partir de relativamente pequeñas contribuciones de un relativo largo número de individuos que usan Internet, sin operadores financieros de por medio” (2014, p. 2). De acuerdo con Larralde & Schwienbacher (2010), crowdfunding es el financiamiento de un proyecto por una multitud de individuos en lugar de instituciones de crédito profesionales.

De acuerdo con Beaulieu et al. (2015), la definición del crowdfunding ha evolucionado a medida que crece el sector, aunque se mantienen algunos elementos clave, como el uso de plataformas de Internet para realizar las transacciones, el *poder de las mayorías* y la apertura del sistema. Bouncken et al. (2015), en un análisis comparativo de siete definiciones de crowdfunding, encontraron los siguientes factores en común: se trata de individuos o grupos de personas que buscan conseguir financiamiento del público mediante plataformas basadas en Internet.

Elementos que componen el crowdfunding

El crowdfunding se compone de los siguientes factores: una acumulación en masa (denominada multitud o *crowd*) de individuos con capital (denominados inversionistas o *funders*) dispuestos a contribuir individualmente al financiamiento de un proyecto, regularmente denominado *campaña*, que puede ser un producto, servicio, idea o actividad social. Estos proyectos son propiedad de los solicitantes de financiamiento (denominados emprendedores o *fundraisers*) que requieren el dinero para realizar el proyecto. Los solicitantes buscan inversionistas vía una plataforma digital (denominada *intermediario*) para recibir el financiamiento (ver Figura 1).

Figura 1. Diagrama del ecosistema de crowdfunding



Fuente: elaboración propia

Los intermediarios conectan las necesidades de los *fundraisers* con las preferencias de los inversionistas. También funcionan como facilitadores de comunicación, información y ejecución. Su principal contribución es aumentar la eficiencia en las transacciones. La comunicación fluida y constante entre las entidades involucradas es fundamental para que un proyecto logre sus metas de financiamiento (Beaulieu et al. 2015).

Existen pocas modalidades de inversión en las plataformas intermediarias. La más común se conoce como "todo o nada" e implica que el *fundraiser* solo recibe la capitalización si se alcanza 100% del monto solicitado. Otra modalidad es cuando los *fundraisers* reciben el monto inversión, independientemente de si se cumplió la meta de financiamiento. Esta modalidad se suele denominar "conservar lo recaudado" o "todo suma".

Los *fundraisers* pueden ser personas, empresas, instituciones u organizaciones sin fines de lucro. Los requisitos para iniciar una campaña de crowdfunding son mínimos, aunque los administradores de las plataformas tienen un proceso de selección para minimizar riesgos de fraude y establecen derechos y obligaciones entre las partes involucradas. El proceso es relativamente sencillo: los *fundraisers* tienen que enviar un proyecto en la plataforma de su elección; después, la plataforma decide si acepta y publica el proyecto, y posteriormente se pasa a un periodo (con una fecha límite) para alcanzar la meta financiera propuesta (Bouncken et al. 2015).

Interacción entre fundraisers, intermediarios e inversionistas

Estudios recientes indican que la participación de los *fundraisers* está motivada, primero, por la necesidad de acceder a financiamiento al que de otra manera no hubieran podido acceder; segundo, por el interés de promover alguna causa que puede tener un beneficio social; y tercero, por recibir retroalimentación del mercado potencial acerca de un proyecto, producto o idea de negocios (Freedman & Nutting, 2015). Este último punto significa que empresas ya establecidas utilizan este canal para recibir información sobre las preferencias de las personas y así, por ejemplo, valorar el lanzamiento de un producto o servicio al mercado (Bouncken et al. 2015).

Normalmente, los inversionistas son usuarios de la plataforma que esperan un beneficio a cambio (que puede ser simbólico, material o financiero). En la mayoría de los casos, los inversionistas contribuyen con una cantidad fija y a través de transferencias bancarias (Bouncken et al. 2015).

Existen diversas explicaciones sobre la motivación de las personas a invertir en proyectos sin rendimiento económico. La primera está relacionada con la satisfacción personal por realizar una acción moralmente positiva (Beaulieu, 2015). Otras explicaciones apuntan a que las personas invierten en este tipo de proyectos en aras de obtener un beneficio simbólico derivado de participar en la campaña.

Las plataformas de crowdfunding son un mercado de dos vías, donde por un lado están los inversionistas que canalizan su capital en los proyectos que consideran valiosos (en muchos casos en busca de rendimiento económico), mientras que por el otro están los *fundraisers* que compiten entre ellos por la obtención de capital. Regularmente, los inversionistas no tienen que pagar por canalizar su capital a través de la plataforma (considerado como el *subsidy-side*), mientras que los *fundraisers* regularmente deben pagar una comisión al intermediario (considerado como el *money-side*) (Bouncken et al., 2015).

No existe un consenso generalizado sobre la categorización de los modelos de crowdfunding, aunque el punto de partida de las distintas categorizaciones es la distinción entre los tipos de retribución que recibe el inversionista (Bouncken et al., 2015; FOMIN, 2014; Gajda & Walton, 2013; Giudici et al. 2012; Nardo et al., 2008). Las retribuciones pueden ser materiales o no materiales. Las retribuciones materiales pueden ser financieras en bienes o servicios, mientras que la retribuciones no materiales pueden ser compensaciones de reconocimiento público o la simple satisfacción personal de contribuir con cierta causa o idea (Freedman & Nutting, 2015). Con base en esta categorización, para el presente trabajo se clasificaron las plataformas de crowdfunding en cuatro tipos: 1) *donaciones* (plataformas con retribuciones puramente no materiales); 2) *recompensas* (plataformas que incorporan una mezcla de retribuciones materiales y no materiales); 3) *deuda*; y 4) *acciones* (las dos últimas son plataformas basadas en rendimiento financiero). En las plataformas de donaciones, los inversionistas aportan capital para un proyecto y reciben una retribución no material por su aportación. Los solicitantes que utilizan el crowdfunding de donación frecuentemente dependen de sus redes sociales para que el proyecto alcance su meta financiera, y regularmente no retribuyen otra cosa más que distintas formas de decir "Gracias" al emprendedor (Beaulieu et al., 2015). El promedio del capital solicitado suele ser el más bajo (aprox. USD $5,000) y la contribución promedio individual también suele ser baja (aprox. USD $100 por persona) (Beaulieu et al., 2015).

En las plataformas de recompensa, los inversionistas aportan capital para un proyecto a cambio de una recompensa específica, que puede ser un bien o servicio. Regularmente, el valor económico de la recompensa no alcanza el valor de la cantidad invertida, por lo que también existe un componente de altruismo en estos casos. Dentro de las plataformas de recompensa existe una sub-categoría muy popular que es la pre-venta de bienes o servicios (p. ej. conciertos). En la pre-venta, el valor económico de la recompensa material es más cercano al capital invertido, en el que incluso los inversionistas logran obtener el bien o servicio a un precio menor que cuando estos entran al mercado (Belleflamme, Omrani, & Peitz, 2015).

En este modelo existe una variación mayor en el capital solicitado (que suele ir de USD $100 hasta $1 millón), siendo el promedio de USD $10,000 (Beaulieu et al., 2015). También hay una variación importante en la contribución individual de los inversionistas, cuyo promedio es de USD $70. Las campañas tienen una fecha límite menor (regularmente de 30 días) y las plataformas suelen utilizar la modalidad "todo o nada;" es decir, se financia el proyecto únicamente si logra al menos 100% de su meta (Beaulieu et al., 2015).

En las plataformas de deuda, los inversionistas adquieren un instrumento de deuda que paga una tasa de interés (FOMIN, 2014). Estas plataformas permiten a los *fundraisers* contratar deuda no segura (sin avales o corresponsales). El modelo de negocio de las plataformas suele ser el cobro de una comisión sobre el monto de la deuda al *fundraiser* y una comisión (fija o por porcentaje) al inversionista (Beaulieu et al., 2015).

Cuando los solicitantes no tienen antecedentes crediticios, esta modalidad suele ser más simple, rápida y barata que solicitar un crédito a un banco (Beaulieu et al., 2015). Uno de los factores que lo hace más barato es que todos los procesos de la plataforma para recibir la solicitud, evaluarla y ponerla en el mercado son automatizados. Sólo un pequeño porcentaje de las aplicaciones son aprobadas y publicadas en la plataforma (Beaulieu et al., 2015). Por ejemplo, Lending Club tiene una tasa de aprobación de un 10% de las solicitudes recibidas (Beaulieu et al., 2015). Este modelo de negocio ha demostrado ser económicamente viable. Por ejemplo, en la plataforma Lending Club en 2013, la tasa de impago de los *fundraisers* catalogados de menor riesgo fue de 1.5%, mientras que la tasa de impago de los *fundraisers* de mayor riesgo fue de 10% (Beaulieu et al., 2015). Cada *fundraiser* que es aprobado recibe una calificación de riesgo (regularmente con base en algoritmos) a partir del cual se establece la tasa de interés. Como referencia, en 2013 en esta plataforma, la tasa de interés promedio para los solicitantes evaluados como de alto riesgo fue de 24.44%, mientras que la tasa de interés para los solicitantes de bajo riesgo fue de 7.65%.

El inversionista, por su parte, tiene la posibilidad de elegir, uno a uno, los instrumentos de deuda que desea financiar. Para ello, cuenta con información sobre las características de la deuda y del solicitante (y en la mayoría de los casos con posibilidad de interactuar con el solicitante para adquirir más información) (Freedman & Nutting, 2015). Este proceso ha demostrado ser exitoso en la selección de la deuda, incluso en algunos casos, más efectivo que los mecanismos tradicionales de la banca. Por ejemplo, de acuerdo con Iyer et al. (2009), los inversionistas pueden predecir la probabilidad de que un individuo caiga en impago con una certeza 45% mayor que los mecanismos de calificación de riesgo tradicionales. Los números de estas plataformas han resultado ser tan atractivos que incluso instituciones inversionistas como compañías de seguros, fondos de inversión o fondos de pensión han incursionado en la adquisición de este tipo de deuda (Beaulieu et al., 2015; Freedman & Nutting, 2015).

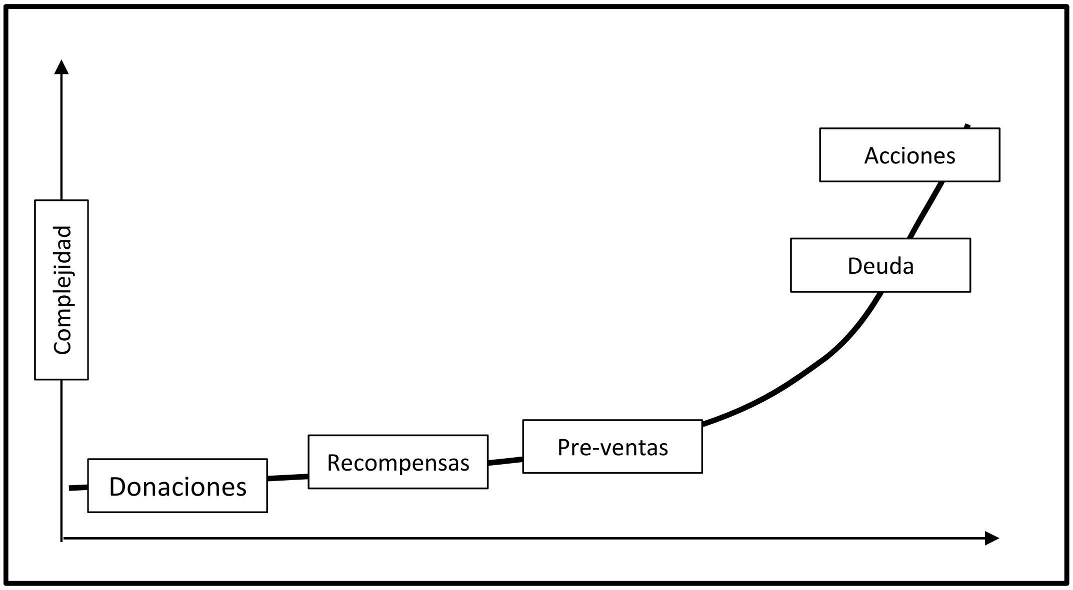
En las plataformas de acciones (también denominadas *equity*), los inversionistas adquieren acciones de una empresa (Bouncken et al., 2015; FOMIN, 2014). Esta categoría es también denominada como *crowdinvesting* por su cualidad de canalizar capital en empresas usualmente de reciente creación (Bouncken et al., 2015; Mollick, 2014).

La principal ventaja que ofrece el crowdfunding en este modelo es la reducción de los costos de información y transacción. En un proceso tradicional, a las empresas les puede tomar entre ocho y doce meses encontrar un capital ángel dispuesto a invertir en su proyecto, mientras que a través del crowdfunding ese tiempo se puede reducir a algunas semanas o incluso algunos días (Freedman & Nutting, 2015). Las solicitudes de financiamiento en este modelo son en promedio de más de un millón de dólares, mientras que la contribución individual promedio de los inversionistas es de USD $10,000 (Beaulieu et al., 2015).

Sin embargo, en comparación con las otras plataformas, en este modelo el riesgo de pérdida de capital para el inversionista es mayor. Puede ser que los inversionistas tengan que esperar años antes de ver un retorno sobre la inversión. El riesgo no sólo está asociado a la forma del negocio, sino también a la complejidad del proyecto.

La información mostrada hasta aquí muestra una gran variación en los niveles de capital solicitado entre los distintos modelos. Una forma de distinguir los modelos de crowdfunding es identificar el nivel de complejidad del proyecto con el nivel de aportación individual de los inversionistas (Danmayr, 2014). De esta manera, las plataformas, cuyos proyectos tienen menos complejidad suelen ser las de donaciones, mientras que las plataformas con proyectos más complejos suelen ser las de acciones (ver Gráfica 1).

Gráfica 1. Principales modelos de crowdfunding por nivel de complejidad e inversión individual promedio de inversionistas.



Fuente: (Danmayr, 2014)

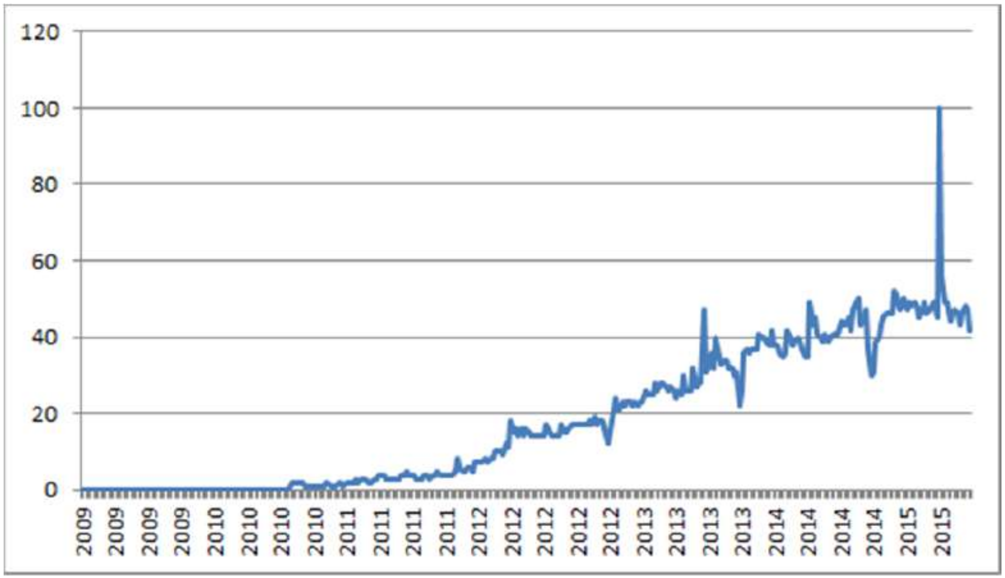
Finalmente, uno de los temas cruciales en el desarrollo de las plataformas es la probabilidad de incumplimiento en los compromisos adquiridos por los *fundraisers* que son exitosamente financiados (especialmente en las plataformas donde no hay contratos de por medio como las de donaciones y recompensas) (Freedman & Nutting, 2015; Mollick, 2014). Mollick estudió 48,500 campañas de Kickstarter para evaluar el nivel de incumplimiento y encontró que, en los ramos de tecnología y desarrollo de productos, menos de uno por ciento de las campañas financiadas tuvo incumplimientos de pago (Mollick, 2014).

Mollick considera que el alto nivel de cumplimiento se debe al poder de la comunidad en los solicitantes; ambos, *fundraisers* e inversionistas, progresan durante la campaña en un proceso de interacción vía preguntas, comentarios y foros de discusión sobre las características del proyecto. Por ello, la relación con las mayorías (o *crowd*) es de una alta interacción social, lo que reduce la posibilidad de eventuales fraudes a través de la plataforma (Mollick, 2014). Estudios recientes se centran en el rol de las redes sociales (*on-line* y *off-line*) para aumentar la probabilidad del acceso al capital y de la capacidad de las mayorías de inferir la calidad crediticia de los prestamistas (Agrawal, Catalini, & Goldfarb, 2013; Iyer et al., 2009). Algunos críticos señalan que el éxito del crowdfunding está fuertemente ligado a la calidad de las redes sociales *off-line* con que cuentan las personas (Danmayr, 2014). Aunque se supone que el crowdfunding reduce, a través de la comunicación y la información en los portales, la necesidad de verificar presencialmente los proyectos, sigue existiendo un factor geográfico en la dinámica de las campañas, donde la cercanía geográfica entre los *fundraisers* e inversionistas es un factor importante para el éxito de las campañas (Danmayr, 2014; Mollick, 2014).

3. EVOLUCIÓN DEL CROWDFUNDING EN AMÉRICA LATINA

El fenómeno de crowdfunding comenzó a crecer en el mundo hace relativamente poco tiempo. El nivel de interés de las personas en el crowdfunding ha tenido un crecimiento constante y, al parecer, se ha estabilizado en los últimos años (ver Gráfica 2). De acuerdo con los registros de búsqueda de Google, el término crowdfunding comenzó a generar interés en el mundo desde 2010, mientras que en América Latina la búsqueda del término comenzó en 2011.

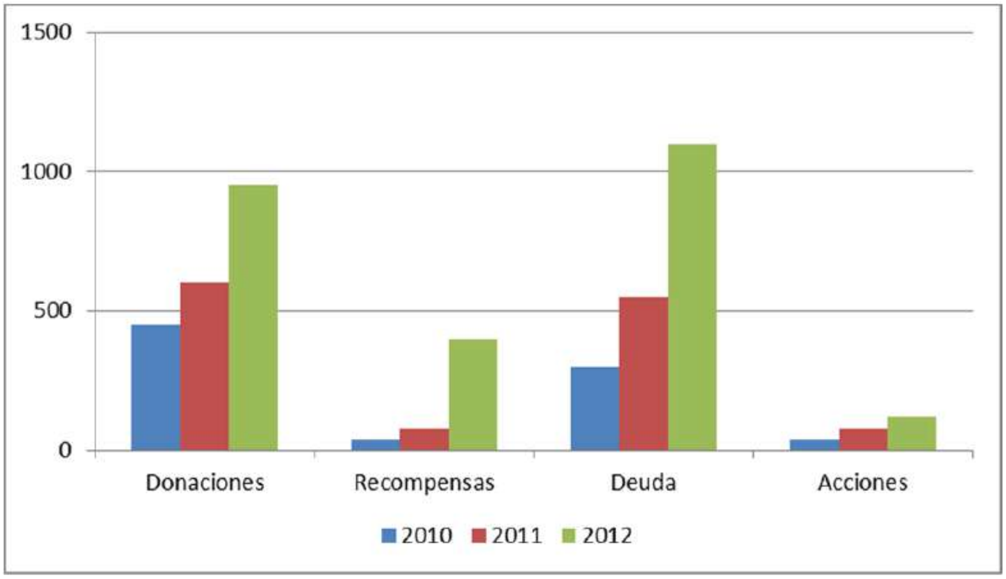
Gráfica 2. Evolución de las búsquedas del término "crowdfunding" a nivel global en la plataforma Google, 2009-2015



Fuente: elaboración propia con datos de Google Trends.
Nota: Google Trends estandariza la cantidad de búsquedas otorgando el valor de 100 a la unidad con mayor número de búsquedas.

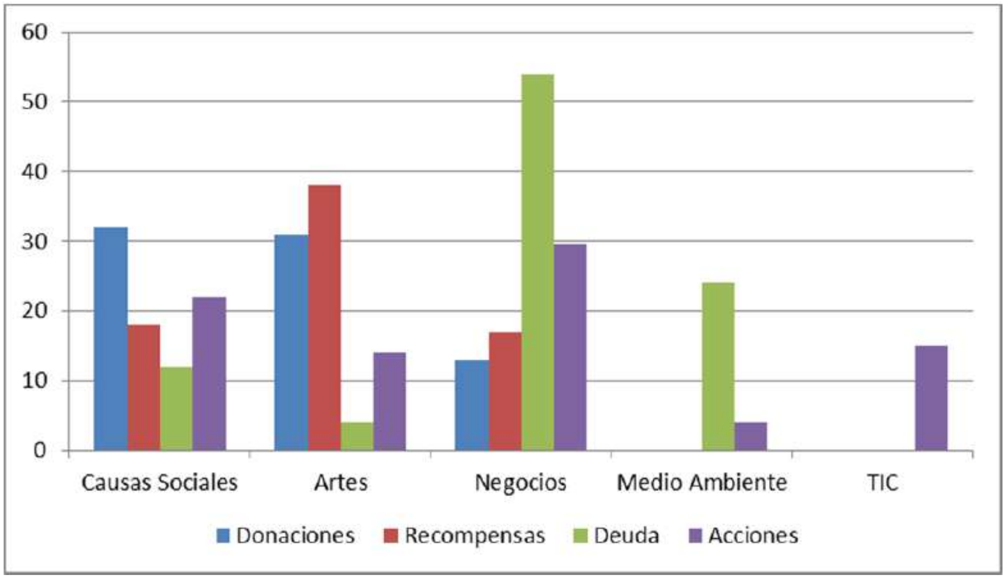
De acuerdo con Massolution, en 2012, las plataformas de América del Norte canalizaron un financiamiento total de 1.6 mil millones de dólares, con una tasa anual de crecimiento de 105%. Las plataformas que más han crecido en los últimos años han sido las de donación y deuda (ver Gráfica 3). Por otro lado, los sectores con más solicitudes de financiamiento han sido los negocios y las causas sociales (ver Gráfica 4). Para 2013, Massolution estimó que el valor de las inversiones canalizadas a través de estas plataformas fue de 5.1 mil millones de dólares (Massolution, 2013).

Gráfica 3. Crowdfunding en USD $ millones por modelo de negocio



Fuente:(Gajda & Walton, 2013)

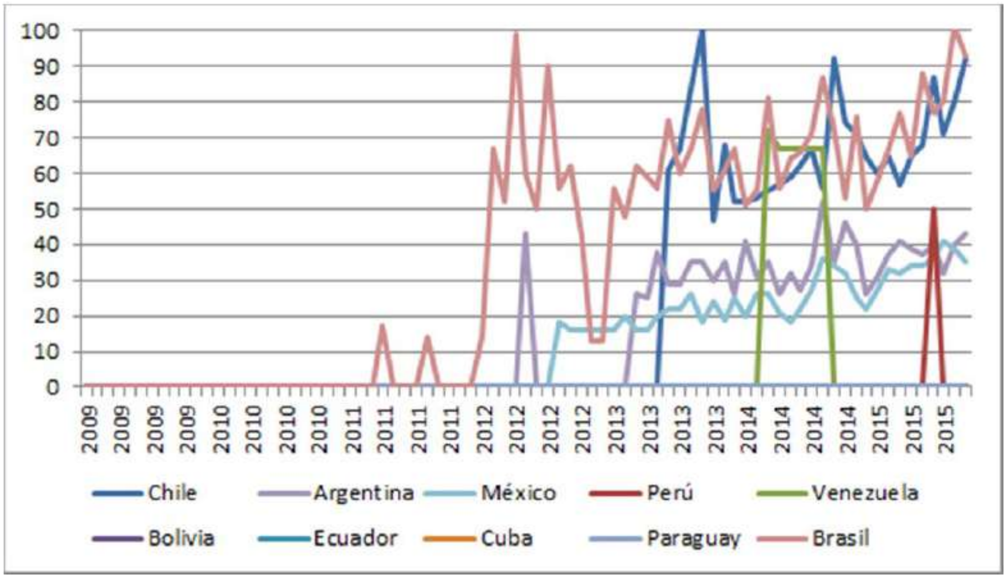
Gráfica 4. Porcentaje de asignación del financiamiento colectivo por sector, 2012



Fuente: (Gajda & Walton, 2013)

Entre los países latinos, Brasil, Chile y México son los países donde se ha mostrado más interés en esta modalidad de financiamiento. Esto se observa claramente, no solo por el número de búsquedas del término, sino también por los países donde se están desarrollando las plataformas y donde se está recibiendo más financiamiento. En la Gráfica 5, llama la atención que Chile es un país donde el fenómeno es más reciente que en otros países de América Latina, pero ha registrado una evolución más acelerada. Por otro lado, no se observó actividad en países como Bolivia, Ecuador, Cuba y Paraguay.

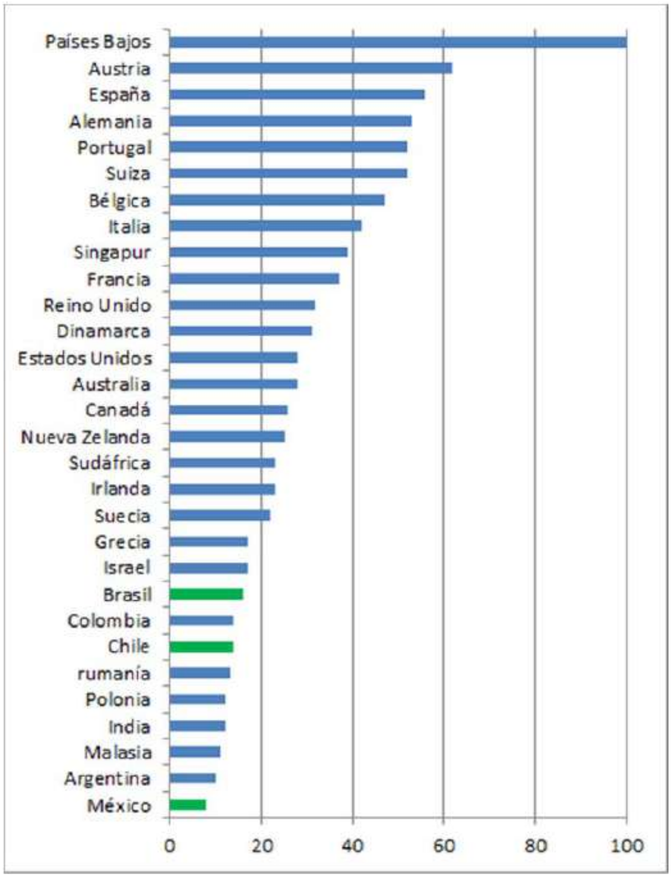
Gráfica 5. Evolución de las búsquedas del término “crowdfunding” en países seleccionados de América Latina en la plataforma Google, 2009-2015



Fuente: elaboración propia con datos de Google Trends.
Nota: Google Trends estandariza la cantidad de búsquedas otorgando el valor de 100 a la unidad con mayor número de búsquedas.

A pesar de la evolución observada en la Gráfica 5, el crowdfunding en países de esta región no tiene la fuerza que tiene otros en el resto del mundo. En un análisis comparativo del nivel de búsqueda del término "crowdfunding" a nivel mundial, se observó que ningún país de América Latina está entre los primeros lugares (Ver Gráfica 6). Llama la atención que los principales países relacionados con el término son europeos, aunque las principales plataformas son estadounidenses.

Gráfica 6. Países con mayor número de búsquedas del término “crowdfunding” a nivel global en la plataforma Google, 2015



Fuente: elaboración propia con datos de Google Trends.
Nota: Google Trends estandariza la cantidad de búsquedas otorgando el valor de 100 a la unidad con mayor número de búsquedas.

La Gráfica 7 sugiere que hay una distribución exponencial en el tráfico global en los portales de crowdfunding. Como se verá más adelante en el análisis de las plataformas latinoamericanas, parece haber una relación importante entre el nivel de tráfico en Internet y la esperanza de vida de las plataformas. La preponderancia en el tráfico, al parecer, se caracteriza por un círculo de retroalimentación (positivo o negativo).

Entre las plataformas, Kickstarter es la más importante a nivel global, tanto por su nivel de tráfico como por su nivel de transacciones económicas. También, las diez plataformas con más tráfico en Internet se operan desde Estados Unidos.[1] Entre las 20 plataformas con mayor tráfico en Internet, sólo aparece una latinoamericana: Catarse. Como se observa en la Gráfica 7, en comparación con las principales plataformas internacionales, las plataformas regionales tienen una mínima participación en el nivel de tráfico.[2] Esta información es fundamental para entender uno de los principales problemas a los que se enfrentan las plataformas regionales. Debido a que las personas pueden publicar y financiar proyectos de manera equivalente en plataformas internacionales y regionales, éstas compiten entre sí. Las plataformas con más tráfico tienden a ser preferidas por los usuarios para publicar sus proyectos, ya que tienen

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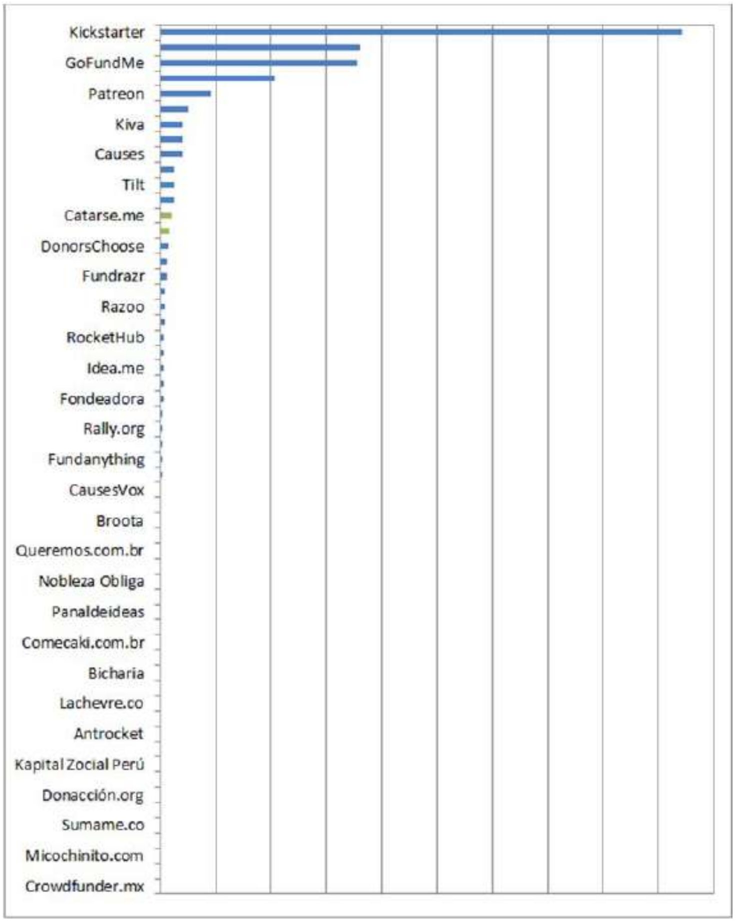
[1] *Prácticamente todas estas plataformas operan desde Sillicon Valley.*

[2] *En adelante, se referirá en el documento como plataformas internacionales a aquellas cuya base de operaciones no está en algún país de América Latina, mientras que se referirá como regionales a aquellas cuya sede sí está en América Latina.*

mayor auditorio y, bajo esa lógica, mayor probabilidad de ser financiados. Este fenómeno se observó empíricamente en la competencia interna entre las plataformas regionales, donde sólo unas cuantas plataformas tienen la gran mayoría de proyectos exitosamente financiados.

Gráfica 7. Nivel de tráfico de plataformas de crowdfunding seleccionadas, 2015



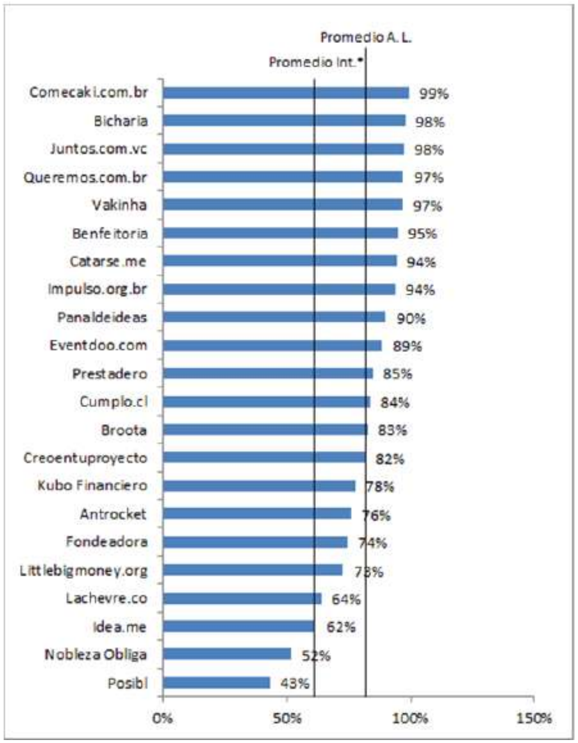
Fuente: elaboración propia con base en datos de Alexa.com

Nota: la gráfica representa el nivel de tráfico en la plataforma con base en el ranking de tráfico de Alexa. Para facilitar la lectura de la gráfica, se invirtieron los valores utilizando la división $\frac{1}{x}$. Véase Tabla 1 del Anexo I.

Aunado a la desventaja en el nivel de tráfico, las plataformas latinoamericanas también limitan su capacidad de tráfico al manejar todo el contenido de su web en español. Si bien esta es una ventaja para el acceso a personas con dominio únicamente del idioma nativo, se pierde la oportunidad de atraer inversionistas de otras partes del mundo. Algunas plataformas, como Fondeadora, ya desarrollaron un portal en inglés y en español para ampliar el auditorio potencial. Más aún, los modelos de negocio de las plataformas latinoamericanas, como se verá más adelante, están enfocados en la mayoría de los casos en uno o dos países.

Ante la interrogante de qué tanto importa que el modelo de negocios esté dirigido a un auditorio internacional, se encontró que no existe una diferencia importante en el tráfico extranjero y doméstico entre las plataformas internacionales y regionales que, como ya se mencionó, se concentran comercialmente en uno o dos países. El promedio de tráfico doméstico en las diez principales plataformas internacionales de crowdfunding es de 62%, mientras que el promedio en América Latina es de 83% (ver Gráfica 8). En la Gráfica 8 se observa que las plataformas brasileñas son las que tienen un nivel casi completo de tráfico local en sus portales web. Esto es posible que se deba principalmente a que su portal está en portugués, lo que lo hace más restrictivo al resto de América Latina. Se destaca que las plataformas con más tráfico en América Latina tienen un alto nivel de tráfico doméstico, lo que invita a la hipótesis de que las plataformas exitosas se sustentan, en buena medida, en un modelo de negocios de financiamiento nacional.

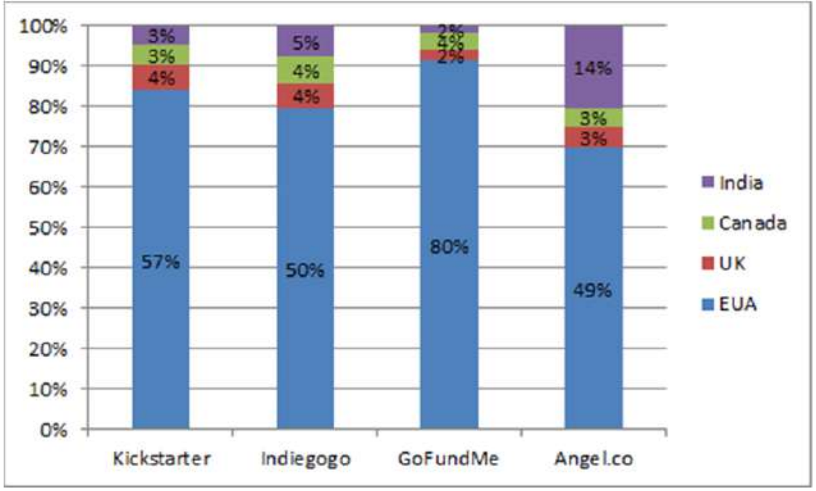
Gráfica 8. Porcentaje de tráfico doméstico en plataformas de crowdfunding de América Latina, 2015



Fuente: elaboración propia con base en datos de Alexa.com

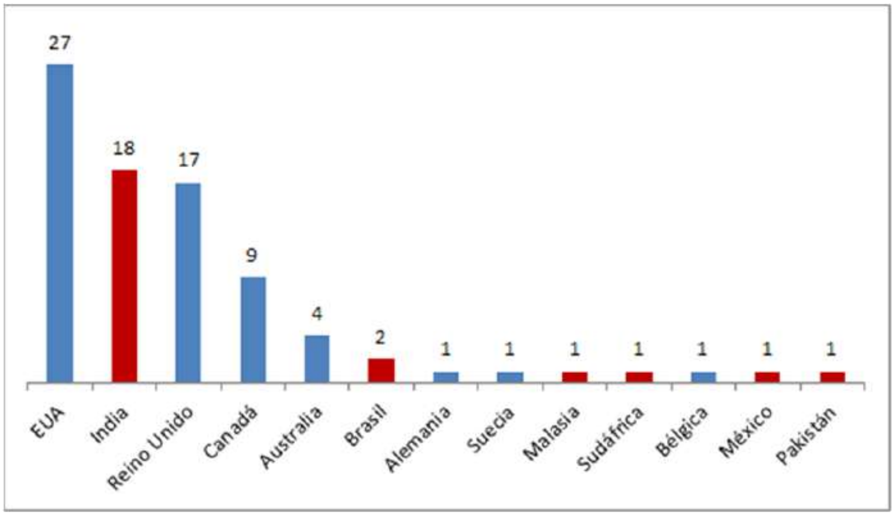
Al analizar el tráfico de las cuatro principales plataformas a nivel global, se encontró que India es uno de los principales países cuya población accede a los portales (ver Gráfica 9). Este hallazgo podría significar un área de oportunidad para los países emergentes de obtener recursos financieros de inversionistas foráneos. Más aún, en las 27 plataformas internacionales analizadas, India está presente entre los primeros cuatro países en 18 de éstas, mientras que otros países emergentes o en desarrollo sólo se encuentran una o dos veces (ver Gráfica 10). No se estudió si este nivel de tráfico indio se corresponde con un nivel similar de proyectos indios financiados o simplemente no existe correlación. Sin embargo, sería importante explorar esto como un área de oportunidad para aumentar la capacidad de financiamiento para América Latina.

Gráfica 9. Porcentaje de tráfico por país en plataformas seleccionadas, 2015



Fuente: elaboración propia con datos de Alexa.com
Nota: no se presenta gráficamente la categoría "otros" por lo que las cifras no suman 100%

Gráfica 10. Número de plataformas en las que el país es uno de los cuatro principales orígenes del tráfico, 2015



Fuente: elaboración propia con datos de Alexa.com

Durante el estudio, se identificaron 46 plataformas de crowdfunding en América Latina. Al cierre del estudio, 17 de ellas estaban cerradas y la mayoría tenía un nivel de actividad bajo. Posiblemente, una de las principales razones por las que se han cerrado las plataformas es por el bajo nivel de actividad en las páginas; nivel que repercute directamente en la viabilidad económica de las plataformas.[3]

Los países con mayor número de plataformas activas son Brasil, México, Colombia y Argentina. Argentina y Chile lideran la lista de plataformas cerradas (ver Gráfica 11). El

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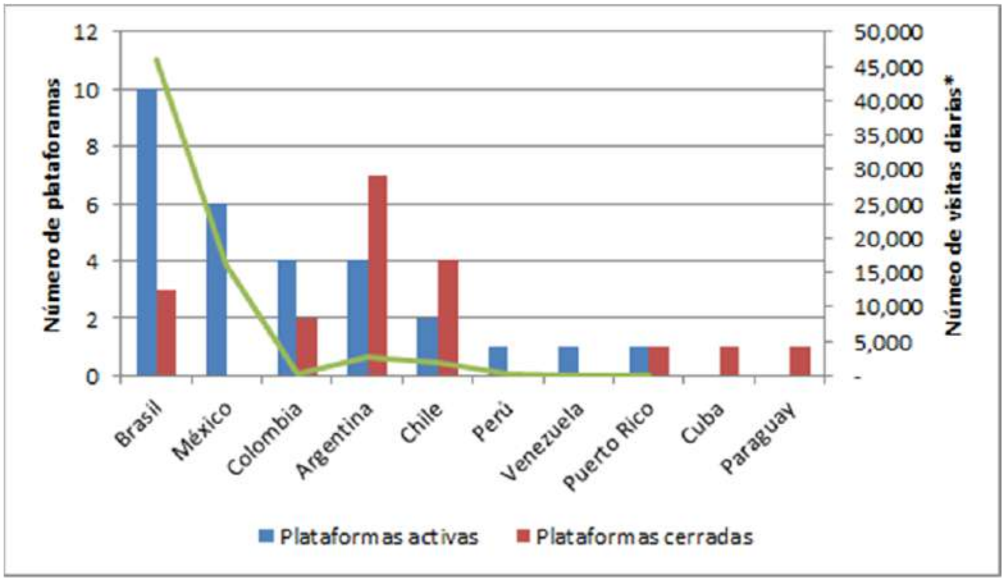
[3] *Un caso excepcional fue la plataforma cubana Yagruma, que de acuerdo con sus administradores, cerró sus actividades por motivos políticos. La Oficina del Departamento del Tesoro de Estados Unidos prohibió el envío de aportaciones de ciudadanos o residentes de dicho país a artistas o creadores en Cuba a través de la plataforma, lo cual limitó severamente las actividades de la plataforma.*

número de visitas diarias, como se ha mencionado, tiene una relación importante con el número de plataformas en el país.

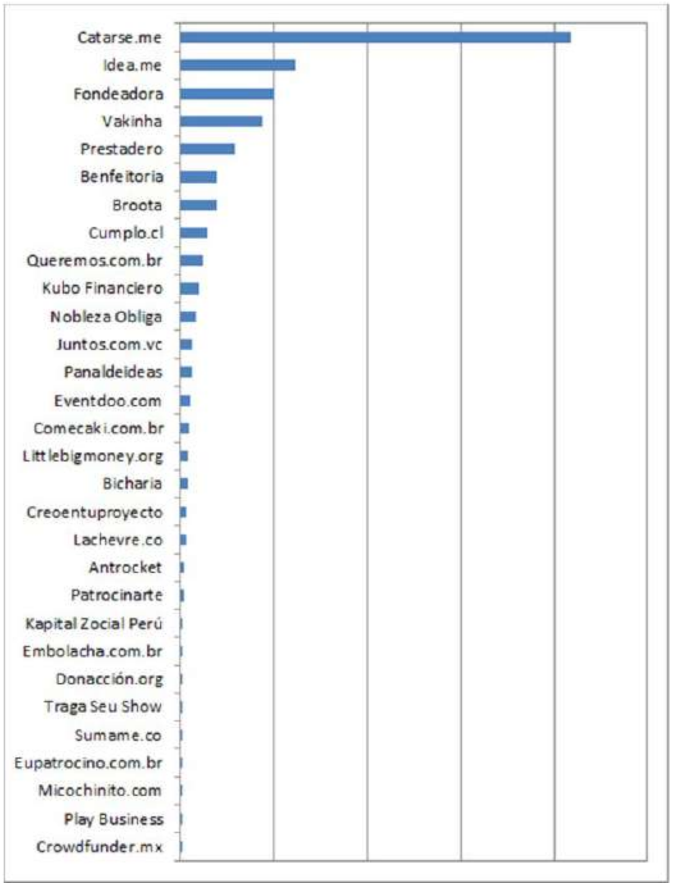
Gráfica 11. Número de plataformas activas y cerradas por país en América Latina, 2015



Fuente: elaboración propia

La plataforma más importante a nivel latinoamericano es Catarse, seguida por Idea.me (Argentina), e (México) y Vakinha (Brasil). La Gráfica 12 muestra una distribución similar a la Gráfica 5, donde se mostró el tráfico de las plataformas internacionales. Esta distribución está altamente relacionada con el número de proyectos publicados y financiados, así como con el nivel de capitalización total. Por otro lado, aproximadamente 47.6% del tráfico en las plataformas latinoamericanas se concentra en Catarse e Idea.me, y 80% se concentra en las ocho principales plataformas (ver Gráfica 13).

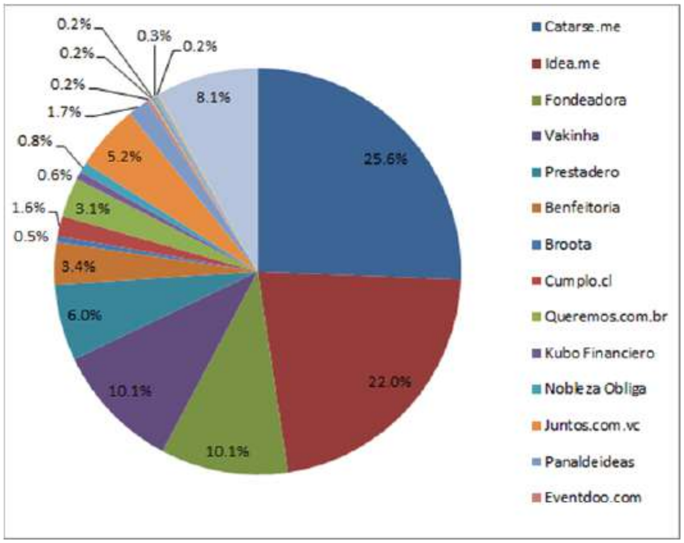
Gráfica 12. Nivel de tráfico de plataformas de crowdfunding latinoamericanas, 2015



Fuente: elaboración propia con datos de Alexa.com

Nota: la gráfica representa el nivel de tráfico en la plataforma con base en el ranking de tráfico de Alexa. Para facilitar la lectura de la gráfica, se invirtieron los valores utilizando la división $\frac{1}{x}$. Véase Tabla 2 del Anexo I.

Gráfica 13. Porcentaje de visitas diarias únicas por plataforma, 2015

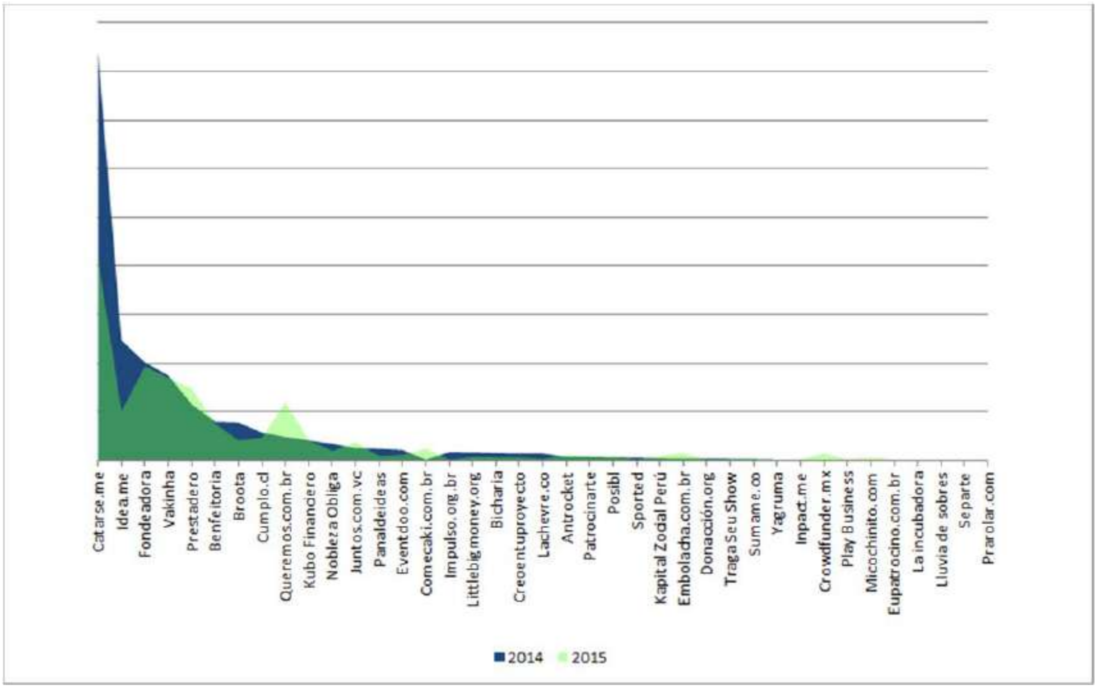


Fuente: elaboración propia con datos de Dominatours.com

El análisis descriptivo del tamaño de las plataformas regionales en comparación con las internacionales muestra que la densidad de usuarios de las plataformas es un activo fundamental. Sin embargo, la mejor forma de lograrlo no es tan clara. La plataforma con mayor tráfico de América Latina (Catarse) tiene un tráfico casi exclusivamente nacional, mientras que la segunda tiene más de la mitad de su tráfico en orígenes foráneos. Asimismo, las plataformas más importantes a nivel internacional tienen un tráfico mayoritariamente local.

Como se mencionó anteriormente, una de las características identificadas sobre la evolución de las plataformas es que tienen una relación con el nivel de densidad de usuarios. Una hipótesis es que, debido a un posible círculo de retroalimentación, las plataformas con mayor número de usuarios tenderán a ganar más usuarios con el paso del tiempo y las plataformas con baja actividad, tenderán a desaparecer. Sin embargo, de acuerdo con datos recolectados sobre el nivel de tráfico en las plataformas durante 2014 y 2015, se observó que este patrón no es consistente (ver Gráfica 14). De hecho, Catarse e Idea.me perdieron un nivel importante de tráfico durante el último año. En general no se observa una tendencia en la gráfica, y llaman la atención casos específicos como Queremos, Comecaki y Prestadero. Una posible explicación a estos hallazgos es que el factor del *management* juega un papel más importante que el círculo de retroalimentación en la ampliación de la base de usuarios. A lo largo del estudio, se observó una variedad de estrategias de gestión y difusión, siendo algunas más exitosas que otras. Y esto posiblemente ha mejorado el posicionamiento de plataformas con una actividad inicial baja.

Gráfica 14. Evolución del nivel de tráfico de plataformas de crowdfunding latinoamericanas durante 2014 y 2015



Fuente: elaboración propia con datos de Alexa.com

Nota: la gráfica representa el nivel de tráfico en la plataforma con base en el ranking de tráfico de Alexa. Para facilitar la lectura de la gráfica, se invirtieron los valores, utilizando la división $\frac{1}{x}$. (fechas de consulta 20/10/2015 y 4/8/2015)

4. CARACTERÍSTICAS DE LOS MODELOS DE NEGOCIO DE CROWDFUNDING EN AMÉRICA LATINA

Para estudiar los modelos de negocio existentes, se realizó una encuesta a las plataformas de crowdfunding de América Latina que estuvieron en operación durante el periodo de estudio. Algunas de ellas dejaron de operar antes del término del presente trabajo y otras comenzaron a funcionar durante el mismo. En total se identificaron 38 plataformas latinoamericanas de crowdfunding operando entre Octubre de 2014 y Mayo de 2015.[4] Se contactó a las 38 plataformas, de las cuales 9 estaban fuera de operación, 6 declinaron contestar la encuesta y 23 accedieron a contestarla (ver Tabla 1 del Anexo II). Esto significa una tasa de respuesta de 60% sobre las plataformas identificadas durante este periodo y de 79% sobre las plataformas que siguen operando.

El cuestionario enviado consta de 30 reactivos divididos en 3 secciones: 1) datos generales de la plataforma (nombre de la empresa, sede de las operaciones, tamaño de la empresa, etc.); 2) característica del modelo de negocio (modelo de crowdfunding, esquema de ingresos, medios de transacción, etc.); y 3) características de las campañas y la interacción entre inversionistas y emprendedores. Los cuestionarios fueron respondidos por los administradores de las plataformas.

El lanzamiento de las plataformas latinoamericanas tuvo un *boom* durante 2011 y 2012, cuando se registró un crecimiento acelerado. Después de dicho periodo se observó un declive en el número de fundaciones (Ver Gráfica 15). Un 57% de las plataformas encuestadas se fundaron durante 2011 y 2012. El patrón, sin embargo, no es el mismo entre los países de América Latina. Brasil ha sido claramente el país pionero en la adopción del crowdfunding, seguido de Chile y México (Ver Gráfica 16).[5] Hasta el final del estudio se observaron algunos *late adopters* en Perú, Colombia, Venezuela y Puerto Rico. No obstante, el crecimiento mayor en términos generales ha sucedido en México. La mayoría de las plataformas encuestadas son de este país, seguido por Brasil y Chile (ver Gráfica 17).

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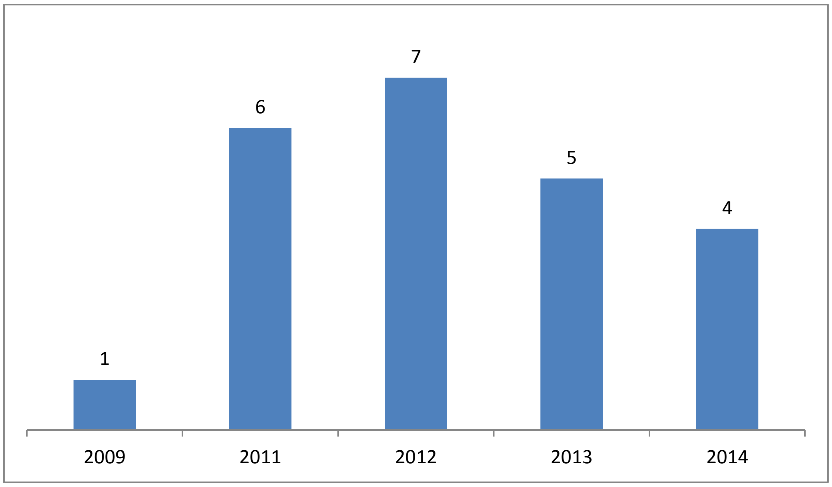
[4] *Adicionalmente, se encontraron 10 plataformas fuera de operaciones antes del inicio del estudio.*

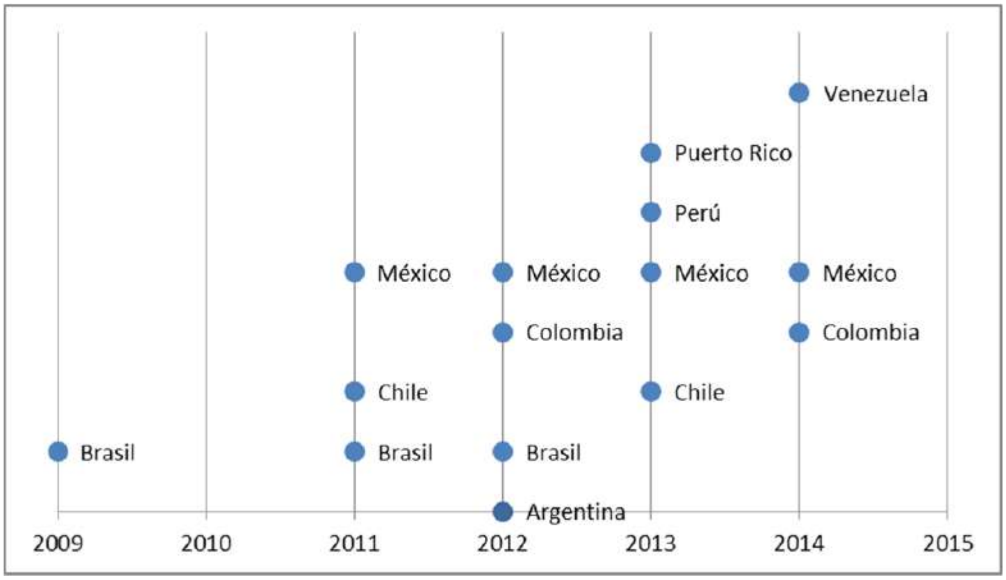
[5] *Este patrón es consistente con la información de la Gráfica 5.*

Gráfica 15. Año de fundación de la plataforma



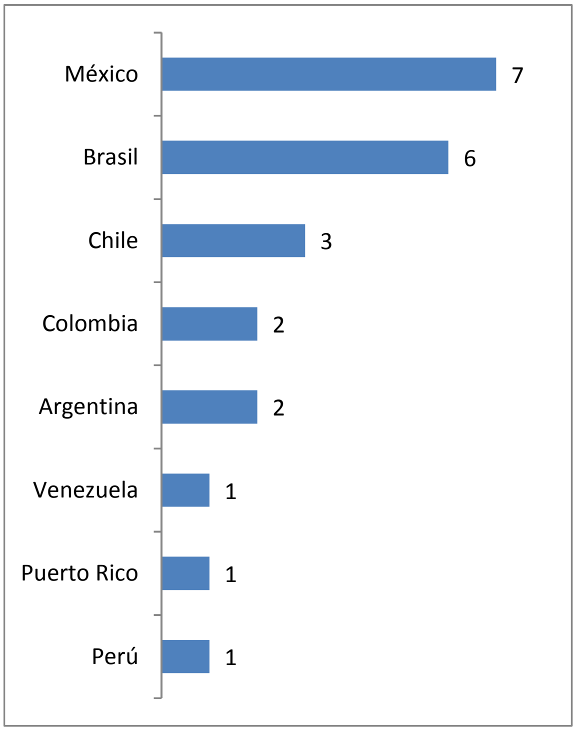
Fuente: elaboración propia

Gráfica 16. Plataformas lanzadas por país, 2009-2014



Fuente: elaboración propia

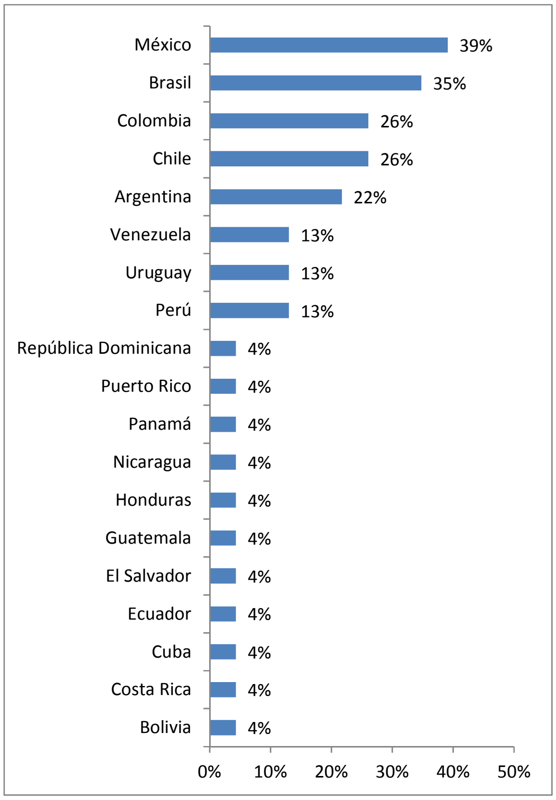
Gráfica 17. Número de plataformas por país



Fuente: elaboración propia

En la sección anterior se discutió que las plataformas se desempeñan en gran medida de manera muy endógena, acumulando el grueso del tráfico en visitas locales. Esto es causado, en buena medida, por el hecho de que no todas las plataformas están abiertas para *fundraisers* que residen fuera del país sede de las operaciones. Las restricciones en la mayoría de los casos tienen que ver con transacciones financieras entre países o por mecanismos de seguridad de las propias empresas para minimizar el riesgo de fraude. En este sentido, los países que cuentan con más plataformas para acceder a financiamiento (sin considerar las empresas internacionales como Kiva o Kickstarter) son México (43%), Brasil (35%) y Colombia (26%, ver Gráfica 18). En la Gráfica 18 se observan efectos de derrame entre países. Por ejemplo, en Uruguay, que no contaba con una plataforma activa al finalizar el estudio, sus ciudadanos tenían acceso a financiamiento a través de tres plataformas. Igualmente, los ciudadanos de Argentina y Chile tienen acceso a tres plataformas adicionales a las nacionales. No es el caso de Bolivia, Ecuador y otros países de Centroamérica, donde sólo tienen acceso a una plataforma.

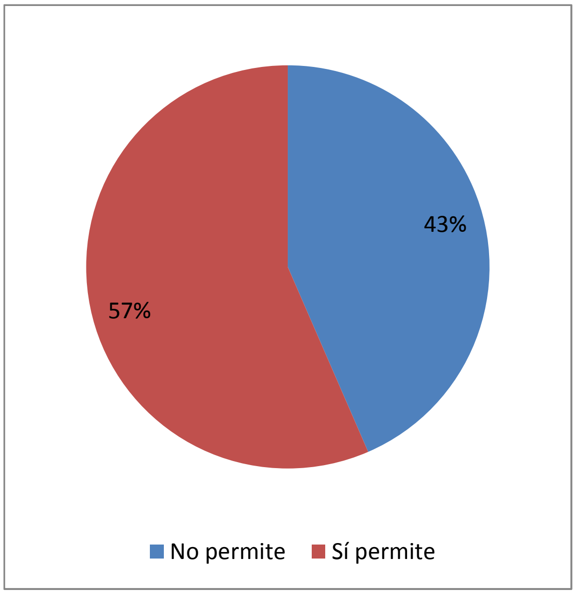
Gráfica 18. Porcentaje de plataformas que permiten publicar campañas de crowdfunding por país, 2015



Fuente: elaboración propia

En cuanto a las fuentes de financiamiento o inversiones, las restricciones son menores en el origen geográfico de éstas. Esto es menos problemático, en buena medida, debido a las plataformas internacionales estandarizadas de pago, como Paypal, Mercado Libre, etc. Un 57% de las plataformas sí está abierto a la recepción de financiamiento de cualquier parte del mundo, mientras que 43% tiene restricciones al respecto (ver Gráfica 19). Algunas de las razones por las cuales las plataformas no están abiertas al financiamiento internacional son el cumplimiento sobre leyes de prevención de lavado de dinero u otro tipo de regulaciones locales.

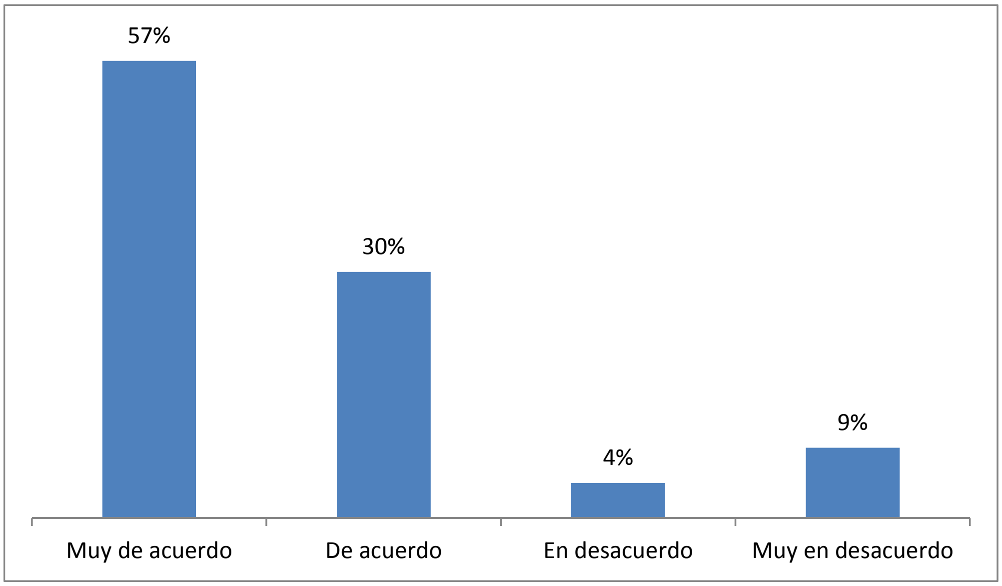
Gráfica 19. Porcentaje de plataformas que permiten inversionistas de cualquier parte del mundo



Fuente: elaboración propia

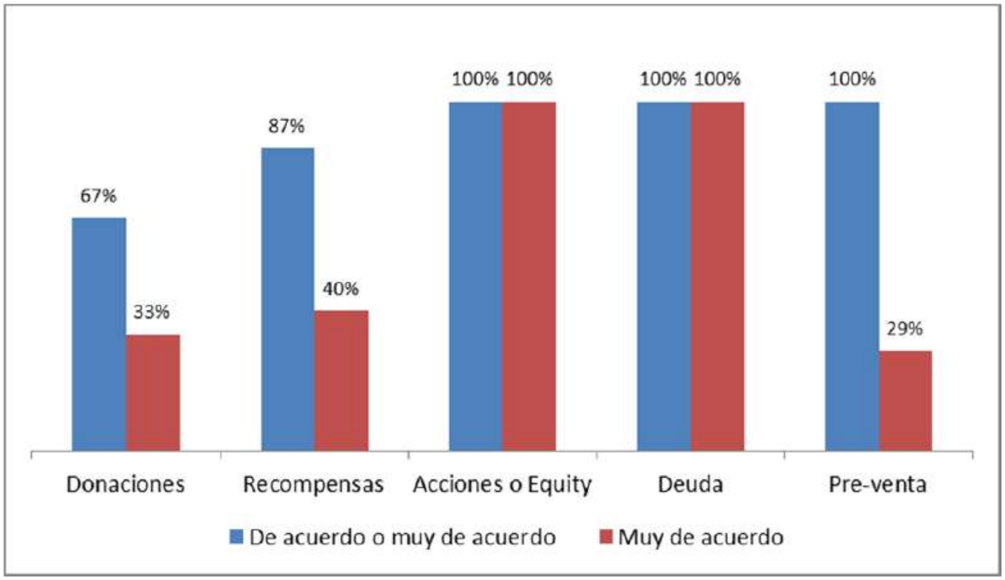
La visión empresarial de las plataformas, independientemente de la causa social que persiga es clara. Un 87% de las plataformas encuestadas están de acuerdo o muy de acuerdo en que sus plataformas son esencialmente una empresa o negocio (ver Gráficas 20 y 21). Apenas tres plataformas manifestaron una opinión negativa al respecto. También se pueden observar diferencias importantes entre los tipos de plataformas.

Gráfica 20. ¿Qué tanto está de acuerdo en que la plataforma es esencialmente un negocio?



Fuente: elaboración propia

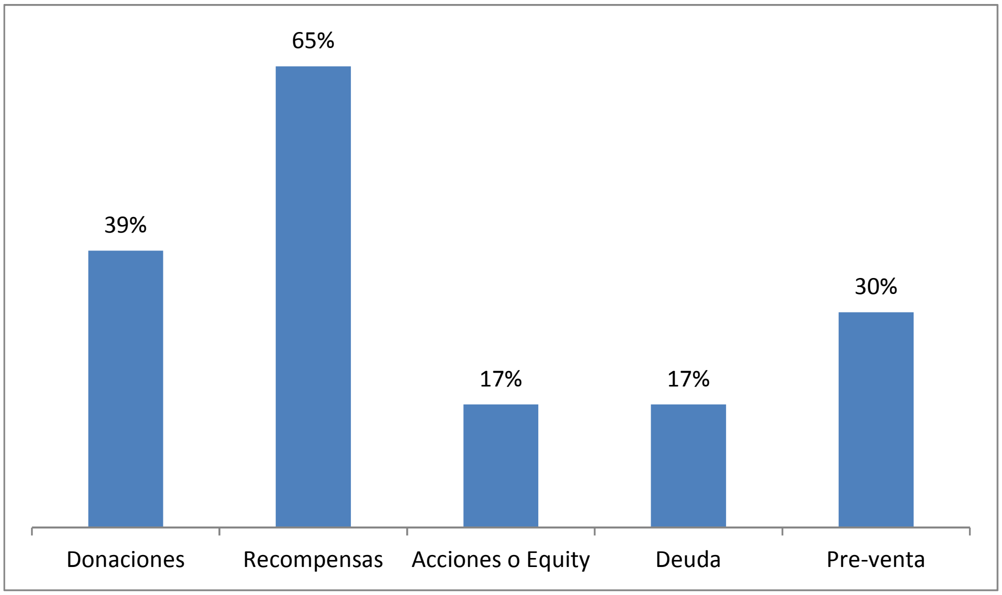
Gráfica 21. ¿Qué tanto está de acuerdo en que su plataforma es esencialmente un negocio?



Fuente: elaboración propia

Las plataformas regularmente tienen más de un modelo de crowdfunding. El principal tipo de crowdfunding es por recompensas (65%), seguido por donaciones (39%) y pre-venta (30%) (Ver Gráfica 22). Estos tres tipos de plataformas se pueden catalogar como "sociales," donde la motivación principal no es una retribución monetaria por el financiamiento. A diferencia de éstas, las plataformas basadas en acciones o deuda, se catalogaron como de “renta económica,” por sus objetivos, discutidos en la revisión de literatura. Estas dos grandes categorías de plataforma son actualmente las que menos existen en América Latina (existe un 17% de cada una de estas plataformas). De hecho, México y Chile son los dos únicos países donde se observaron plataformas enfocadas a deuda y acciones. En particular, llama la atención México, donde 71% de sus plataformas son de este tipo. En buena medida, esto explica la reciente organización de las plataformas de crowdfunding mexicanas para formar una asociación que busca contribuir a la regulación de este tipo de financiamiento.[6] Es importante notar, sin embargo, que este tipo de plataformas han tenido un crecimiento importante en los últimos años. A diferencia del *boom* mencionado anteriormente, el crecimiento de estas las plataformas de renta económica presentaron un patrón de crecimiento lineal hasta 2013 (ver Gráfica 23). Existe también una diferencia importante en el tamaño de las empresas según el tipo de crowdfunding. Las plataformas sociales tienen en promedio 8.3 empleados, mientras que las de renta económica tienen en promedio 22.7 empleados; esto implica un tamaño de los recursos humanos 2.7 veces mayor.

Gráfica 22. Porcentaje de plataformas que tienen disponible cada modalidad de crowdfunding



Fuente: elaboración propia

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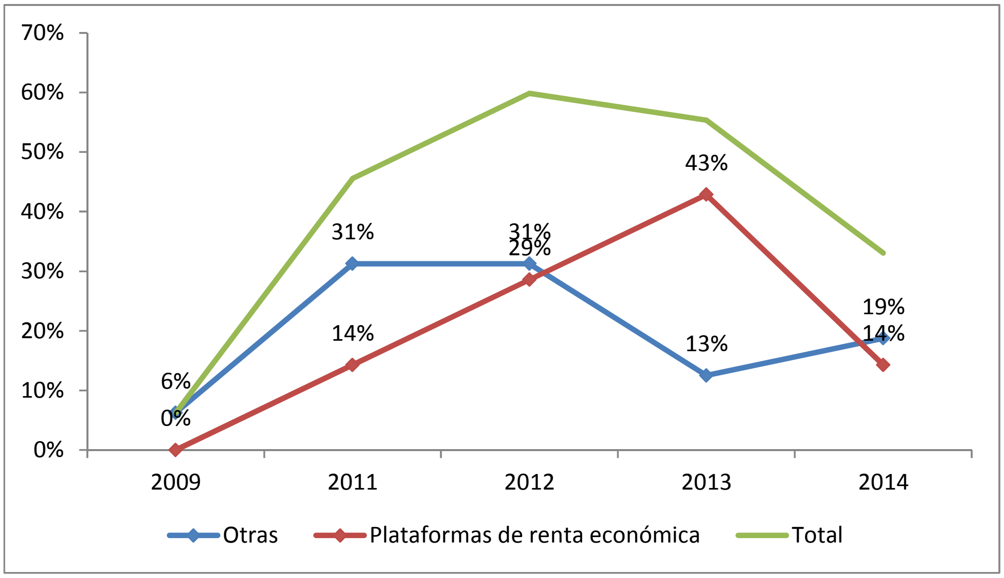
[6] *Véase Asociación Mexicana de Plataformas de Financiamiento Colectivo, A.C. (http://afico.org/).*

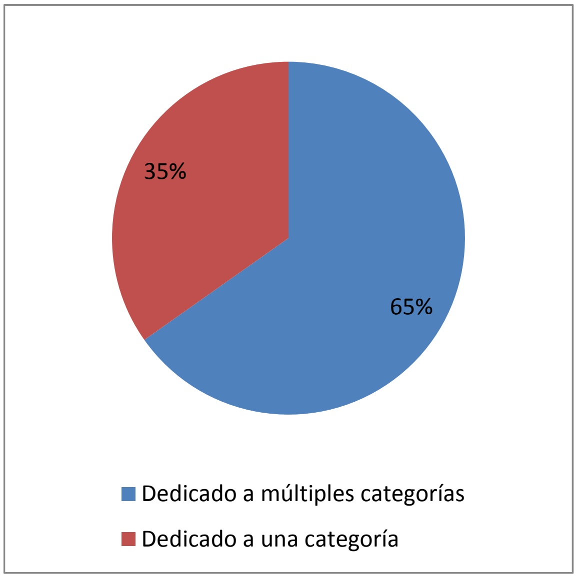
Gráfica 23. Porcentaje de plataformas fundadas por año, por tipo de plataforma



Fuente: elaboración propia

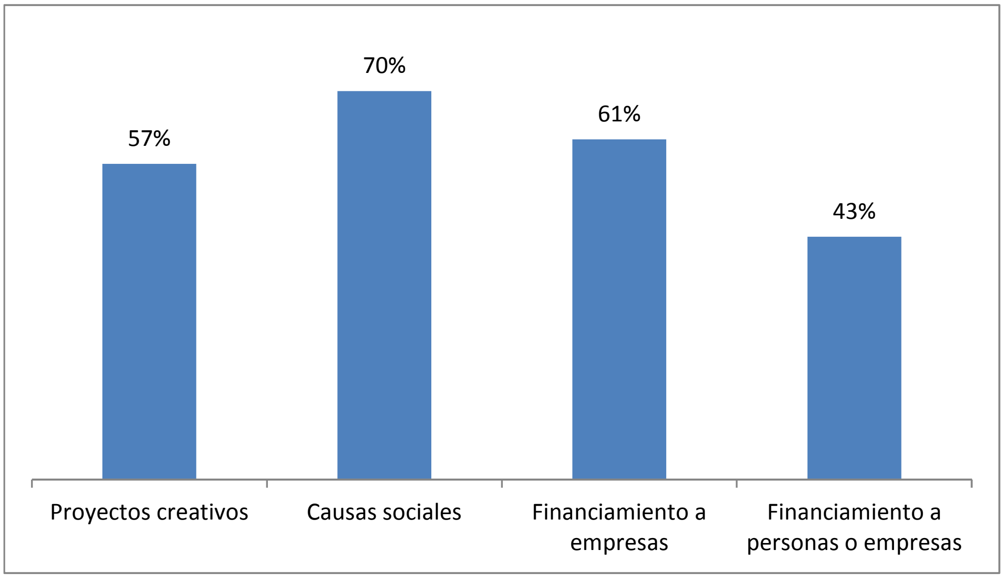
A nivel global, la tendencia de las plataformas es la especialización en un campo específico de donaciones. Por ejemplo, están emergiendo plataformas únicamente para el financiamiento de proyectos de investigación científica, promoción del deporte, eventos musicales, manifestaciones artísticas, etc. De las plataformas encuestadas, sólo 35% manifestó estar dedicada a una categoría en específico (ver Gráfica 24). De éstas, las principales categorías mencionadas fueron: proyectos artísticos y culturales, causas solidarias, causas en favor de los animales y negocios. Agregando los tipos de financiamiento que suelen presentarse en las plataformas latinoamericanas, se observa que la principal categoría es las causas sociales, promovidas en un 70% de las plataformas, y seguidas del financiamiento a empresas en un 61% de las plataformas (ver Gráfica 25).

Gráfica 24. Porcentaje de plataformas dedicadas a una categoría



Fuente: elaboración propia

Gráfica 25. Porcentaje de plataformas que habilitan la promoción en categorías de campaña seleccionadas



Fuente: elaboración propia

Las plataformas de tipo social funcionan principalmente sobre comisiones por las campañas que cumplen su meta de fondeo. A estas campañas se les suele llamar "exitosas". Un 93% de las plataformas sociales funciona bajo esta modalidad y el promedio de comisión que cobra la plataforma por campaña es de 8%, siendo 15% el máximo y 5% el mínimo. Un 57% de las plataformas tiene la posibilidad de financiar las campañas que no logran llegar a la meta propuesta, a este tipo de campañas se les denomina "semi-exitosas". La comisión promedio sobre las campañas semi-exitosas es de 6%, siendo igualmente la máxima 15% y la mínima 5% (ver Tabla 2). Sólo dos plataformas tienen la opción de cobrar una comisión fija sobre las campañas y tres plataformas cuentan con otro tipo de ingresos (p. ej. cuota de membresía para el acceso a la plataforma).

Tabla 2. Estadísticas de comisiones en plataformas sociales

Tipo de comisión	Sí cobra	Porcentaje que sí cobra	Promedio de comisión	Máximo de comisión	Mínimo de comisión	Observaciones
Cobra comisión por campaña exitosa	13	93%	8%	15%	5%	14
Cobra comisión por campaña semi-exitosa	8	57%	6%	15%	5%	14
Cobra comisión fija	2	14%	NA	NA	NA	14
Otro tipo de comisiones	3	21%	NA	NA	NA	14

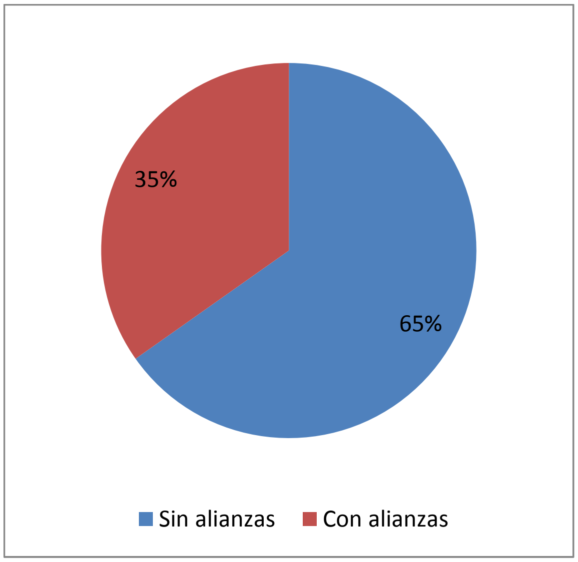
Fuente: elaboración propia

En las plataformas de deuda, el modelo de negocios suele basarse en una comisión sobre el monto del crédito otorgado al *fundraiser*. Tres de las cuatro plataformas de deuda encuestadas utilizan este mecanismo. Otras modalidades de ingreso para estas plataformas son el cobro por servicios o asesoría en financiamiento y comisiones de apertura.

En las plataformas de acciones, el modelo de negocios igualmente gira principalmente alrededor de las comisiones. Principalmente, se cobra una comisión a los *fundraisers* sobre el monto de la cantidad financiada a través de la plataforma. Otras plataformas cobran comisiones fijas por el uso de la misma (*software as a service*, *SaaS*) y otras cobran una comisión al inversionista sobre el monto de las acciones adquiridas.

Únicamente, 35% de las plataformas tienen alianzas con otras instituciones para fortalecer sus actividades (ver Gráfica 26). Los principales tipos de alianzas son: 1) convenios de participación; 2) alianzas comerciales de canalización de pagos; 3) redes de crowdfunding. Algunas plataformas acuerdan convenios con fundaciones o instituciones, donde éstas últimas se comprometen a buscar financiamiento de sus proyectos a través de crowdfunding. La segunda categoría se trata de alianzas comerciales con bancos o sistemas de pago en línea (p. ej. Mercado Pago o Paypal) para mejorar los mecanismos de financiamiento. Finalmente, en la medida en que este sector crece, se están formando asociaciones de plataformas de crowdfunding. En el caso mexicano, existe ya la Asociación de Plataformas de Fondeo Colectivo (Afico). En el caso de Colombia, existe una red informal de estas plataformas que se está consolidando como una asociación de plataformas. Es posible que en el resto de los países donde existen varias plataformas esté sucediendo el mismo fenómeno y se espera que este tipo de asociaciones se consoliden en los próximos años, principalmente por la necesidad de actualizar los marcos regulatorios nacionales en materia de fondeo colectivo.

Gráfica 26. Porcentaje de plataformas que cuentan con algún tipo de asociación o alianza con otras instituciones



Fuente: elaboración propia

Las oportunidades de alianzas, por otro lado, pueden estar en la construcción de acuerdos para el lanzamiento o el fortalecimiento institucional de las plataformas. Se preguntó a las plataformas si recibieron algún tipo de apoyo, ya sea económico o no económico, para el lanzamiento o el fortalecimiento de su plataforma. Un 52% de las plataformas manifestó haber recibido algún tipo de apoyo para el fortalecimiento de sus actividades (ver Gráfica 27). Las principales entidades que han apoyado a las plataformas latinoamericanas son: fondos para emprendedores sociales, inversionistas privados, inversionistas ángel, fondos de inversión privados y subsidios gubernamentales a través de incubadoras de empresas. Las principales plataformas beneficiadas por este último tipo de apoyo son las de renta económica; solo 9% de las plataformas que no son de renta económica recibieron apoyos de éste tipo, mientras que 50% de las plataformas de renta económica recibieron apoyos de este tipo.

Gráfica 27. Porcentaje de plataformas que han recibido apoyo económico o no económico de alguna institución pública o privada para el impulso de sus actividades

Fuente: elaboración propia

El proceso de selección de campañas a ser publicadas en los portales es un momento que requiere el uso de discrecionalidad por parte de los administradores del portal. Existe cierta diversidad en la forma en que este proceso es llevado a cabo. Algunas plataformas realizan evaluaciones detalladas de cada uno de los proyectos y, en el otro extremo, hay plataformas que no establecen ningún tipo de criterio.

El principal criterio observado en la mayoría de las plataformas es el establecimiento de pre-requisitos que son normalmente publicados en los portales. Estos requisitos son, por ejemplo, la provisión de documentos con información básica como descripción del proyecto, las recompensas y metas de recaudación, así como videos promocionales. Algunas plataformas complementan los pre-requisitos con ciertas restricciones, por ejemplo, no ser partidos políticos u organizaciones religiosas, validar la identidad a través de sus redes sociales, validar la legalidad del proyecto propuesto, etc. Al menos, 48% de las plataformas tienen un proceso de análisis cualitativo de las propuestas. Este tipo de análisis implica, por ejemplo, evaluaciones sobre la probabilidad de éxito de la campaña, sobre el impacto social o comunitario o sobre su potencial de innovación. Este tipo de análisis es de naturaleza subjetiva, aunque se pueden desarrollar herramientas de análisis que den consistencia a las decisiones a lo largo del tiempo. No obstante, se trata de criterios importantes para conservar o aumentar la calidad de los proyectos y la confianza en la plataforma.

Otras plataformas incorporan mecanismos de tipo auditoría, orientados a analizar el comportamiento de las personas o empresas. Por ejemplo, se observó la implementación de análisis de riesgo crediticio con información financiera del solicitante, análisis del valor social de los proyectos, investigaciones previas a una empresa (*due diligence*) y algoritmos usados para evaluar la calidad crediticia del solicitante. Finalmente, una característica adicional del proceso de selección de propuestas son las entidades asociadas al análisis y validación de las mismas. Particularmente, en las empresas que utilizan análisis subjetivos de los proyectos, se observó el uso de agentes externos a los operadores de la plataforma para la evaluación de las propuestas. Este tipo de evaluadores son, por ejemplo, asesores externos o comités de evaluación.

El proceso de selección descrito anteriormente tiene una alta incidencia en el número de propuestas que logran ser publicadas en la plataforma. Aproximadamente, 42% de los proyectos recibidos son publicados en el portal (ver Tabla 3); menos de la mitad logran superar las restricciones de las plataformas. Esto supone un nivel de rigor importante sobre la calidad de las propuestas o sobre la calidad crediticia o de credibilidad de los solicitantes de fondeo. Los datos indican que el rigor en la selección de proyectos a ser publicados es mayor en las plataformas de renta económica. En este tipo de plataformas, aunque su promedio de solicitudes es mayor, el porcentaje de proyectos lanzados en la plataforma es de 18%, muy por debajo del promedio en las plataformas sociales (49%). Sin embargo, en cuanto al porcentaje de proyectos exitosos, no hay una diferencia importante entre los tipos de plataformas.

Tabla 3. Estadística de proyectos recibidos, lanzados y exitosos en las plataformas

Estatus de los proyectos	Promedio	Mínimo	Máximo	Observaciones
Todas las plataformas				
Total de proyectos recibidos	936	4	6,614	21
Porcentaje de proyectos lanzados	42%	6%	100%	21
Porcentaje de proyectos exitosos*	45%	5%	100%	20
Tasa de impago	1.5%	0.0%	12%	19
Número de inversionistas en proyectos exitosos	10,707	18	88,500	19
Plataformas sociales				
Total de proyectos recibidos	629	6	4,275	14
Porcentaje de proyectos lanzados	49%	10%	100%	14
Porcentaje de proyectos exitosos	43%	5%	100%	14
Plataformas de renta económica				
Total de proyectos recibidos	1796	4	6614	5
Porcentaje de proyectos lanzados	18%	6%	50%	5
Porcentaje de proyectos exitosos	39%	15%	100%	5

Fuente: elaboración propia.

* El porcentaje de proyectos exitosos se calculó dividiendo estos sobre los proyectos lanzados en la plataforma.

En sentido inverso, el número de inversionistas es mayor en las plataformas sociales que en las de rentas económicas. En las primeras, el promedio de inversionistas involucrados en todas las campañas exitosas durante 2014 fue 16,301, mientras que el promedio en plataformas de renta económica fue 558 (ver Tabla 4). Al desagregar más estos datos, se observó una variación importante entre las categorías tradicionales. Las plataformas de donación tienen el promedio más alto de inversionistas (16,586), seguida por las de recompensas (12,238) y pre-ventas (6,084) (ver Gráfica 28). Entre las plataformas de renta económica, se observó que las de acciones triplican el número de inversionistas de las plataformas de deuda.

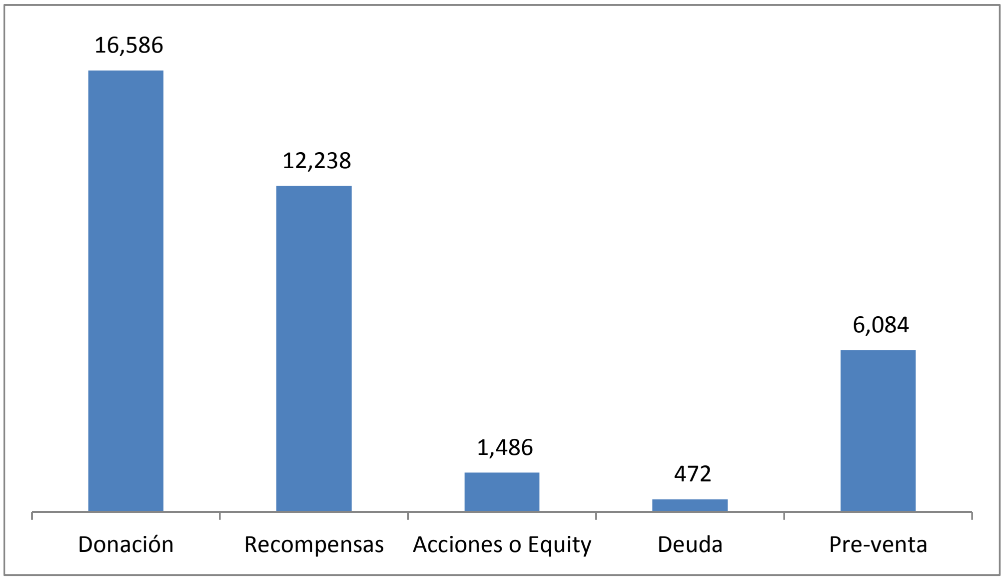
Tabla 4. Total de inversionistas involucrados en campañas exitosas durante 2014, por tipo de plataforma

Tipo de plataforma	Promedio	Mínimo	Máximo	Observaciones

Todas	10,707	18	88,500	19
Renta económica	558	18	1,244	5
Social	16,301	22	88,500	14

Fuente: elaboración propia

Gráfica 28. Promedio de inversionistas por tipo de plataforma durante 2014



Fuente: elaboración propia

Como cualquier sistema de financiamiento, el crowdfunding está sujeto al incumplimiento de las obligaciones por parte de las personas financiadas. Esto tiene una afectación económica para los inversionistas en las plataformas de renta económica; esto es el caso también para las plataformas de pre-venta. En las plataformas sociales es más difícil observar la pérdida en términos tangibles, ya que se trata de un bienestar asociado al valor subjetivo que los inversionistas otorgan a los objetivos de la campaña financiada. En las plataformas de donaciones no se espera un bien tangible en retribución, pero sí la consecución de los objetivos de la campaña. En las plataformas de recompensas, sí existe una pérdida material en caso de incumplimiento, aunque la recompensa es generalmente una retribución simbólica por el apoyo.

La tasa de incumplimiento es un indicador que permite, entre otras cosas, observar la calidad de la selección de los solicitantes de financiamiento o de los proyectos, así como el nivel de confianza que pueden tener los inversionistas en la plataforma. De acuerdo con los datos de la encuesta, 74% de las plataformas reportó tener una tasa de incumplimiento de 0%, mientras que el promedio en las plataformas que sí tuvieron tasa de incumplimiento fue de 8%.

Se preguntó a las empresas qué tipo de mecanismos tienen en caso de que una persona fondeada cayera en incumplimiento de compromisos. Las estrategias observadas se pueden dividir en tres tipos:

1. **Libertad de acción y auto-regulación.** Algunas plataformas consideran que el problema de incumplimiento puede ser atajado mediante la incorporación de este riesgo en los mecanismos de selección de proyectos señalados arriba. Operan bajo el principio de que el sector de crowdfunding, al ser pública la personalidad de las personas financiadas, existe un proceso natural de auto-regulación. Asimismo, se considera que un alto porcentaje de las personas que fondean los proyectos son familiares, amigos o conocidos de quienes iniciaron la campaña, lo que reduce las probabilidades de incumplimiento por fraude.

2. **Seguimiento y recordatorios del compromiso.** Los supuestos sobre la probabilidad de incumplimiento de los *fundraisers* son similares a los expuestos en el punto anterior. La diferencia en este caso es que las plataformas tienen planificada una estrategia de seguimiento con las personas financiadas que incumplan. Las estrategias de seguimiento pueden ser correos electrónicos o llamadas telefónicas. Otras plataformas contemplan la difusión al resto de las plataformas un expediente negativo de la persona financiada.
3. **Mecanismos formales de cobranza.** Existe un contrato formal de por medio que se ejerce en caso de incumplimiento. Este instrumento es fundamental en las plataformas de rendimiento económico. Los mecanismos de cobranza pueden tener distintas etapas. Por ejemplo, algunas plataformas contemplan comenzar con cobranza preventiva (llamadas telefónicas para recordar los compromisos incumplidos), seguida de mecanismos más elaborados de cobranza hasta, en última instancia, vender la deuda a despachos jurídicos especializados en cobro de deuda vencida. Otras plataformas contemplan la firma de un pagaré y un respaldo de garantía sobre el cuál ejercer el cobro de la deuda.

5. ANÁLISIS DE DATOS SOBRE CAMPAÑAS FINANCIADAS EXITOSAMENTE

Para analizar las características de las campañas financiadas, se construyó una base de datos con la información pública en dos plataformas de crowdfunding latinas: Fondeadora e Idea.me.[7] La metodología de recolección de los datos fue distinta para cada caso. En el caso de Fondeadora se recolectaron todos los casos de éxito hasta Septiembre de 2015. En Fondeadora sólo se financian las campañas que alcanzan 100% de sus metas, mientras que en Idea.me se financian también campañas semi-exitosas. Precisamente debido a esta variación en el monto recaudado (con respecto a la meta) se decidió utilizar otra estrategia para recolectar los datos en Idea.me. Se realizó una selección sistemática con una cuota de 30 casos por categoría para lograr una base de datos balanceada en cuanto al número de observaciones por categoría de proyectos.[8]

En Fondeadora se observaron 25 categorías con campañas exitosas, siendo la más importante Cine y Video con 23% de los casos, seguida de Música (18%) y Teatro (10%) (Ver Gráfica 29). Aproximadamente, 60% de las categorías financiadas pueden considerarse como creativas. Asumiendo que los inversionistas eligen a que campaña financiar analizando las opciones en los portales, esto indica una fuerte preferencia de los inversionistas por proyectos creativos y artísticos. Lo anterior, sin embargo, es contrastante con otras categorías creativas que aparecen en los últimos lugares, como Literatura, Moda o Comics. Resultaría útil poder conocer las desiguales preferencias de los inversionistas entre los tipos de proyectos creativos.

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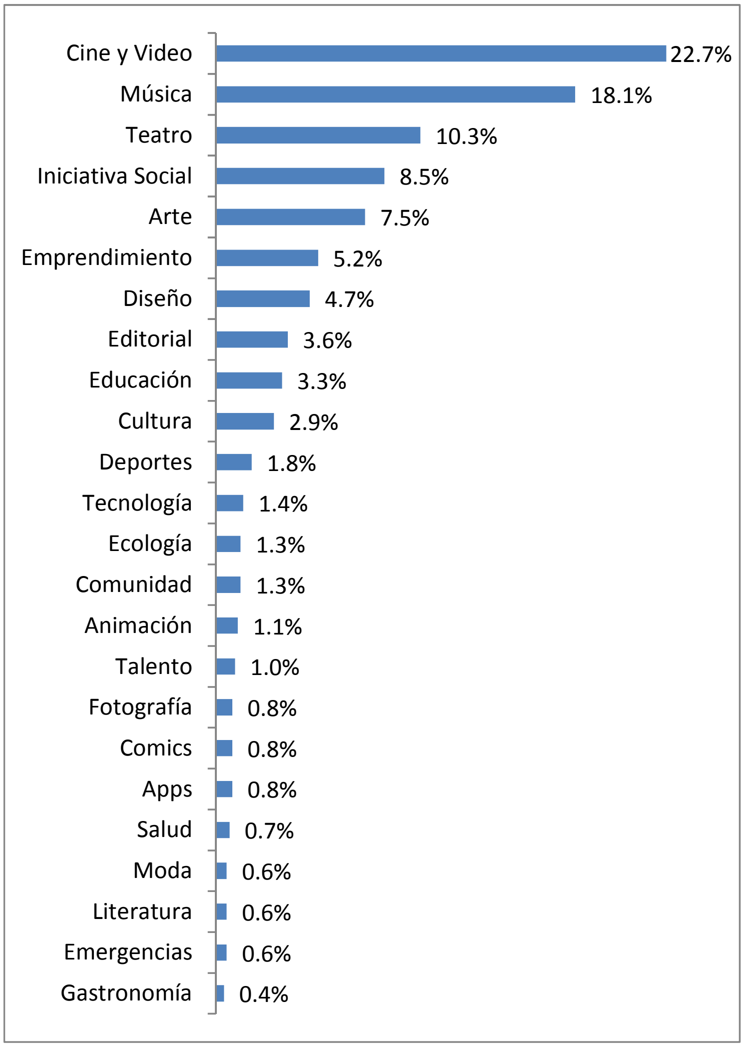
[7] *Se consideraron únicamente éstas por ser dos de las tres plataformas con mayor número de campañas exitosas (la tercera es Catarse) y la disponibilidad de la información en su portal.*

[8] *Se obtuvieron 30 casos para cada categoría, con la excepción de las categorías "Capacitación", "Deportes" y "Urbanismo", cuya cuota no alcanzó los treinta debido al pequeño número de casos (8, 24 y 2, respectivamente).*

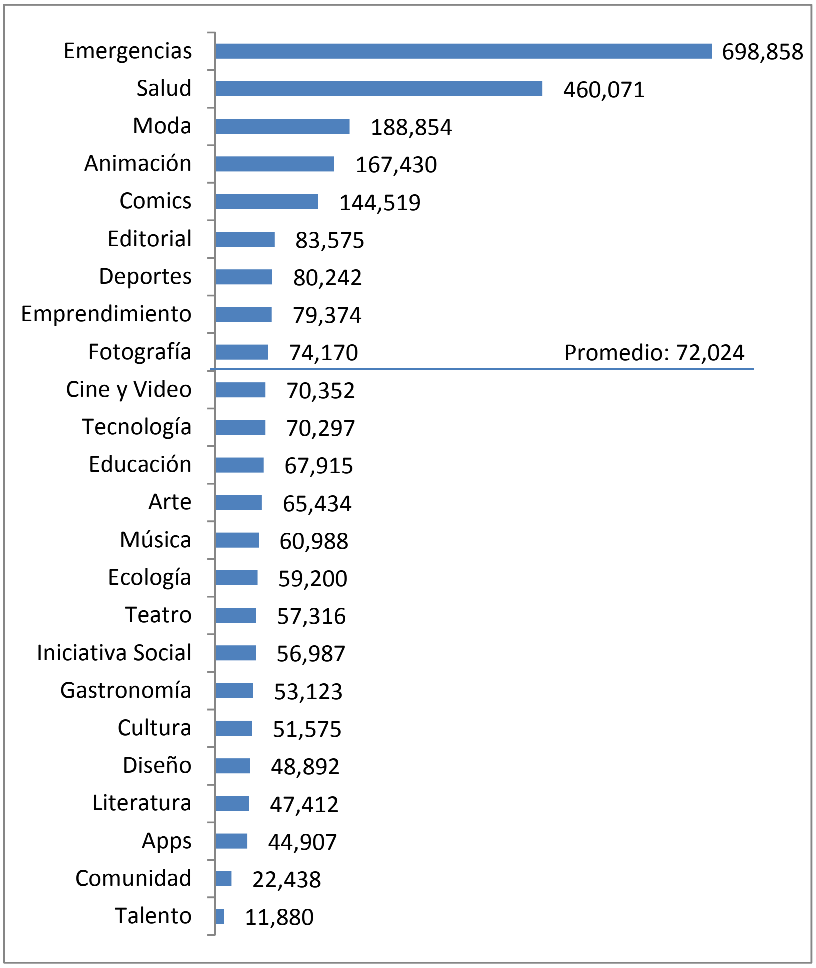
Gráfica 29. Porcentaje de campañas financiadas en Fondeadora por categoría



Fuente: elaboración propia con base en datos de Fondeadora

Al analizar los datos por monto de financiamiento, se observan patrones distintos. Los proyectos con más apoyo son los de Emergencias y Salud, mientras que Cine y Video, así como Música están cerca del promedio general (ver Gráfica 30).

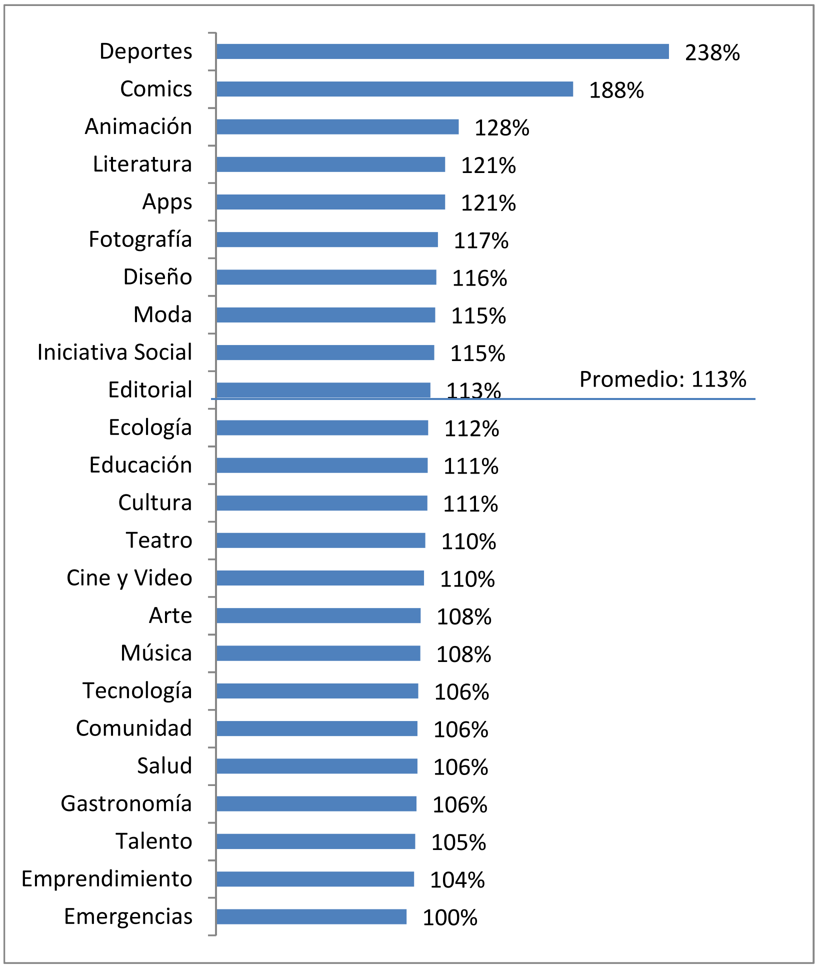
Gráfica 30. Promedio de financiamiento a campañas por categoría



Fuente: elaboración propia con base en datos de Fondeadora.
Nota: los datos están en pesos mexicanos.

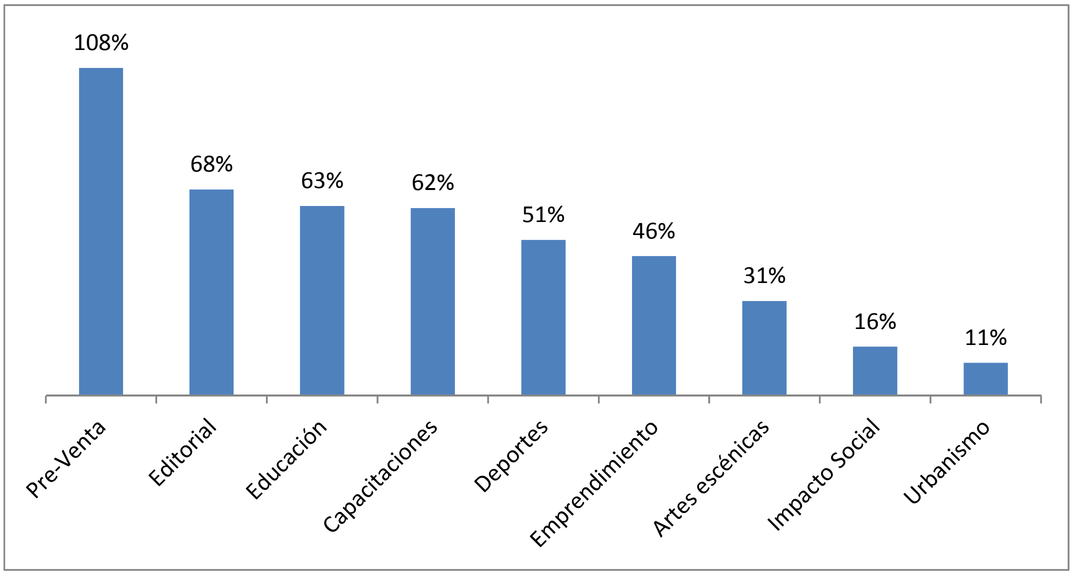
La relación entre la cantidad recibida y la solicitada es un indicador que puede dar cuenta de las preferencias de los inversionistas. Si bien las categorías Comics y Deportes no tienen un alto número de campañas exitosas, sí tienen un alto nivel de apoyo, promediando financiamientos de 188% y 238%, respectivamente (ver Gráfica 31). El bajo número de campañas exitosas podría deberse más a la falta de oferta que de interés. En el caso de Idea.me, además de tener categorías muy diferentes, la distribución del porcentaje de dinero financiado por campaña (en este caso semi-exitosas) es muy diferente (ver Gráfica 32). La Gráfica 32 permite observar con más claridad la variación de las preferencias de financiamiento, ya que no tienen fijado un porcentaje mínimo, como en el caso de la Gráfica 31.

Gráfica 31. Porcentaje promedio de financiamiento, con respecto a la cantidad meta en Fondeadora



Fuente: elaboración propia con base en datos de Fondeadora

Gráfica 32. Porcentaje emprendedor en campañas semi-exitosas con respecto a la meta, por categorías en Idea.me



Fuente: elaboración propia con base en datos de Idea.me.

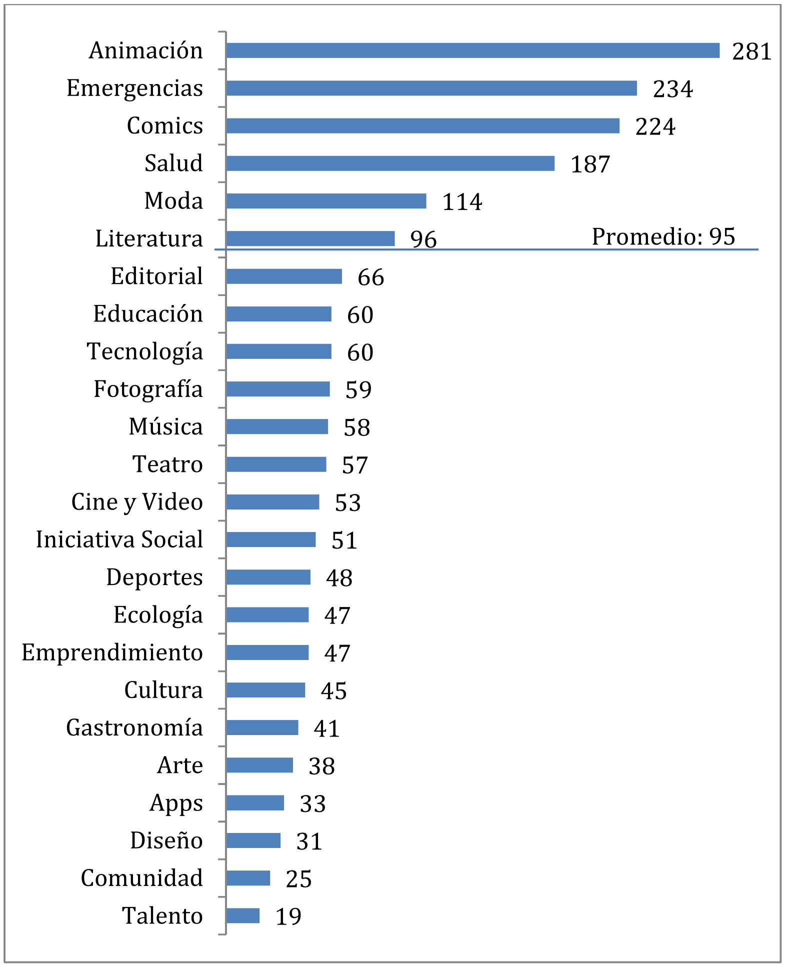
Tabla 5. Estadísticas descriptivas del porcentaje emprendedor en campañas semi-exitosas con respecto a la meta

Categoría	Promedio	Mínimo	Máximo
Editorial	68%	12%	172%
Educación	63%	10%	147%
Capacitaciones	62%	11%	108%
Deportes	51%	10%	158%
Emprendimiento	46%	10%	126%
Artes escénicas	31%	10%	86%
Impacto Social	16%	10%	28%
Pre-Venta	108%	14%	184%
Urbanismo	11%	10%	12%

Fuente: elaboración propia con base en datos de Idea.me

Existe un patrón diferente en la distribución de las categorías cuando se analizan. por el número de inversionistas que apoyaron una campaña exitosa (ver Gráfica 33). Las categorías Animación, Emergencias, Comics y Salud, son las que producen más apoyo en número de personas, mientras que las de mayor cantidad de campañas exitosas, Cine y Música, están por debajo del promedio.

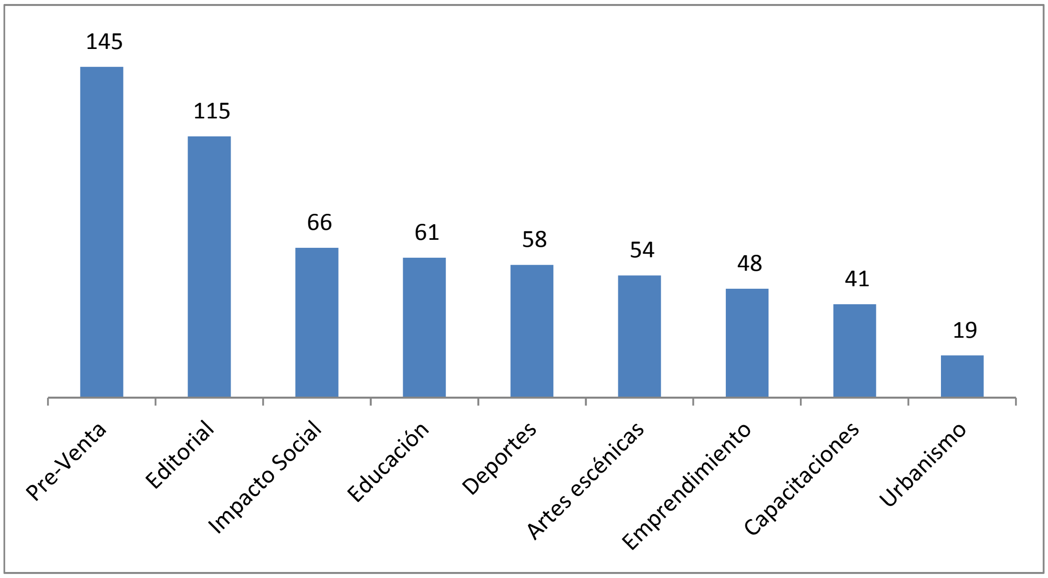
Gráfica 33. Inversionistas promedio por campaña exitosa



Fuente: elaboración propia con base en datos de Fondeadora.

Con respecto a los datos obtenidos en la plataforma Idea.me, se observó que el número de inversionistas es consistente, no sólo en el orden de las categorías, sino también en la magnitud (ver Gráfica 34). Los datos de las seis categorías que coinciden en las dos bases de datos tienen un coeficiente de correlación positivo de 0.76. Una conclusión derivada de esto es que el número de inversionistas al parecer es aproximadamente el mismo en ambas plataformas, independientemente de si el proyecto alcanzó la meta o no. Se observó también cierta correlación en la aportación promedio por categoría. Aunque en Fondeadora la aportación individual promedio es tres veces mayor que en Idea.me, la correlación en la asignación de los recursos entre categorías es considerable (ver Tabla 6). Salvo en los casos de Editorial e Impacto Social, se observó una correlación importante también en la cantidad de recursos solicitados.

Gráfica 34. Inversionistas promedio por campaña en Idea.me



Fuente: elaboración propia con base en datos de Idea.me

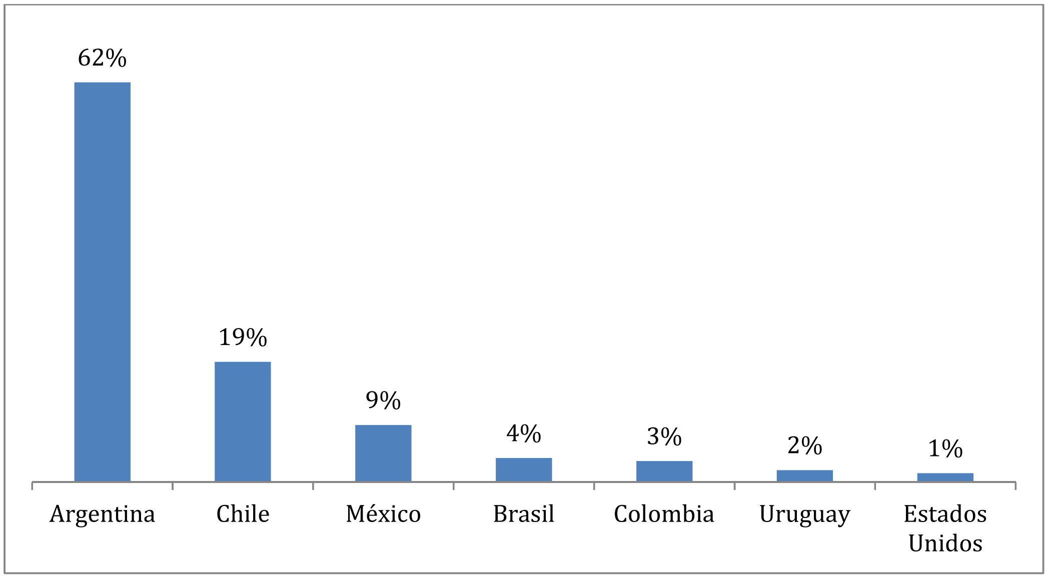
Tabla 6. Correlaciones entre categorías equivalentes entre Fondeadora e Idea.me

	Número de inversionistas		Cantidad financiada por inversionista		Cantidad solicitada	
Categoría	Idea.me	Fondeadora	Idea.me	Fondeadora	Idea.me	Fondeadora
Editorial	115	66	$340	$1,266	$41,493	$72,617
Impacto Social	66	51	$180	$1,117	$73,101	$50,884
Educación	61	60	$657	$1,132	$66,439	$61,562
Deportes	58	48	$450	$1,672	$61,254	$65,539
Artes escénicas	54	57	$246	$1,006	$43,574	$50,517
Emprendimiento	48	47	$555	$1,689	$73,893	$75,828
Coeficiente de correlación	0.76		0.45		0.053	

Fuente: elaboración propia con base en datos de Idea.me
Nota: el análisis de cantidad solicitada se realizó en pesos mexicanos para ambos casos.

En otro orden de ideas, el país de origen de la propuesta produce patrones de comportamiento importante en el financiamiento. Como ya se ha discutido anteriormente, el principal origen de las campañas exitosas y semi-exitosas es el mismo que en el que opera la plataforma (ver Gráficas 35 y 36). Sobre el porcentaje de financiamiento de las campañas semi-exitosas, se observó un nivel similar entre los países. Como se puede observar en la Gráfica 37, el número de inversionistas promedio en una campaña puede estar fuertemente asociado con el país de origen de la plataforma y puede tener un efecto de derrame geo-espacial.

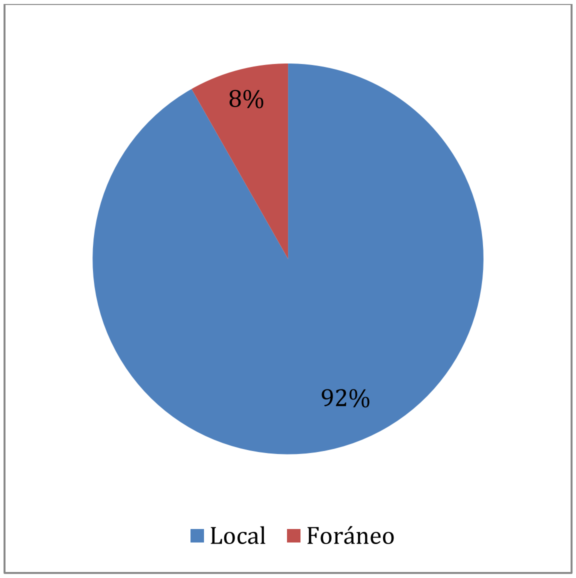
Gráfica 35. Porcentaje financiado en campañas semi-exitosas con respecto a la meta, por países



Fuente: elaboración propia con base en datos de Idea.me

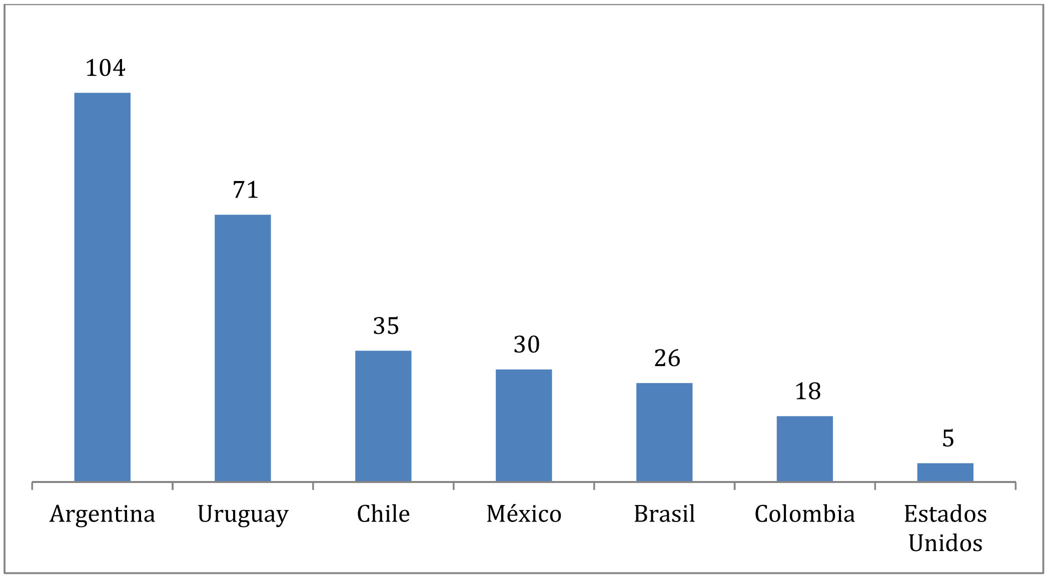
Nota: Brasil (n=4), Uruguay (n=2), Estados Unidos (n=3), Argentina (n=133), México (n=19), Chile (n=40) y Colombia (n=7)

Gráfica 36. Porcentaje de campañas financiadas que son originarias del país donde opera Fondeadora



Fuente: elaboración propia con base en datos de Fondeadora

Gráfica 37. Número de inversionistas promedio en campañas por país



Fuente: elaboración propia con base en datos de Idea.me
Nota: Brasil (n=4), Uruguay (n=2), Estados Unidos (n=3), Argentina (n=133), México (n=19), Chile (n=40) y Colombia (n=7)

Los datos de Fondeadora permiten hacer un análisis de la distribución de las campañas al interior del país. Al respecto, se observó que la gran parte de las campañas financiadas están en la capital del país y un 78% se distribuye en las cuatro principales entidades del país. La escasa distribución de las campañas en las ciudades con menor densidad poblacional, es uno de los principales retos de las plataformas de crowdfunding. A nivel internacional se observó una distribución desigual de las campañas al igual que en la distribución al interior de los países. Este último argumento sólo pudo ser reflejado con datos para México, pero fue una característica observada en otras plataformas. Uno de los principales retos para la contribución a la inclusión financiera de las plataformas es la capacidad de llegar a las zonas geográficas con mayores dificultades en el acceso al financiamiento.

6. CONCLUSIONES

Las plataformas de crowdfunding están convirtiéndose en una alternativa valiosa para proyectos de negocio y sociales en América Latina. El presente documento provee información útil para entender el desarrollo tanto de las plataformas y sus modelos de negocio, así como las campañas de financiamiento y sus inversionistas. Por el lado de las plataformas, se observó un crecimiento importante en la creación de éstas durante 2011 y 2013. A pesar de que existen plataformas internacionales con fuerte presencia en América Latina, las plataformas de origen y operación latinoamericanas han logrado posicionarse fuertemente en sus respectivos países. Se observaron distintas estrategias entre las plataformas para procurar la expansión de sus operaciones y la calidad de las campañas publicadas; en esta dimensión se observaron diversas propuestas innovadoras.

Existe una asignatura pendiente en el estudio de las dinámicas de competencia entre las plataformas latinoamericanas y las internacionales. A partir de los datos ofrecidos en el presente estudio no se distingue si éstas son realmente competidoras directas. Se observaron también patrones desiguales de crecimiento (o decrecimiento) entre las plataformas, lo que amerita estudios cualitativos a fondo para conocer los factores de éxito (o de fracaso) en la gestión de plataformas de crowdfunding.

Por el lado de las campañas, el presente documento ofrece una fotografía detallada entre las dinámicas de oferta y demanda de capital a través del crowdfunding. Si bien, los proyectos creativos son los que capturan mayormente la atención de los usuarios, no son necesariamente los que obtienen las mayores cantidades de financiamiento.

Finalmente, se observó una brecha importante en el nivel de actividad de crowdfunding entre los países de América Latina. Hasta ahora, son muy pocos los países en los que estas plataformas han proliferado y tienen actividad. Más allá de la interrogante de por qué no se han desarrollado estas plataformas en otros países latinoamericanos (en la mayoría de ellos), es más importante cuestionarse cómo se puede trabajar para integrar regionalmente el mercado del financiamiento colectivo.

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ANEXO 1 : TABLAS Y GRÁFICAS DE LA SECCIÓN 7

Tabla 1. Nivel de tráfico de plataformas de crowdfunding seleccionadas

Nombre	Ranking Alexa (global, 20/10/2014)	Origen	1/x
Kickstarter	530	Internacional	0.0018868
Indiegogo	1,390	Internacional	0.0007194
GoFundMe	1,408	Internacional	0.0007102
Angel.co	2,415	Internacional	0.0004141
Patreon	5,420	Internacional	0.0001845
Lemding Club	9,965	Internacional	0.0001004
Kiva	12,334	Internacional	0.0000811
YouCaring	12,391	Internacional	0.0000807
Causes	12,590	Internacional	0.0000794
Crowdrise	19,679	Internacional	0.0000508
Tilt	19,768	Internacional	0.0000506
GiveForward	19,837	Internacional	0.0000504
Catarse.me	23,908	Latinoamericana	0.0000418
Crowdfunder	28,838	Internacional	0.0000347
DonorsChoose	32,820	Internacional	0.0000305
Fundable	41,157	Internacional	0.0000243
Fundrazr	43,315	Internacional	0.0000231
Firstgiving	63,619	Internacional	0.0000157
Razoo	65,800	Internacional	0.0000152
Honeyfund	68,939	Internacional	0.0000145
RocketHub	75,312	Internacional	0.0000133

Global giving	80,136	Internacional	0.0000125
Idea.me	81,100	Latinoamericana	0.0000123
CircleUp	90,199	Internacional	0.0000111
Fondeadora	99,330	Latinoamericana	0.0000101
Vakinha	114,692	Latinoamericana	0.0000087
Rally.org	151,341	Internacional	0.0000066
Betterplace.org	159,469	Internacional	0.0000063
Fundanything	166,084	Internacional	0.0000060
Prestadero	173,671	Latinoamericana	0.0000058
CausesVox	186,042	Internacional	0.0000054
Benfeitoria	251,832	Latinoamericana	0.0000040
Broota	257,142	Latinoamericana	0.0000039
Cumplo.cl	350,807	Latinoamericana	0.0000029
Queremos.com.br	416,992	Latinoamericana	0.0000024
Kubo Financiero	487,325	Latinoamericana	0.0000021
Nobleza Obliga	583,305	Latinoamericana	0.0000017
Juntos.com.vc	799,747	Latinoamericana	0.0000013
Panaldeideas	835,873	Latinoamericana	0.0000012
Eventdoo.com	930,041	Latinoamericana	0.0000011
Comecaki.com.br	1,103,476	Latinoamericana	0.0000009
Littlebigmoney.org	1,221,125	Latinoamericana	0.0000008
Bicharia	1,346,080	Latinoamericana	0.0000007
Creoentuproyecto	1,432,998	Latinoamericana	0.0000007
Lachevre.co	1,448,099	Latinoamericana	0.0000007
Citizinvestor	2,421,745	Internacional	0.0000004
Antrocket	2,793,489	Latinoamericana	0.0000004

Patrocinarte	2,838,980	Latinoamericana	0.0000004
Kapital Zocial Perú	5,396,258	Latinoamericana	0.0000002
Embolacha.com.br	6,567,750	Latinoamericana	0.0000002
Donacción.org	7,002,234	Latinoamericana	0.0000001
Traga Seu Show	7,055,717	Latinoamericana	0.0000001
Sumame.co	8,390,852	Latinoamericana	0.0000001
Crowdfunder.mx	20,000,000	Latinoamericana	0.0000001
Eupatrocino.com.br	20,000,000	Latinoamericana	0.0000001
Micochinito.com	20,000,000	Latinoamericana	0.0000001
Play Business	20,000,000	Latinoamericana	0.0000001

Tabla 2. Nivel de tráfico de plataformas de crowdfunding latinoamericanas

Nombre	País	Ranking Alexa (4/8/2015)	1/x
Catarse.me	Brasil	48,250	0.0000207
Fondeadora	México	103,687	0.0000096
Vakinha	Brasil	117,707	0.0000085
Prestadero	México	135,338	0.0000074
Queremos.com.br	Brasil	167,194	0.0000060
Idea.me	Argentina	197,103	0.0000051
Benfeitoria	Brasil	265,011	0.0000038
Cumplo.cl	Chile	431,644	0.0000023
Kubo Financiero	México	478,153	0.0000021
Broota	Chile	490,193	0.0000020
Juntos.com.vc	Brasil	535,194	0.0000019
Comecaki.com.br	Brasil	813,030	0.0000012
Nobleza Obliga	Argentina	1,060,837	0.0000009
Embolacha.com.br	Brasil	1,386,277	0.0000007
Crowdfunder.mx	México	1,391,183	0.0000007
Eventdoo.com	Argentina	1,832,550	0.0000005
Antrocket	Puerto Rico	1,904,297	0.0000005
Kapital Zocial Perú	Perú	2,211,975	0.0000005
Panaldeideas	Argentina	2,354,792	0.0000004
Patrocinarte	Venezuela	2,553,997	0.0000004
Posibl	Argentina	2,559,194	0.0000004
Littlebigmoney.org	Colombia	3,024,609	0.0000003
Bicharia	Brasil	3,147,875	0.0000003

Creoentuproyecto	España	3,480,656	0.0000003
Micochinito.com	México	3,598,114	0.0000003
Traga Seu Show	Brasil	5,602,252	0.0000002
Sumame.co	Colombia	6,528,831	0.0000002
Lachevre.co	Colombia	7,891,548	0.0000001
Inpact.me (WeHeroes)	Uruguay	8,412,770	0.0000001
Vakita Capital (Play Business)	México	10,148,844	0.0000001
Yagruma	Cuba	18,627,671	0.0000001

ANEXO 2 : TABLAS Y GRÁFICAS DE LA SECCIÓN 8

Tabla 1. Plataformas identificadas durante el estudio

Plataforma	País	Situación
Catarse.me	Brasil	Respondió el cuestionario
Idea.me	Chile	Respondió el cuestionario
Fondeadora	México	Respondió el cuestionario
Vakinha	Brasil	Respondió el cuestionario
Prestadero	México	Respondió el cuestionario
Benfeitoria	Brasil	Respondió el cuestionario
Broota	Chile	Respondió el cuestionario
Cumplo.cl	Chile	Respondió el cuestionario
Queremos.com.br	Brasil	No se logró contactar o estaba fuera de operaciones
Kubo Financiero	México	Respondió el cuestionario
Nobleza Obliga	Argentina	Respondió el cuestionario
Juntos.com.vc	Brasil	Respondió el cuestionario
Panaldeideas	Argentina	Respondió el cuestionario
Eventdoo.com	Argentina	No se logró contactar o estaba fuera de operaciones
Comecaki.com.br	Brasil	No se logró contactar o estaba fuera de operaciones
Impulso.org.br	Brasil	Declinó responder
Littlebigmoney.org	Colombia	Declinó responder
Bicharia (Mascotas)	Brasil	Respondió el cuestionario
Lachevre.co	Colombia	Respondió el cuestionario
Antrocket	Puerto Rico	Respondió el cuestionario
Patrocinarte	Venezuela	Respondió el cuestionario
Sported	Argentina	Declinó responder
Kapital Zocial Perú	Perú	Respondió el cuestionario
Embolacha.com.br	Brasil	No se logró contactar o estaba fuera de operaciones
Donacción.org	Colombia	No se logró contactar o estaba fuera de operaciones
Traga Seu Show	Brasil	No se logró contactar o estaba fuera de operaciones
Sumame.co	Colombia	Respondió el cuestionario
Yagruma	Cuba	Declinó responder
Crowdfunder	México	Respondió el cuestionario
Vakita Capital (Play Bussiness)	México	Respondió el cuestionario
Micochinito.com	México	Respondió el cuestionario
Eupatrocino.com.br	Brasil	Respondió el cuestionario

La incubadora	Colombia	Declinó responder
Prarolar.com	Brasil	Declinó responder
Lluvia de sobres	Colombia	Declinó responder
Creoentuproyecto	España	Respondió el cuestionario
Se parte	Paraguay	Declinó responder
Inpact.me / We Heroes	Uruguay	Declinó responder

A Systematic Literature Review of the Relationships Between Policy Analysis and Information Technologies: Understanding and Integrating Multiple Conceptualizations

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Abstract. Researchers and practitioners are increasingly aware of changes in the environment, broadly defined, that affect the policy process and the current capabilities for policy analysis. Examples of these changes are emergent information technologies, big and interconnected data, and the availability of computational power to perform analysis at a very disaggregate level. These and other forces have the potential to significantly change multiple stages of the policy process, from design to implementation and evaluation. The emergence of this phenomenon has led to the use of a variety of labels to define it. Potentially, a variety of labels might contribute to some conceptual confusion, but most importantly to concept stretching. This article aims to provide a conceptual space by identifying the attributes that compose the phenomenon. Based on a systematic literature review, this paper identifies the terms that have been used to refer to this phenomenon and analyzes their associated attributes. Based on Gerring & Barrosi's Min-Max strategy of concept formation, we propose two sets of attributes to define the phenomenon.

Keywords: Policy informatics · Policy analytics · IT-enabled policy analysis · E-policy-making · Systematic literature review · Policy analysis · Policy process

1 Introduction

Recent technological and analytical developments have grabbed the attention of researchers and practitioners as potential innovations that could improve the quality and timeliness of the policy process, compared with more traditional methods and approaches to collecting and analyzing information for policymaking. In this paper, we broadly refer to this as the relationship between policy analysis and information technologies. This relationship involves, among other things, new data sources and structures, improved computational capacity, and new methods of analysis that could contribute to better address the increasing complexity, interconnectedness, and uncertainty of public problems [1–4].

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Recent academic interest has been brought on the matter from diverse fields, such as health [5], policy analysis [6–8], statistics [9], electronic government [10], population studies [11], complexity science [2], computational science [12], and informatics [2, 3, 13]. There is a variety of terms of concepts that have emerged from these backgrounds to refer to that phenomenon. For example, Janssen [2] identified the following terms: e-policy-making, computational intelligence, digital policy sciences, and policy informatics. Other authors have associated the terms IT-enabled policy analysis, policy modeling, and data-driven decision-making as well as other forms to label the same phenomenon [2, 14].

The high number of different terms to refer, arguably, to approximately the same phenomenon is a problem of conceptual clarity [15, 16]. Because every term has associated certain attributes, a number of terms imply a loose constellation of attributes associated with the same phenomenon. This conceptual ambiguity (in the constitutive attributes) might limit the possibility to build knowledge on top of previous works. Conceptual clarity is not to prefer a label rather than others, but to provide insights to facilitate future research on the matter. For example, as a basis for case selection or comparative analysis, for the operationalization of measurements, or to undergo a revision of the conceptual definition of current terms. Conceptual clarity also contributes to mitigate conceptual stretching, which is defined by Goertz [17] as “concepts [that] are loosened up so that they apply to additive cases. Thus, we seek to contribute in the study of the relationship of policy analysis and information technologies by defining a conceptual space[1] for the phenomenon of interest, as well as to provide two sets of attributes that best suit the definition of the phenomenon and have clear conceptual boundaries. Based on this, our research question is: what are the common and distinct attributes of the terms defining the relationship between policy analysis and information technologies?

The article is structured in five sections, including the present introduction. Section two explains the methodological approach used to develop the proposed conceptual space. This is followed by a brief description of the terms’ backgrounds and an assessment of their conceptual clarity (or ambiguity). Section four provides a description of the minimal and ideal-type definitions, as well as the set of the constitutive attributes of the proposed conceptual space. In the final section, we provide some conclusions and discuss future research directions.

2 Methodological Approach

2.1 Min-Max Strategy of Concept Formation

The Min-Max strategy of concept formation was proposed by Gerring and Barresi [15] as a mechanism to provide conceptual clarity, by uncovering the defining attributes of a concept. The strategy is particularly useful when uncovering these attributes across contesting defining terms. This is because the strategy focus on identifying the *non-idiosyncratic definitions* (those that are less dependent on particularities of certain field or period). Gerring & Barresi’s strategy is based on Sartori’s

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[1] A conceptual space is defined here as the range of attributes extracted from the concepts or terms aforementioned.

propositions of the “ladder of abstraction.” This is in reference to the generality or specificity of a concept due to the augment or decrease of the concept’s *intension*. The intension of a concept is the set of properties or attributes that determine the constitutive elements belonging to a concept [16]. The concepts are found to be more general by simply reducing the set of attributes, whereas the concept is more specific by adding or unfolding attributes [16]. These changes have a direct effect on the *extension*, which is the group of observations that have the attributes specified in the concept. Thus, the *extension* increases as *intension* decreases, and vice versa.

To define what attributes should be kept in a prototypical definition, Gerring & Barresi propose two strategies. The first strategy is a *minimal definition*. This refers to a set of necessary attributes that must be present in all terms or concepts. Identifying such attributes is an empirical endeavor, rather than theoretical. The goal is to identify the attributes that are present across all the concepts reviewed. This strategy aims to find a *non-idiosyncratic definition* (i.e. a set of attributes that will not vary across the terms used). The second strategy is an *ideal-type definition*. This strategy seeks to identify a definition that is “maximal” in that it includes all the attributes that could possibly compose the definition [15].

The empirical strategy proposed by Gerring & Barresi is unfolded in three steps. The first step is to gather a representative sample of the terms or concepts of interests. In this regard, our work departs from the lists presented in the introduction. Next, we did a systematic literature review to find the relevant manuscripts that use the terms or concepts of interest. The protocol of the systematic literature review is presented in the next section. The second step is to typologize the attributes from analyzing the manuscripts found in the systematic literature review. We built a typology of attributes by obtaining explicit referenced attributes (characterized here as “strong” attributes) and by interpreting implicit attributes (characterized as “weak” attributes). The third step corresponds to the organization of the attributes in two sets. The first set corresponds to a *minimal definition* and an *ideal-type definition*.

2.2 Systematic Literature Review

We conducted a systematic literature review of the relationship between policy analysis and information technologies in academic publications, following the widely used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The PRISMA protocol confers to the research process limited bias, transparency, and replicability [18]. We collected publications from three digital libraries to cover the publications in social sciences: Scopus, Web of Science, and JSTOR. These libraries combined offer the best coverage of publications in social sciences [19, 20]. In addition, we selected the digital library DBLP that accounts for the most extended coverage in computer science [21].

Our inclusion criteria were as follows. In terms of publications, we considered peer-reviewed articles, books or book chapters, and conference proceedings. All types of study designs were considered. We considered publications that: (1) provided or was related with a descriptive or conceptual discussion about policy analysis and information technologies; and/or (2) provided an application of an innovative approach, method or technology in the policy process. Our exclusion criteria were to limit the search to the following research fields: computer science, complexity science, health, informatics, and social sciences, which are the fields from which we had previous knowledge of being using related terms. We also discarded the publications that did not made a substantial reference to policy analysis, policy process or policy cycle.

Based on our previous knowledge of the topic, we considered the following search terms: (1) “policy informatics”, (2) “e-policy-making”, (3) “IT-enabled policy analysis”, (4) “policy modeling”, (5) “computational intelligence”, (6) “digital policy science”, (7) “policy analytics”, (8) “data science”, (9) “computational social sciences”, (10) “digital science”, (11) “data-driven decision-making”. For the database searching, we followed two rounds of search queries with clearly defined query rules.[2] The first round was based on a search of the exact terms, after the application of the inclusion criteria. In the first round, we noticed that our search strategy needed further specificity for some terms, since the publications retrieved were populous. For example, we retrieved 2,087 for “computational social sciences” (see Table 1). In the second searching round, all exact concepts were combined with common concepts in public administration literature (“governance”, “public administration”, “policy analysis”, “policy-making”, and “policy process”). The reason of this intersection was to automatically reduce the possibility of including articles that did not match the inclusion criteria, without scanning the titles or abstracts. This was a practical solution to address massive matches in broader concepts such as “computational intelligence”, “data science” or “policy modeling”.

Table 1. Publications retrieved by first and second rounds of refinement

Concept	First round	Second round
Policy informatics	121	31
E-Policy-Making	15	6
IT-Enabled policy analysis	10	9
Policy modeling	18,979	1,301
Computational intelligence	175,418	34,760
Digital policy science	52	12
Data science	11,504	2,083
Computational social sciences	893	76
Digital science	1,156	104
Data-Driven Decision-Making	920	303

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[2] Illustratively, the search query string for policy informatics in the first round is shown below. All the terms followed the same string. ALL (“policy informatics”). In the second round was: ALL (“policy informatics”) AND (ALL(“governance”) OR ALL (“public administration”) OR ALL (“policy analysis”) OR ALL (“policy-making”) OR (“policy process”)).

The search period of our review spans from 2000 to December 27th, 2016. By testing the search queries, we observed that most of the publications are not older than 8 years; however, we decided to extend the search period to 16 years to make sure we have a thorough coverage of research publications (thus, the lower bound is 2000).

Based on the results of the second round of search queries, we discarded some concepts from the study. The terms "computational social sciences", "data science", "digital science", "data-driven decision-making", "policy modeling", and "computational intelligence" were discarded as being considered too broad for the purposes of this research. We acknowledge that there is a chance that a subset of the articles retrieved with these terms might be related with the policy cycle and are not captured in the present study. In these cases, future research is needed in understanding whether these concepts could be associated with the policy analysis and how.[3] Finally, the concept "digital policy science", although we found publications in the search queries, this concept did not pass the fourth step in our PRISMA flowchart. Thus, we also discarded this term. The final list of terms was the following: (1) policy informatics, (2) e-policy-making, (3) IT-enabled policy analysis, and (4) policy analytics.

The search strategy consisted of five steps (see Fig. 1). In the first step, we performed database searching following the inclusion and exclusion criteria defined above. The number of records identified in the first step was 367. In the second step, we extracted the reference metadata from the digital libraries and placed them into the reference manager software Mendeley, grouping the references by term. We then search for duplicates with the managing tools provided by Mendeley. As some records mentioned more than one term, we discarded duplicates within groups of references. We also grouped all records in a single file and searched for duplicates across groups, but keeping a research memo on the records that included many terms. The number of records after all duplicates were removed was 342. In the third step, we screened the titles and abstracts of the records to exclude the records that did not meet our inclusion. The number of records after screening titles and abstracts was 62. In the fourth step, we screened the full-text in the remaining records and removed those that did not meet the inclusion criteria. The third and fourth steps discarded mostly records that did not make any substantial reference to policy analysis, policy process or policy cycle. Finally, we included records identified while reading the selected records and were not identified through the search queries. This snowball sampling contributed to the identification of 6 relevant records that were included in the final sample. Based on that, the final number of records included in the systematic review was 43.

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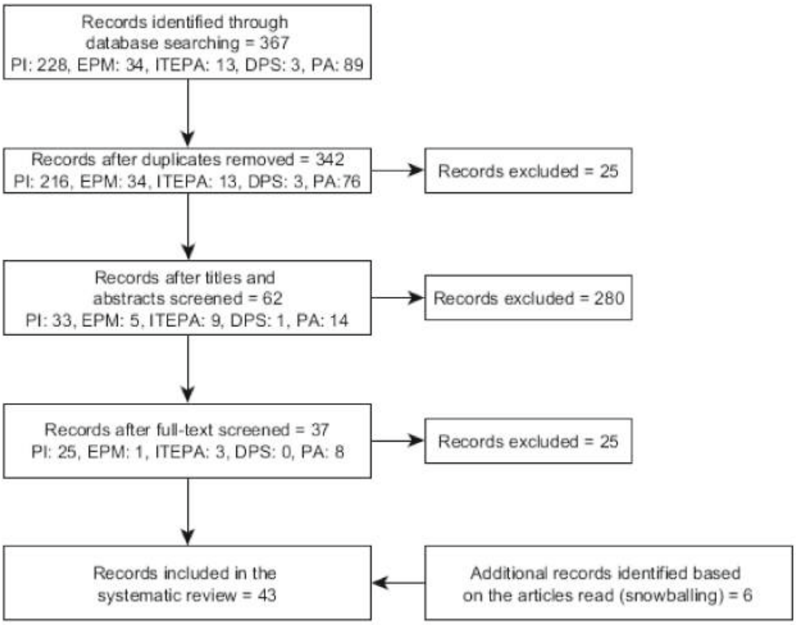
[3] Furthermore, at the end of the literature review, we found three other related terms: "social data science", "data-centered policy-making", "data science for government and policy-making", and policymaking 2.0".



Notes: PI: Policy Informatics; EPM: E-Policy-Making; ITEPA: IT-Enabled Policy Analysis; DPS: Digital Policy Science; PA: Policy Analytics.

Fig. 1. Flow diagram of the search strategy and results

3 Understanding the Multiple Conceptualizations

3.1 “Insufficiently” Developed Terms

Aside from the terms that we considered not pertaining exclusively to policy analysis, policy process or policy cycle (computational social sciences, quantitative social sciences, data science, digital science, data-driven decision-making, policy modeling, and computational intelligence), we concluded that two of the terms reviewed lack of constituent attributes or they are vaguely defined. The first term that lies within this vagueness is Digital Policy Science, from which although we found little evidence of its use in academic literature, there is neither an explicit definition, nor an implicit description of its constitutive attributes. The second term is e-policy or e-policy-making, which, although we found some attributes, we perceive them as weakly defined. In fact, the defining attributes found in the literature make direct reference to the defining attributes of other terms. As Hochtl [22] states, e-policy-making conceptually “shares many features of ‘policy informatics,’ such as analysis, administration, and governance [3], and ‘policymaking 2.0,’ […]” [22]. Sticking with the rule of discriminatory power in the intentionality of the attributes, we concluded that this term fails to set clearly some definitional boundaries as the definitional attributes are not described beyond these types of superficial descriptions.

3.2 Brief Presentation of Studied Terms

So far, the set of developments that have been perceived as useful for improving the policy process have been conceptualized in different terms. Janssen and Wimmer [2] include e-policy-making, computational intelligence, digital policy sciences, and policy informatics. Additionally, other authors have associated IT-enabled policy analysis, policy modeling, and data-driven decision-making as emergent concepts that also affect the policy process. Among these concepts, some have evolved recently as more complex conceptualizations than others, perhaps setting a framework for understanding the processes through which emergent developments could affect public policy.

For instance, IT-enabled policy analysis (ITEPA) is a framework that seeks to advance the study of policy analysis by integrating the views of Bardach's policy cycle with Sterman's system dynamics approach. This framework also expands the conceptualization of policy analysis as a task with a necessary combination of institutions, actors, data, and information technologies. ITEPA is a perspective primarily concerned with the relationship between government and citizens. Its background spans through the study of e-government and governance. In this perspective, the substantial change in policymaking is caused by the development of open government and open data initiatives [10, 14, 23]. In this sense, the deployment of open government policies, and the release of open data in particular can strengthen new mechanisms of government-citizen relationships such as co-production, collaboration, and participation of the citizens in public processes as they are provided with new sources of information on public issues. Because data is regularly an input for decision-making, the increased availability of public data in the public domain may shift the approach to policymaking from a top-down decision-making approach towards a networked participatory approach. Furthermore, potential changes in policymaking are not only driven by data and technology possibilities, but also by a set of governing principles on the rise: transparency, participation, collaboration, and empowerment.

E-Policy-Making (EPM) is a term less used and developed in its contents. This terms refers to the use of "e-governance processes" in policymaking. Hochtl [22] points out that the concept formation intersects the attributes of policy informatics and Policymaking 2.0. Furthermore, the authors imply that the study of e-policy-making encompass both the improvements of already existing structures in policymaking by the incorporation of technology, as well the transformation of the policymaking structure itself [22].

Policy analytics is a concept formed to encompass different methods able to cope with the growing challenges that the rise of Big Data poses on data analysis [24, 25]. Its conceptualization is an adaptation of the idea of "business analytics" in the private sector, but applied to public policies. The focus of this conceptualization is to understand which methods or approaches could contribute to leverage the emergence of massive, complex and unstructured data production for the decision-making in the policy process. Thus, policy analytics is a field of study about how to adapt the set of skills, applications, methods, and technologies that lie within the field of data science to assist the construction of evidence for decision-making. Policy analytics is a perspective primarily concerned with the exploit of data quality, quantity and availability commonly known as the data revolution [24–26]. Overall, analytics are perceived as a way to solve the challenges associated with analyzing massive and unstructured data [25]. The term comes primarily from the field of operations research, as an attempt to understand the implications of adopting quantitative decision support methods in the private sector known as business analytics. Business analytics is a collection of innovative computational techniques to leverage and, at the same time, cope with the challenges of managing big data to inform decision-making.

Decision-making under this perspective pursues the ideal of evidence-based decision-making, where big data features and data science techniques are perceived as more accurate, rich, and timely, as well as less costly than traditional methods of collecting data [24, 25]. Furthermore, these are perceived as less biased in the collection and interpretation processes [24, 26]. As for the policy process, this perspective directly implies the incorporation of new sources of information for decision-making; remarkably, Daniell [25] has attempted to organize the blending of data sources and data science techniques and associate them as tools for policy analysis at different stages in the policy cycle. In addition, policy analytics indirectly implies the incorporation of predictive analysis to the toolkit of policy analysts (Table 2).

Table 2. Summary of definitions

Concept	Definition
E-policy-making	"The act of policymaking in e-government using e-governance processes, with the distinctive feature that evaluation happens as an integral part of all along the policy cycle rather than a s a separate step at the end of policymaking process" [22]
IT-enabled policy analysis	"The use of IT tools, mathematical modeling and analytical methods to take advantage of the available data to aid individuals and groups make policy options or solve policy problems" [14]
Policy informatics	"The study of how computation and communication technology is leveraged to understand and address complex public policy and administration problems and realize innovations in governance processes and institutions" [3]
Policy analytics	"The development and application of […] skills, methodologies, methods, and technologies, which aim to support relevant stakeholders engaged at any stage of a policy cycle, with the aim of facilitating meaningful and informative hindsight, insight and foresight" [27]

4 Integrating the Attributes from Multiple Terms: A Min-Max Approach

Even though the Min-Max strategy is generally used to set the conceptual space of a given concept (i.e. democracy or culture), here we used this method to ensemble the attributes of a constellation of concepts that we hypothesized belong to the same latent concept. The argument is that this latent concept has been characterized through different lenses, where each lens has its own background and thus would likely assign different attributes to the same phenomenon.

Each concept formation offers, explicitly or implicitly, a variety of definitional attributes, where some of them will intersect each other, whereas others are context-specific reminiscent or idiosyncratic attributes [15, 28]. Thus, the *minimal definition* comprises the attributes that are common to all perspectives, providing a more general and agnostic perspective on the phenomenon.

The relationship between policy analysis and information technologies, minimally defined, is a phenomenon composed by the development of methods, technology, and data. Adding the idiosyncratic attributes allows to broaden the definition to a more overarching idea without blurring the definitional boundaries. This *ideal-type definition* includes all the attributes that comprise the conceptual space of the phenomenon, regardless of the perspective. The *ideal-type definition* is equivalent to the conceptual space in that both comprise the full range of attributes. Thus, as will be described below, the conceptual space is composed by five attributes: human resources, governance, methods, technology, and data (see Table 3).

Table 3. Table of attributes, by term

	Human resources	Governance	Methods	Technology	Data
E-policy-making		Weak	Weak	Weak	Weak
IT-enabled policy analysis	Strong	Strong	Strong	Strong	Strong
Policy informatics		Strong	Strong	Strong	Strong
Policy analytics			Strong	Weak	Strong
Typology of attribute	Ideal-Type	Ideal-Type	Minimal	Minimal	Minimal

Note: "Strong" stands for strongly defined attribute, whereas "Weak" means weakly defined attribute.

We also found that some terms had a stronger identification of attributes than others. For example, e-policy-making had a weak definition of attributes (i.e. subject to textual exegesis). Policy analytics has a strong emphasis on data as the fundamental attribute constitutive of the concept, whereas there is a weak connection with technologies. As for IT-enabled policy analysis and policy informatics, there is an evenly strong identification of attributes across the definitional works reviewed. Interestingly, although the IT-enabled policy analysis framework has more constitutive attributes than policy informatics, the authors consider this as a possible variation of policy informatics [10].

The results show that the attributes observed across the concepts are convergent towards a unified core of attributes (the minimal definition). All these perspectives are relatively aligned, with some idiosyncratic attributes that are likely to be explained by their intellectual background.

4.1 Minimal Attributes

Methods

In this context, methods refer to the analytical tools that people, primarily in the public sector, use to obtain useful information insights or knowledge from data for decision-making. These methods are generally suited for the analysis of quantitative data, although Puron-Cid, Gil-Garcia and Luna-Reyes [14] also recognize analytical methods for qualitative data. The perceived constitutive methods of policy analysis span from a wide variety of fields, such as mathematics, statistics, economics, operations research, psychology, sociology, management, finance, and political science [14, 24, 25, 27, 29], although the focus is stressed in emergent methods or techniques from computer science. For example, text mining, exploratory data analysis, support vector machines, spreadsheet models, and machine learning [25]. Other methods considered that are not yet part of the traditional policy analyst's toolkit are group model building, multi-criteria analyses, simulation and optimization modelling, participatory planning, resource allocation modelling, real-time operations optimization, remote sensing, smart metering, and participatory GIS/evaluation [25]; simulation modelling, and cognitive mapping [2, 3, 14, 25]. There is no clarity however, on whether the list of methods considered as part of this phenomenon is pertaining to a single technological innovation (i.e. data revolution) or the concept should be extended to all methods that eventually would fit technological innovations in the future.

Data

Data is an input for decision making in the policy process [10, 30–32]. This is regarded as sets of measurements of social activity that require analytical skills or methods to be transformed into useful information or knowledge for decision making. Data is also perceived as an element that could be easily spread into the public domain, contributing to re-shape the relationships between government and citizens. Under certain circumstances, data is also perceived as a potential driver towards networked governance, transparency, and other activities beyond policy decision-making [14]. Although this attribute also refers to traditional data (e.g. survey data), the primary focus is on big data, which is perceived as massive, usually costless, and unstructured. There are several types of such data, primarily organized by its source; for example, commercial data, administrative data, open data, electronic data, on-line data, cellphone data, geospatial data, daily census data, as well as data from sensor readings and crowd computing sources.

Technology

Technology or IT tools refers to the computational infrastructure that contributes to increase government's capacity [14, 30, 33–35]. This increased capacity comes in a variety of activities linked with both decision-making and governing. These activities are the likes of visualization technologies for the communication of policy analysis or decisions, technologies to process and manage information overload and ambiguity, technologies to generate and collect data, technologies for understanding patterns and detect trends in data, to increase the reach of the policy discussion, to enable collaborative networks, or to crowdsource public policy analysis, policy monitoring, evaluation or implementation.

4.2 Idiosyncratic Attributes

Human Resources
This attribute refers to the stock of capacities and skills for policymaking in the human resources available in an organization [14]. Any given development in computation and communication in the organization requires a body of expertise and knowledge in the human resources to effectively accomplish any task. More specifically, human resources refer to the personnel in charge of tasks such as producing insights for or advising decision-making, as well as being responsible for decisions in any given stage of the policy cycle.

Governance
Governance refers to the technological infrastructure through which governance processes could occur [14, 36–42]. The governance platforms are perceived to have the capacity to improve the flexibility and responsiveness of bureaucracies [39]. In addition, improved computation and communication capabilities in government activities could improve the interaction between citizens and government, as well as among government agencies. As a constitutive element for decisions in policymaking, governance represents the institutional and social arrangements in which a decision-making process takes place. As such, governance is highly intertwined with the rest of the constitutive elements of policy analysis and information technologies, since it might be shaped by data or technologies or it might determine the use of types of data and technologies in the policy process.

5 Conclusion

Rising literature on this topic suggests that information technologies and the availability of new types of data are already affecting the policy process and the way people think about policy analysis. The increasing computational power and alternative analytical methods also add to this situation and make it complex and not easy to conceptualize. In this paper, we have shown that there are many labels to refer to this phenomenon, including policy informatics, IT-enabled policy analysis, and E-Policy, among others. Despite the very diverse labels there are some important commonalities that should be part of our understanding of this phenomenon and a more comprehensive, but concise definition. There are aspects related to methods, data, technology, human resources, and governance and all of them contribute to a rich conceptualization of the relationships between information technologies and policy analysis.

In addition, this analysis identifies some terms with insufficient conceptual development, and other that are not clearly related to the policy process. In contrast, there are a core set of conceptualizations that help to identify the common attributes and specific attributes of the phenomenon in our approach. There are also references to the policy cycle, but almost no strong links to theories of the policy process. This is still a limitation of the existing terms and their respective conceptual definitions. Finally, there is also the challenge of identifying and integrating new technologies or analytical methods when they emerge. The usefulness of a concept related to these important and frequently rapid changes is also related to its capacity to leverage past research and being useful for future research. This paper aimed to contribute to conceptual clarity by uncovering some underlying attributes and structure them into two sets of definitions. Since ideas are not set in stone, it may well make sense to use these insights as material to reassess the conceptual definition of current terms.

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Toward an Enabler-Based Digital Government Maturity Framework: A Preliminary Proposal Based on Theories of Change

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ABSTRACT

Digital government has been seen as a strategy to improve public services, foster engagement with citizens, and modernize government agencies. Regardless of the recognition of this important role in government transformation, there is no consistent evidence in terms of the determinants and results of digital government strategies. More specifically, there is no clarity about what leads to successful digital government initiatives. Stage-based maturity models have been used to better understand the current situation of digital government in terms of results. They are also seen as useful in helping to understand the resources and capabilities of government agencies and how they contribute to successful digital government projects. However, existing maturity models have been criticised due to their lack of theory, oversimplification of reality, and linear thinking. In an attempt to overcome some of these shortcomings, this paper proposes what we call an enabler-based digital government maturity model. Our proposed model not only argues for a multidimensional view, but also suggests how to think about specific mechanisms of impact. By specifying the mechanisms of influence, our proposal starts a necessary conversation about maturity models and the potential complementarity of stage-based and enabler-based approaches.

CCS CONCEPTS

• **Applied computing → Computers in other domains →** Computing in government → *E-government*

KEYWORDS

maturity model, e-government, comparative analysis.

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1. INTRODUCTION

Digital government maturity models are helpful tools for agencies to diagnose their ability to use information technologies to improve performance and prepare strategies and action plan to move toward a desired stage of technology appropriation. A strong maturity model provides a desired state and recommendations that help accelerate the adoption of information technologies toward that desired stage. Most information technology maturity models focus on guiding organizations toward advanced stages of technology appropriation by providing a rich description of what technology appropriation looks like in each stage. Therefore, most existing models focus on conceptualizing and describing each stage [1, 18, 19, 28, 32, 38, 43, 44], and several literature reviews have compiled and synthesized these stages [4, 15, 29, 34]. These models are typically referred as “stage-based models” or "stage of growth models".

Maturity models are also the basis for maturity assessment frameworks, which organizations often use to diagnose their use of information technologies [3, 10, 30]. Considering the gap between the assessment and certain stages in the model "recommendations for improvement measures can be derived and prioritized in order to reach higher maturity levels" [3]. Despite some important criticisms [4, 13, 14], maturity models have been

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a favoured tool for organizations and are an evergreen research topic in digital government and information systems. Since their emergence in the 70's [33], maturity models have been published with regularity over a wide variety of fields [9, 15, 17, 29]. Given the existence of an increasing number of maturity models, users must find ways to identify the strongest or most reliable models for their purposes [34].

Stage-based models help provide a diagnosis and a path to follow for improving an organization's overall performance and competitiveness. Recommendations resulting from an assessment, however, are often weakly grounded in theory or empirical evidence [4, 7, 14, 23, 26, 30]. These blind-spots result from the emphasis (in many models) on conceptualizing the models' stages, while paying little attention to the organizational structures and processes that are changed by the adoption of technologies and the specific mechanisms behind such changes.

Strong recommendations, based on such assessments, must be accompanied by a clear, and theoretically and/or empirically grounded explanation of why the adoption of information technologies evolves the way it does (or the way the maturity model says it will). We argue that the conceptualization of enablers in maturity models can help overcome this weakness. Conceptualizing enablers means identifying the theories of change that explain how and why the adopted technology is expected to transform different structures and processes of the organization and help accomplish its overall goals. Understanding the theories of change beneath the maturity models may also reveal the enabling factors for accelerating technology appropriation in the public sector. This enabler-based approach moves the idea of maturation to the centre of the conceptualization, and seeks to establish clear mechanisms upon which recommendations can be grounded. That doesn't mean that stage and enabler approaches are mutually exclusive; on the contrary, both are essential for a strong maturity model.

Our empirical analysis seeks to understand what theories of change are implied in the literature of digital government maturity models, and how they are specified. To do so, we used an interpretive approach to extract the dimensions and related theories of change from three digital government maturity models. Specifically, we did open coding on the documents available from each case to develop categories for enablers, and then we revisited the documents to validate or re-assign the categories created. We selected three cases that met the inclusion criteria (Gartner's Digital Government Maturity Model, McKinsey's Digital by Default, and United Nations METER 2). Our inclusion criteria were maturity models for digital governments with a rich description of the organizational areas expected to change along with the maturity stages, and available through academic repositories. Compared to other maturity models, these cases have a rich description of how diverse organizational dimensions change when trying to achieve advanced maturity stages.

This paper is organized in seven sections, including the foregoing introduction. Section two reviews the current literature on stage-based models and some related critical perspectives. Section three presents the methodology used for extracting the implicit (or explicit) enablers in the cases studied. For each case, we describe their dimensions and enablers. We synthesize the findings from the three cases in a single set of enablers, on what we define as the Enabler-Based Digital Government Maturity Framework (EDGMF). Our framework focuses on dimensions, rather than stages, and intends to give clarity on the theories of change for each dimension. Section six proposes some implications and revisits the study's research motivation in the light of the empirical results. Finally, section seven presents our conclusions and a future research agenda.

2. LITERATURE REVIEW

A maturity models is a sequence of stages that "represent an anticipated, desired, or typical evolution path of [an organization] shaped as discrete stages." [3]. These models help organizations by revealing their position in comparison with the capabilities and other resources needed to achieve the organization's goals [3, 42]. In particular, information technology maturity models seek to exploit the opportunities offered by technologies to improve the organizations' performance [3, 10, 22]. These models provide a sense of focus and direction to the organization's improvement strategies and help as the basis for assessing the current positioning towards desired advanced stages of technology adoption and use.

Most maturity models are designed to describe each maturity stage. A stage is a snap-shot that describes the expected organization's resources, capabilities and operations for each level of maturity. Stage snap-shot serve as a reference for comparing the current organizational stage with the desired stage, and subsequently plan investments in information technologies and their corresponding implementation accordingly [4, 5, 9, 27].

Along the way, information systems maturity models have received criticisms over some perceived flaws [4, 5, 7, 10, 14, 22, 23, 26, 29]. For example, critics point out the lack of methodological rigor and empirical validation in the conceptualization of stages [10, 14, 22, 26, 27]. Further, the common "evolutionary" perspective of the models, where the features of each stage are pre-requisites of the next stage's features often lacks empirical validity [5, 26, 27]. Critics have also noted that the digital government maturity models are typically accurate in describing the early stages, but empirical accuracy drops in later stages. Further, later models are mostly based on an scenario idealized by the authors of the model, yet to be empirically observed [13, 39].

Although case studies have been growing recently, most maturity models have not been subjected to empirical testing [4]. Some scholars have proposed a methodological blend between empirical observation and design science for strengthening the validity of maturity models [10, 26, 30, 35]. Yet, design science applied to maturity models, particularly when the latter are heavily technology-focused, could cause them to become obsolete as new technologies emerge [14, 23, 27].

Critics also emphasize that sound theoretical bases are missing in many maturity models [7, 14, 26, 30, 34]. As explained by Poeppelbuss et al. [34], "maturity model designers should, to a greater extent, refer to the existing body of theoretical knowledge for defining both the maturing entity and the rationale of maturation." This is a clear reference to the need for a better understanding about what makes organizations advance the maturity stages and how. Despite extensive research on organizational change, most maturity models are silent on maturation agents. Discussion about maturation agents or enablers is limited. Debri & Banniser [14], for example, argue that most of the models implicitly assume that the primary driving force for organizational change is the managers.

Most of existing maturity models are uni-dimensional. This means that the conceptualization and description of the stages treats the organization as a single unit, rather than decomposing it into organizational dimensions or units (for example, institutions, technologies, governance mechanisms, managers) [10, 27]. Therefore, most of the maturity models only provide a general description for each stage [1, 18, 19, 28, 32, 38, 43, 44], whereas some provide a description of how different dimensions (e.g., leadership, technology, governance mechanisms) of the organizations look in every stage [45–47]. For example, Table 1 presents the conceptualization of a stage-based model [29].

Table 1: Lee's Maturity Model

Stage	Description
Integration	Assimilates (or replicates) processes and services in the information space with the ones in the real world.
Streamlining	Reform the processes and services in the real world to match the information space requirements, fitting for efficiency.
Transformation	Change the shape and scope of processes and services in the information space as well as the ones in the real world, fitting for effectiveness.
Process Management	Processes and services in both worlds are synchronously managed, reflecting citizen involved changes with re-configurable processes and services.

2.1. Enabler-Based approach

To address some of the criticisms presented above, we propose an approach that emphasizes the maturity enablers. The focus of an Enabler-Based Digital Government Maturity Framework (EDGMF) is on identifying and explaining the theories of change for the mechanisms that can advance the maturity stages of an organization.

To conceptualize the enablers, we borrowed the concept of theory of change from evaluation studies [8, 36, 41]. A theory of change is an explanation about "how and why the program will work" [41]. A theory of change pre-specifies how some activities will lead to the desired organizational changes, and identifies the contextual conditions to do so [36]. Ultimately, the value of a good theory of change is rooted in good theory [41]; but most importantly, a good theory of change should be: plausible (supported by evidence and logical consistency), operable (the organization can carry out actions with the available resources), and testable [36].

An enabler is the force that triggers "development towards the better" [4]. Metaphorically, an enabler can be thought as a maturing agent2 that helps organizations improving the critical factors behind the performance of digital government. Technological maturity could be seen as a natural consequence of organizational growth, or it can be induced through targeted interventions in diverse areas of the organization. An enabler or maturation agent can be any organizational asset (including resources and capabilities), as long as the model explains, and justifies, how and why the asset is advancing the organization towards advanced maturity stages. Some of the enablers discussed in the literature of digital government are management, institutions, governance networks and collaboration, and technologies. Conversely, the theory of change is the explanation that makes each enabler a relevant target for acting, in the context of the maturity model.

3. METHODOLOGY

This section briefly describes the methodology we followed for data collection and analysis. It includes a description of the sample and analytical strategy.

Sample. For the analysis, we considered the maturity models reviewed by Poeppelbuss et al. [34] and Fath Allah et al. [15], which combined analysed 56 maturity models. Then, we selected cases based on our inclusion criteria:

1) Digital Government. We included maturity models for information technologies adoption in governments (at the national, state or local levels).
2) Dimensions. We included models with an explicit description of the organizational areas expected to change along with the maturity stages. For example, the Gartner model provides a snapshot on how "leadership" changes for each stage.
3) Availability. All government maturity models were searched and retrieved through several academic repositories. However, some models (especially proprietary models) were not available during the analysis period.

After screening the maturity models, we identified 27 models, published between 2000 and 2012. From these models, only three met the remaining two criteria: 1) Gartner's Digital Government Maturity Model, 2) McKinsey's Digital by Default, and 3) United Nations METER 2. The data collected for the analysis was composed by documents (either journal articles, grey literature, business reports, and/or business websites) that described the features of the government maturity model.

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2 We used the term "maturing agent", but related terms may be found in the literature. For example, "advancing," "maturation," "digital transformation," "enabling mechanisms", etc.

Analysis. We conducted our analysis in two steps. In the first step, we reviewed the overall descriptions of the maturity model goals and a definition for each of the dimensions in the maturity model. In the second part, we interpreted the contents of the documents to extract the factors that we considered "enablers." This is, subjects of policy intervention (i.e. regulatory framework) that would likely need a change in order to transform the digital government services. Then, for each enabler of digital transformation, we identified a theory of change that explains how the enabler contributes to the development of digital government in sight of the overall government priorities.

We extracted each enabler in two rounds of qualitative analysis. In the first round of review, we used open coding to develop categories related to our definition of "enablers." The categories developed in this stage were "data", "monitoring" "third-party service delivery", "leadership", "laws", "institutional arrangements", "organization networks", and "ICT". Then, we reviewed the documents to validate or re-assign the categories developed during the first stage. We concluded our qualitative analysis when all data instances satisfactorily fit into one of the categories developed.

Based on the qualitative analysis, we developed the Enabler-Based Digital Government Maturity Framework. This framework has a set of dimensions that reflect the key government functions that must be transformed to improve the maturity level. Each dimension represents a key maturation enabler (although it can have more than one theory of change). For each dimension, we defined the dimension and its key theories of change. Each dimension can be decomposed into a variety of sub-dimensions. For example, leadership can be broken down into mobilizing innovation and mobilizing collaboration. Each sub-dimension should have its own theory of change and be consistent with the dimension's theory of change. Notwithstanding, discussing sub-dimensions is beyond the scope of this article.

4. CASES ANALYZED IN DETAIL

This section briefly describes each of the cases and analyzes them in terms of the dimensions and enablers they include, either implicitly or explicitly.

4.1. McKinsey’s Digital by Default

The main goal of the McKinsey Model is improving citizen's experience when interacting with government [45]. McKinsey's Model emphasizes the benefits of efficiency in public service delivery, accuracy in decision-making and public trust through data sharing and cybersecurity principles. It also balances organizational features with technology innovation.

Dimensions. The McKinsey Model is composed of five dimensions: services, processes, decisions, data sharing, and cybersecurity.

Services looks at the technologies used for public service delivery. The evolutionary perspective in this dimension is that technologies serve as means to simplify and automate the government's interaction with citizens and businesses.

Processes refers to all organizational processes that are behind any public service delivered. This dimension distinguishes digitized and analog operations, relating the former as desirable and the latter as inefficient.

Decisions is a dimension that describes the barriers of limited or imprecise information and complex problems (i.e. wicked problems) for decision-making. Thus, the stages perspective describes precision on the topic of interest, on the capacity for predictive immediate reaction policies, or personalized public services.

Data sharing describes a set of government actions towards unifying registries, linking open data, and standardizing open data policies from multiple entities such as government and non-government organizations. Cybersecurity is a challenging consequence of the digitization of public services and data sharing, which jeopardize the security of sensitive and valuable information in government's hands. As the availability of big data increases, cybersecurity is becoming a key factor contributing to citizen trust in government. Assuming that it is not possible to build defenses against every possible cyber-attack, governments must prioritize their information assets and build appropriate defense strategies around them.

Table 2: Dimensions in McKinsey’s Model

Dimension	Description
Services	Technologies used to simplify and automate government’s interaction with citizens and businesses.
Processes	The digitalization of all back end processes behind public service delivery.
Decisions	Decision-making based on technologies for predictive data analytics. The goal is to integrate a system that produces data from multiple sources and uses algorithms to refine the accuracy of the insights for the public managers.
Data-sharing	Actions for unifying and linking open data to make it valuable for government or citizen’s use.
Cybersecurity	Actions to safeguard sensitive and valuable information exposed by the digitization of public services and data sharing.

Enablers. The McKinsey's Model has four enablers: strategy, governance, leadership and technology. Strategy is a plan for coordinated action that sets the direction of the digital government as a constitutive element of the overall government priorities. The theory of change is that the strategy must link technological opportunities available as solutions for the overall government priorities.

Governance could be seen as the organizational capability that helps government departments and agencies to jointly accomplish strategic goals. The theory of change is all about coordination. Mechanisms of inter-organizational coordination strengthen the diffusion of new policies and technologies across all organizations involved.

Leadership refers to the ability of public managers to lead other members of the organization to make a concerted effort towards a common goal. In this dimension, the theory of change is three-folded. Leaders help to maintain the link of the strategy with the government priorities. Also, leaders promote goals by overseeing the hiring and development of talent, as well as the continuous monitoring. Finally, leaders promote innovation, which is key for organizational change and advancing maturity stages.

Finally, technology indicates the replacement of information technologies by newer ones. Replacement helps advancing maturity stages by blending a fast transition in the front-end technologies with a slow transition in the back-end, known as the "two-speed IT mode."

Table 3: Enablers in McKinsey's Model

Enabler	Theory of change
Strategy	A good strategy weaves clearly the opportunities that emerging information technologies offer to address some of the overall government priorities.
Governance	Mechanisms of inter-organizational coordination strengthen the diffusion of new policies and technologies across government agencies.
Leadership	Helps cementing the alignment of the strategy within government priorities, oversees the required talent and coordinated effort required for its implementation, and promotes innovation and organizational change.
Technology	A smooth replacement of old IT systems with emerging technologies sets the basis for delivering better public services.
Data	Getting more data from multiple sources helps overcoming the problem of limited information and helps facing complex problems by providing more data from multiple sources.

4.2. Gartner's Digital Government Maturity Model

The Gartner Digital Government Maturity Model focuses primarily on public service delivery [46]. It is a technology-driven model (with emphasis on data) that assumes no resistance in the user acceptance and use of technology, as well as the pre-existence of the regulations needed for making technology work. Overall, the stages describe the desired stage as an improved convenience and choice of public service delivery, an extended and cohesive network of providers, partners and user of public services, and an intense use of big data for prediction customization of service's needs.

Dimensions. The Gartner Model is composed of six dimensions: value focus, service model, platform, ecosystem, leadership and technology. Service model describes four principles of public service delivery that government should follow:

1) Convenience and choice. Citizens value having alternatives to the traditional physical office to access public services. This can be achieved by increasing entry points and improving their accessibility or ease of use.
2) Third-party intermediation. This is an "external" alternative to increase convenience and choice for citizens in public service delivery. According to the model, third-party intermediation may also increase government's legitimacy by incorporating non-government actors into public service delivery networks. Third-Party intermediation is assumed to become possible as the availability and usability of government data increases.
3) Prediction. Government's ability to foresee an incident that will require government intervention (e.g., preventive health care or preventing traffic jam). Prediction is expected to be possible as the availability and use of big data grows, and as predictive models (e.g., machine learning) are used more intensively.
4) Customization. Government's ability to treat each citizen with equity, rather than equality. This means that the government is able to distinguish the diverse needs from individuals and react based on those differences ---relinquishing the one-size-fits-all approach. The assumption is that customized public services or customized law enforcement are possible with the increase of big data. Individual customization is possible through technologies such as wearable sensors or IoT-equipped environments.

Table 4: Dimensions in Gartner's Model

Dimension	Description
Value focus	Democratic values that government prioritizes. For example, efficiency, openness, and transparency.
Service	Describes four principles of public services delivery that government can follow: convenience and choice, intermediation, prediction, and personalization.
Platform	Government's set of IT supporting the chosen service model. This dimension emphasizes the diversified production of big data (e.g., internal, outsourced, or crowdsourced) to advance maturity.
Ecosystem	The set of stakeholders of public service delivery. For example, contractors, partners, and users.
Leadership	Jurisdiction-wide leadership that coordinates members of the organisation to achieve digital transformation.
Technology focus	Describes the desired technological features of a data-driven technology strategy.

Enablers. The Gartner Model has three enablers: data, monitoring, and third-party service delivery. Data refers to the production and use of big data for the achievement of the organizational values. Initiatives such as open data help the government move forward in terms of transparency and openness. Monitoring is the capacity from sensors, data mining and data analytics to measure and monitor activities or events that were not possible before. By enabling measurement, government can set up or expand performance management systems or improve their emergency response systems, among other possibilities. Finally, the distribution of responsibilities across non-government actors improves citizen convenience and choice when accessing public services.

Table 5: Enablers in Gartner's Model

Enabler	Theory of change
Data	The production and use of data help to accomplish organizational values, such as efficiency, openness, transparency, proactivity, and resilience.
Monitoring	Data production technologies (i.e. sensors) and data mining techniques (e.g., web scrapping or social network analysis) improve the organization's monitoring capabilities. These capabilities subsequently improve service models or prompt new ones, such as emergency response, prediction of citizen's needs, and anticipation of citizen's problems.
Third-party service delivery	Citizens prefer a networked governance system where responsibilities are distributed among government and a variety of non-government actors. Enabling non-government actors as co-creators or co-producers of public services improves citizen's convenience and choice when accessing public services, and ultimately improves citizen's satisfaction.

4.3. United Nations METER 2

The main goal of METER 2 is to help decision-makers self-assess their organizational capabilities for the use of information technologies to provide public services [47]. METER 2 is conceptualized around the idea of transforming government, which refers to the transition toward better public service delivery and government-citizen interaction.

Dimensions. The UN METER 2 Model is composed by five dimensions: commitment, legal, vision and policy, organization, and technology. Commitment refers to the mobilization of resources to support a digital transformation strategy. Commitment refers to a managerial capacity to motivate public officers and build political will to set in motion the resources needed (i.e., human and financial resources, as well as infrastructure) towards a common organizational goal. Legal is the set of laws, rules, guidelines and standards that are relevant to the digital transformation strategy. The regulatory regime might be unfriendly to the desired organizational change, and therefore slow down the appropriation of IT. In contrast, a "friendly" regulatory regime, not only does not prevent organizational change, but its design prompts the behaviors desired from the people involved.

Vision and policy refer to strategic plan that links how the technological opportunities help governments to achieve their overall priorities. It is a plan that sets common goals and helps the members of the organization follow a plan to achieve them. The organizational view is assessed primarily on its capacity to break down the organizational silos for inter-organizational collaboration and sharing of information. Finally, technology is a dimension that describes the information technologies that help to create an interconnected government –among government agencies, and with citizens and businesses. Technologies also improve government responsiveness.

Table 6: Dimensions in UN METER 2 Model

Dimension	Description
Commitment	Mobilization of organizational resources for enabling a supportive environment for a digital transformation strategy.
Legal	Set of laws, rules, guidelines, and standards relevant to digital government activities. These could be existing or planned rules.
Vision & Policy	Statement that links how the technological opportunities help government achieve their overall priorities.
Organizational View	Describes the dominant model of public service delivery. The dominant model can be, for example, a networked governance or a traditional hierarchical organization.
Technology	Information technologies help to create a connected government, and improves government responsiveness.

Enablers. From this model, we identified five enablers: leadership, regulatory regime, institutional arrangements, networks of organizations, and access to information and communication technologies (ICT). Leadership focuses on the capacity of building commitment from public officers and political will from government's leaders. Commitment helps a digital transformation strategy advancing the organization's maturity level.

The regulatory regime is perceived as a constraint for technological changes. The perceived barriers are related to "archaic laws" or regulatory regimes having opposed goals than the ones set in the digital transformation strategy. The theory of change of the regulatory regime emphasizes that a revision and change of the regulatory regime leads to a "friendly" or supportive environment for advancing the organization's maturity level.

The institutional arrangements are processes that shape the interaction among public officers within the same organizations or among different organizations. Institutional arrangements help advance maturity levels when a specific organization or institution has been established as a focal point for planning, supporting, coordinating and overseeing the efforts from the relevant organization's departments and agencies.

Horizontal and vertical coherence among all government's departments and agencies provides the alignment of efforts around a digital transformation strategy and helps conciliating possible disagreements with among agencies or between government and citizens.

Finally, on the technological aspect, the advance towards desired stages of maturity requires that all parties involved (i.e. public officers and citizens) have access to reliable ICT's. Access refers to the physical access to the technological devices, and the skills required to use them.

Table 7: Enablers in UN METER 2 Model

Enabler	Theory of change
Leadership	Commitment from leaders guide the interweaving of strategic goals, resistance to IT changes, and programmatic actions necessary for organizational change.
Regulatory	Archaic laws, old regulatory regimes, and overlapping regulations complicate the adoption or use of new It. It-based regulatory reforms are normally a boost for a digital transformation.
Institutional Arrangements	An agency or institutional mechanism should serve as the focal point of planning, supporting, coordinating and overseeing the collective efforts from different departments and agencies.
Network of Organizations	Networked governance models improve citizen's satisfaction of public service delivery. A horizontally and vertically cohesive network of government organizations also improves public service delivery effectiveness.
Access to IT	Reliable access to IT infrastructure to public officers and citizens must be improved.

5. TOWARDS AN ENABLER-BASED FRAMEWORK

Based on the previous discussion and findings, we developed the Enabler-Based Digital Government Maturity Framework (EDGMF). This framework compiles and integrates the dimensions commonly found across the different cases analyzed as well as their theories of change. The EDGMF seeks to provide a road map for improving organizational capabilities to optimize the use of information technologies. We must emphasize that the dimensions referred below represent an initial effort and the framework is far from being conclusive. Our goal is to show an operational enabler-based model and, to do so, we present an illustration.

The EDGMF is composed of seven dimensions: (1) leadership, (2) regulatory regime, (3) strategy, (4) organization, (5) governance, (6) technology, and (7) data. Leadership refers to the level of commitment of the managers leading the digital transformation. These managers are usually at the executive office level and could include a (management-oriented) Chief Executive Officer, and a (technology-oriented) Chief Information Officer. Leaders must employ management skills to ease the tensions associated with technological and managerial changes. Leaders can also promote staff's engagement and informativeness to better accomplish the goals.

Regulatory regime is the set of rules that may promote or prevent the adoption and use of information technologies. Archaic laws, old regulatory regimes, and overlapping regulations complicate the adoption and use of new IT. Normally, the regulatory regime must be reviewed and revised to align the rules with the desired digital transformation.

Strategy refers to the planning that weaves and communicates the opportunities that emerging IT offer to address some of the overall government priorities. The strategy helps keeping focus, pace, and purpose on the organizational efforts to bring organizational change. Strategies compile the assumptions and choices that governments make on how to pursue their goals.

Organizations with more readiness to work in collaboration are more likely to succeed in advancing maturity stages. A horizontally and cohesive network of government agencies improves effectiveness in public service delivery, and therefore improves citizen's satisfaction. Central to this dimension are all efforts to ease inter-organizational collaboration, such as meetings, joint planning, etc. A quest for collaboration, however, lessens the overall government capacities for decentralization and specialization [11, 12, 24]. This is not trivial, since government reforms worldwide during the last two decades have stressed these two organizing principles [20, 31, 40].

Governance as a dimension is related to organization, since it also explains the need for multiple agencies working in coordination. The organization dimension focuses on the capacities within agencies to ease collaboration. In contrast, the governance dimension looks at the overall structure of government to assess governance mechanisms. Governance mechanisms are important because they help different agencies to accomplish both common and agency-specific goals. Governance mechanisms also include non-government actors to improve the public service delivery, democratic governance, or decision-making.

Technologies are perceived as supporting elements of the broader digital strategies. Maturity is not only advanced by adopting new technology, but also by making sure it is reliable and available for all intended users. Reliability requires a human and physical infrastructure that will repair or replace damaged equipment, so the technology is running seamlessly. Availability requires access to technological devices and the development of skills in the users (public officers and citizens).

Data is a dimension that emphasizes the emerging possibilities regarding the rise of big data. More data not only means a bigger sample size or variables available, but also a broader variety of data structures (e.g., social network, geographic, text, sensor data). The traditional problem of limited information for decision-making can be lessened with more availability of, and access to and use of data. Also, complex problems, also referred to as wicked problems, can be better addressed or understood with the use of better data. Big data solutions, however, also requires new skills in both data management and use.

Table 8: Dimensions in EDGMF

Enabler	Theory of change
Leadership	Commitment from the manager to lead the digital transformation. Leaders must employ management skills to ease the tensions risen from technological or managerial changes.
Regulatory Regime	Regulations may undermine the development of digital government. The regulatory regime must be reformed to align rules with the desired digital transformations.
Strategy	Planning weaves and communicates the opportunities that emerging IT offer to address some overall government priorities.

Organization	Organizational models that ease inter-organizational collaboration will improve public service delivery and citizen's satisfaction.
Governance	By distributing responsibilities, among government and non-government actors, governance network mechanisms improve public service delivery, democratic governance, and decision-making.
Technology	Technological change must be done through a smooth transition. This transition must be accompanied with actions to develop necessary skills for users.
Data	Getting more data from multiple sources helps overcoming the problem of limited information and helps facing complex problems. Big data solutions also require a new set of skill data management and use.

6. IMPLICATIONS

After reviewing the literature and existing digital government maturity models, this article analysed three maturity models with rich descriptions of their dimensions and stages to explore their enablers. We found some common enablers among all cases, from which we developed the EDGMF. Each enabler presented in the EDGMF draws from a general theory of change to advance digital government initiatives. General theories of change, however, are insufficient unless accompanied by specific subordinate minor theories of change. We refer to these as sub-enablers. For example, the enabler "leadership" is considered a key factor in the maturity models, but leadership alone, is a vague concept that could be operationalized in different ways. To make leadership an influential factor, action must be taken by the leaders on certain features that affect organizational change, such as creating vision [6, 16] or possessing motivation skills [25].

When screening the 27 maturity models that met the first inclusion criteria for the case selection, we observed that most of the models had a limited uni-dimensional description of the stages. Most of the maturity models, especially from journal articles, provide a brief overall snapshot for each stage. Such limited descriptions imply that limited attention was paid to the organizational dimensions while advancing maturation stages. As a result, these maturity models, although strong for diagnosing and setting goals, are weak for providing recommendations for organizational change.

A recurrent criticism of maturity models has been the lack of theory supporting the "evolutionary" path towards advanced levels of technology appropriation [13, 14, 23, 39]. Developing a maturity model entails a decision on whether to start by empirically observing emerging technologies or by systematically reviewing existing theories. Starting with emerging technologies promotes the rapid assimilation of promising new technologies for making operations more efficient or effective. Several authors have pointed, however, that technology-based models often become obsolete with the advent of newer technologies [7, 14, 21, 22, 39].

Starting with theory, on the other hand, has many advantages. For example, it reduces risk of failure on technology assimilation [2, 21, 39], allows models to be empirically tested [37], and helps build more accurate constructs around enablers and the areas of the organization relevant to the model [37]. Having good constructs also helps in building more reliable measurements [37]. Ultimately, this helps to ground recommendations on sound theory, which means to convincingly explain why digital government evolves the way it does. In addition, from a more practical perspective, enabler-based models can help decision makers to understand better which actions, resources and capabilities are more important to move from one stage to another.

The EDGMF's set of enablers and theories of change are not always grounded in sound theory. Some of them are based on what could be considered weak theories of change. The spirit of this proposal, however, is illustrative and we do not argue that this is a final product. Rather, we hope to start a conversation about mechanisms of action in the literature of digital government maturity models. We argue that this paper will help this conversation forward by providing a model that goes beyond current stage-based maturity models.

One explanation for why this and other, models are weakly grounded on theory is seemingly the lack of multidisciplinary research. The enablers are broad and complex constructs, and draw from so many diverse fields of study, that different types of expertise are needed while conceptualizing maturity models. For example, regulatory regimes require expertise on legal studies, while leadership and organization must draw from organizational theory, and management studies, respectively. Organizational theory, in particular, has been especially absent on the development of maturity models [34].

The stage and enabler-based approaches are both useful and complementary. Stage-based models are useful for comparisons, and provides a sense of position, progress and direction. Normative in nature, they have a prescription to follow. Enabler-based models inform what actions are required in which organizational areas, so a government can reach the progress and direction set in the stage-based model. An enabler-based approach helps to reduce failure in technology assimilation, as key factors are better understood. Enabler-based models provide prescriptions for action, based on explanatory information (e.g., how leadership works, and what is affected by leadership).

The enabler-based approach provides a second set of guiding principles for maturity model users to choose among the vast range of options. A strong maturity model must offer a stage path to follow. Also, a strong maturity model must make a case on why organizations should follow that path and provide strong recommendations for achieving different levels of maturation. It should clearly explain how and why different dimensions of digital government will evolve. The theories of change should also be connected to overall government goals, such as improving citizen trust in government, citizen satisfaction, and service quality. To do so, a strong maturity model should be blended with design science and social sciences, as some scholars have suggested recently [10, 14, 30, 34]. Design science helps to imagine what is possible, what possibly adds value, but not yet empirically observed or validated. Social sciences provide stable models of behaviour, across time and space, which help in understanding government organizations and individual stakeholders.

7. CONCLUSIONS

In recent decades, literature on digital government maturity models has focused on conceptualizing stages. As a result, current knowledge about stages of technology maturation is well developed. Such knowledge is useful in identifying the current state of affairs in terms of digital government and envisioning a desired alternative scenario. Identifying and understanding the mechanisms underlying potential recommendations for action, however, have been largely overlooked. In this regard, a broad base of literature from multiple disciplines and fields of knowledge has great potential for strengthening digital government maturity models. A greater focus on the mechanisms by which certain resources and capabilities help an organization to advance to the next stage of maturity would lead not only to more detailed understanding of those mechanisms and their interdependence, but also to solid recommendations for action.

In an attempt to better understand the enabling mechanisms of digital government maturity, this article presents an Enabler-Based Digital Government Maturity Framework. This is yet another, and limited, maturity model, but it adds value in its focus on enablers rather than stages. As noted, the main benefit of this approach is to allow for more accurate and specific recommendations based on the diagnostic assessment provided by the same model. We argue that stage and enabler-based approaches are complementary tools; while stage models set the diagnosis and the path to follow, enabler-based models provide insights on how to get there. After considering dozens of maturity models, we believe that these two parameters could be seen as the key to helping decision makers and researchers know which ones are strong models, with the greatest value to theory and practice. Finally, we believe an enabler-based approach could help to develop better recommendations for action and improve the overall utility of digital government maturity models.

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Por medio de la presente se informa que del punto 9 “Documentos que acreditan la experiencia” del participante Cesar Renteria Marín del proceso de selección para ocupar los puestos vacantes de la Dirección de Inteligencia de Datos, se extrajeron un total de 8 hojas referentes a la investigación denominada “Contrasting the Perceptions about Citizen Participation between Organized Civil Society and Government with an Open Government Approach: The Case of the State of Jalisco, Mexico”, toda vez que en dicha investigación se mostraba una leyenda de “copia no autorizada para su reproducción” conforme lo prevé los artículos 123 y 125 fracción I y II de la Ley Federal del Derecho de Autor

STATISTICAL ANALYSIS OF 311 CALLS IN NYC 2013-2016

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Prepared for New York City Deserves Better

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Introduction

The data required posed some challenges in the visualization, since every question has three dimensions to be displayed: geography (neighborhood), time (monthly data), and categories (types of complaints). Additionally, each one of these dimensions has a big number of units (i.e. 196 neighborhoods, 61 months, and many complaints reduced to 12 broader categories). To reduce complexity, we decided to present most the data visualized in maps, since this strategy allows us to present the three dimensions in fewer and more readable figures. Auxiliary, we used graphs and tables. All Maps and Graphs will be delivered in file formats .png. Full datasets will be provided in .csv files for further analysis.

Based on the requirements from NYC Deserves Better, we produced two general types of information. The first are graphs or maps that seek to identify the disparity among neighbors for any variable required. These figures are based on the global average (2013-216) for any variable required. The second are graphs or maps that seek to identify trends among years by neighborhood. These figures portray the various local (yearly) averages for any variable required. The comparison is straightforward by looking at multiple figures for any variable required.

The Number of calls by complaint type for the period 2011-2016 is as follows:

TOTAL

Category	Number of 311 calls	Percentage
Building Housing	2,331,628	21.8%
Construction	408,224	3.8%
Corruption	1,903	0.0%
DOT/Infrastructure Conditions	719,935	6.7%
Environment Water Quality	610,281	5.7%
Homelessness	70,366	0.7%
Noise	1,763,181	16.5%
Public Safety	154,736	1.4%
Schools	8,597	0.1%
Seniors	1,565	0.0%
Street Conditions	1,252,193	11.7%
Vermin	146,559	1.4%
Other	3,223,803	30.1%
Total	10,692,971	100.0%

2011

Category	Number of 311 calls	Percentage
Building Housing	440,296	26.10%
Construction	138,732	8.22%
Corruption	348	0.02%
DOT/Infrastructure Conditions	115,675	6.86%
Environment Water Quality	106,937	6.34%
Homelessness	1,932	0.11%
Noise	192,857	11.43%
Public Safety	18,254	1.08%
Schools	1,892	0.11%
Seniors	253	0.01%
Street Conditions	216,356	12.83%
Vermin	21,240	1.26%
Other	432,031	25.61%
Total	1,686,803	

2012

Category	Number of 311 calls	Percentage
Building Housing	379,115	24.18%
Construction	119,833	7.64%
Corruption	312	0.02%
DOT/Infrastructure Conditions	114,862	7.33%
Environment Water Quality	98,175	6.26%
Homelessness	2,302	0.15%
Noise	217,098	13.85%
Public Safety	21,239	1.35%
Schools	1,204	0.08%
Seniors	248	0.02%
Street Conditions	174,065	11.10%
Vermin	21,038	1.34%
Other	418,403	26.69%
Total	1,567,894	

2013

Category	Number of 311 calls	Percentage
Building Housing	387,094	24.33%
Construction	117,821	7.41%
Corruption	334	0.02%
DOT/Infrastructure Conditions	129,513	8.14%
Environment Water Quality	91,132	5.73%
Homelessness	3,063	0.19%
Noise	255,856	16.08%
Public Safety	20,887	1.31%
Schools	1,200	0.08%
Seniors	234	0.01%
Street Conditions	163,414	10.27%
Vermin	22,081	1.39%
Other	398,213	25.03%
Total	1,590,842	

2014

Category	Number of 311 calls	Percentage
Building Housing	406,355	21.67%
Construction	22,975	1.23%
Corruption	281	0.01%
DOT/Infrastructure Conditions	126,434	6.74%
Environment Water Quality	98,832	5.27%
Homelessness	4,971	0.27%
Noise	333,423	17.78%
Public Safety	29,832	1.59%
Schools	1,355	0.07%
Seniors	266	0.01%
Street Conditions	223,764	11.93%
Vermin	24,200	1.29%
Other	602,310	32.12%
Total	1,874,998	

2015

Category	Number of 311 calls	Percentage
Building Housing	389,536	19.12%
Construction	7,871	0.39%
Corruption	309	0.02%
DOT/Infrastructure Conditions	123,948	6.08%
Environment Water Quality	110,085	5.40%
Homelessness	11,315	0.56%
Noise	380,436	18.67%
Public Safety	33,426	1.64%
Schools	1,496	0.07%
Seniors	264	0.01%
Street Conditions	254,900	12.51%
Vermin	29,030	1.42%
Other	694,869	34.10%
Total	2,037,485	

2016

Category	Number of 311 calls	Percentage
Building Housing	329,232	17.02%
Construction	992	0.05%
Corruption	319	0.02%
DOT/Infrastructure Conditions	109,503	5.66%
Environment Water Quality	105,120	5.43%
Homelessness	46,783	2.42%
Noise	383,511	19.82%
Public Safety	31,098	1.61%
Schools	1,450	0.07%
Seniors	300	0.02%
Street Conditions	219,694	11.35%
Vermin	28,970	1.50%
Other	677,977	35.04%
Total	1,934,949	

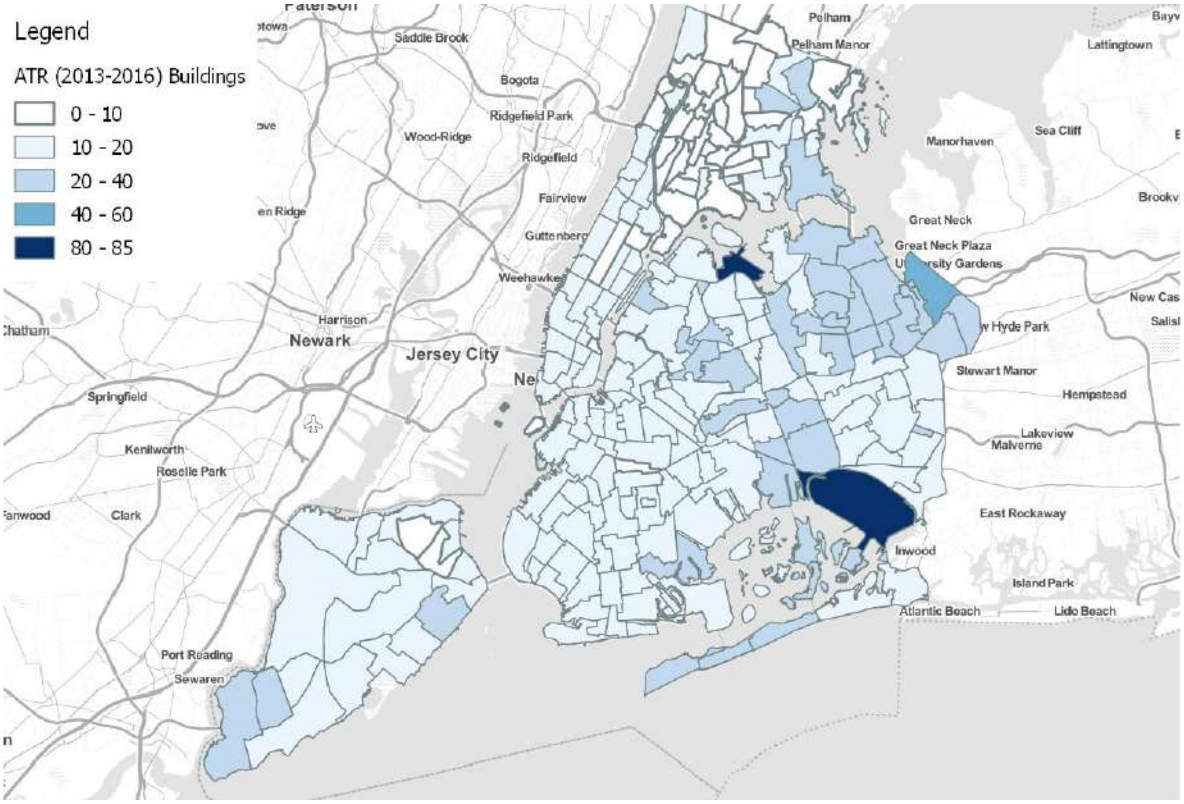
1. Average time to resolve complaints by type, and by neighborhood (2013-now)

Geographic Analysis

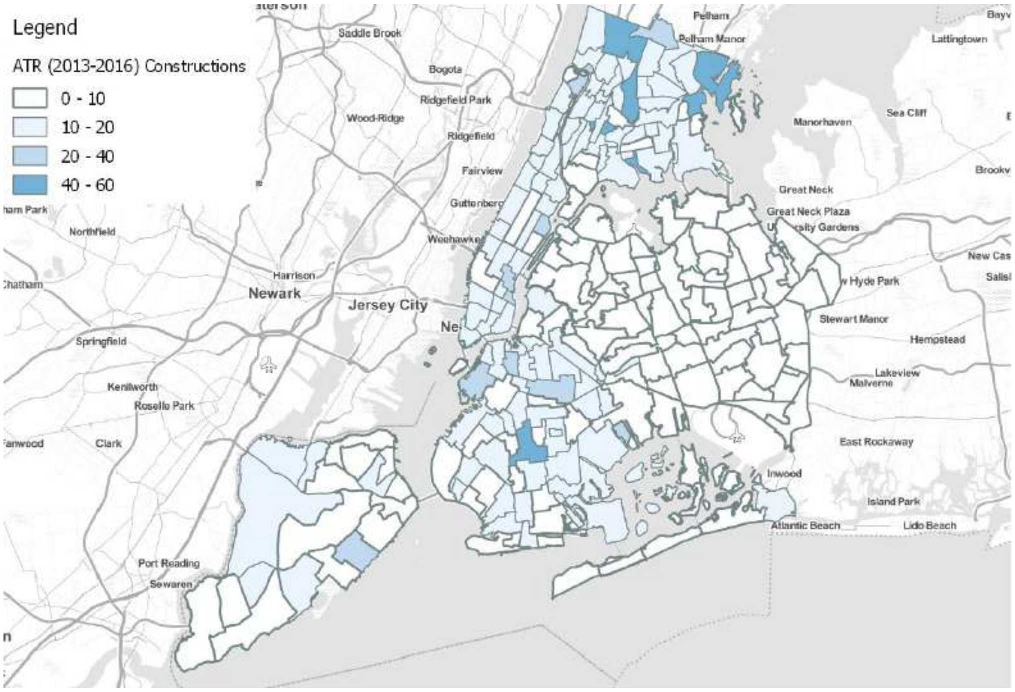
This section analyzes the average time to resolve complaints by type and by neighborhood for the global average in the years 2013-2016.

Next twelve maps present the global average time to resolve complaints by type of complaint and by neighborhood. The average time is measured in days. See the Methodological Report to review the strategy to estimate "time to respond."

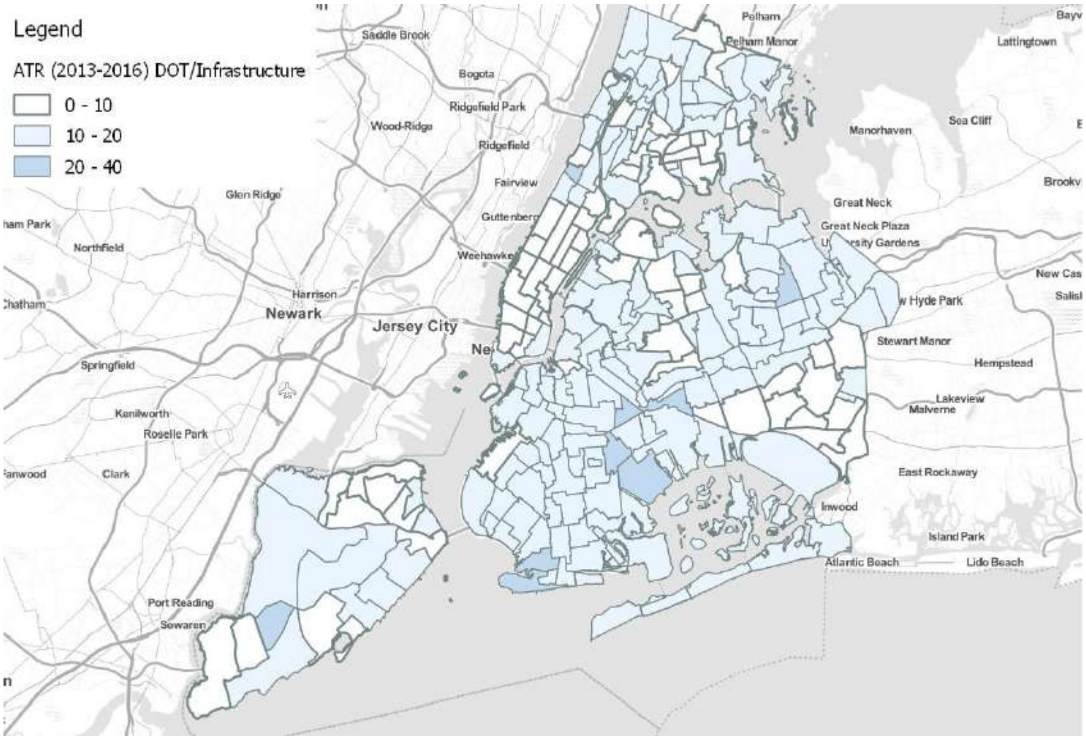
Buildings Housing



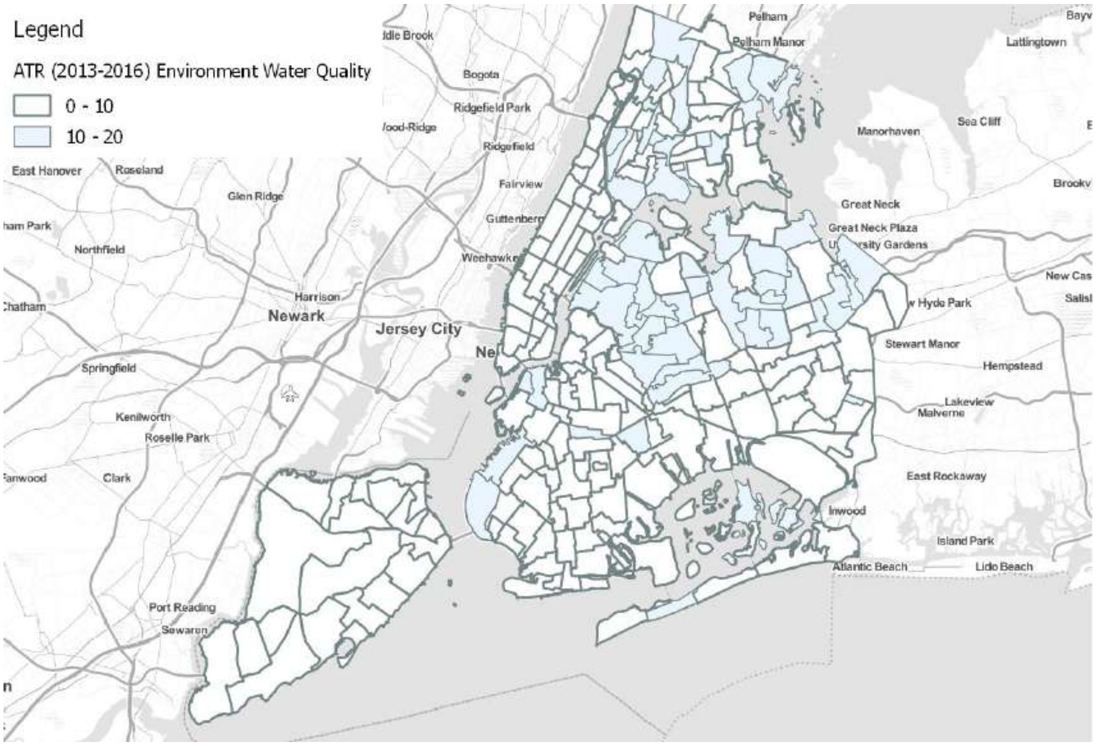
Construction



DOT / Infrastructure Conditions



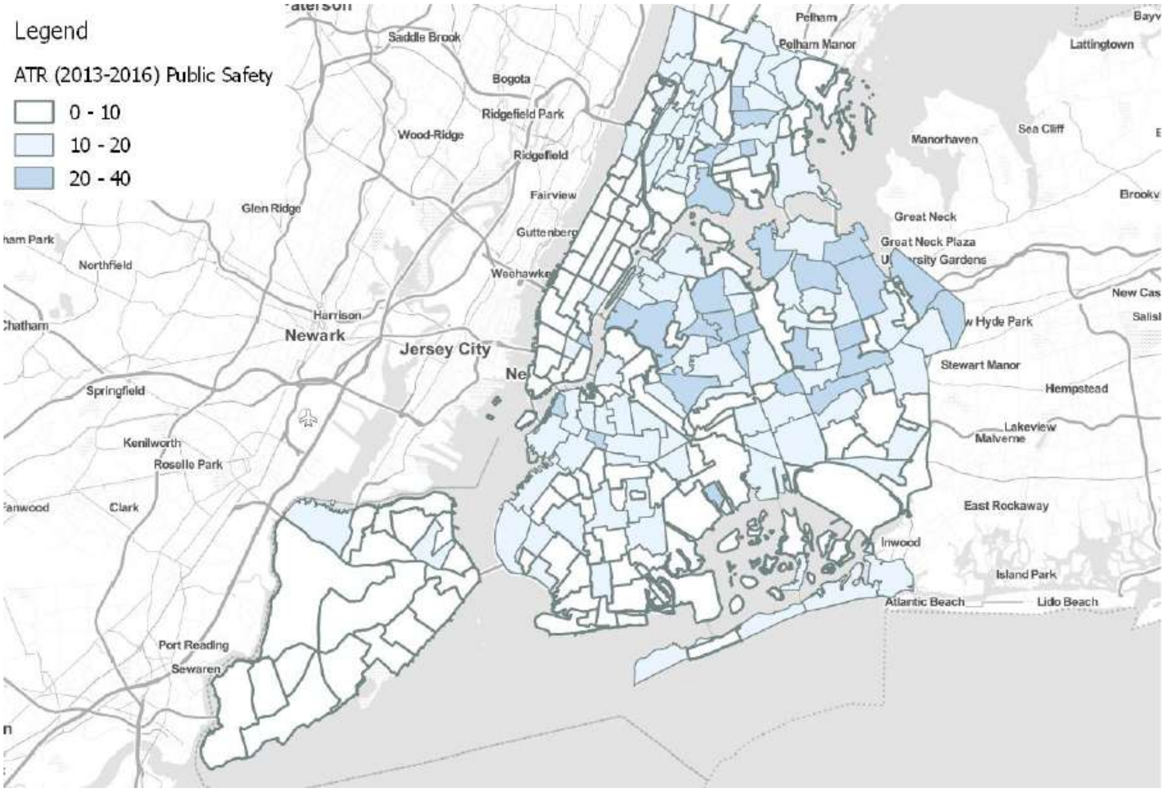
Environment Water Quality



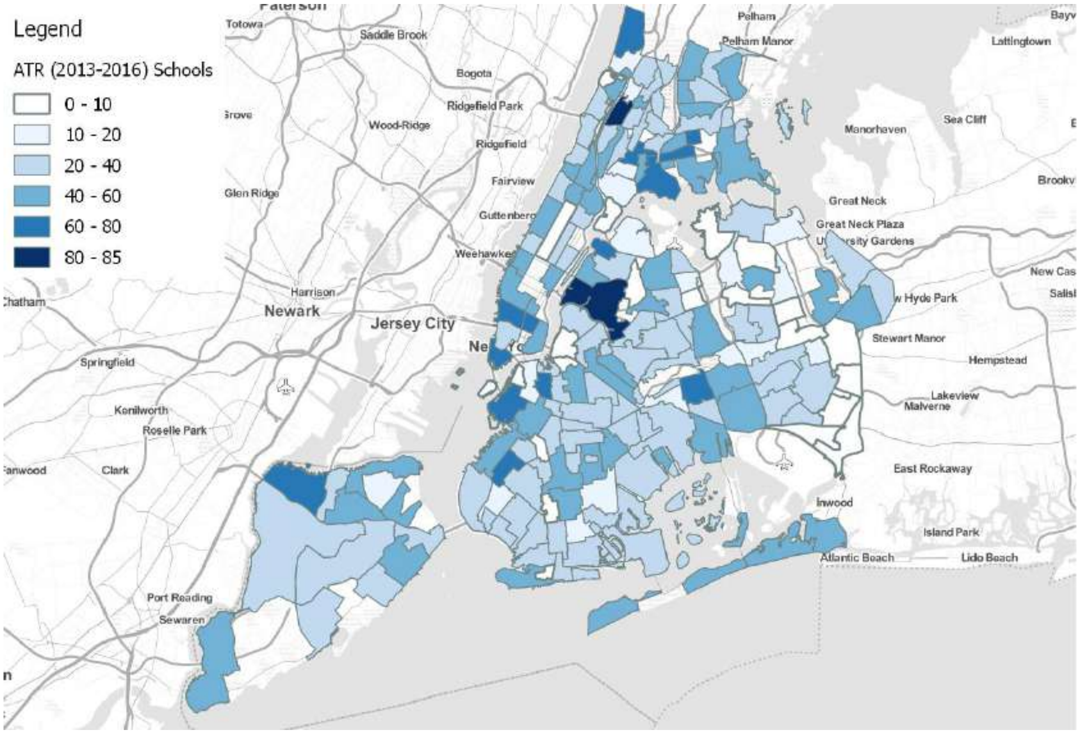
Homelessness

Noise

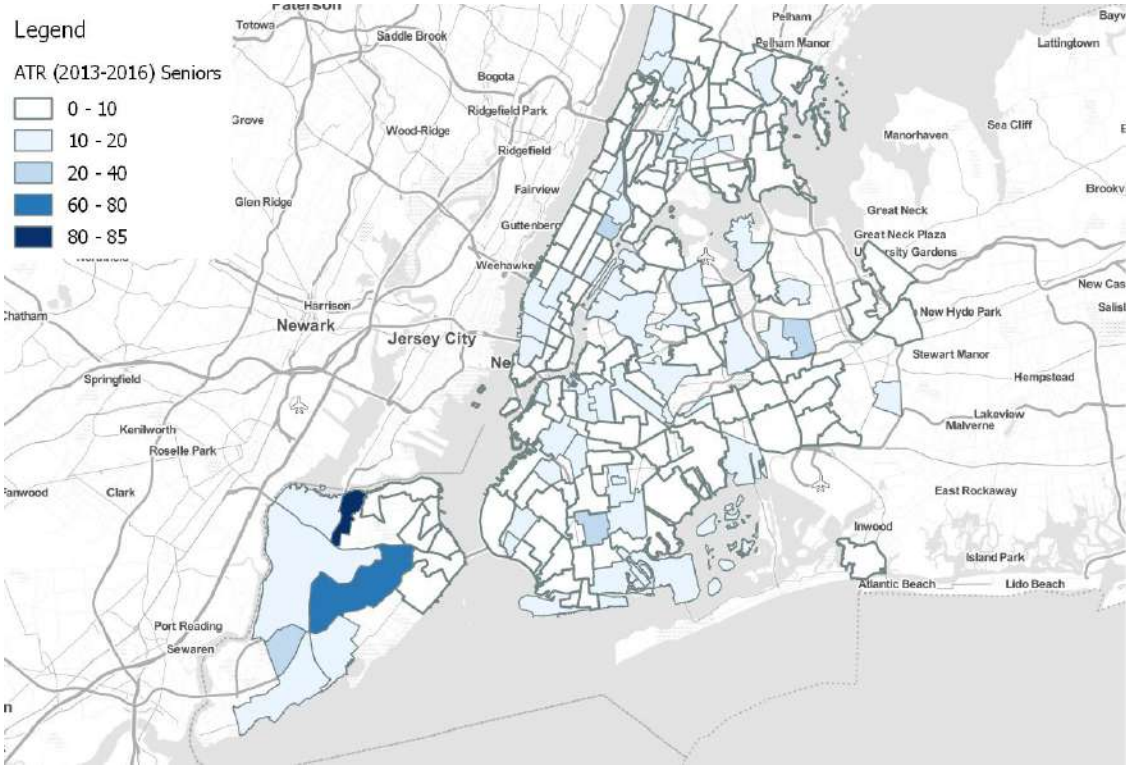
Public Safety



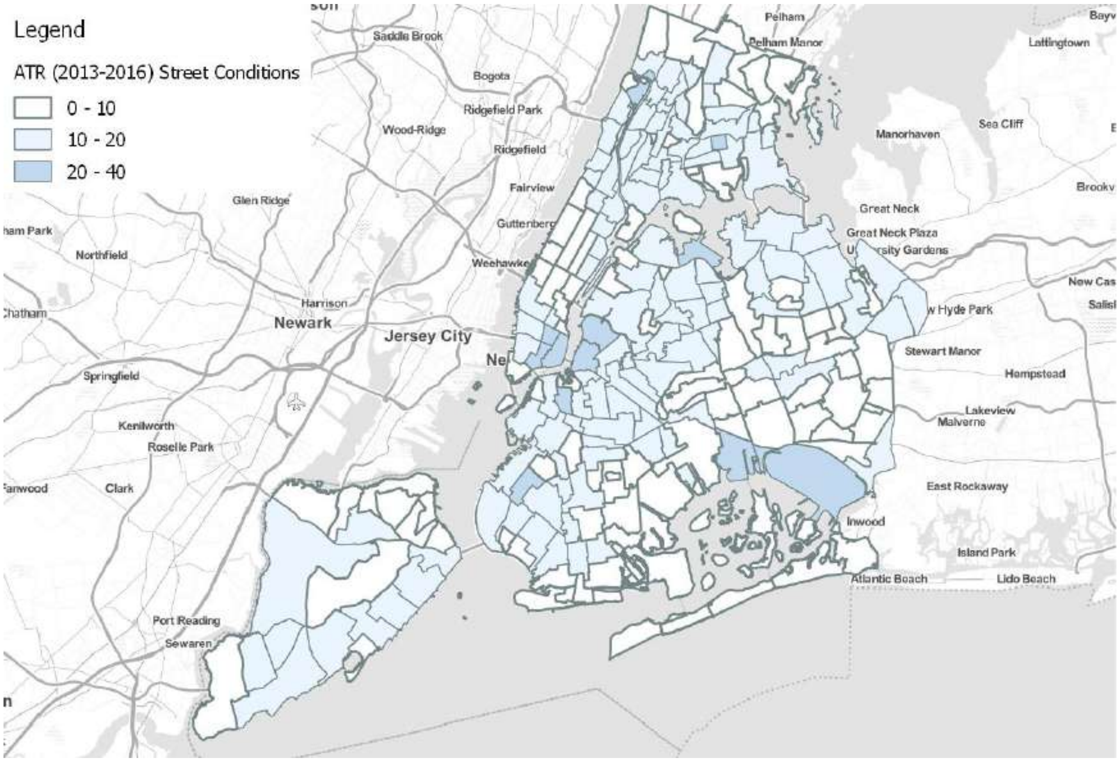
Schools



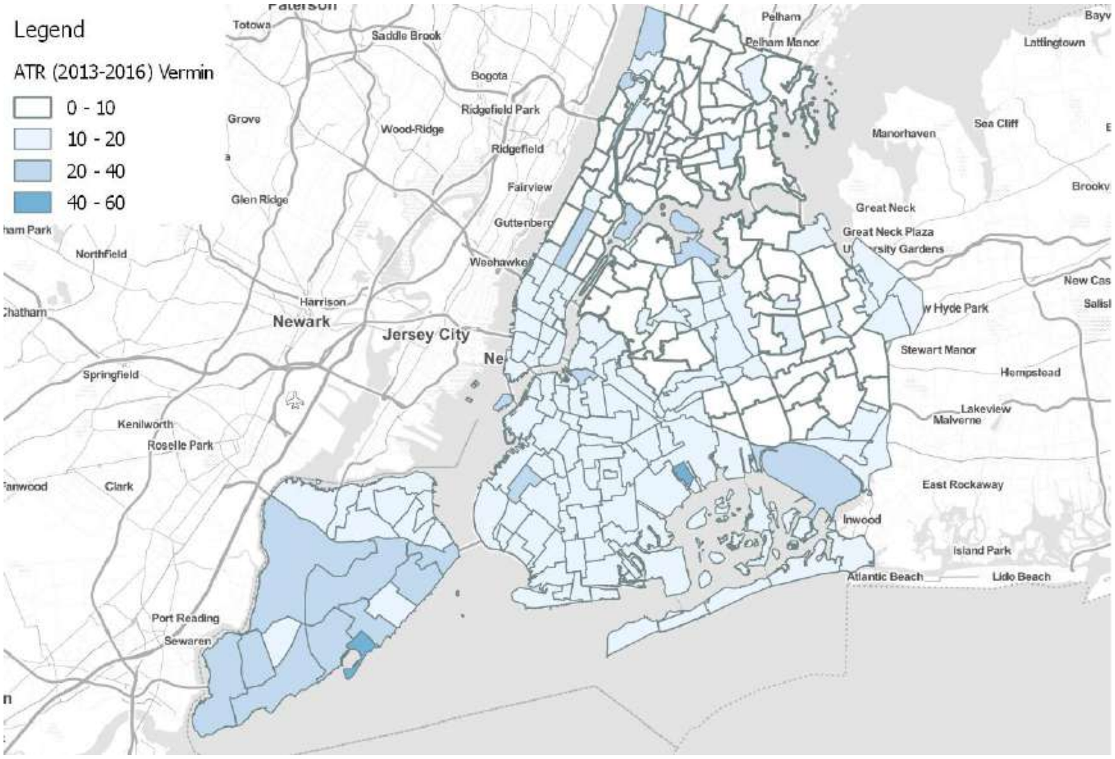
Seniors



Street Conditions



Vermin



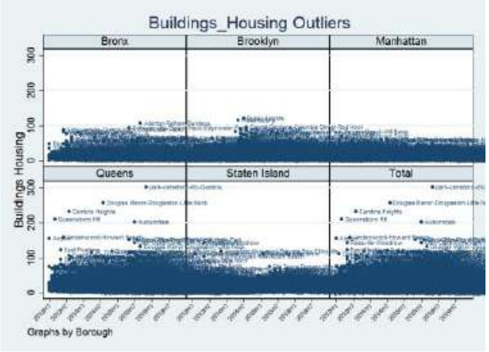
Corruption

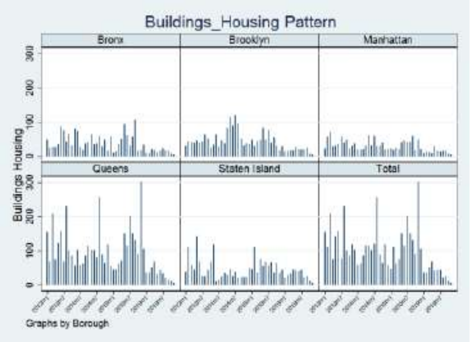
Time Series Analysis

This section analyzes the patterns of the monthly average time to response by complaint over the period 2013-2016. Each complaint is analyzing with a set of two graphs at the Borough level. The first Graph (Pattern) shows the pattern of the monthly average time to respond per borough, whereas the second (outliers) seeks to identify which are the neighborhoods with the highest average time to response per complaint and per month.

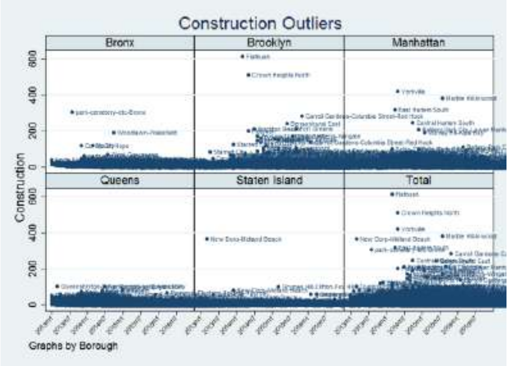
This report shows only the graphs for the average time to respond at the aggregated level (borough). To analyze the details of the average time to response for all neighborhoods, see .png files with the prefix “z91” in Appendix 1.

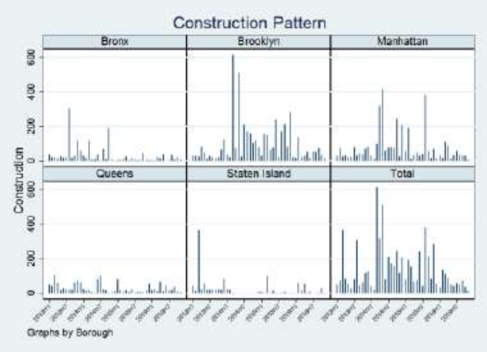
Building Housing



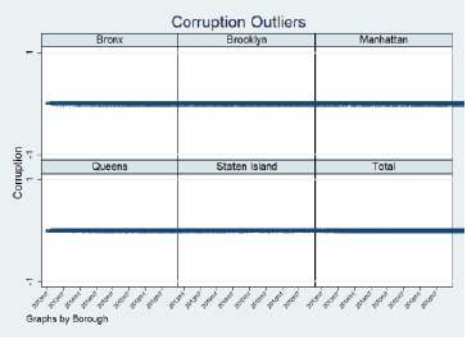


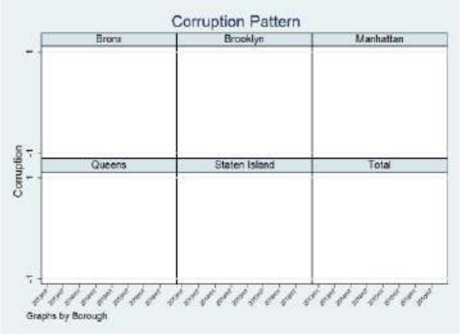
Construction



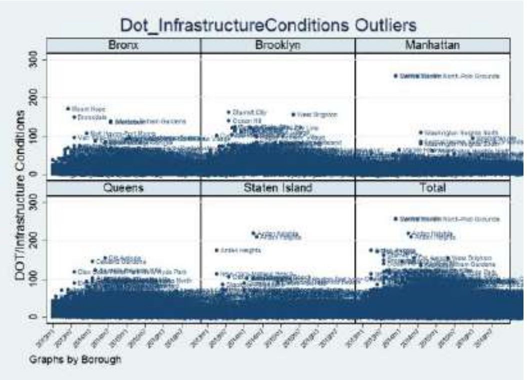


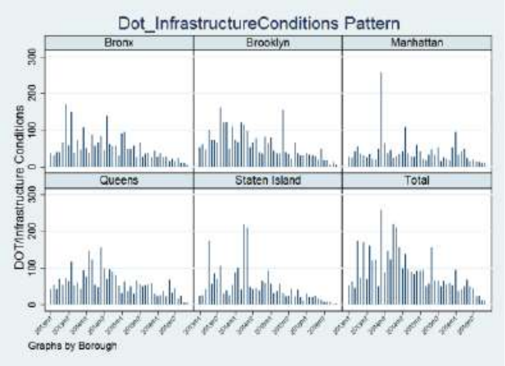
Corruption



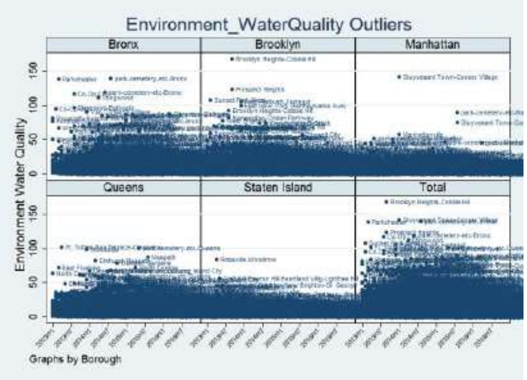


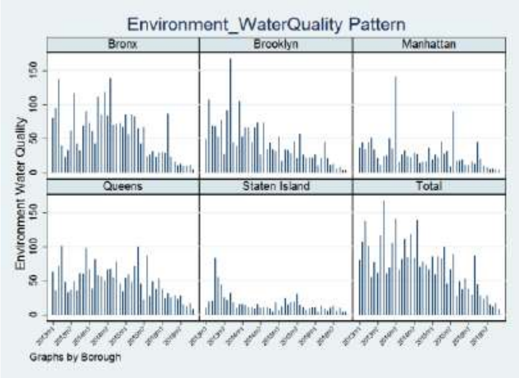
DOT/Infrastructure Conditions



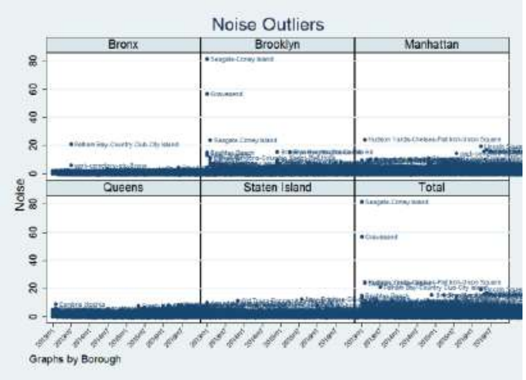


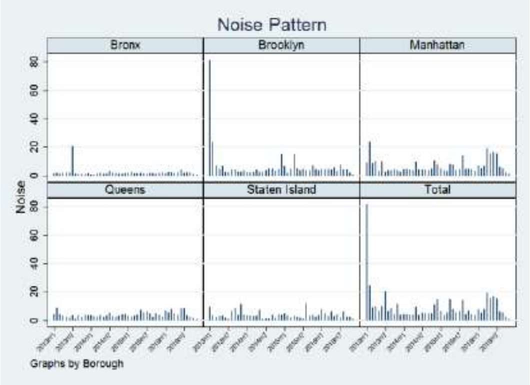
Environment Water Quality



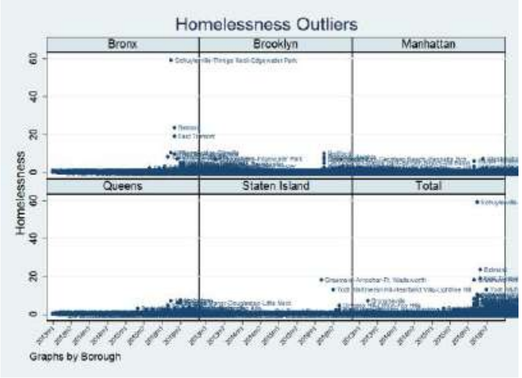


Noise

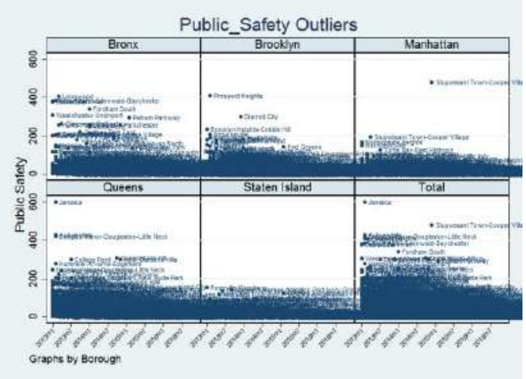


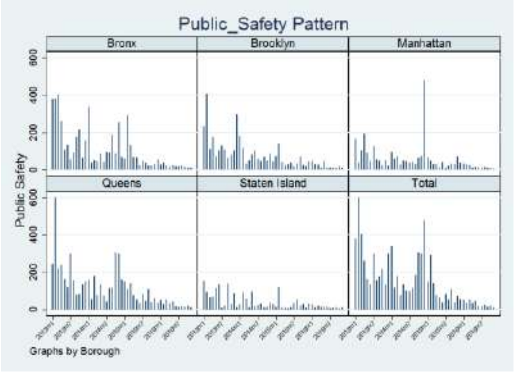


Homelessness

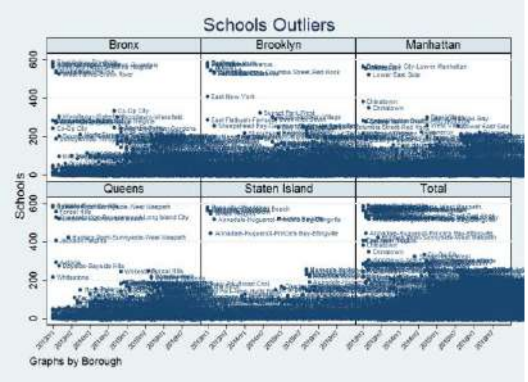


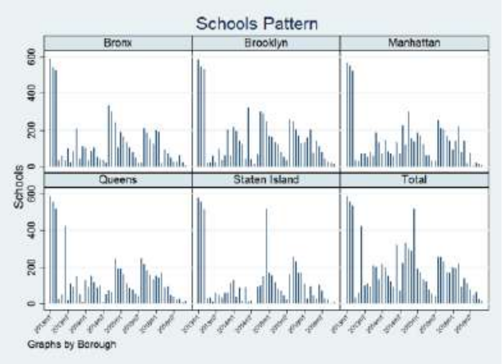
Public Safety



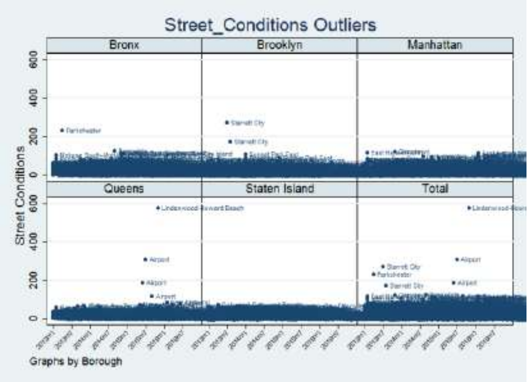


Schools

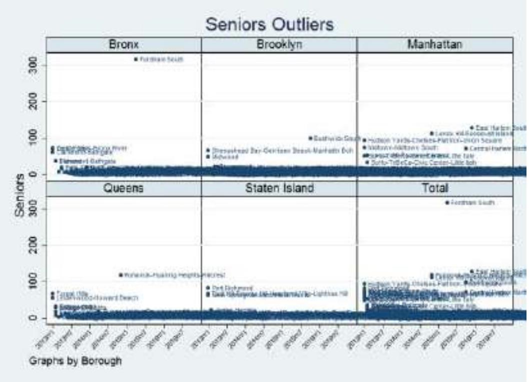


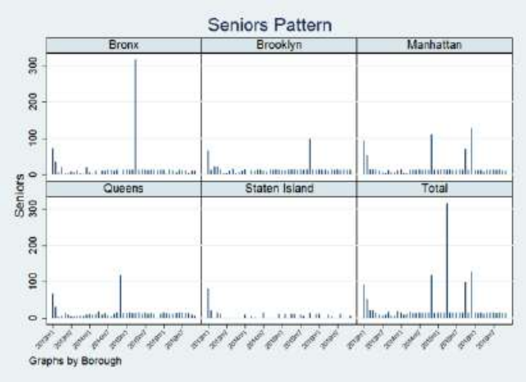


Street Conditions

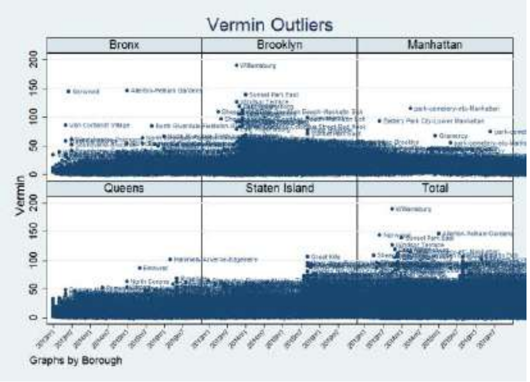


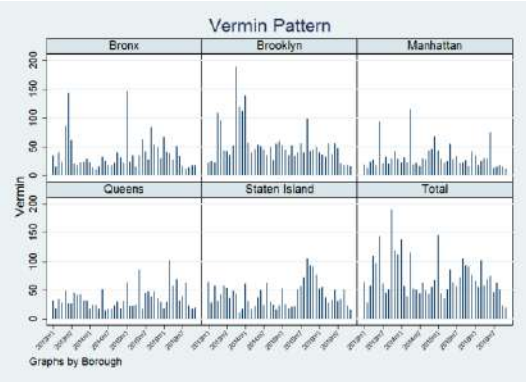
Seniors





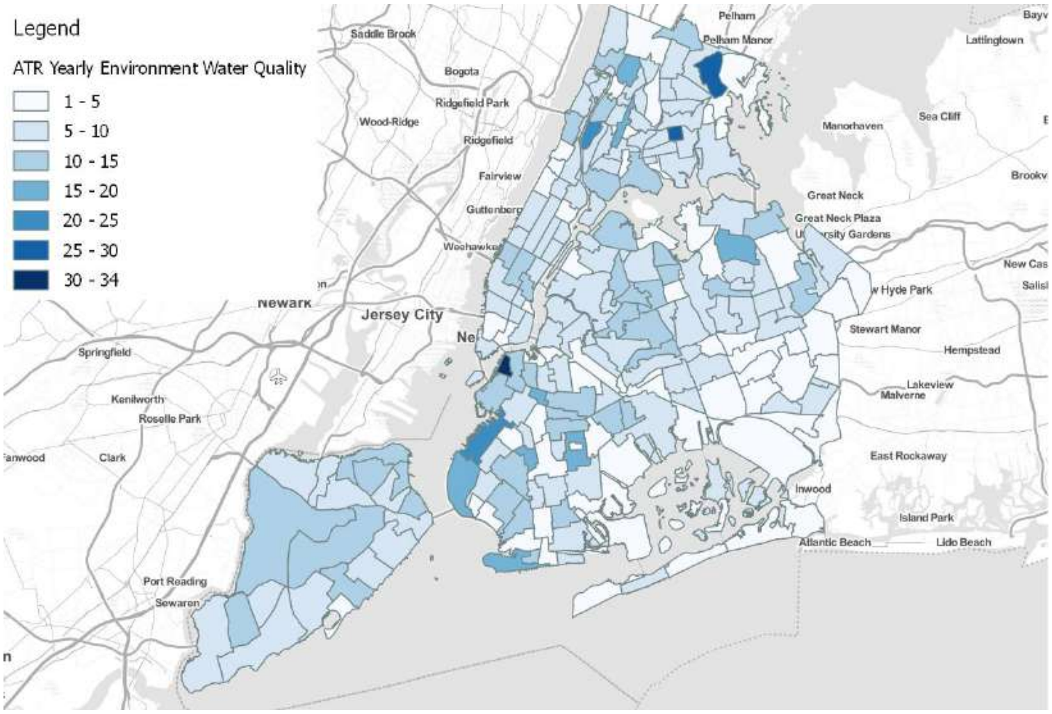
Vermin



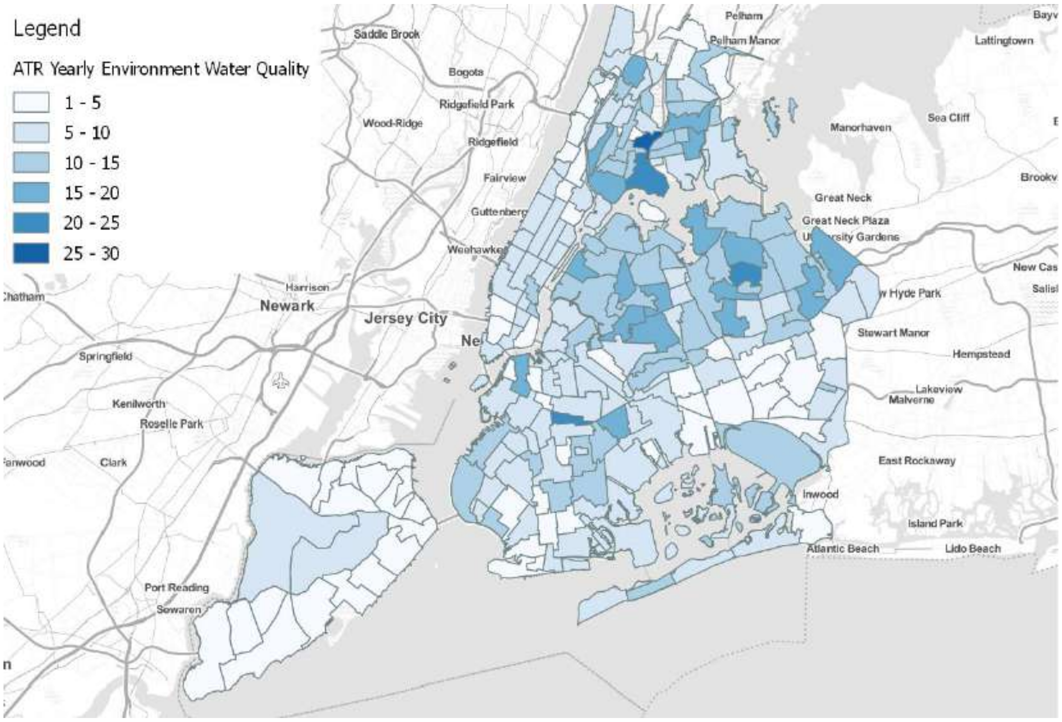


ADDENDUM: AVERAGE TIME TO RESOLVE COMPLAINTS BY YEAR (SELECTED TOPICS)

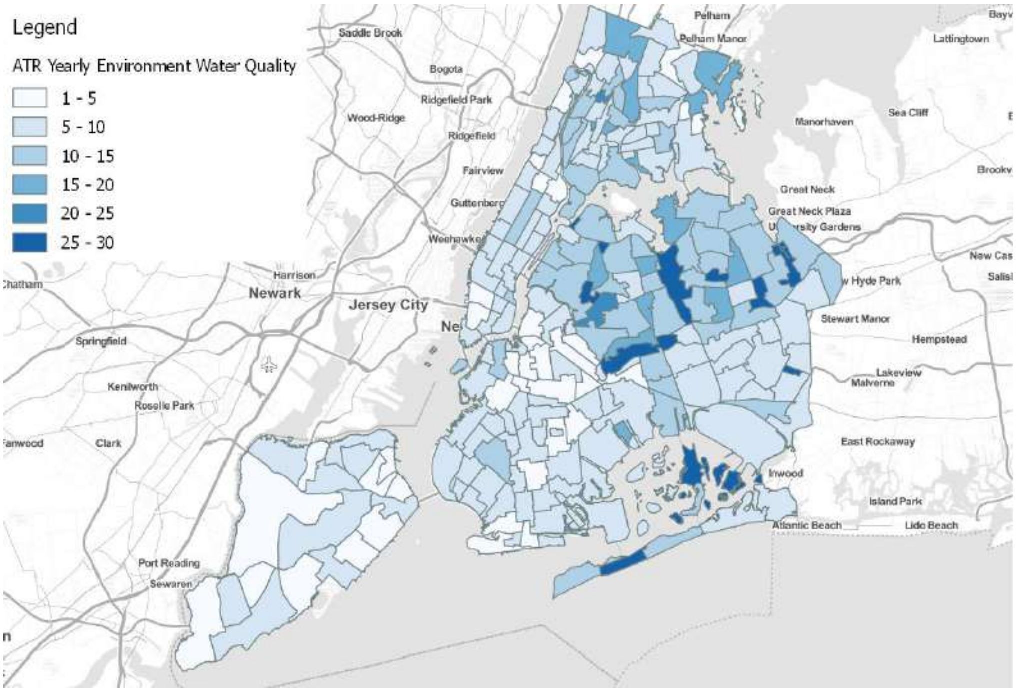
Environment Water Quality 2013



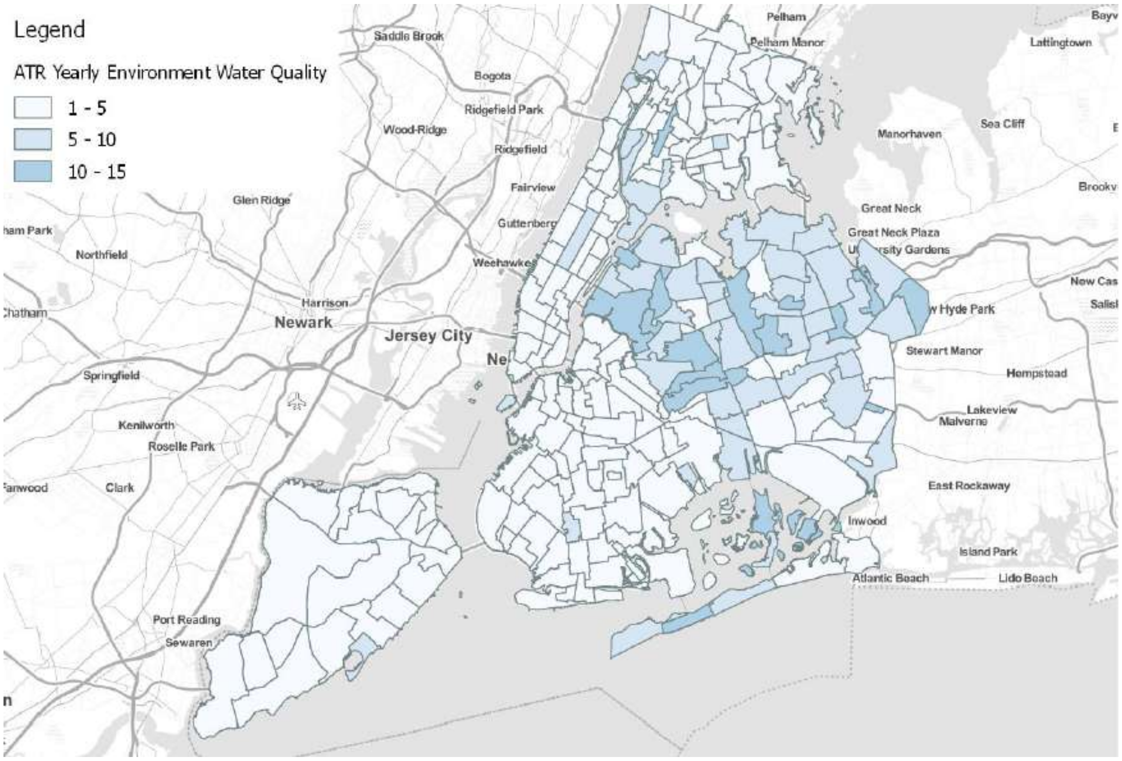
Environment Water Quality 2014



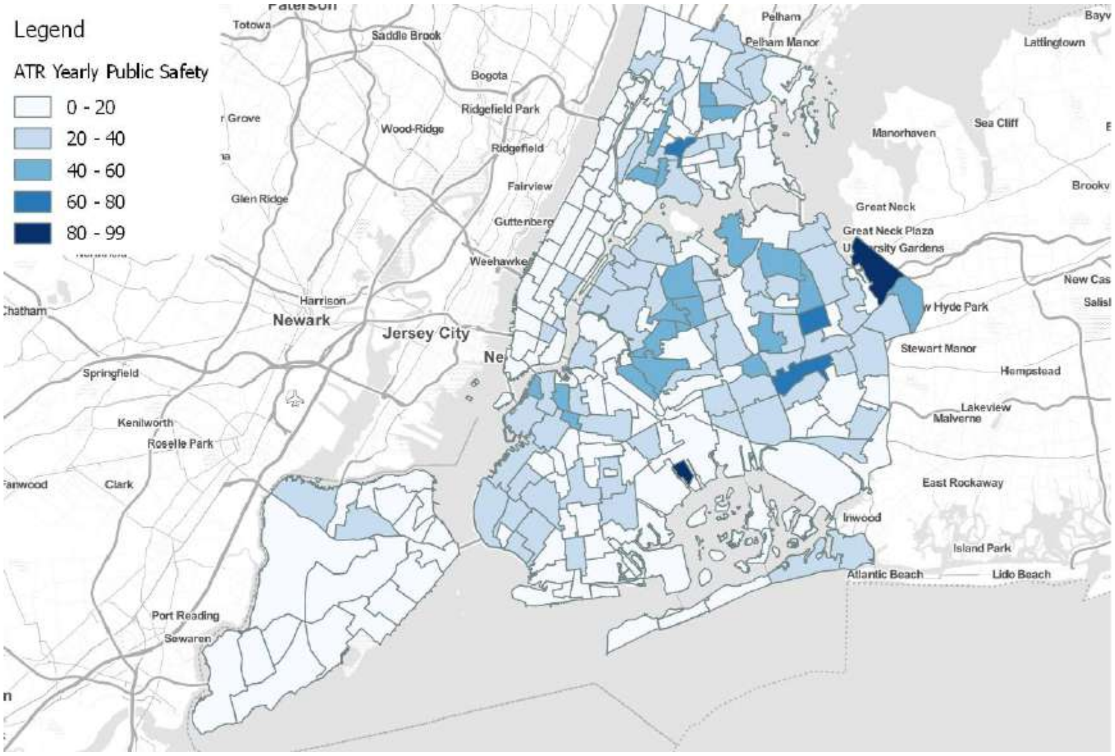
Environment Water Quality 2015



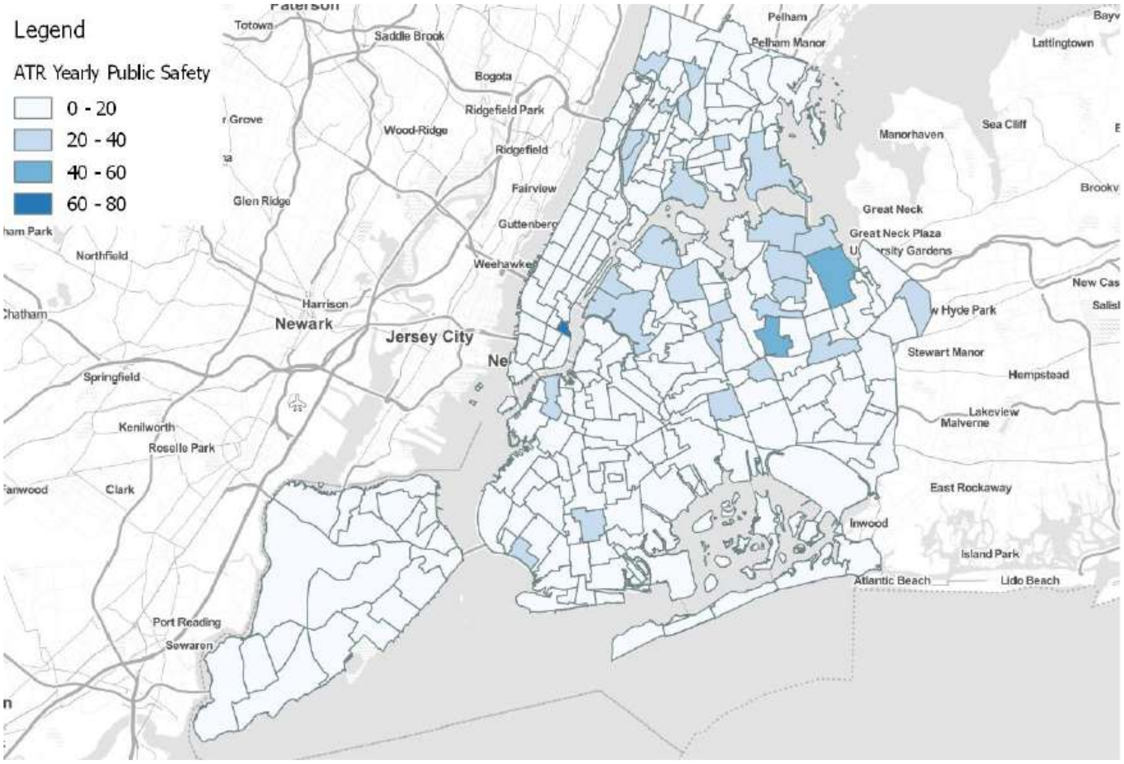
Environment Water Quality 2016



Public Safety 2013



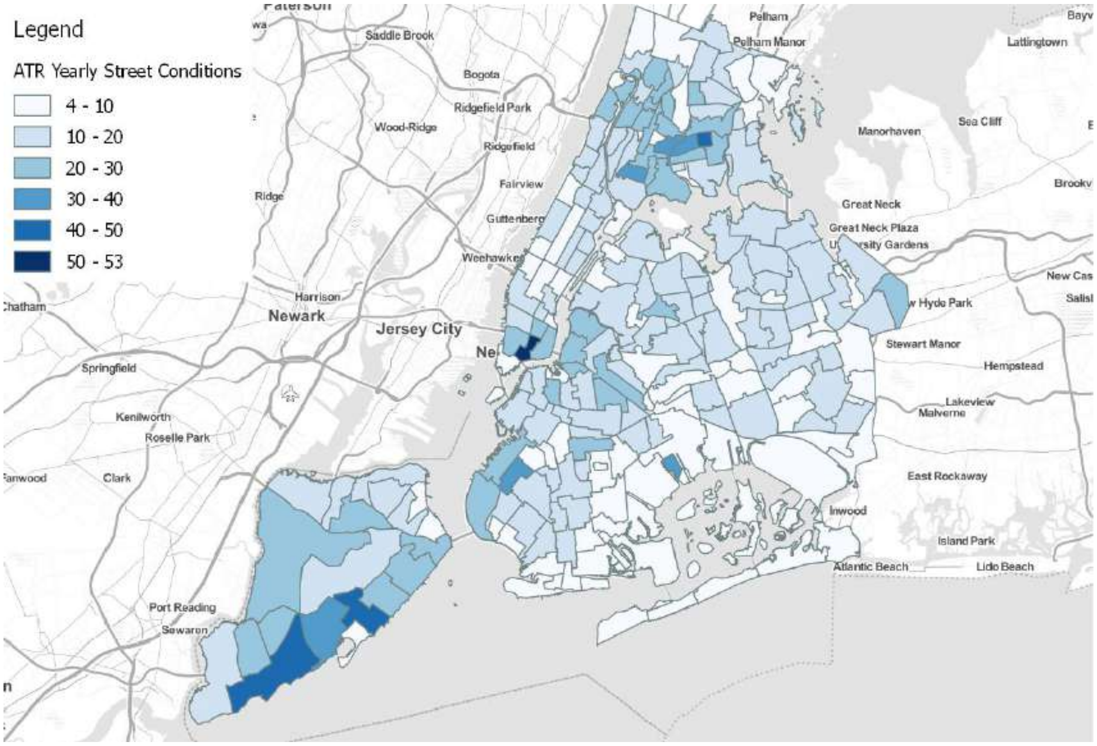
Public Safety 2014



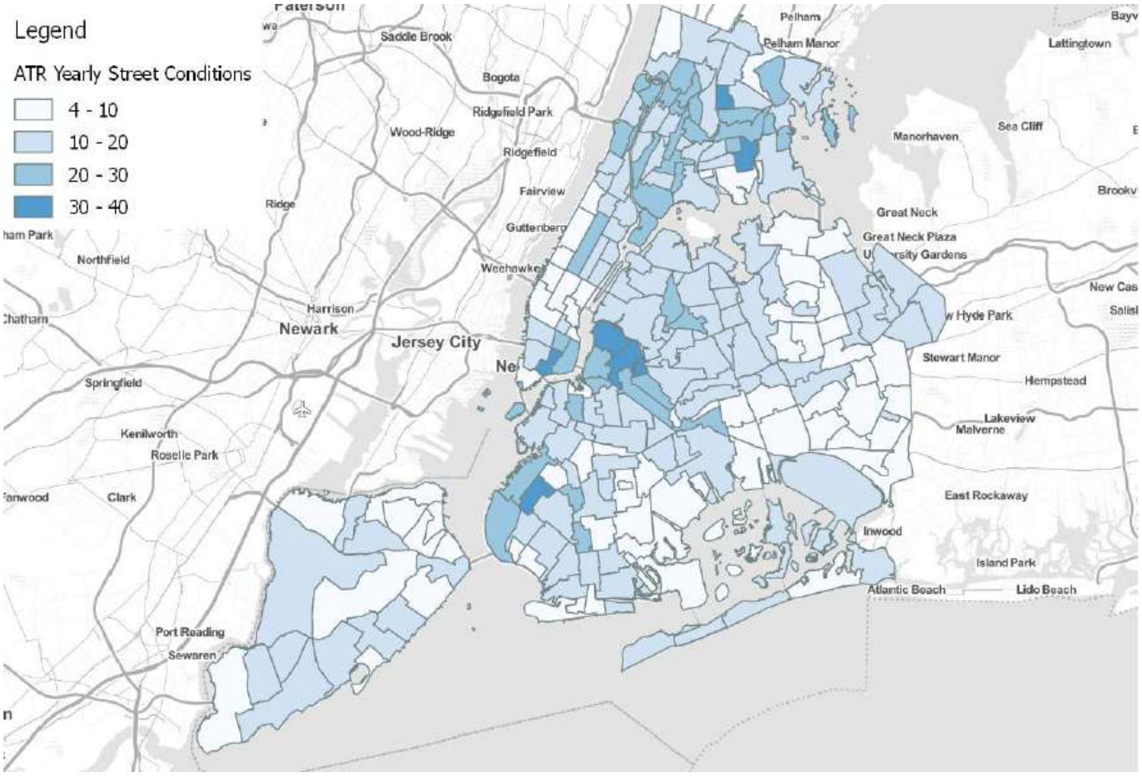
Public Safety 2015

Public Safety 2016

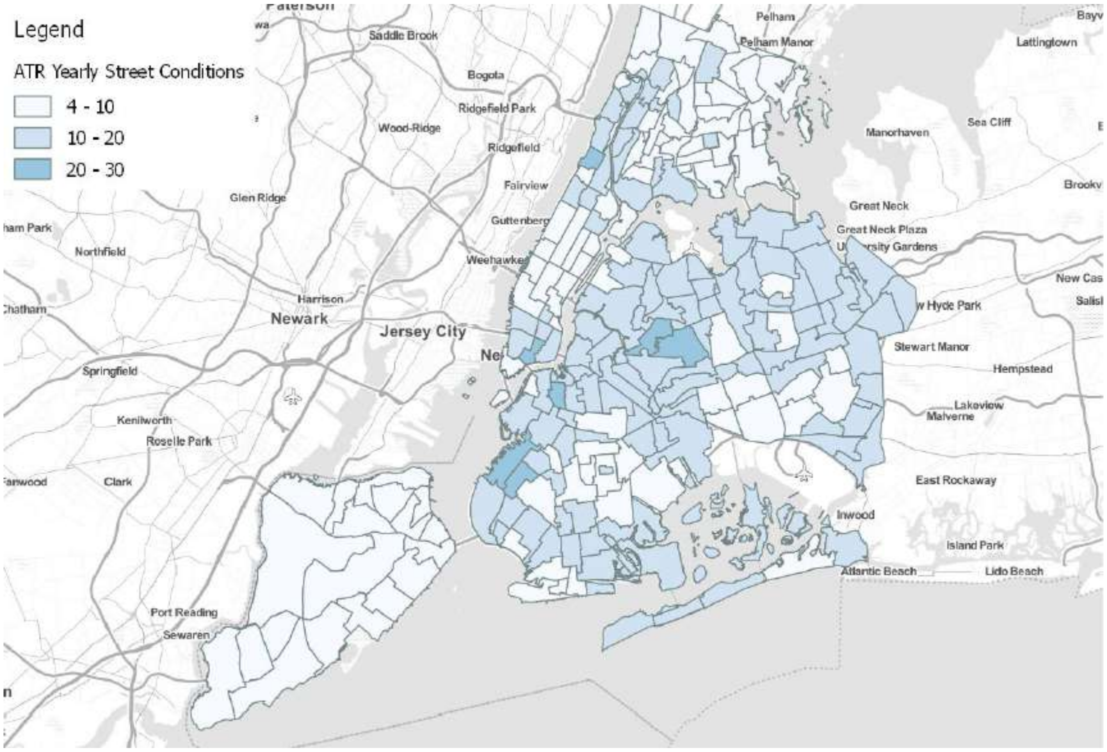
Street Conditions 2013



Street Conditions 2014

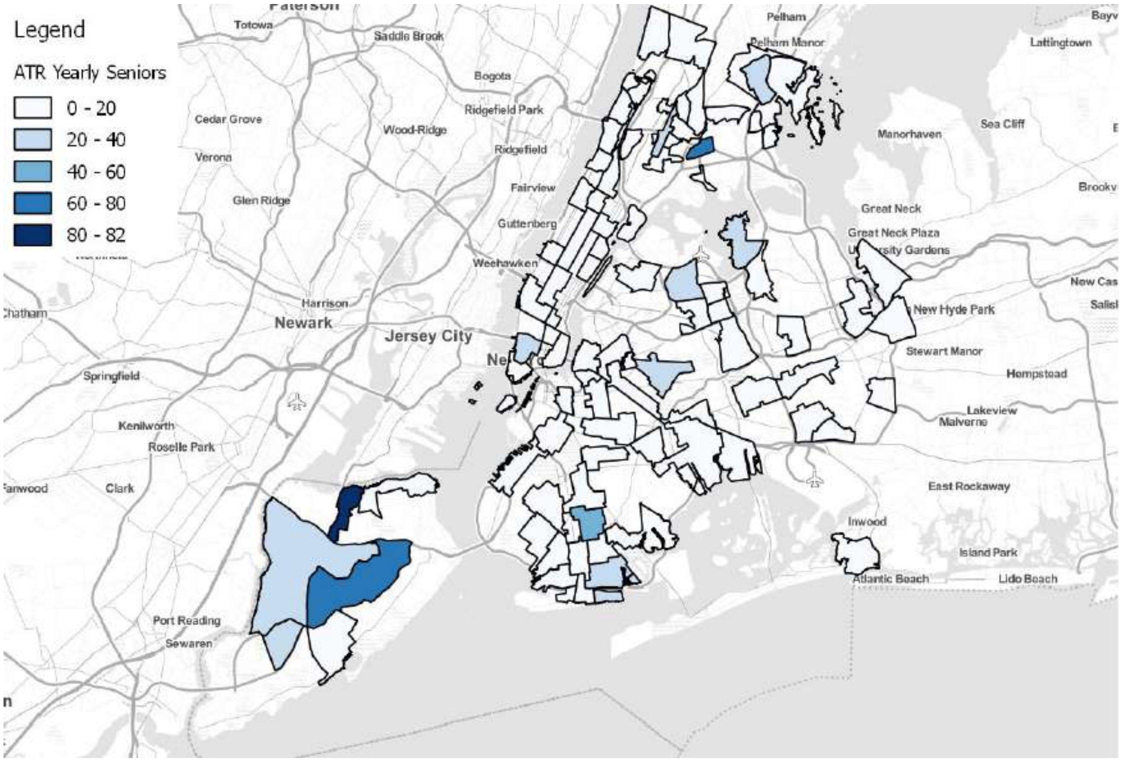


Street Conditions 2015

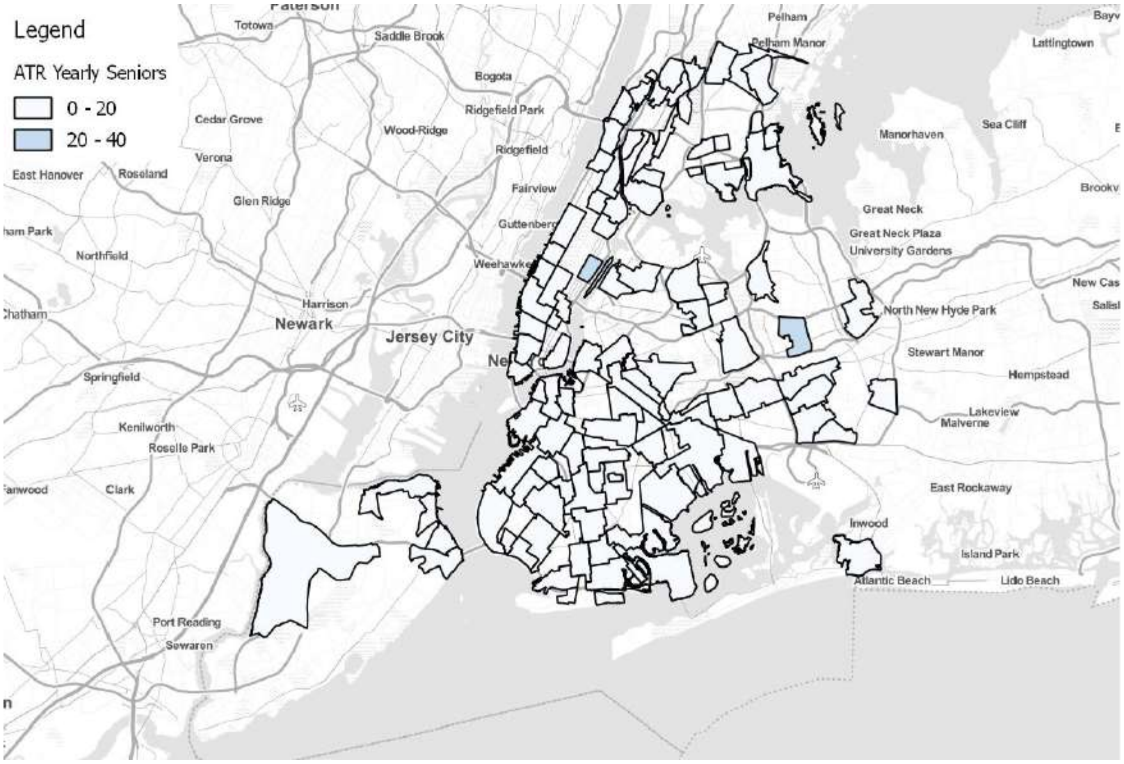


Street Conditions 2016

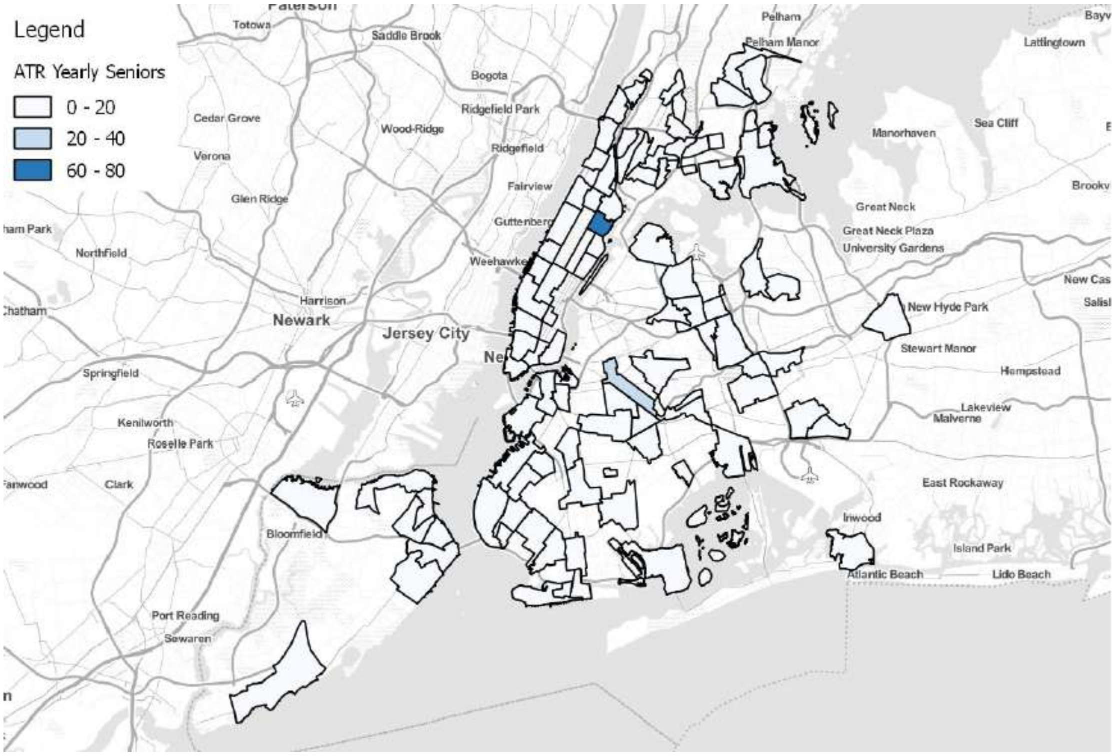
Seniors 2013



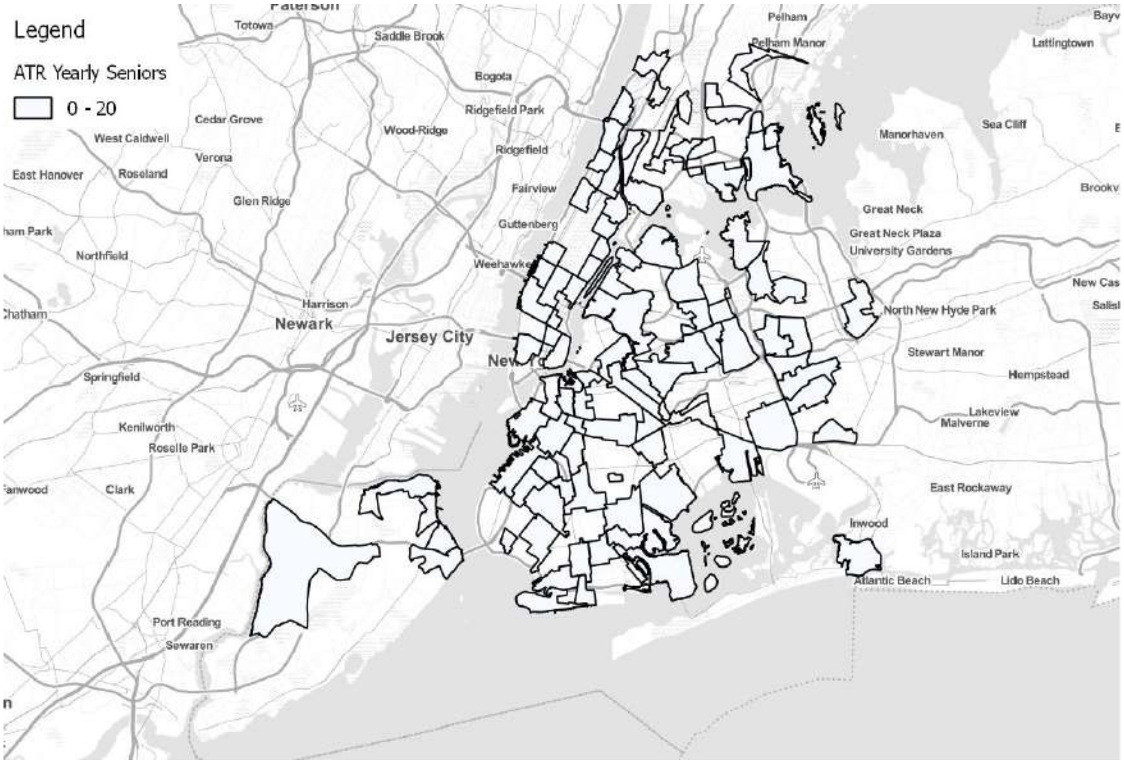
Seniors 2014



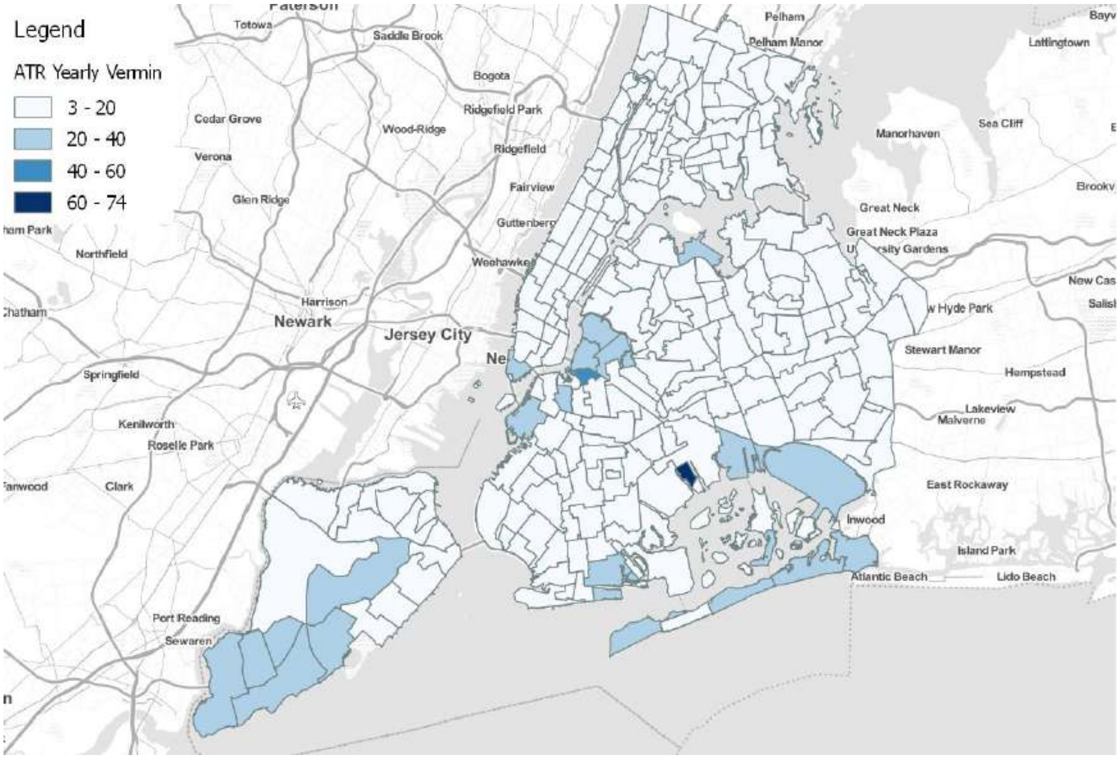
Seniors 2015



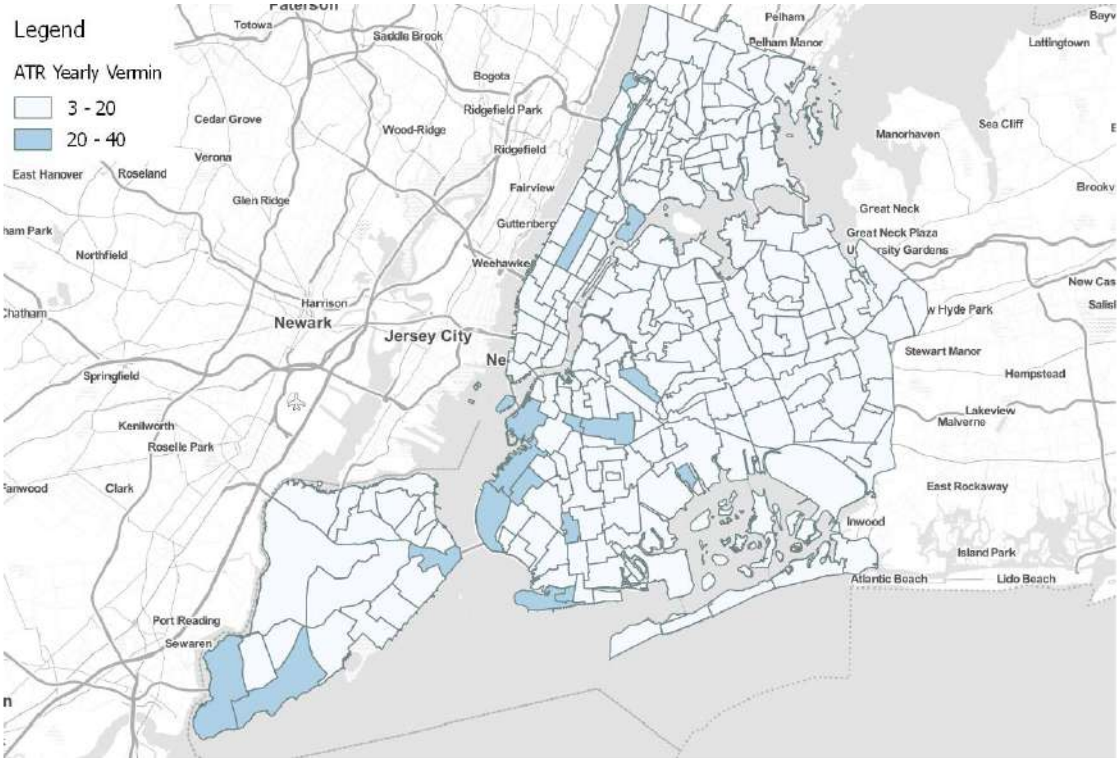
Seniors 2016



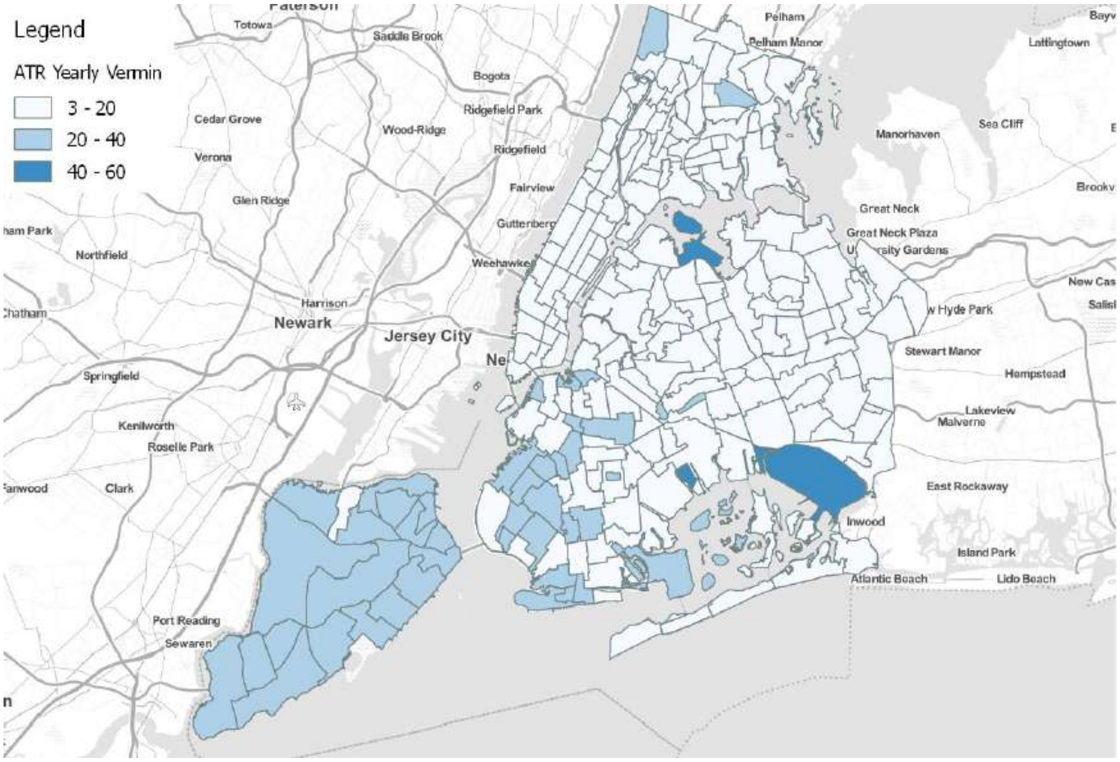
Vermin 2013



Vermin 2014



Vermin 2015



Vermin 2016

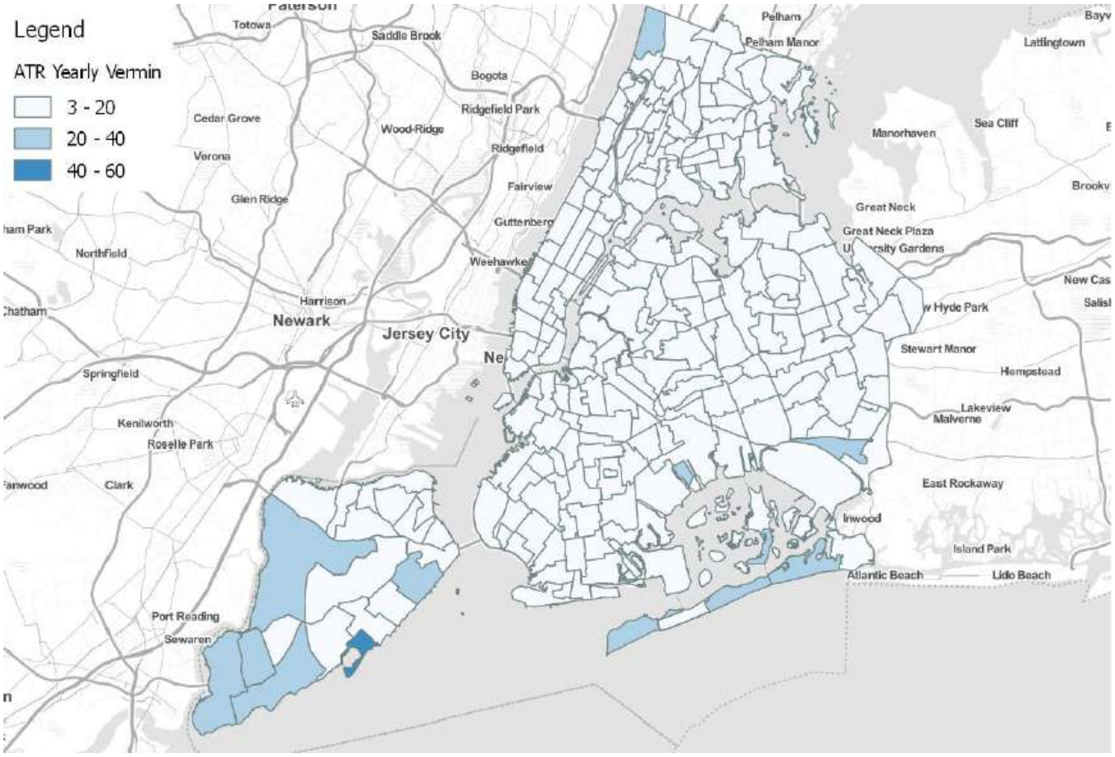


Table 1.1 Descriptive statistics, by topic and year

Variable	Obs	Mean	Std. Dev.	Min	Max
2013					
EWQ	194	9.209437	4.66957	1.625	34.14813
Public Safety	193	23.27896	16.52615	0.45	99.16666
Seniors	84	12.26589	15.5548	0	82
Street Conditions	194	16.67685	8.083231	4.641578	53.12992
Vermin	193	12.68559	7.93675	3.8	74.5
2014					
EWQ	195	9.621896	5.386222	0	37.67714
Public Safety	194	13.78233	9.031331	1.281061	64.66666
Seniors	96	8.768678	4.536383	0	35.875
Street Conditions	195	15.42711	6.809392	1	36.93301
Vermin	193	12.61309	5.813888	4.357143	36.91082
2015					
EWQ	195	9.35595	4.156922	0	27.91197
Public Safety	193	9.624527	4.985094	0	34.82669
Seniors	90	14.86235	32.92908	1	317
Street Conditions	194	12.65315	7.022074	1.375	69.67593
Vermin	194	15.82709	8.330577	5.566558	49
2016					
EWQ	195	5.319125	2.541878	0.5	14.58692
Public Safety	193	5.842858	2.497606	0	13.35713
Seniors	90	8.810895	3.466228	1	14
Street Conditions	195	8.70769	5.261111	2.617908	32.88496
Vermin	195	12.51165	5.416646	3.25	52

Dataset 1.1 Average time to resolve complaints by type and by neighborhood (Monthly, 2013-2016) Data file name: “q1_Global.csv”

Dataset 1.2 Average time to resolve complaints by type, by month and by neighborhood (Monthly, 2013-2016) Data file name: “q1.csv”

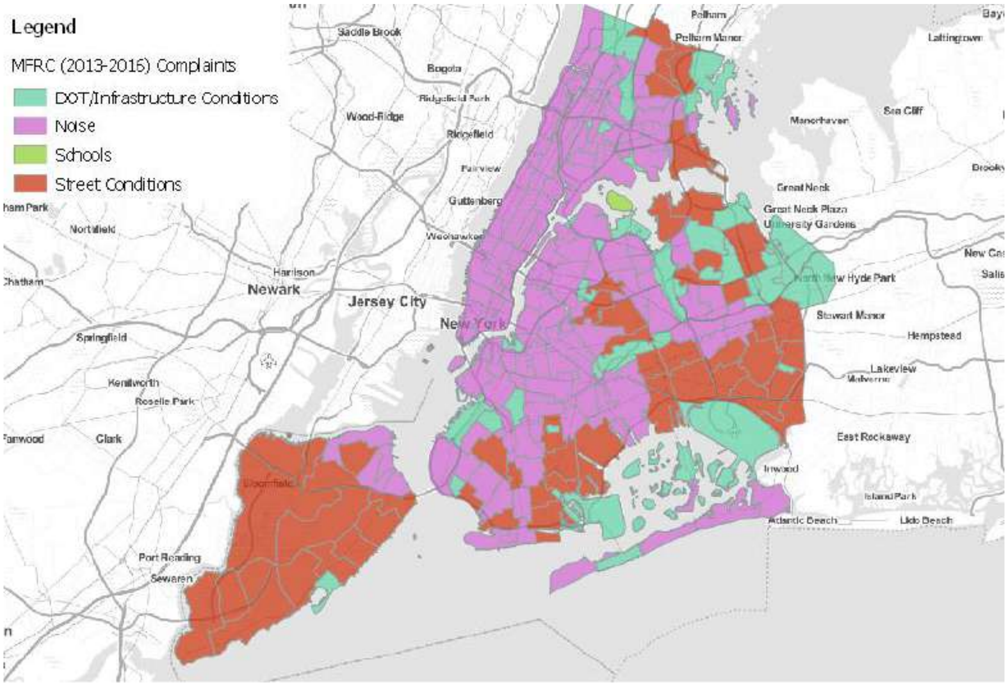
2. Frequent reoccurring complaints in same location (2013-now)

Geographic Analysis

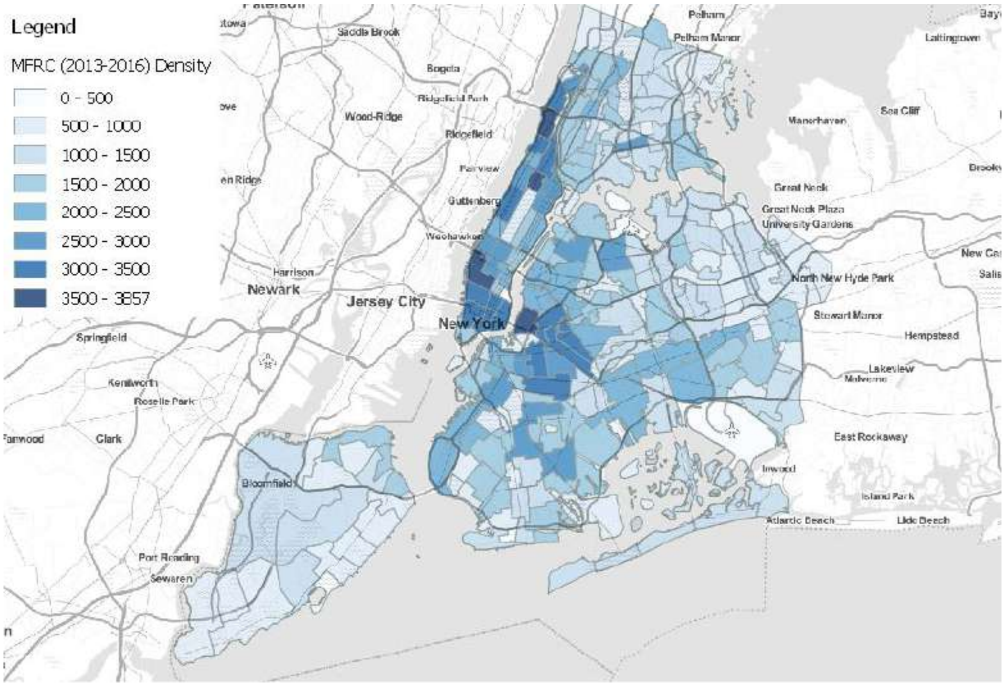
This section analyzes the most frequent reoccurring complaint in the same location using the total count of reoccurrences in the years 2013-2016 and by yearly averages in the same period. See the Methodological Report for the definition and operationalization of a reoccurrence.

Next three maps show the most frequent reoccurring complaints in the neighborhoods. The first map illustrates only the most frequent reoccurring complaint observed. The second map illustrates only the frequency in which the most frequently reoccurring complaint was reported (density is measured in number of 311 calls). The third map is a combination of the previous two: an illustration of the most frequent reoccurring complaint, and the representative colors for each complaint are weighted by the complaint's reoccurrence frequency (where the brightest version represent less frequency and the darkest more frequency).

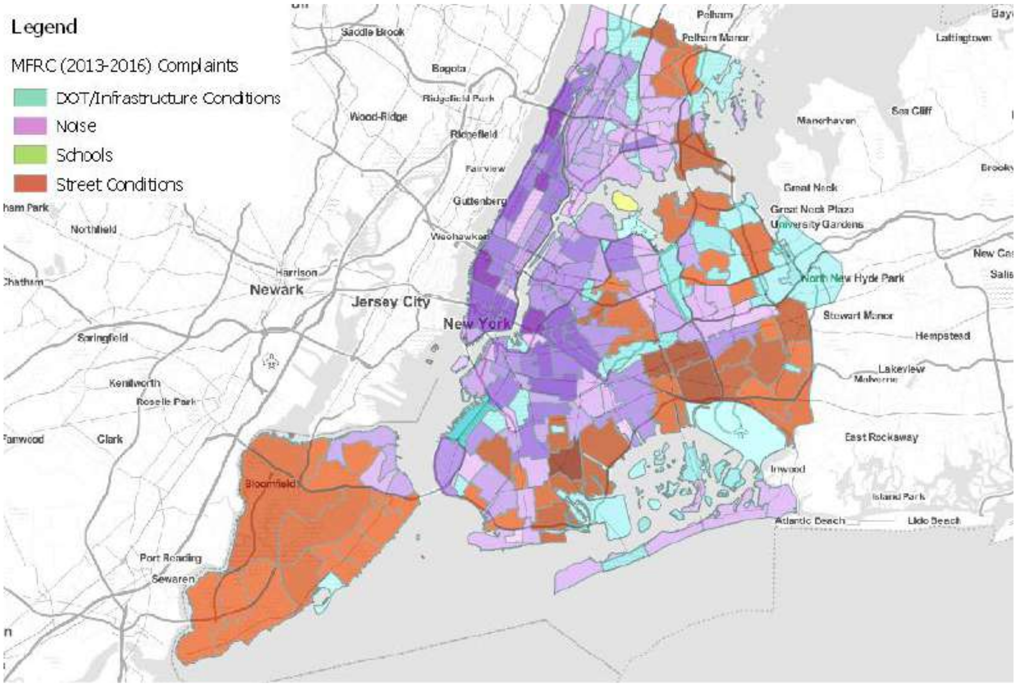
Most Frequent Reoccurring Complaint



Frequency of 311 Calls for the Most Frequent Reoccurring Complaint

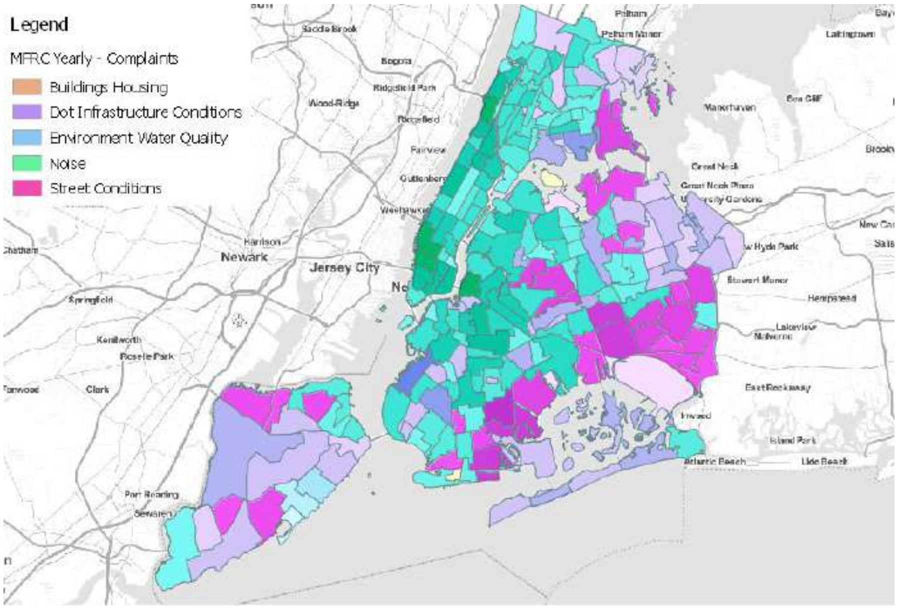


Most Frequent Reoccurring Complaint, by Density

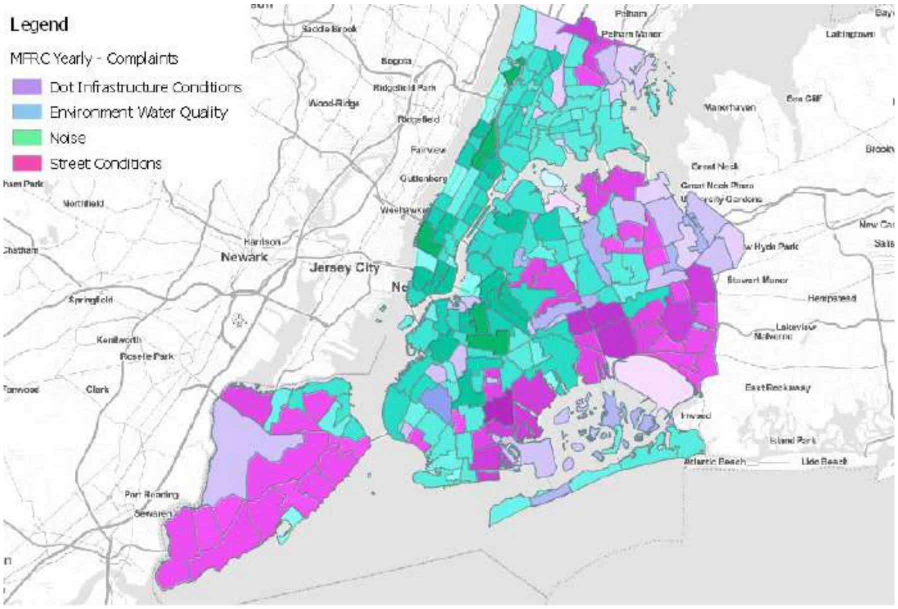


Next four maps seek to illustrate the yearly trends in most frequently reoccurring complaint by neighborhood. These are maps with combined layers, where the representative colors for each complaint are weighted by the complaint's reoccurrence frequency (where the brightest version represent less frequency and the darkest more frequency).

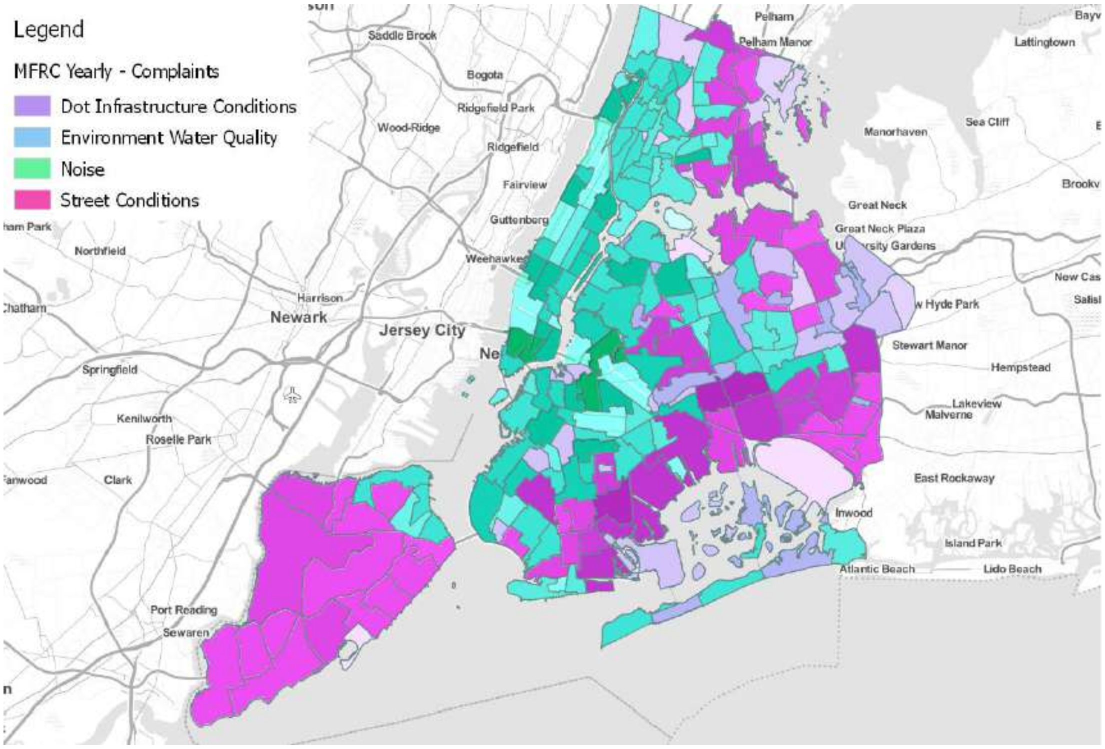
2013



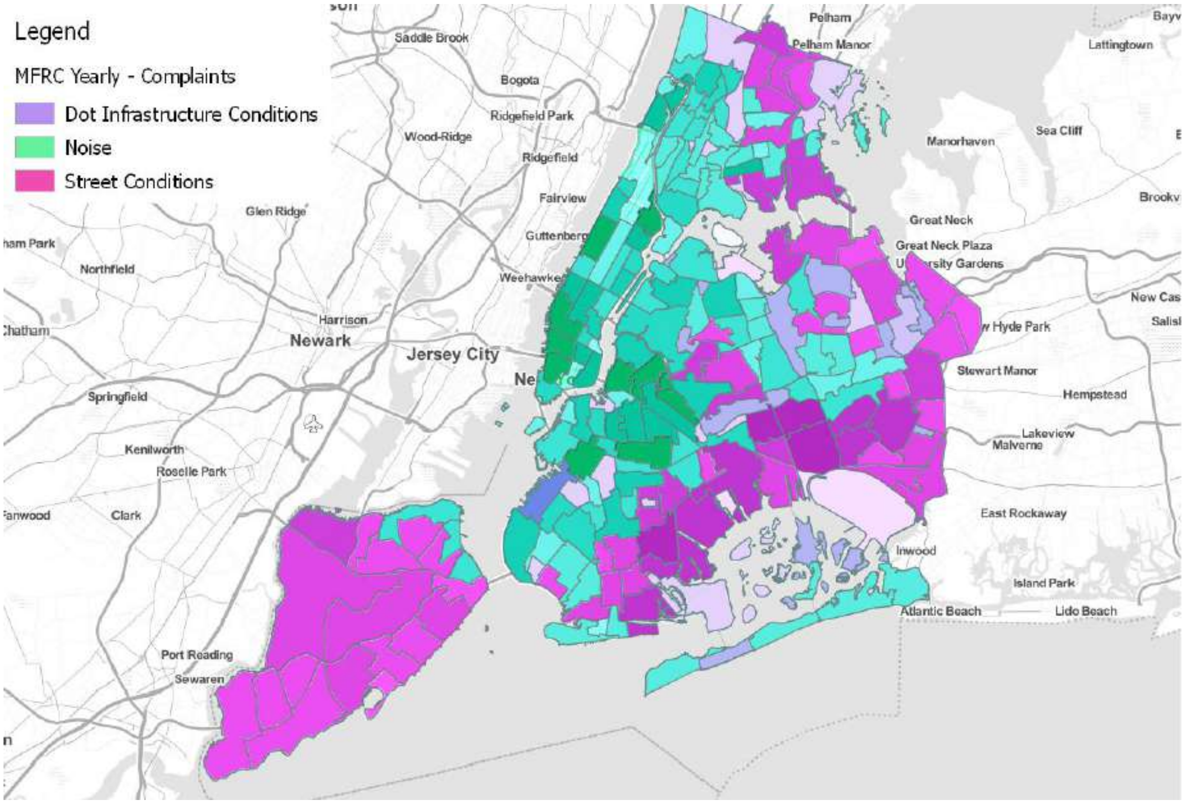
2014



2015


Legend
MFRC Yearly - Complaints
Dot Infrastructure Conditions
Environment Water Quality
Noise
Street Conditions
Saddle Brook
Bogota
Pelham
Pelham Manor
Lattingtown
Ridgefield Park
Wood-Ridge
Ridgefield
Manorhaven
Sea Cliff
Fairview
Guttenberg
Weehawken
Great Neck
Great Neck Plaza
University Gardens
Northfield
Harrison
Newark
Jersey City
Chatham
New Hyde Park
Stewart Manor
Hempstead
Springfield
Lakeview
Malverne
Kenilworth
Roselle Park
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

2016


Legend
MFRC Yearly - Complaints
Dot Infrastructure Conditions
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Street Conditions
Saddle Brook
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Pelham
Pelham Manor
Lattingtown
Ridgefield Park
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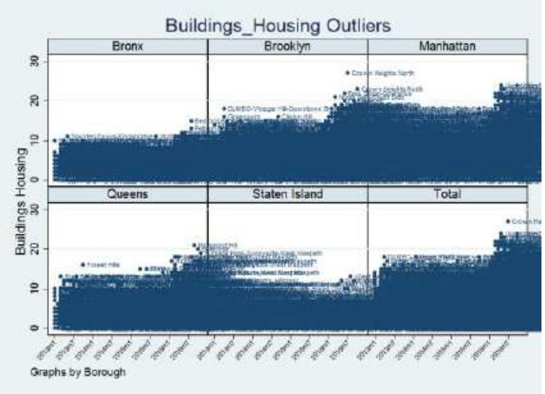
Lakeview
Malverne
Kenilworth
Roselle Park
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

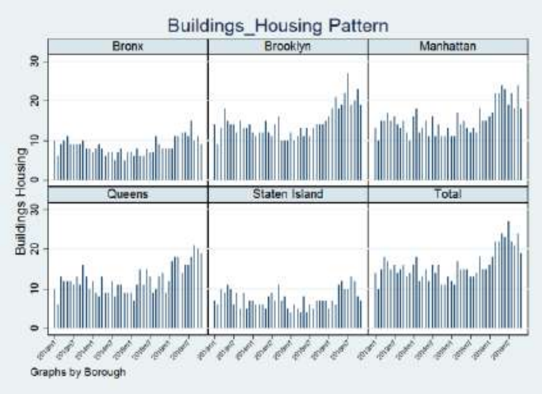
Time Series Analysis

This section analyzes the patterns of the monthly reoccurrence frequency by complaint over the period 2013-2016. Each complaint is analyzed by a set of two graphs at the Borough level. The first Graph (Pattern) shows the pattern of the monthly reoccurrence frequency per borough, whereas the second (outliers) seeks to identify which are the neighborhoods with the highest reoccurrence frequency per complaint and per month.

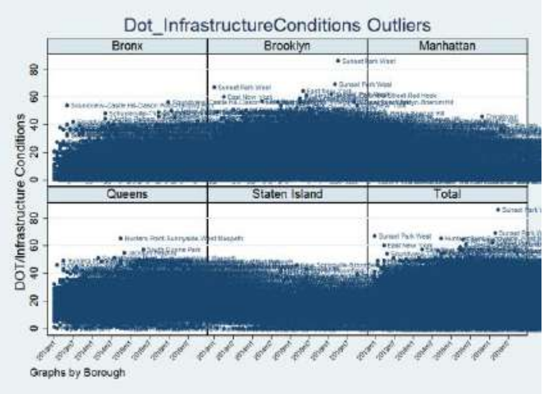
This report shows only the graphs for the most frequent reoccurring complaints. To analyze the trends for the rest of the reoccurring complaints, see .png files in Appendix 2. Look for the files with prefix “z2” for the general trends by Borough as presented here. Look for the files with prefix “z92” for graphs with frequency of complaint reoccurrence for all neighborhoods.

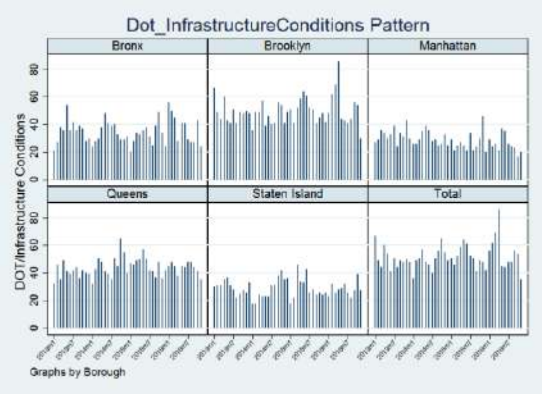
Building Housing



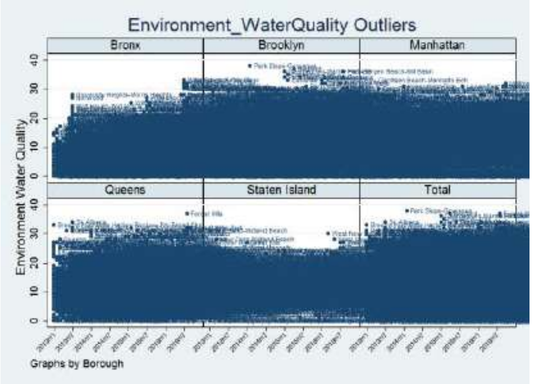


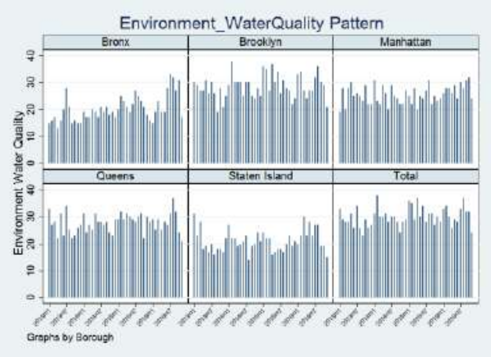
DOT/Infrastructure Conditions



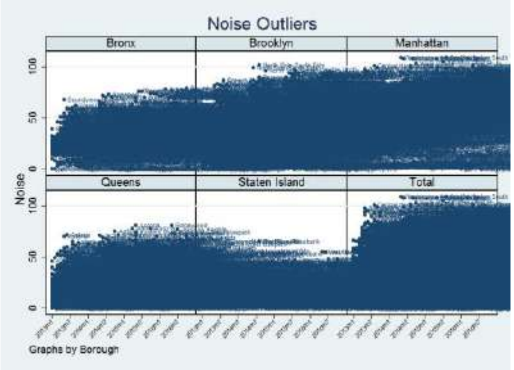


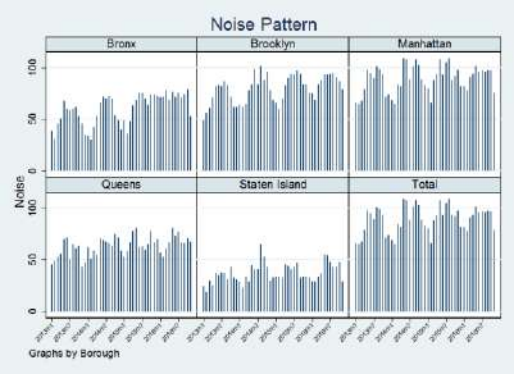
Environment Water Quality



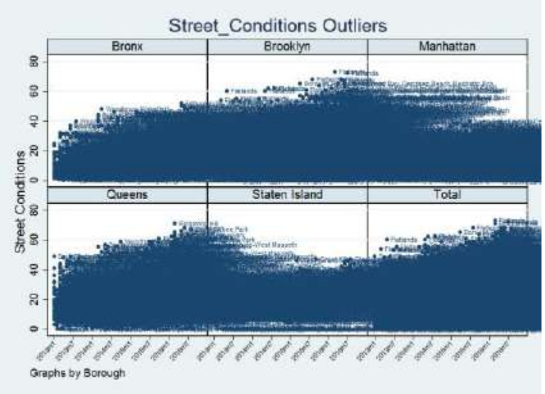


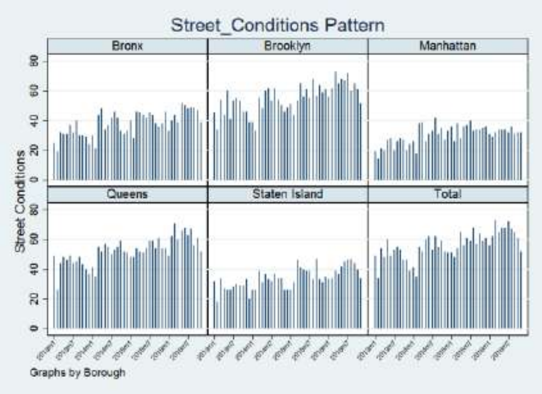
Noise





Street Conditions





Dataset 1.1 Number of reoccurred complaints in the same location (Monthly, 2013-2016) Data file name: “q2.csv”

Dataset 1.2 Number of reoccurred complaints in the same location Global Average (2013-2016) Data file name: “q2_Global.csv”

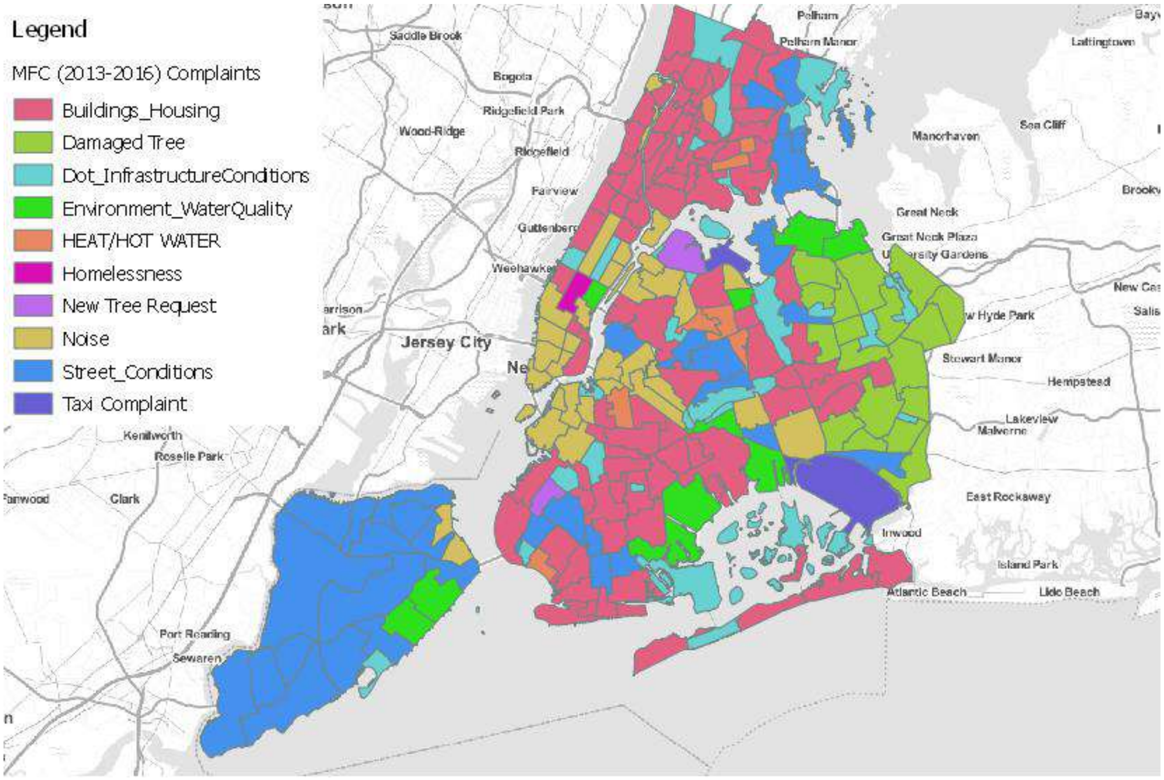
Dataset 1.3 Reoccurring complaint density by type, by year and by neighborhood (2013-2016) Data file name: “q2_Yearly.csv”

3. Most frequent complaint type by neighborhood (2013-now)

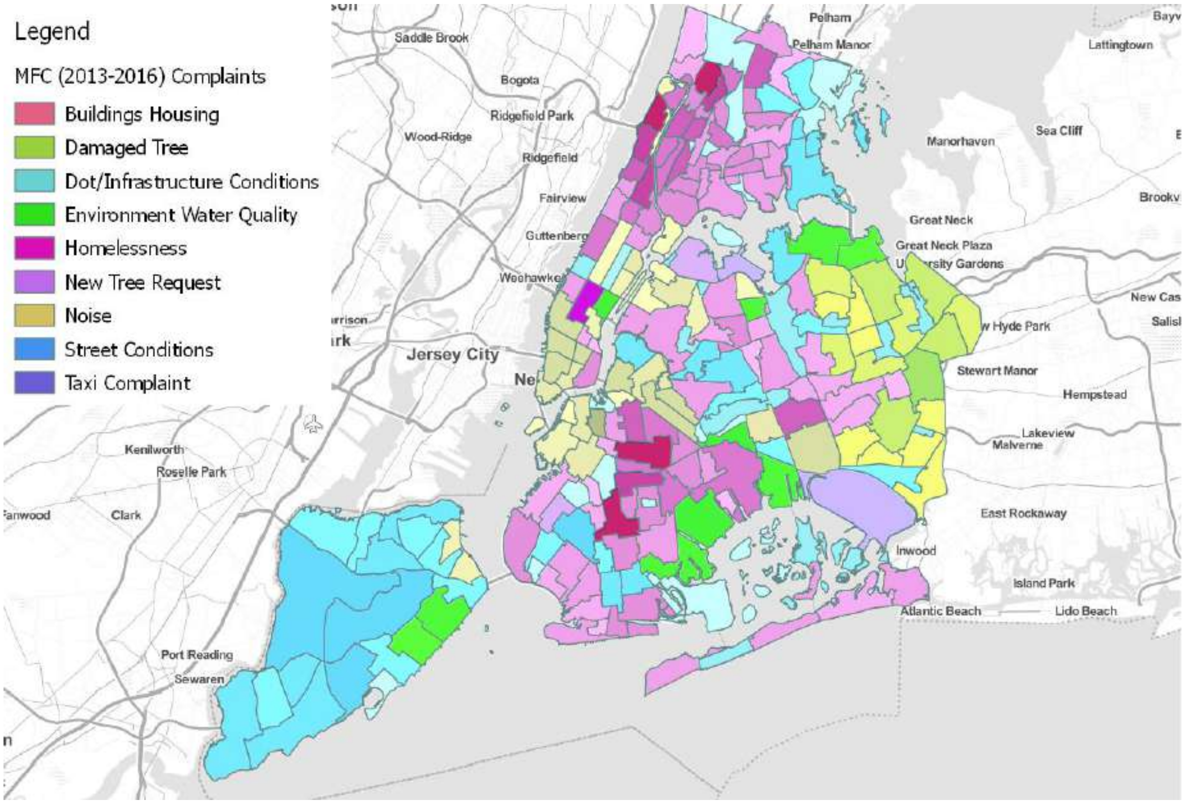
Geographic Analysis

This section analyzes the <u>most frequent complaint type by neighborhood</u> using the total count of complaints in the years 2013-2016 and by yearly averages in the same period. Next two maps show the most frequent complaints in the neighborhoods. The first map illustrates only the most frequent reoccurring complaint observed in the neighborhoods. The second map illustrates the most frequent complaint by neighborhood, and the representative colors for each complaint are weighted by the complaint's frequency (where the brightest version represent less frequency and the darkest more frequency).

Most Frequent Complaint type by Neighborhood

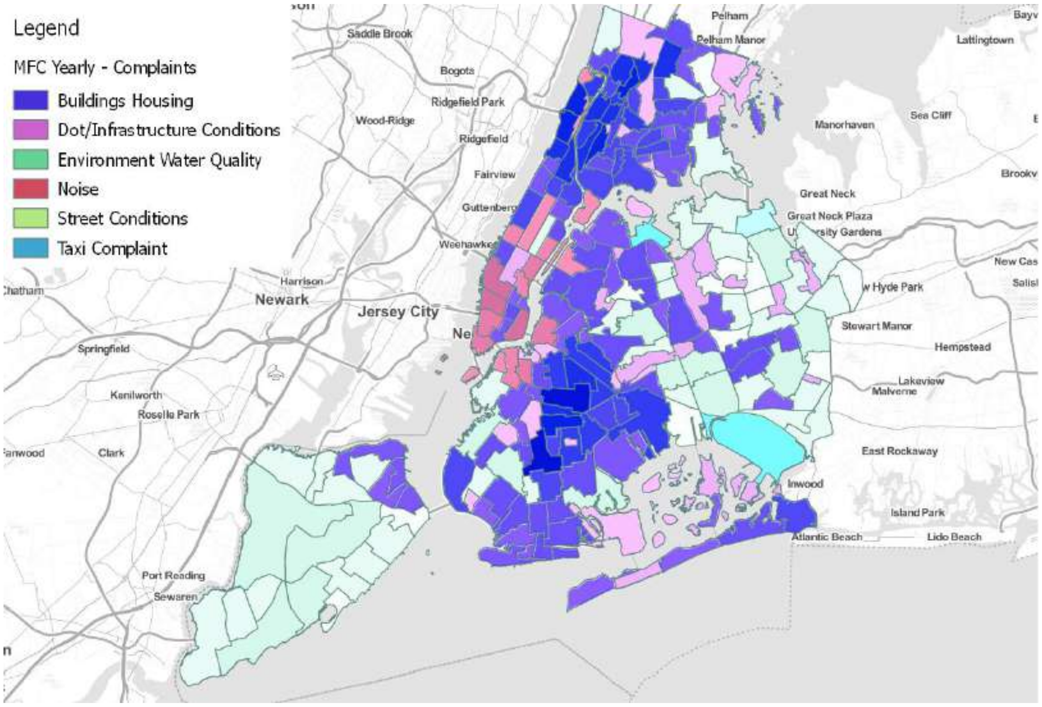


Most Frequent Complaint type by Neighborhood, by Density



Next six maps seek to illustrate the yearly trends in most frequently complaint by neighborhood. These are maps with combined layers, where the representative colors for each complaint are weighted by the complaint's frequency (where the brightest version represent less frequency and the darkest more frequency).

2011


Legend
MFC Yearly - Complaints
Buildings Housing
Dot/Infrastructure Conditions
Environment Water Quality
Noise
Street Conditions
Taxi Complaint
Saddle Brook
Pelham
Pelham Manor
Lattingtown
Bogota
Ridgefield Park
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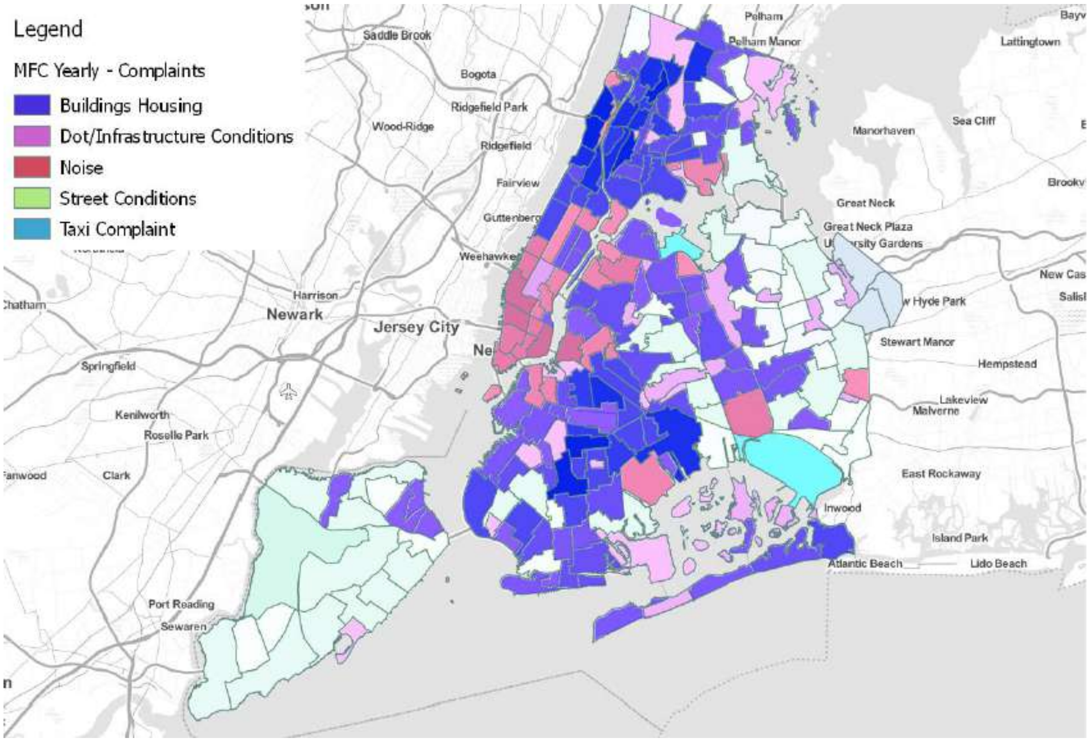
Ridgefield
Manorhaven
Sea Cliff
Fairview
Guttenberg
Weehawken
Great Neck
Great Neck Plaza
University Gardens
Harrison
Newark
Jersey City
Chatham
Springfield
Kenilworth
Roselle Park
Fanwood
Clark
Port Reading
Sewaren
Stewart Manor
Hempstead
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

2012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MFC Yearly - Complaints
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Dot/Infrastructure Conditions
Noise
Street Conditions
Taxi Complaint
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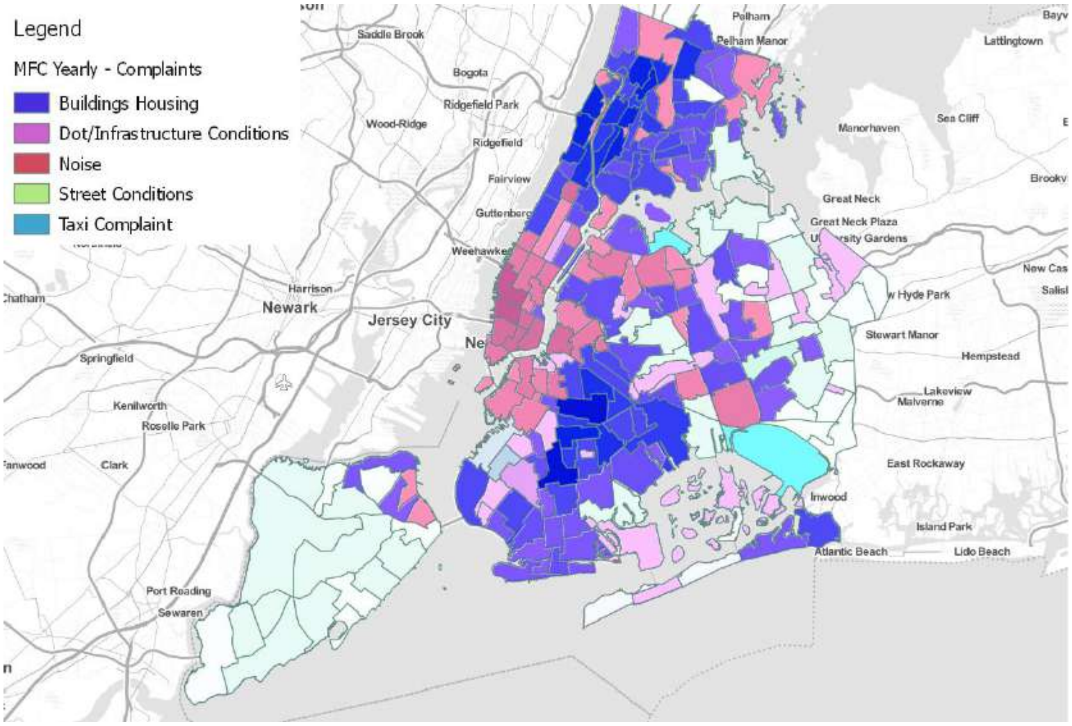
Guttenberg
Weehawken
Great Neck
Great Neck Plaza
University Gardens
Harrison
Newark
Jersey City
Chatham
Springfield
Kenilworth
Roselle Park
Fanwood
Clark
Port Reading
Sewaren
Stewart Manor
Hempstead
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

2013


Legend
MFC Yearly - Complaints
Buildings Housing
Dot/Infrastructure Conditions
Noise
Street Conditions
Taxi Complaint
Saddle Brook
Pelham
Pelham Manor
Lattingtown
Bogota
Ridgefield Park
Wood-Ridge
Ridgefield
Sea Cliff
Manorhaven
Fairview
Brookv
Great Neck
Guttenberg
Great Neck Plaza
University Gardens
Weehawken
New Cas
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Stewart Manor
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Kenilworth
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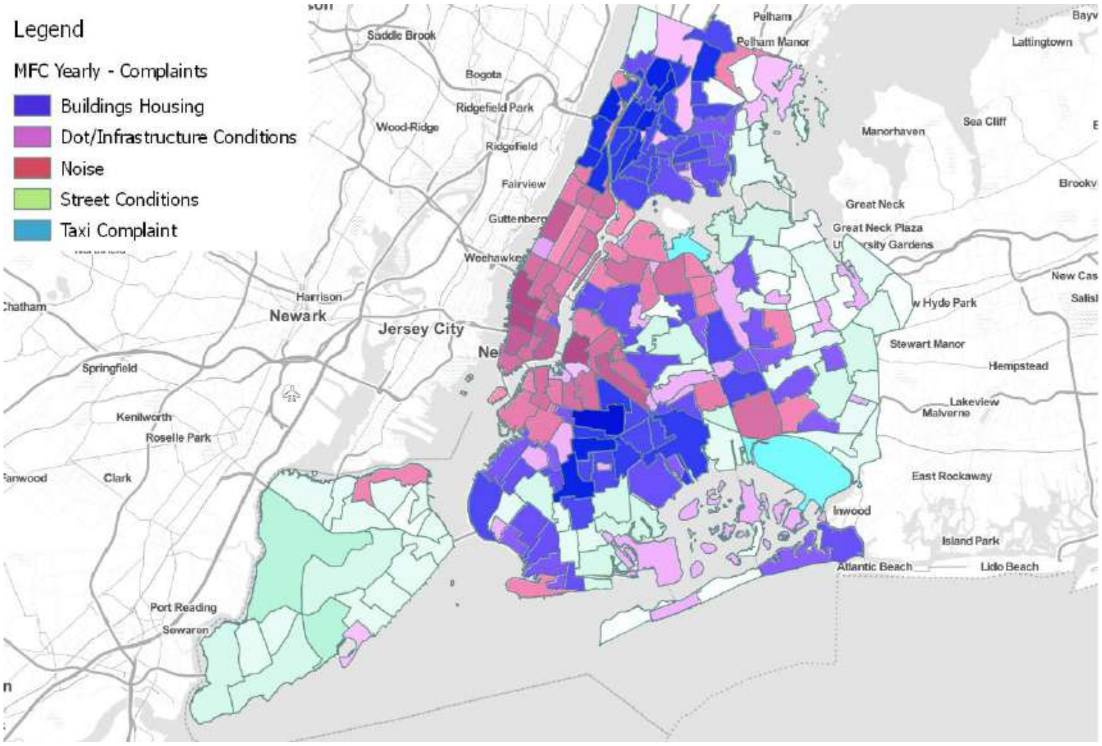
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

2014


Legend
MFC Yearly - Complaints
Buildings Housing
Dot/Infrastructure Conditions
Noise
Street Conditions
Taxi Complaint
Saddle Brook
Pelham
Pelham Manor
Lattingtown
Bogota
Ridgefield Park
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Kenilworth
Roselle Park
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Malverne
Fanwood
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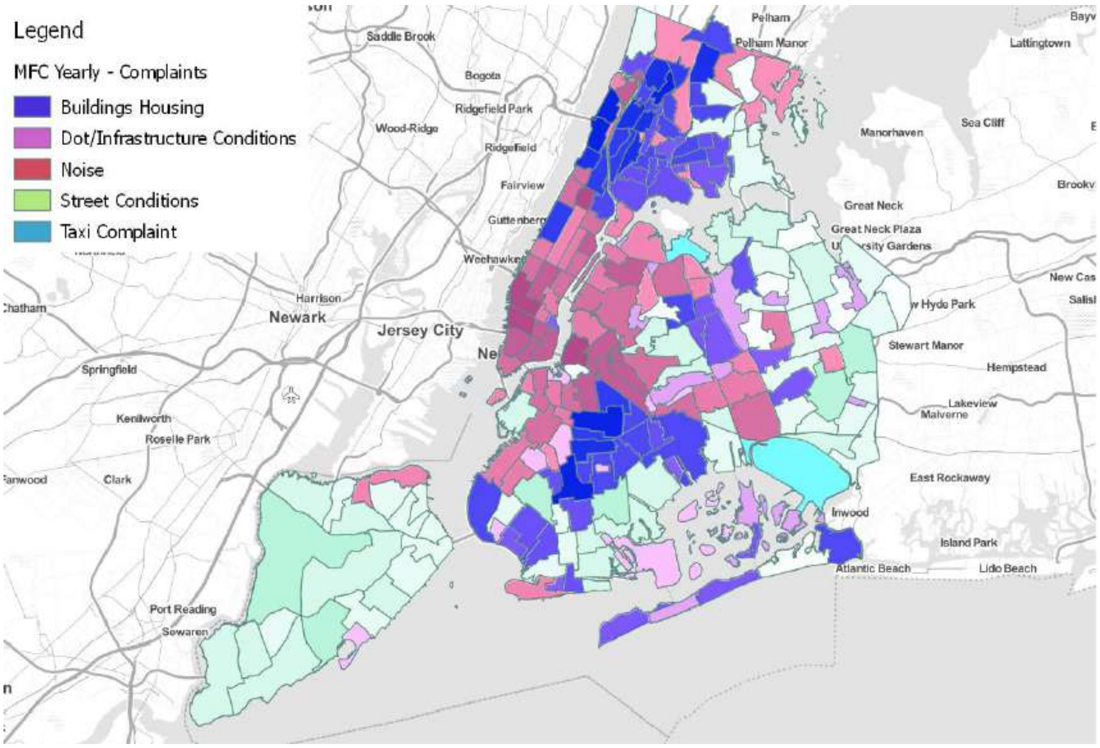
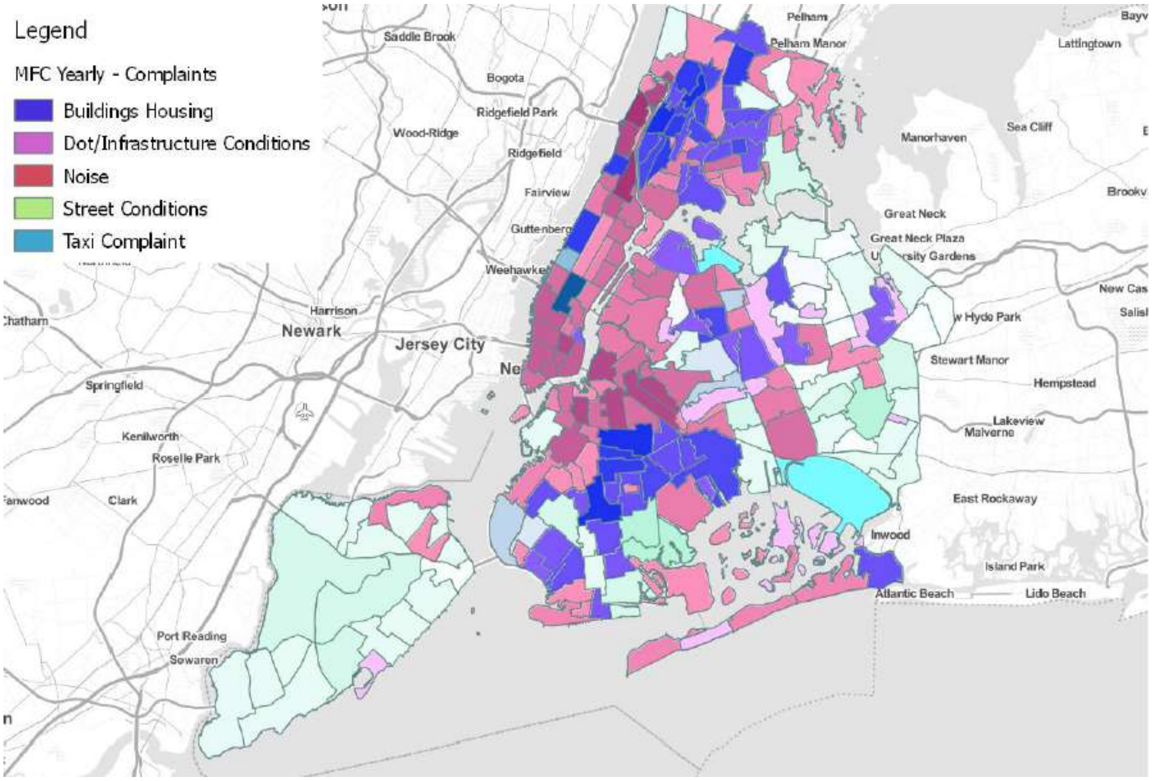
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

2015



2016

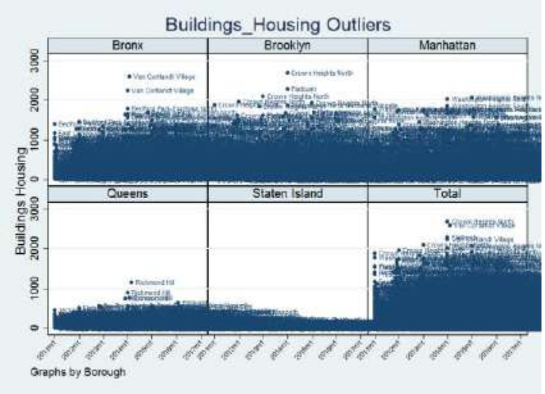


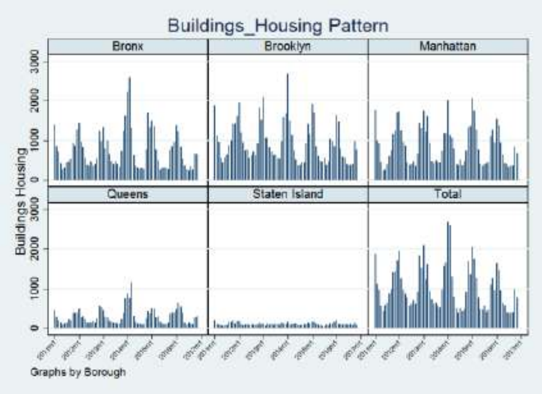
Time Series Analysis

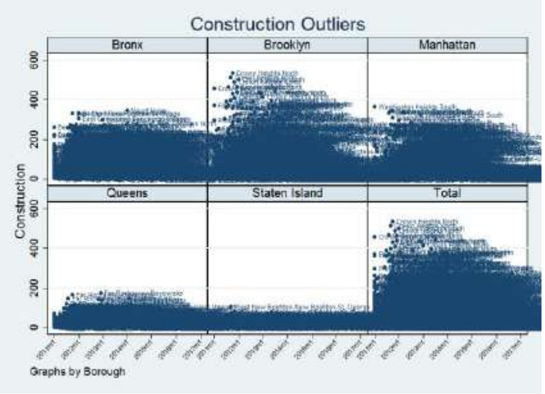
This section analyzes the patterns of the monthly frequency by complaint over the period 2013-2016. Each complaint is analyzed by a set of two graphs at the Borough level. The first Graph (Pattern) shows the pattern of the monthly frequency per complaint per borough, whereas the second (outliers) seeks to identify which are the neighborhoods with the highest frequency per complaint type per month.

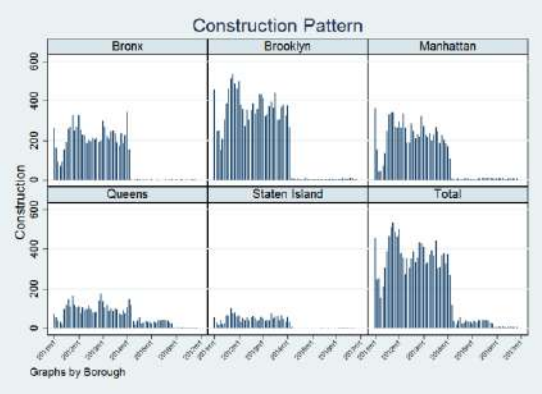
This report shows only the graphs for the most frequent complaints (observed in the maps above). To analyze the trends for the rest of the complaints, see .png files in Appendix 3. Look for the files with prefix “z3” for the general trends by Borough as presented here. Look for the files with prefix “z93” for graphs with the frequency of complaints for all neighborhoods.

Building Housing



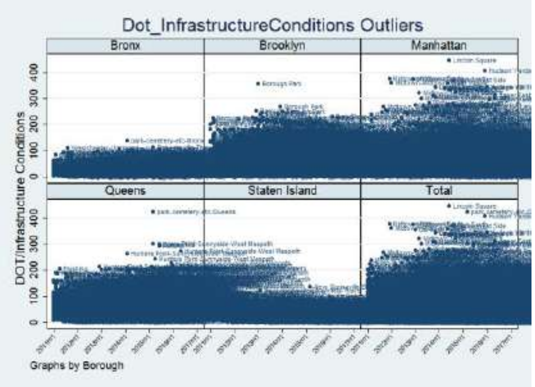


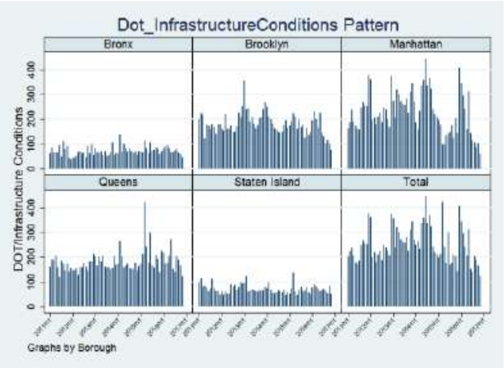




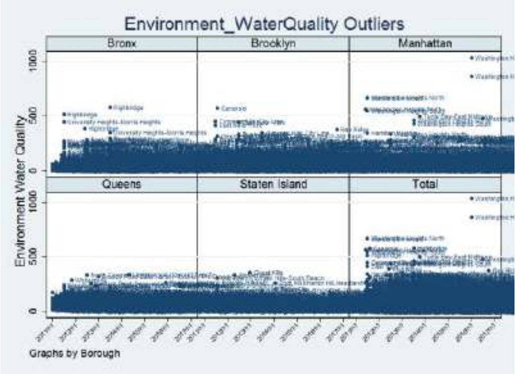
DOT/Infrastructure Conditions

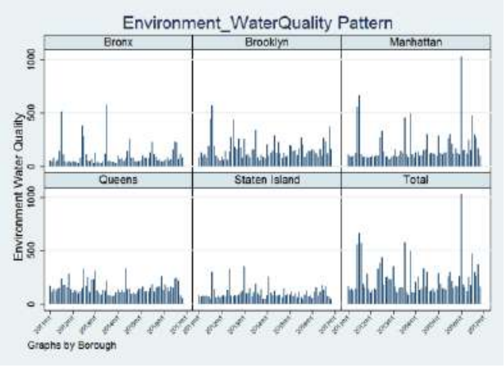
Construction



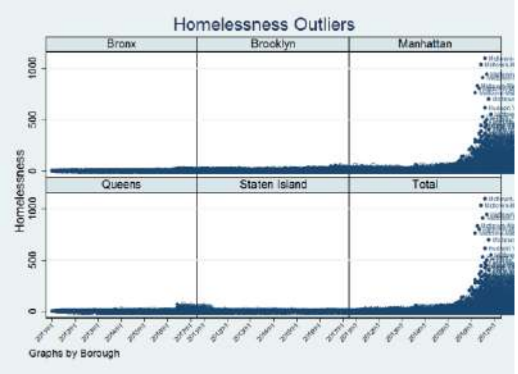


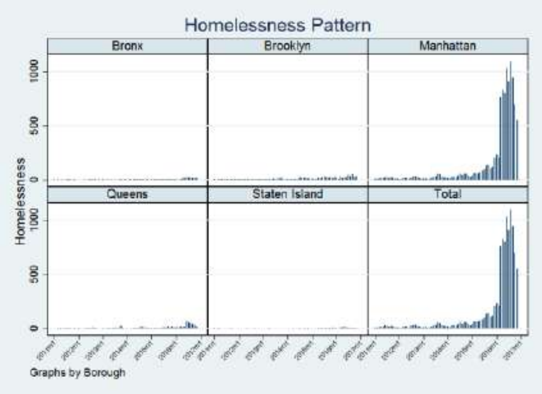
Environment Water Quality



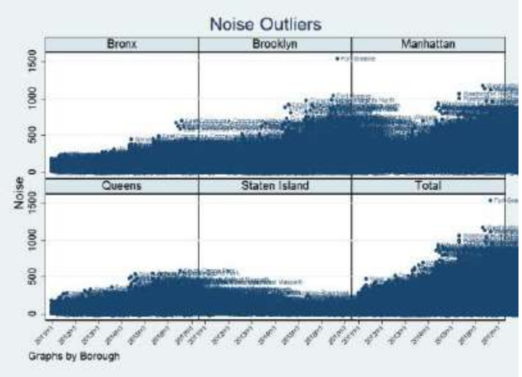


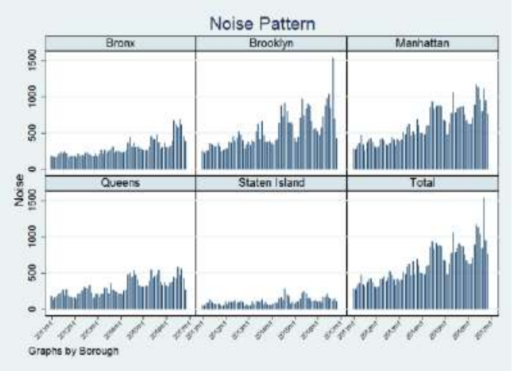
Homelessness



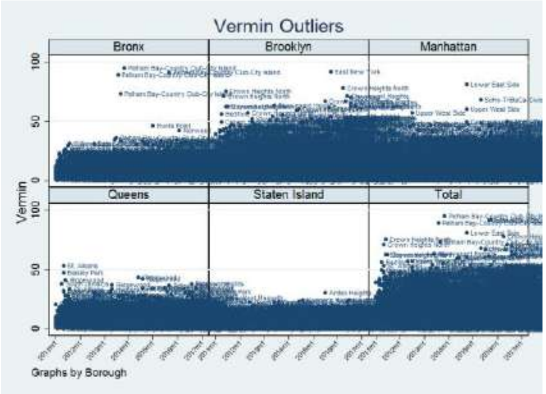


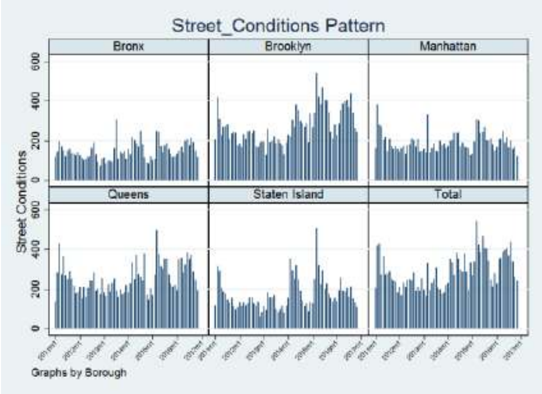
Noise





Street Conditions





Dataset 3.1 Most Frequent Complaint Type by Neighborhood (2013-2016) File name “q3.csv”

Dataset 3.1 Frequency of Complaints for Every Complaint Type by Neighborhood (2013-2016) File name “q3_Frequencies.csv”

4. Spikes in complaints by type and neighborhood (spanning 2011 - now)

Data shown in Section 2 already illustrate the spikes for every type of complaint in every neighborhood. Therefore, in this section, we aim to summarize the main patterns in spikes by type of complaint. Next table shows the percentage of small spikes (sustained average increase between 150% and 300% during 3 months), big spikes (sustained average increase between 300% and 500% during 3 months), and large spikes (sustained average increase above 500% during 3 months). This table allows to briefly compare complaint types by its "volatility" or "stability" over time.

Percentage of months with spikes in NYC

Complaint Type	**Year**	**Percentage of Months per neighborhood with spikes**		
		Small	**Big**	**Large**
Buildings	**2011**	**25.04%**	**1.80%**	**0.47%**
	2012	**20.26%**	**2.96%**	**0.86%**
	2013	**21.27%**	**3.69%**	**0.73%**
	2014	**20.15%**	**4.38%**	**0.90%**
	2015	**21.10%**	**3.39%**	**0.77%**
	2016	**9.82%**	**0.65%**	**0.05%**
	Average	**19.82%**	**2.84%**	**0.64%**
Construction	**2011**	**18.57%**	**5.53%**	**4.59%**
	2012	**14.21%**	**2.06%**	**1.03%**
	2013	**12.83%**	**2.15%**	**0.90%**
	2014	**5.67%**	**1.07%**	**0.69%**
	2015	**6.13%**	**1.59%**	**0.56%**
	2016	**0.98%**	**0.33%**	**0.05%**
	Average	**9.85%**	**2.15%**	**1.32%**
Corruption	**2011**	**0.04%**	**0.04%**	**0.04%**
	2012	**0.00%**	**0.00%**	**0.00%**
	2013	**0.00%**	**0.00%**	**0.00%**
	2014	**0.04%**	**0.04%**	**0.00%**
	2015	**0.00%**	**0.00%**	**0.00%**
	2016	**0.05%**	**0.00%**	**0.00%**
	Average	**0.02%**	**0.01%**	**0.01%**
DOT/Infrastructure	**2011**	**11.84%**	**0.56%**	**0.09%**
	2012	**15.71%**	**0.86%**	**0.17%**
	2013	**13.22%**	**1.16%**	**0.39%**
	2014	**11.51%**	**0.95%**	**0.26%**
	2015	**15.35%**	**0.81%**	**0.26%**
	2016	**6.97%**	**0.33%**	**0.05%**
	Average	**12.51%**	**0.78%**	**0.20%**
Environment	**2011**	**19.04%**	**3.34%**	**1.46%**
	2012	**21.63%**	**3.99%**	**2.70%**
	2013	**22.83%**	**4.33%**	**1.67%**
	2014	**21.09%**	**2.58%**	**0.90%**

	2015	**19.60%**	**1.93%**	**1.37%**
	2016	**14.50%**	**2.34%**	**0.89%**
	Average	**19.85%**	**3.10%**	**1.51%**
Homelessness	**2011**	**2.23%**	**0.90%**	**0.17%**
	2012	**2.88%**	**1.50%**	**0.34%**
	2013	**3.82%**	**1.42%**	**0.73%**
	2014	**6.14%**	**1.76%**	**0.95%**
	2015	**10.46%**	**3.43%**	**1.46%**
	2016	**10.71%**	**4.07%**	**2.53%**
	Average	**5.98%**	**2.15%**	**1.01%**
Noise	**2011**	**13.12%**	**1.11%**	**0.13%**
	2012	**13.26%**	**1.16%**	**0.56%**
	2013	**14.33%**	**1.67%**	**0.39%**
	2014	**16.49%**	**1.80%**	**0.34%**
	2015	**14.84%**	**2.10%**	**0.69%**
	2016	**14.50%**	**1.03%**	**0.42%**
	Average	**14.42%**	**1.49%**	**0.42%**
Safety	**2011**	**20.50%**	**3.86%**	**1.46%**
	2012	**18.58%**	**4.46%**	**1.37%**
	2013	**18.33%**	**4.33%**	**2.83%**
	2014	**19.89%**	**4.98%**	**2.19%**
	2015	**18.31%**	**3.56%**	**1.37%**
	2016	**13.75%**	**1.87%**	**0.65%**
	Average	**18.29%**	**3.87%**	**1.66%**
Schools	**2011**	**0.94%**	**0.21%**	**0.04%**
	2012	**0.82%**	**0.43%**	**0.00%**
	2013	**1.12%**	**0.30%**	**0.04%**
	2014	**1.76%**	**0.21%**	**0.13%**
	2015	**1.11%**	**0.21%**	**0.09%**
	2016	**0.51%**	**0.00%**	**0.09%**
	Average	**1.05%**	**0.23%**	**0.07%**
Seniors	**2011**	**0.13%**	**0.00%**	**0.00%**
	2012	**0.09%**	**0.04%**	**0.00%**
	2013	**0.04%**	**0.04%**	**0.00%**
	2014	**0.17%**	**0.00%**	**0.00%**
	2015	**0.09%**	**0.00%**	**0.00%**
	2016	**0.19%**	**0.00%**	**0.00%**
	Average	**0.12%**	**0.01%**	**0.00%**
Street conditions	**2011**	**10.42%**	**0.81%**	**0.09%**
	2012	**13.43%**	**0.30%**	**0.13%**
	2013	**20.09%**	**1.29%**	**0.17%**
	2014	**13.45%**	**0.69%**	**0.13%**
	2015	**16.08%**	**1.37%**	**0.13%**
	2016	**5.29%**	**0.19%**	**0.09%**
	Average	**13.23%**	**0.78%**	**0.12%**
Vermin	**2011**	**19.25%**	**3.56%**	**2.06%**

	2012	**16.78%**	**4.68%**	**1.63%**
	2013	**18.03%**	**4.94%**	**2.10%**
	2014	**17.65%**	**4.64%**	**2.19%**
	2015	**18.70%**	**4.16%**	**2.53%**
	2016	**16.23%**	**3.98%**	**1.54%**
	Average	**17.80%**	**4.33%**	**2.02%**

Note: N=13,790 (months times neighborhoods)

Dataset 4.1 Spikes by Complaint Type, Spike Type, Month, and Neighborhood (2011-2016) File name “q4.csv”

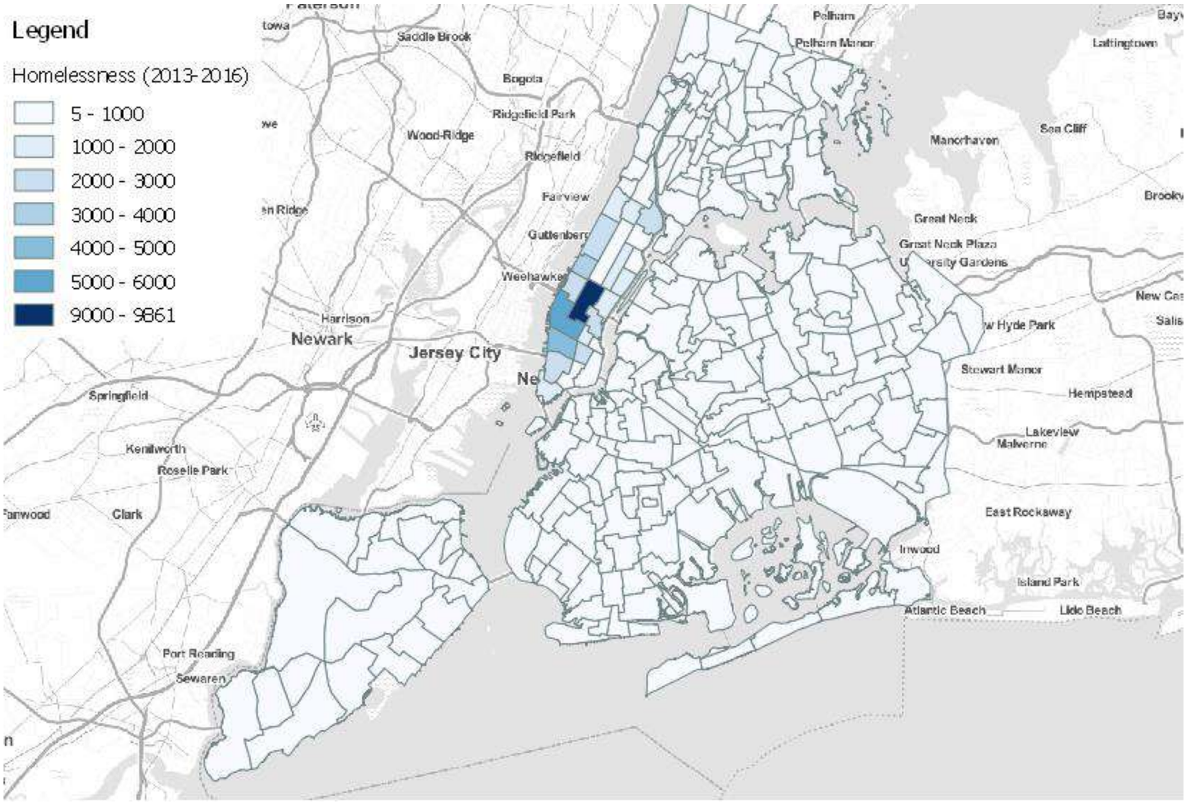
5. Trends

5.1 Trends in homeless person complaints (spanning 2011 - now)

Geographic Analysis

This sub-section analyzes the trends in homeless person complaints in the years 2011-2016 and by yearly averages in the same period. Next map illustrates the total homeless person complaints for the 2011-2016 period by neighborhood, and the following five maps illustrate the number of complaints by year and by neighborhood.

Number of complaints per neighborhood



2011


Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
Paterson
Totowa
Saddle Brook
Pelham
Pelham Manor
Lattingtown
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Verona
Ridgefield
Manorhaven
Sea Cliff
Glen Ridge
Fairview
Guttenberg
Great Neck
Great Neck Plaza
University Gardens
Weehawken
Harrison
Newark
Jersey City
Chatham
New Hyde Park
Stewart Manor
Springfield
Hempstead
Kenilworth
Roselle Park
Lakeview
Malverne
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

2012


Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
Paterson
Totowa
Saddle Brook
Pelham
Pelham Manor
Lattingtown
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Verona
Ridgefield
Manorhaven
Sea Cliff
Glen Ridge
Fairview
Guttenberg
Great Neck
Great Neck Plaza
University Gardens
Weehawken
Harrison
Newark
Jersey City
Chatham
New Hyde Park
Stewart Manor
Springfield
Hempstead
Kenilworth
Roselle Park
Lakeview
Malverne
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren

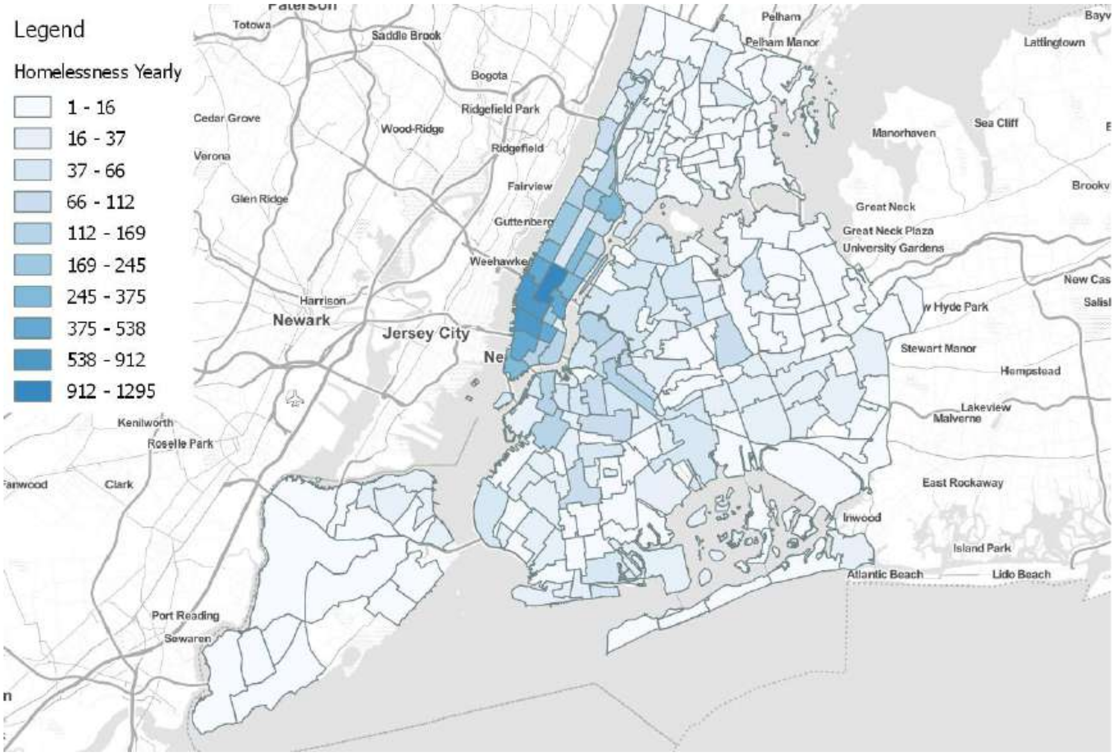
2013


Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
169 - 245
Paterson
Totowa
Saddle Brook
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Ridgefield
Verona
Fairview
Glen Ridge
Guttenberg
Weehawken
Harrison
Newark
Jersey City
Chatham
Springfield
Kenilworth
Roselle Park
Fanwood
Clark
Port Reading
Sewaren
Pelham
Pelham Manor
Lattingtown
Manorhaven
Sea Cliff
Great Neck
Great Neck Plaza
University Gardens
New Hyde Park
Stewart Manor
Hempstead
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

2014


Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
245 - 375
375 - 538
Paterson
Totowa
Saddle Brook
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Ridgefield
Verona
Fairview
Glen Ridge
Guttenberg
Weehawken
Harrison
Newark
Jersey City
Springfield
Kenilworth
Roselle Park
Fanwood
Clark
Port Reading
Sewaren
Pelham
Pelham Manor
Lattingtown
Manorhaven
Sea Cliff
Great Neck
Great Neck Plaza
University Gardens
North New Hyde Park
Stewart Manor
Hempstead
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

2015


Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
169 - 245
245 - 375
375 - 538
538 - 912
912 - 1295
Totowa
Saddle Brook
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Ridgefield
Verona
Fairview
Glen Ridge
Guttenberg
Weehawken
Harrison
Newark
Jersey City
Kenilworth
Roselle Park
Clark
Port Reading
Sewaren
Pelham
Pelham Manor
Lattingtown
Manorhaven
Sea Cliff
Great Neck
Great Neck Plaza
University Gardens
Stewart Manor
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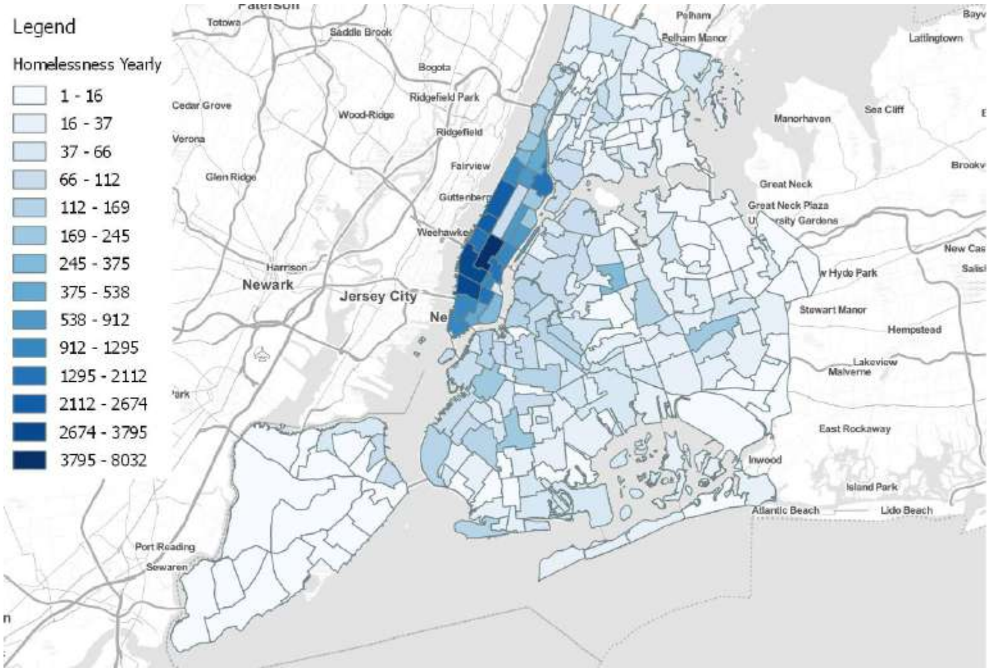
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

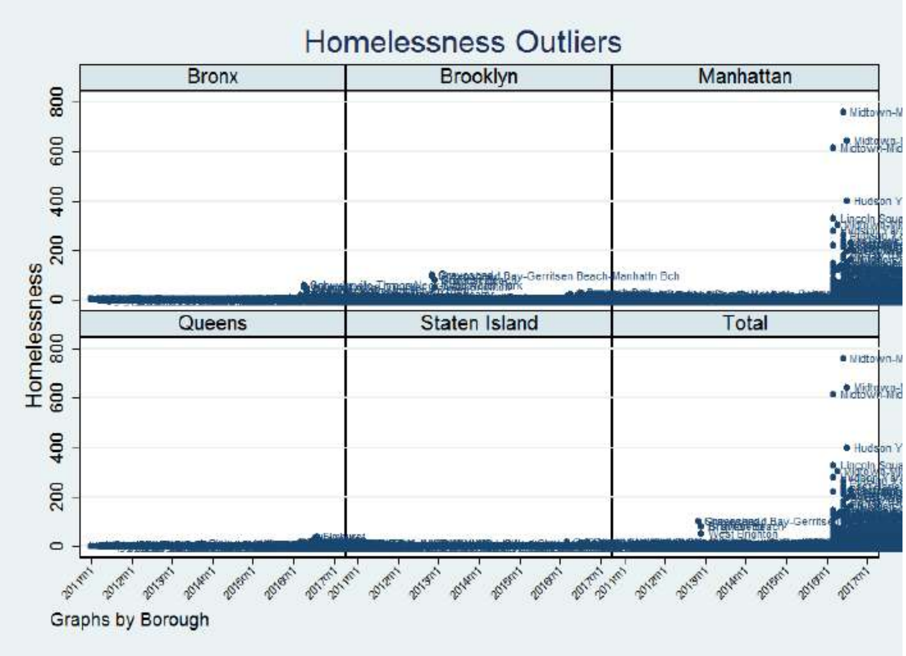
2016

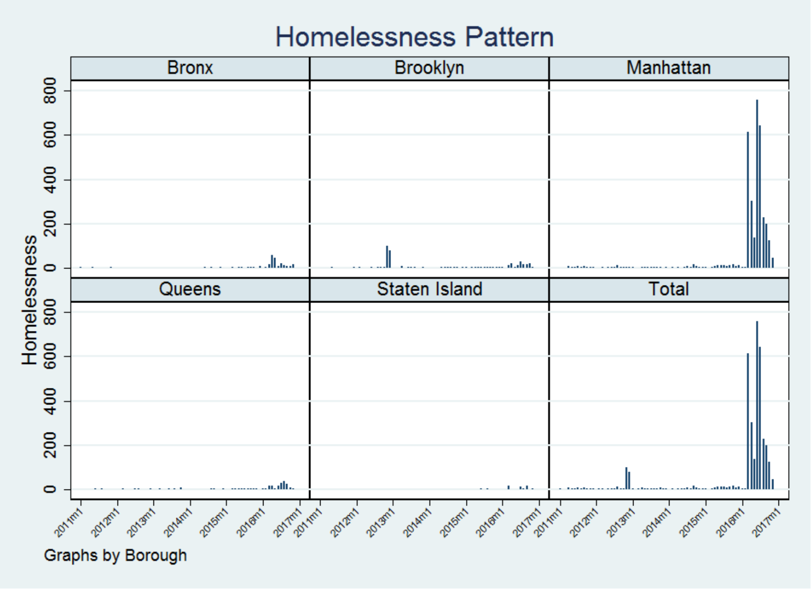

Legend
Homelessness Yearly
1 - 16
16 - 37
37 - 66
66 - 112
112 - 169
169 - 245
245 - 375
375 - 538
538 - 912
912 - 1295
1295 - 2112
2112 - 2674
2674 - 3795
3795 - 8032
Totowa
Saddle Brook
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Ridgefield
Verona
Fairview
Glen Ridge
Guttenberg
Weehawken
Harrison
Newark
Jersey City
Port Reading
Sewaren
Pelham
Pelham Manor
Lattingtown
Manorhaven
Sea Cliff
Great Neck
Great Neck Plaza
Stewart Manor
Hempstead
Lakeview
Malverne
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach

Time Series Analysis

This section analyzes the patterns of the monthly frequency of homelessness complaints over the period 2011-2016. This set of complaints is analyzed by a set of two graphs at the Borough level. The first Graph (Pattern) shows the pattern of the monthly frequency of complaints per borough, whereas the second (outliers) seeks to identify which are the neighborhoods with the highest frequency of complaints per month.

Homelessness





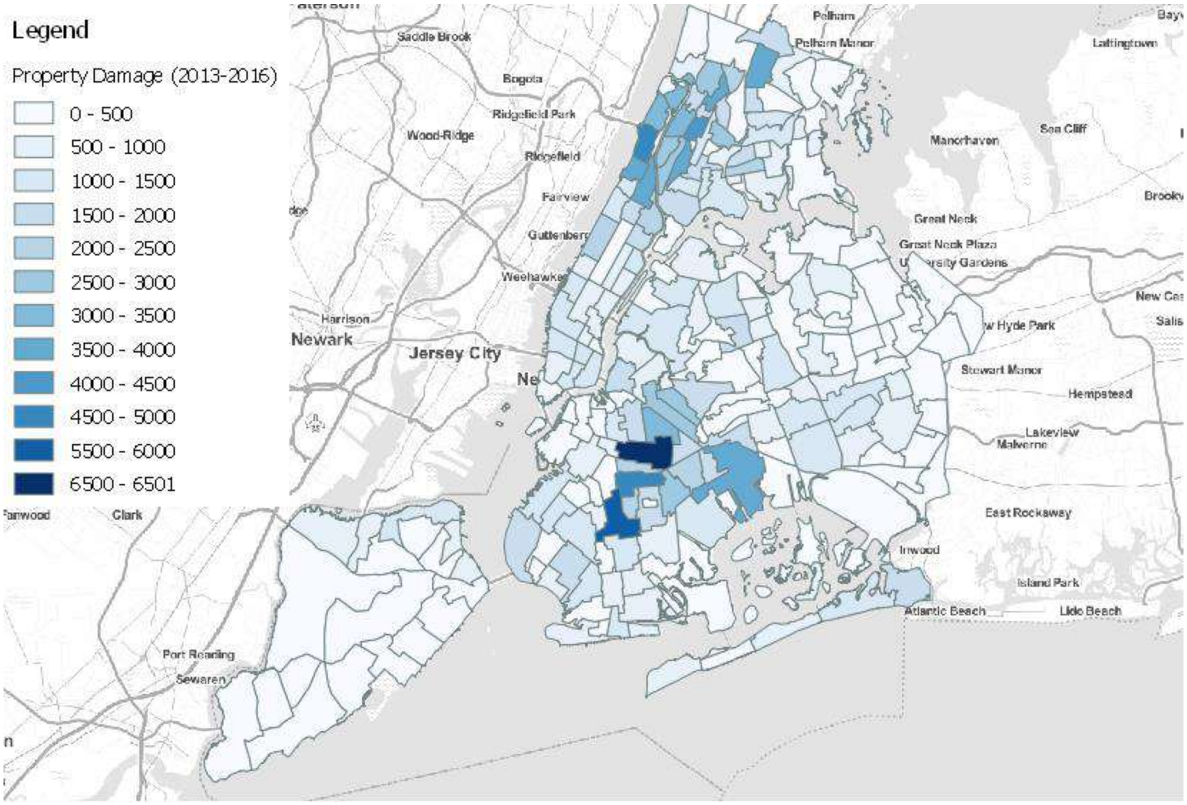
5.2. Trends in non-emergency PD-related complaints- (spanning 2011 - now)

Non-emergency property-damage-related complaints refer to categories such as: “criminal mischief,” vandalism, property damage, dangerous location or situation, drug activity, lewd act, panhandling, public defecating/urinating, squeegee, and stolen property/vehicle. However, many of these complaints were not found in the dataset. For a complete list of the items considered in this section, see the Methodological Report.

Geographic Analysis

This sub-section analyzes the trends in non-emergency property-damage-related complaints in the years 2011-2016 and by yearly averages in the same period. Next map illustrates the total non-emergency property-damage-related complaints for the 2011-2016 period by neighborhood, and the following five maps illustrate the number of complaints by year and by neighborhood.

Number of complaints per neighborhood



2011

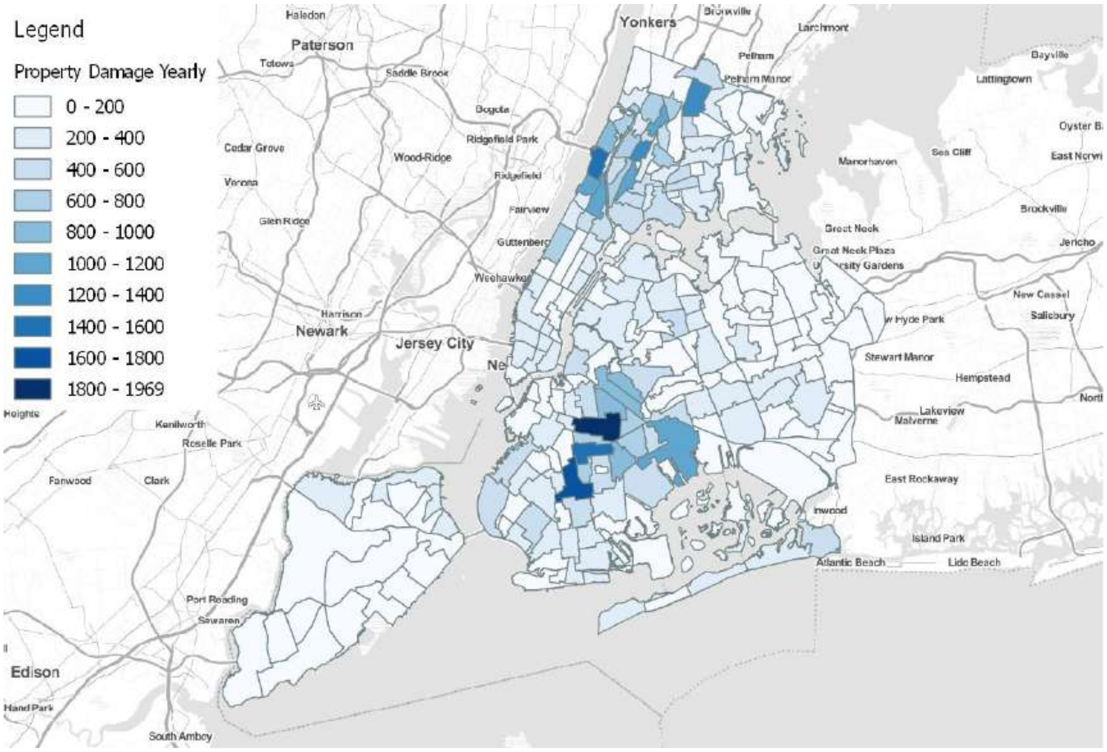

Legend
Property Damage Yearly
0 - 200
Haledon
Paterson
Totowa
Saddle Brook
Yonkers
Bronxville
Larchmont
Pelham
Pelham Manor
Bayville
Lattingtown
Bogota
Ridgefield Park
Oyster B
Cedar Grove
West Caldwell
Wood-Ridge
Ridgefield
Manorhaven
Sea Cliff
East Norwi
Verona
East Hanover
Roseland
Glen Ridge
Fairview
Brookville
Great Neck
Guttenberg
Florham Park
Great Neck Plaza
Jericho
Northfield
University Gardens
Weehawken
Harrison
New Cassel
Chatham
Newark
Jersey City
Salisbury
New Hyde Park
Ne
Stewart Manor
Springfield
Hempstead
Nort
Heights
Kenilworth
Lakeview
Malverne
Roselle Park
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren
Edison
Hland Park
South Amboy

2012

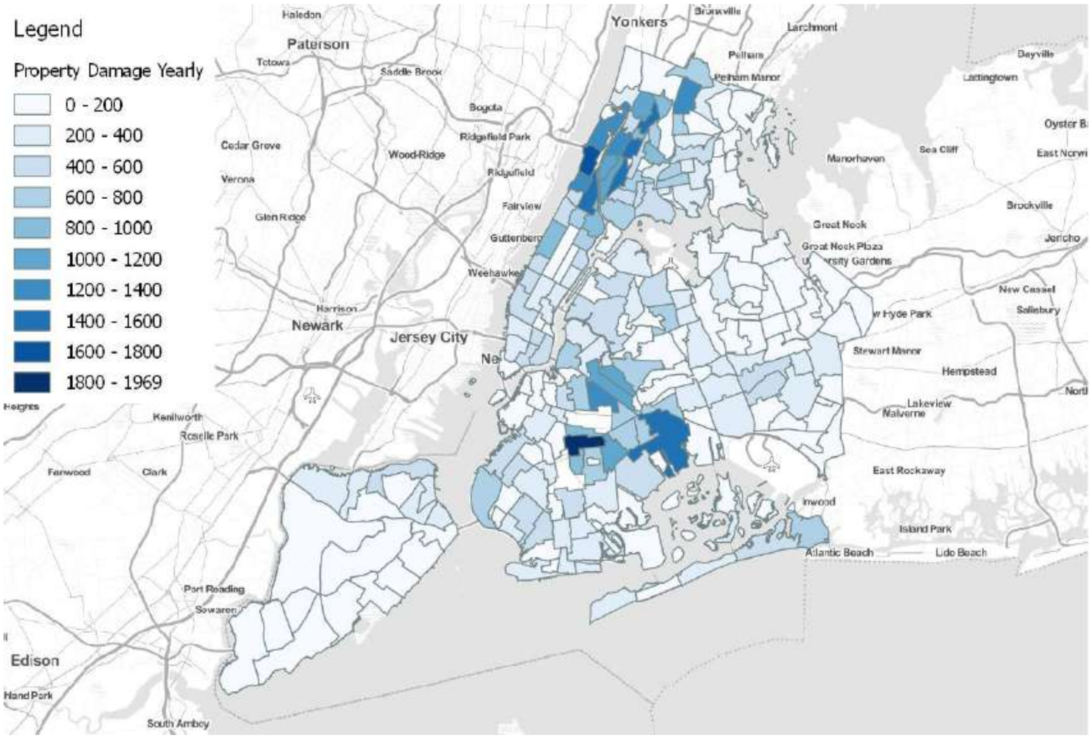

Legend
Property Damage Yearly
0 - 200
Haledon
Paterson
Totowa
Saddle Brook
Yonkers
Bronxville
Larchmont
Pelham
Pelham Manor
Bayville
Lattingtown
Bogota
Ridgefield Park
Oyster B
Cedar Grove
West Caldwell
Wood-Ridge
Ridgefield
Manorhaven
Sea Cliff
East Norwi
Verona
East Hanover
Roseland
Glen Ridge
Fairview
Brookville
Great Neck
Guttenberg
Florham Park
Great Neck Plaza
Jericho
Northfield
University Gardens
Weehawken
Harrison
New Cassel
Chatham
Newark
Jersey City
Salisbury
New Hyde Park
Ne
Stewart Manor
Springfield
Hempstead
Nort
Heights
Kenilworth
Lakeview
Malverne
Roselle Park
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren
Edison
Hland Park
South Amboy

2013

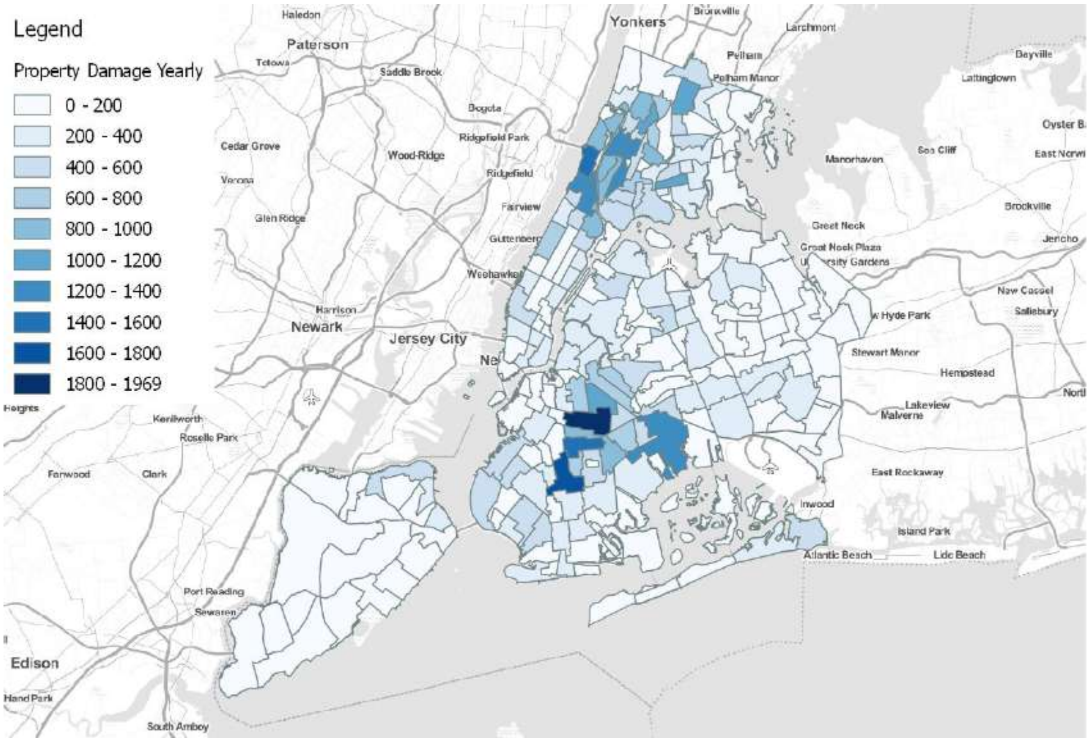
2014



2015



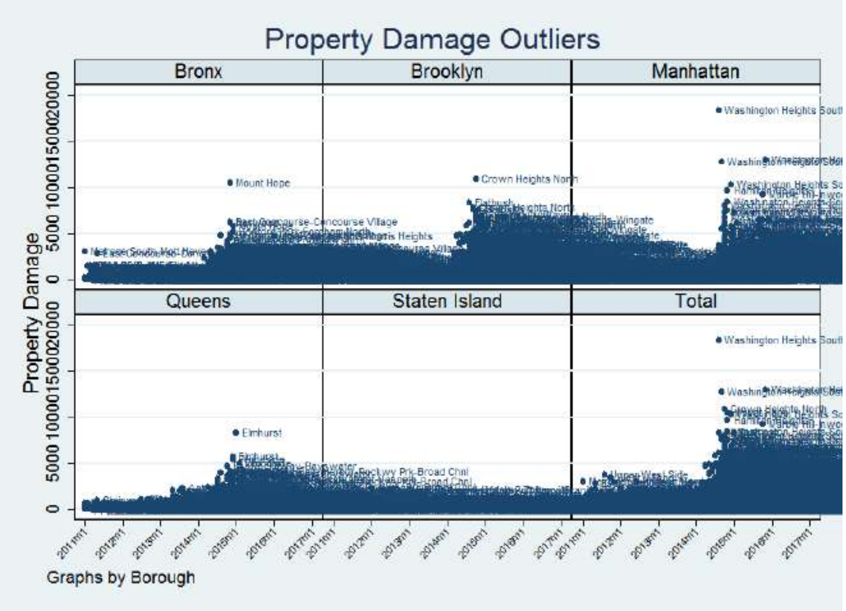
2016

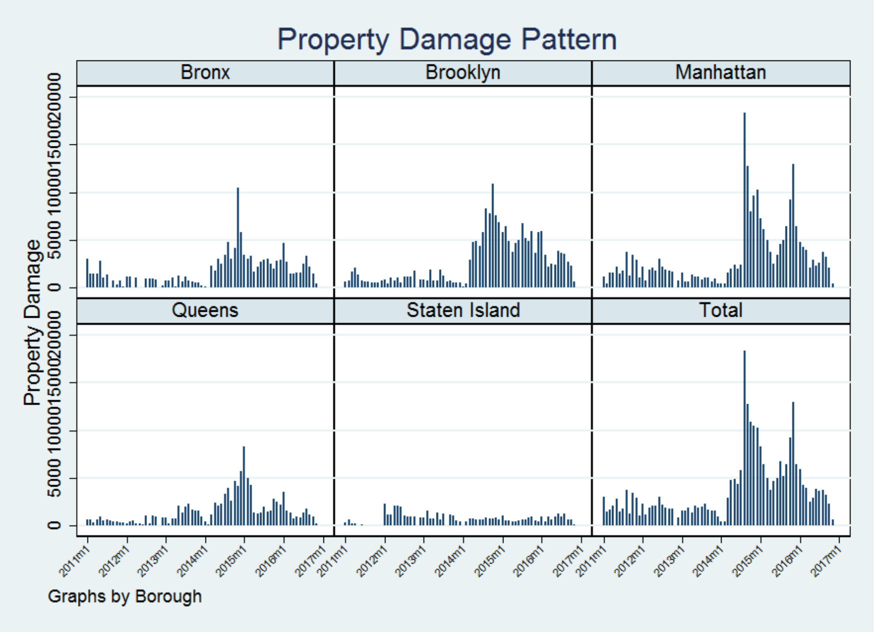


Time Series Analysis

This section analyzes the patterns of the monthly frequency of non-emergency property-damage-related complaints over the period 2011-2016. This set of complaints is analyzed by a set of two graphs at the Borough level. The first Graph (Pattern) shows the pattern of the monthly frequency of complaints per borough, whereas the second (outliers) seeks to identify which are the neighborhoods with the highest frequency of complaints per month.

Property Damage





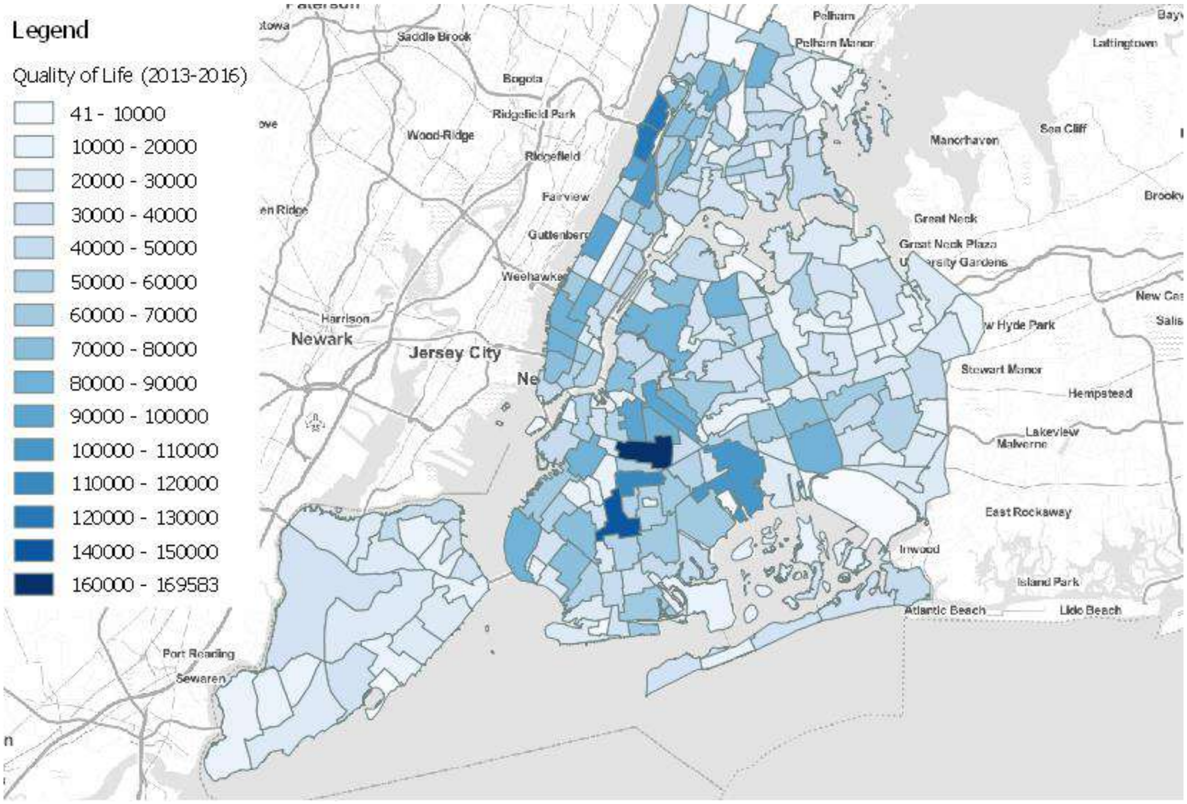
5.3. Trends in quality of life complaints- (spanning 2011 - now)

Quality of Life complaints refer to categories such as: dirty sidewalk or gutter, garbage/recycling, bag of garbage or loose debris, graffiti, pest control, Public Housing Maintenance, public plaza, snow/ice sidewalks, water, sewer backup, sewer line, rodent, street not swept. However, many of these complaints were not found in the dataset. For a complete list of the items considered in this section, see the Methodological Report.

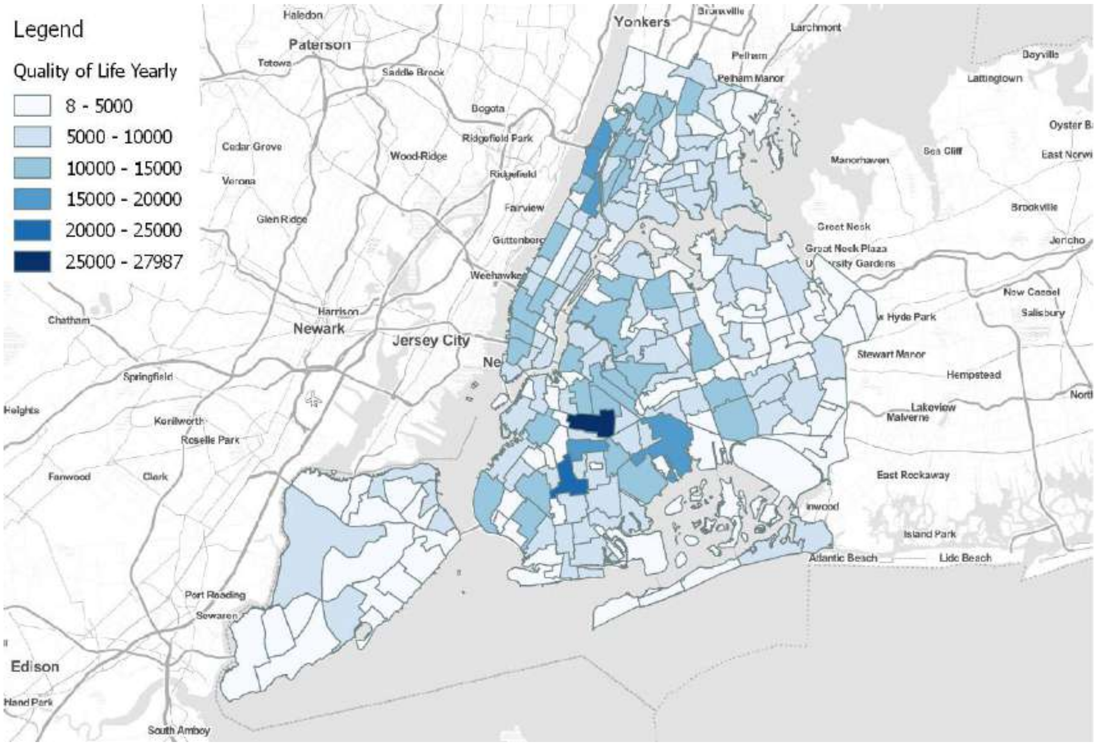
Geographic Analysis

This sub-section analyzes the trends in Quality of Life complaints in the years 2011-2016 and by yearly averages in the same period. Next map illustrates the total Quality of Life complaints for the 2011-2016 period by neighborhood, and the following five maps illustrate the number of complaints by year and by neighborhood.

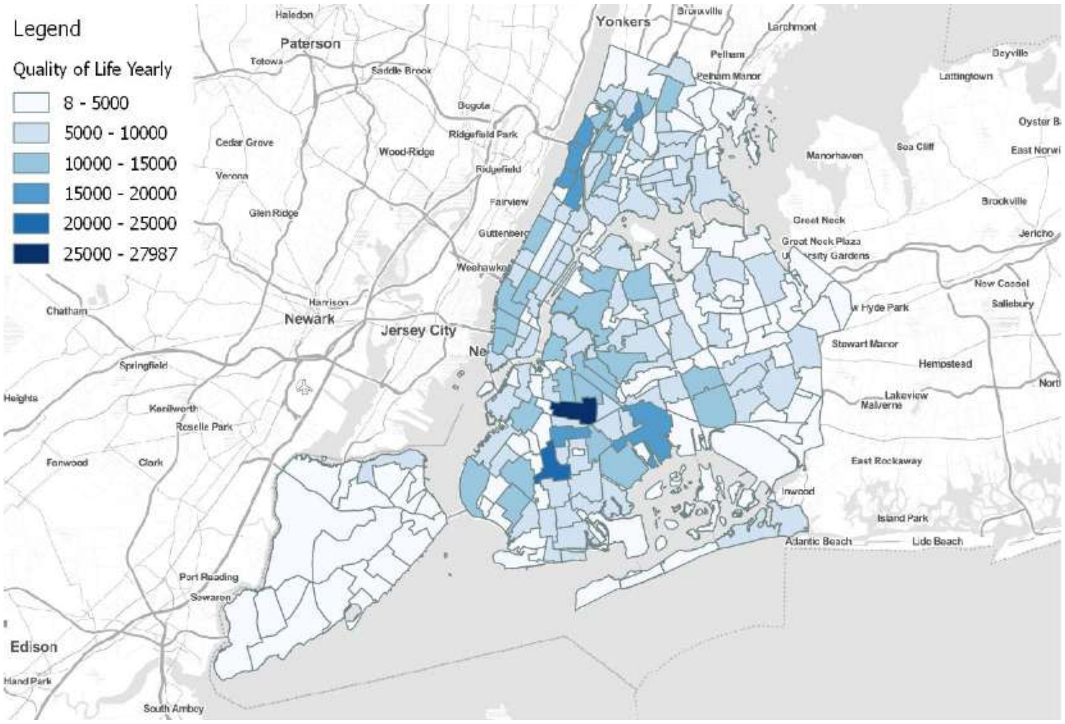
Number of complaints per neighborhood



2011


Legend
Quality of Life Yearly
8 - 5000
5000 - 10000
10000 - 15000
15000 - 20000
20000 - 25000
25000 - 27987
Yonkers
Paterson
Newark
Jersey City
Edison

2012


Legend
Quality of Life Yearly
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5000 - 10000
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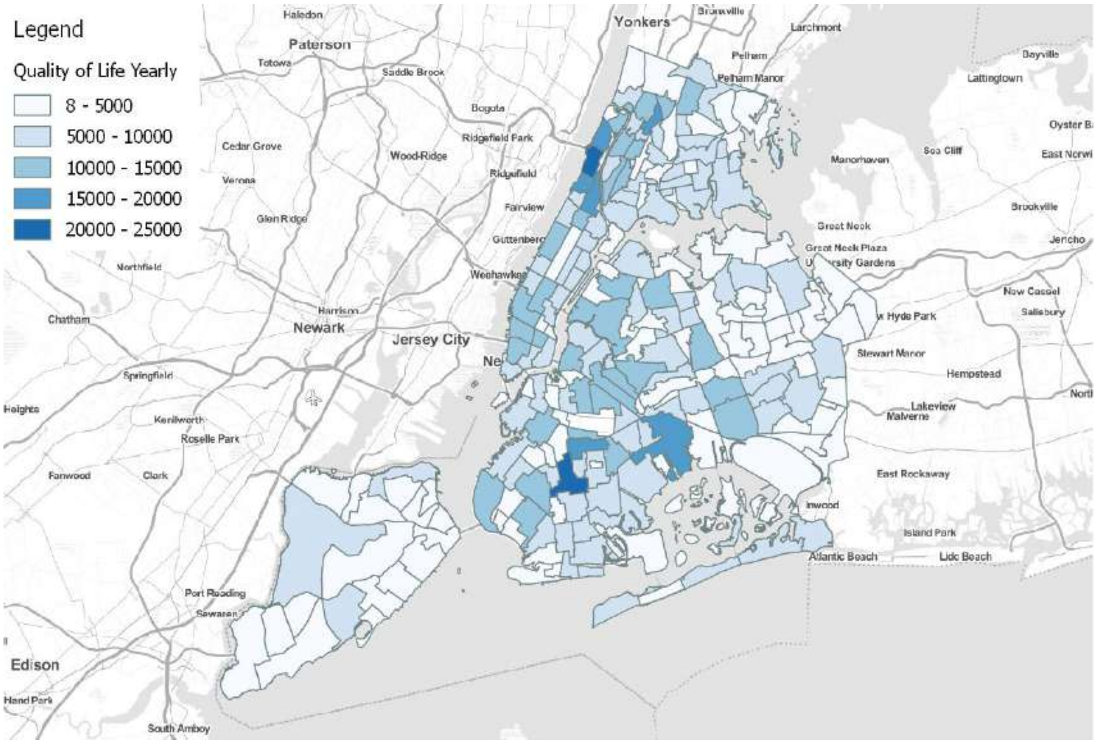
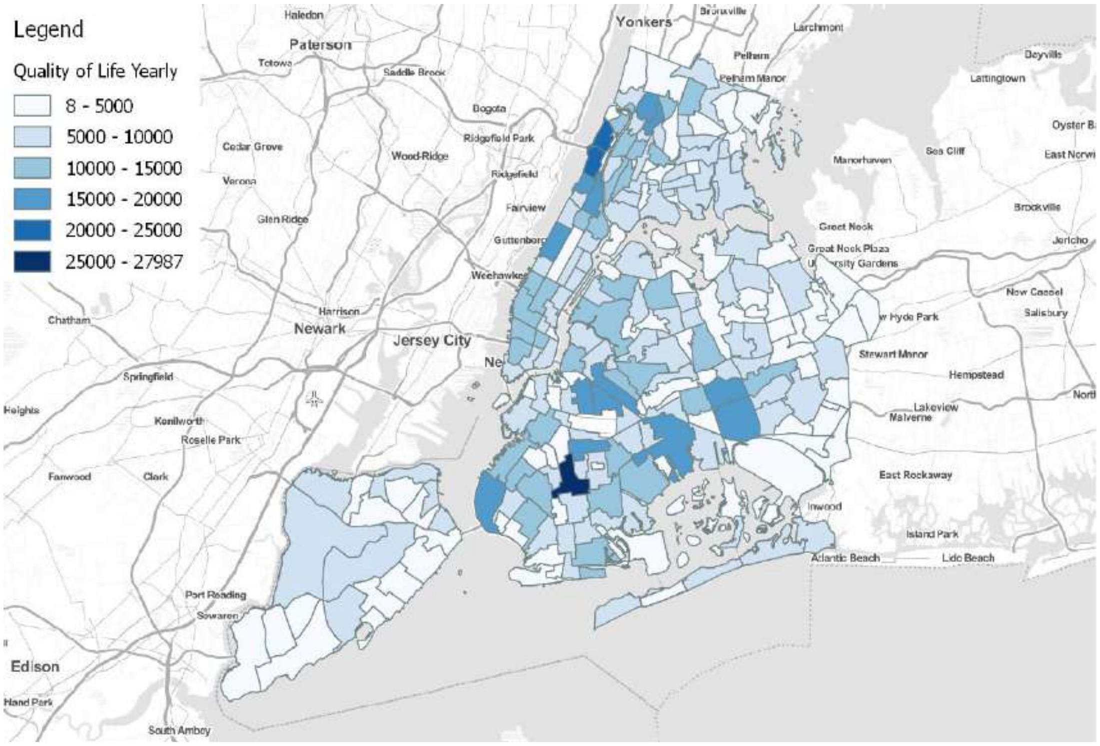
15000 - 20000
20000 - 25000
25000 - 27987
Yonkers
Paterson
Newark
Jersey City
Edison

2013


Legend
Quality of Life Yearly
8 - 5000
5000 - 10000
10000 - 15000
15000 - 20000
20000 - 25000
Haledon
Paterson
Totowa
Saddle Brook
Yonkers
Bronxville
Larchmont
Pelham
Pelham Manor
Bayville
Lattingtown
Oyster B
East Norwi
Bogota
Ridgefield Park
Cedar Grove
Wood-Ridge
Ridgefield
Verona
Fairview
Glen Ridge
Guttenberg
Weehawken
Manorhaven
Sea Cliff
Brookville
Great Neck
Great Neck Plaza
University Gardens
Jericho
Northfield
Harrison
Newark
Jersey City
Chatham
New Cassel
Salisbury
Hyde Park
Stewart Manor
Hempstead
Springfield
Heights
Kenilworth
Roselle Park
Lakeview
Malverne
North
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren
Edison
Hand Park
South Amboy

2014


Legend
Quality of Life Yearly
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10000 - 15000
15000 - 20000
20000 - 25000
25000 - 27987
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East Rockaway
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Island Park
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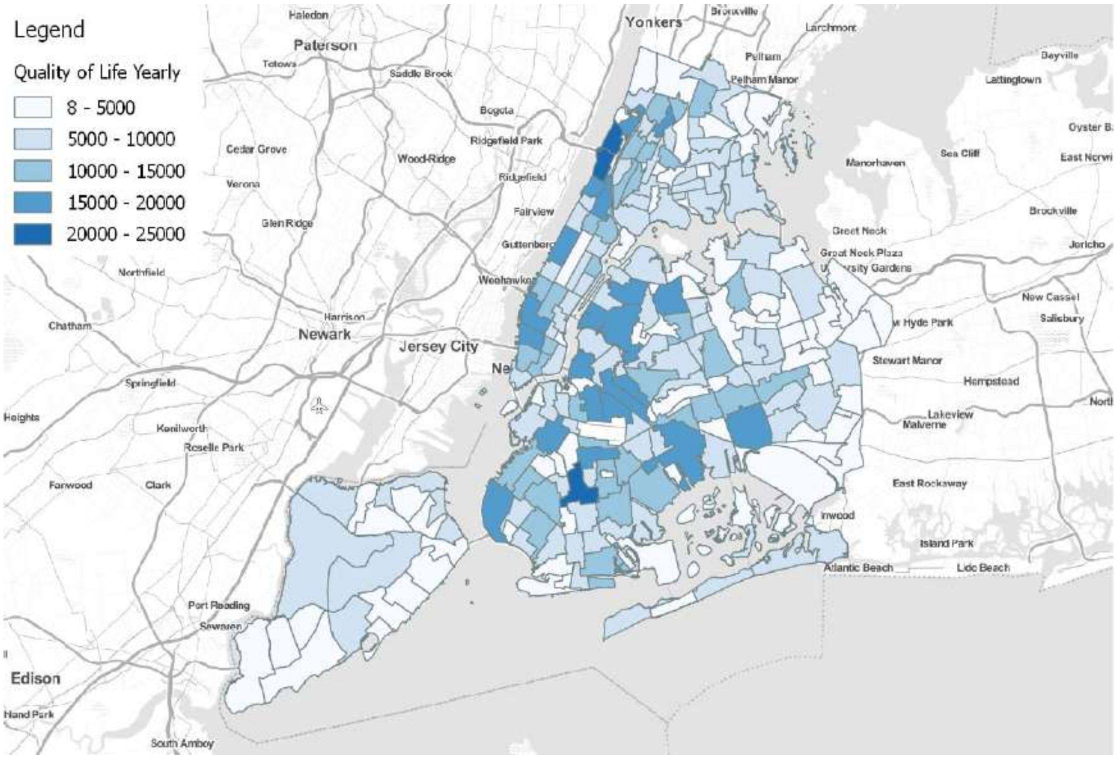
Lido Beach
Port Reading
Sewaren
Edison
Hand Park
South Amboy

2015


Legend
Quality of Life Yearly
8 - 5000
5000 - 10000
10000 - 15000
15000 - 20000
20000 - 25000
Haledon
Paterson
Totowa
Saddle Brook
Yonkers
Bronxville
Larchmont
Pelham
Pelham Manor
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Bogota
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Wood-Ridge
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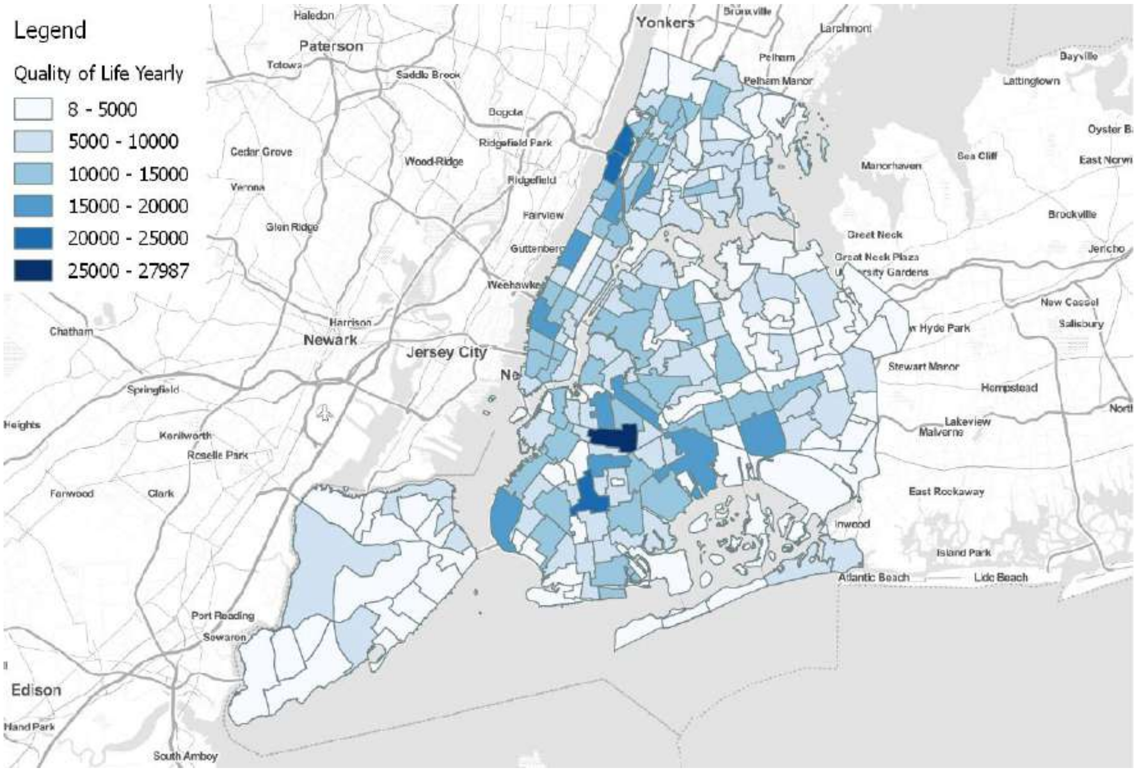
Fanwood
Clark
East Rockaway
Inwood
Island Park
Atlantic Beach
Lido Beach
Port Reading
Sewaren
Edison
Hand Park
South Amboy

2016


Legend
Quality of Life Yearly
8 - 5000
5000 - 10000
10000 - 15000
15000 - 20000
20000 - 25000
25000 - 27987
Haledon
Paterson
Totowa
Saddle Brook
Yonkers
Bronxville
Larchmont
Pelham
Pelham Manor
Bayville
Lattingtown
Bogota
Cedar Grove
Wood-Ridge
Ridgefield Park
Ridgefield
Verona
Oyster Bay
East Norwich
Manorhaven
Sea Cliff
Glen Ridge
Fairview
Brookville
Guttenberg
Great Neck
Great Neck Plaza
University Gardens
Jericho
Weehawken
New Cassel
Salisbury
Chatham
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Port Reading
Sewaren
Edison
Hand Park
South Amboy

Time Series Analysis

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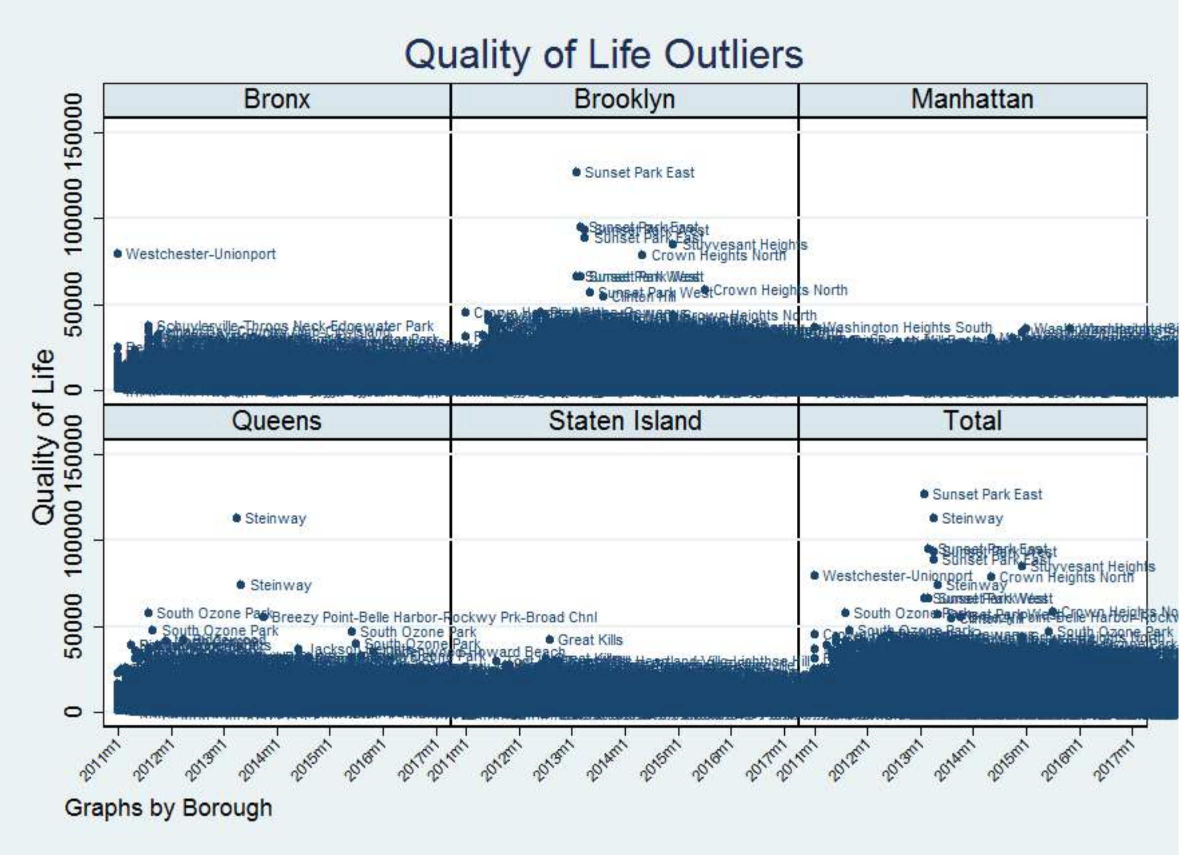
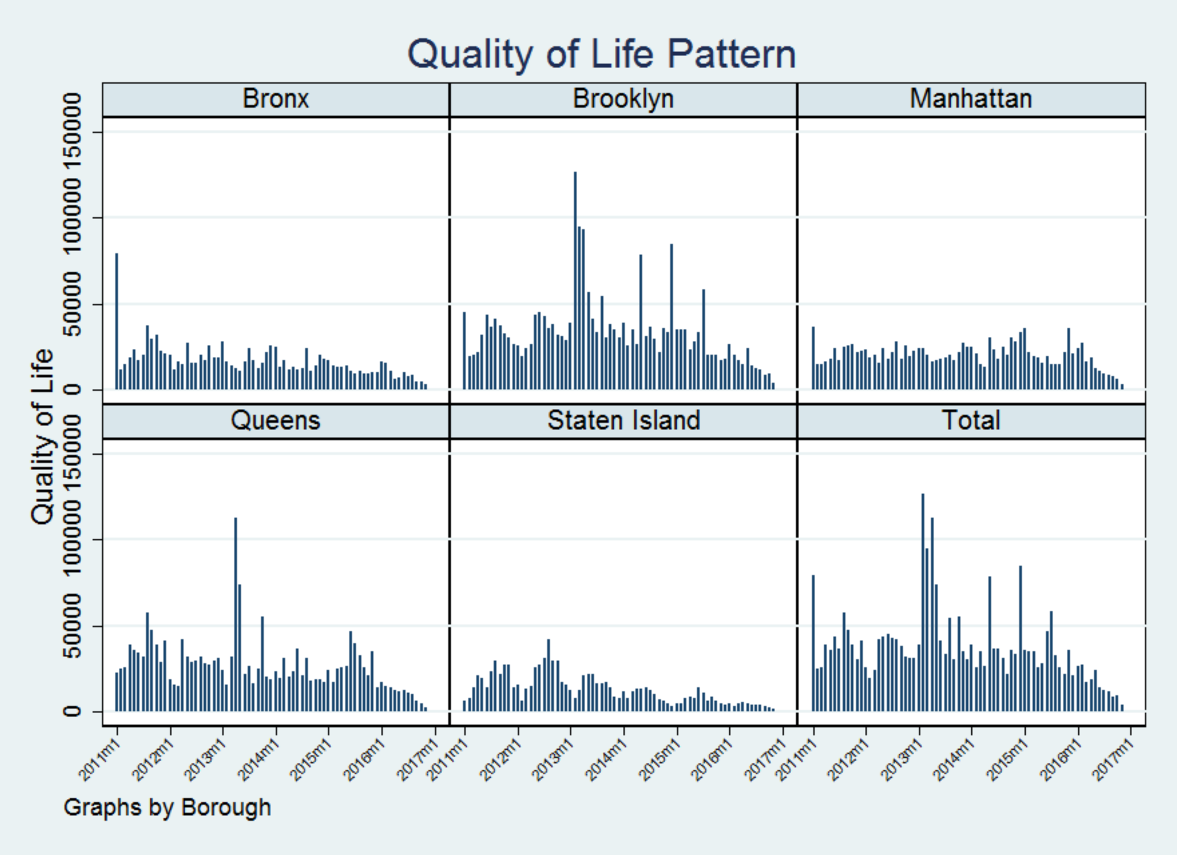
Quality of Life

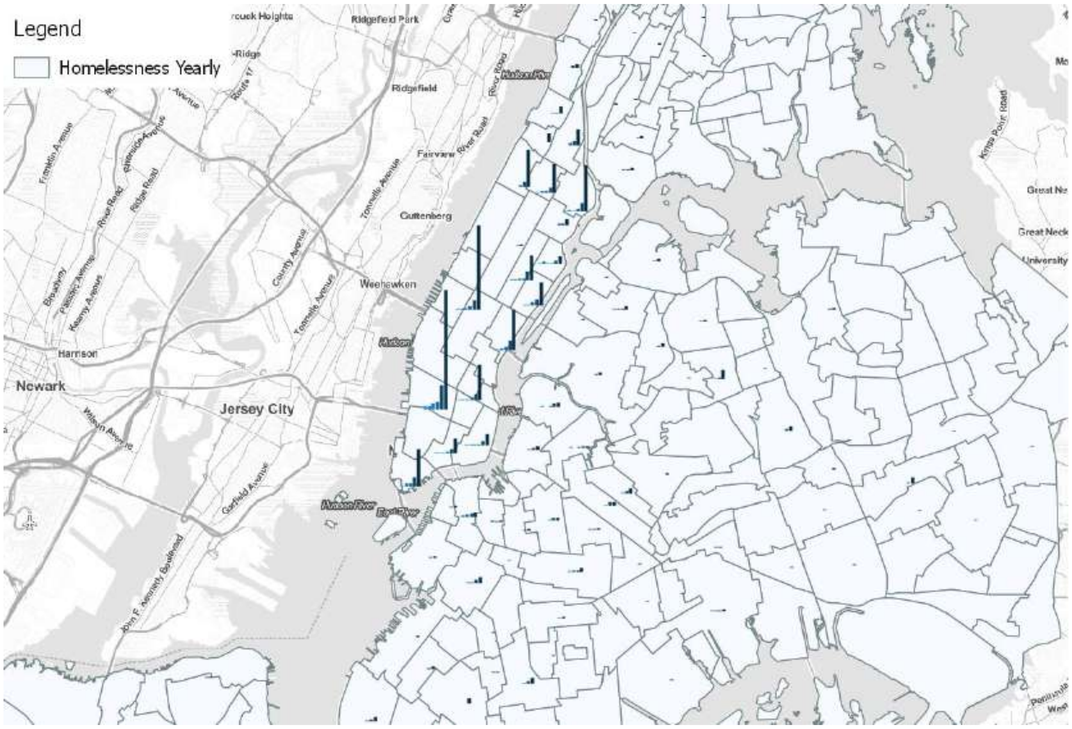



Quality of Life Pattern
Bronx
Brooklyn
Manhattan
Queens
Staten Island
Total
Quality of Life
0
50000
100000
150000
2011m1
2012m1
2013m1
2014m1
2015m1
2016m1
2017m1
Graphs by Borough

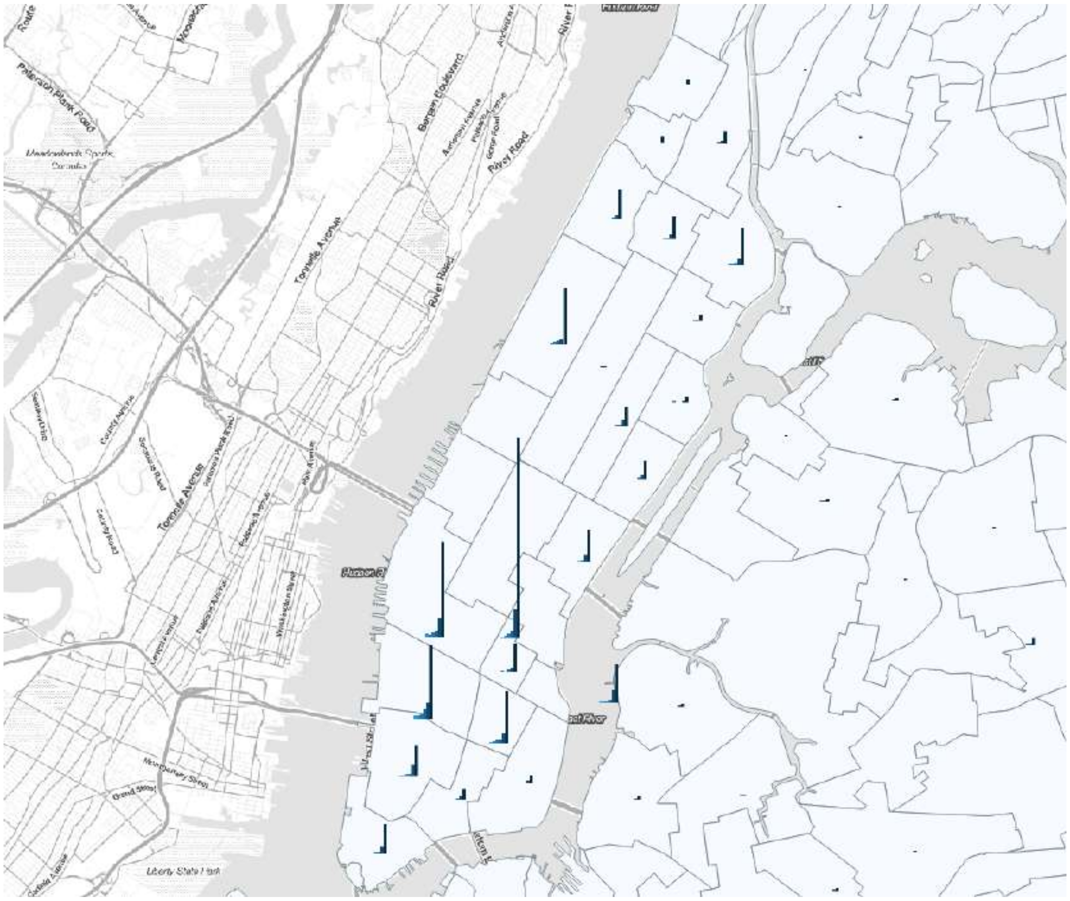
ADDENDUM: HOMELESSNESS BY YEAR (2013-2016)

Homelessness NYC 2013-2016

Homelessness NYC 2013-2016 (ZOOM)



Homelessness Manhattan 2013-2016



Dataset 5.1 Homeless Person Complaints, by year and by neighborhood (2011-2016) File name "q5_Homeless_yr.csv"

Dataset 5.2 Number of Non-emergency PD-related Complaints, by year and by neighborhood (2011-2016) File name "q5_PD_yr.csv"

Dataset 5.3 Quality of life Complaints, by year and by neighborhood (2011-2016) File name "q5_QoL_yr.csv"

STATISTICAL ANALYSIS OF 311 CALLS IN NYC 2013-2016

METHODOLOGY REPORT

Prepared by: Cesar Renteria
Rockefeller College of Public Affairs & Policy
University at Albany, State University of New York

Prepared for New York City Deserves Better

Table of contents

1. Data

The data used for the analysis was retrieved from https://nycopendata.socrata.com/. The data was retrieved by year for the years 2011 to 2016. The dataset for year 2016 covers calls up to July 31. The original number of observations was 12.3 million observations (311 calls registered). From these, approximately 10% of the data was lost because it lacked georeferenced information and the corresponding neighborhood could not be assigned. We looked at the characteristics of the missing variables and we observed that there was not a discernible pattern. Therefore, we have some confidence that the values were missing at random and won't bias the results. However, for absolute values, as a rule of thumb, it may well make sense to multiply the counts by 1.1 to correct for missing values.

Table 1 Shows the list of variables included in the dataset and their description. The variables used for the analysis are bolded.

Column Name	Description
Unique Key	**Unique identifier of a Service Request (SR) in the open data set**
Created Date	**Date SR was created**
Closed Date	**Date SR was closed by responding agency**
Agency	Acronym of responding City Government Agency
Agency Name	Full Agency name of responding City Government Agency
Complaint Type	**This is the fist level of a hierarchy identifying the topic of the incident or condition. Complaint Type may have a corresponding Descriptor (below) or may stand alone.**
Descriptor	This is associated to the Complaint Type, and provides further detail on the incident or condition. Descriptor values are dependent on the Complaint Type, and are not always required in SR.
Status	Status of SR submitted
Due Date	**Date when responding agency is expected to update the SR. This is based on the Complaint Type and internal Service Level Agreements (SLAs).**
Resolution Action Updated Date	**Date when responding agency last updated the SR.**
Resolution Description	Describes the last action taken on the SR by the responding agency. May describe next or future steps.
Location Type	Describes the type of location used in the address information
Incident Zip	Incident location zip code, provided by geo validation.
Incident Address	House number of incident address provided by submitter.
Street Name	Street name of incident address provided by the submitter
Cross Street 1	First Cross street based on the geo validated incident location
Cross Street 2	Second Cross Street based on the geo validated incident location
Intersection Street 1	First intersecting street based on geo validated incident location
Intersection Street 2	Second intersecting street based on geo validated incident location
Address Type	Type of incident location information available.
City	City of the incident location provided by geovalidation.
Landmark	If the incident location is identified as a Landmark the name of the landmark will display here

Facility Type	If available, this field describes the type of city facility associated to the SR
Community Board	Provided by geovalidation.
Borough	Provided by the submitter and confirmed by geovalidation.
X Coordinate (State Plane)	Geo validated, X coordinate of the incident location.
Y Coordinate (State Plane)	Geo validated, Y coordinate of the incident location.
Latitude	**Geo based Lat of the incident location**
Longitude	**Geo based Long of the incident location**
Location	Combination of the geo based lat & long of the incident location
Park Facility Name	If the incident location is a Parks Dept facility, the Name of the facility will appear here
Park Borough	The borough of incident if it is a Parks Dept facility
School Name	If the incident location is a Dept of Education school, the name of the school will appear in this field. If the incident is a Parks Dept facility its name will appear here.
School Number	If the incident location is a Dept of Education school, the Number of the school will appear in this field. This field is also used for Parks Dept Facilities.
School Region	If the incident location is a Dept of Education School, the school region number will be appear in this field.
School Code	If the incident location is a Dept of Education School, the school code number will be appear in this field.
School Phone Number	If the facility = Dept for the Aging or Parks Dept, the phone number will appear here. (note - Dept of Education facilities do not display phone number)
School Address	Address of facility of incident location, if the facility is associated with Dept of Education, Dept for the Aging or Parks Dept
School City	City of facilities incident location, if the facility is associated with Dept of Education, Dept for the Aging or Parks Dept
School State	State of facility incident location, if the facility is associated with Dept of Education, Dept for the Aging or Parks Dept
School Zip	Zip of facility incident location, if the facility is associated with Dept of Education, Dept for the Aging or Parks Dept
School Not Found	Y' in this field indicates the facility was not found
School or Citywide Complaint	If the incident is about a Dept of Education facility, this field will indicate if the complaint is about a particualr school or a citywide issue.
Vehicle Type	If the incident is a taxi, this field describes the type of TLC vehicle.
Taxi Company Borough	If the incident is identified as a taxi, this field will display the borough of the taxi company.
Taxi Pick Up Location	If the incident is identified as a taxi, this field displays the taxi pick up location
Bridge Highway Name	If the incident is identified as a Bridge/Highway, the name will be displayed here.
Bridge Highway Direction	If the incident is identified as a Bridge/Highway, the direction where the issue took place would be displayed here.
Road Ramp	If the incident location was Bridge/Highway this column differentiates if the issue was on the Road or the Ramp.

Bridge Highway Segment	Additional information on the section of the Bridge/Highway were the incident took place.
Garage Lot Name	Related to DOT Parking Meter SR, this field shows what garage lot the meter is located in
Ferry Direction	Used when the incident location is within a Ferry, this field indicates the direction of ferry
Ferry Terminal Name	Used when the incident location is Ferry, this field indicates the ferry terminal where the incident took place.

NTA Codes. We used the Neighborhood Tabulation Areas (NTA) from the Department of City Planning as the bases for zoning. NTAs were created based on the Census tracks from the 2010 Census. Original data could be retrieved in the following link:

https://www1.nyc.gov/site/planning/data-maps/open-data/dwn-nynta.page

2. Categories

The types of complaints in the dataset were reduced to twelve categories defined by NYC Deserves Better, and an additional category "Others" that comprise the rest of the complaints. The list of the categories constructed for the analysis is provided in the Table below.

Table 2 Categorization of types of complaints

Categories	Complaints as appeared in the dataset
Construction	BEST/Site Safety CONSTRUCTION Construction Cranes and Derricks GENERAL CONSTRUCTION Scaffold Safety
DOT/Infrastructure Conditions	Bridge Condition Broken Muni Meter Bus Stop Shelter Placement Curb Condition Highway Condition Highway Sign - Dangling Highway Sign - Missing Street Light Condition Street Sign - Damaged Street Sign - Dangling Street Sign - Missing Traffic Signal Condition Broken Parking Meter Highway Sign- Damaged
Buildings/Housing	General Construction/Plumbing Indoor Air Quality Indoor Sewage

	HEATING Lead Mold Non-Residential Heat PAINT - PLASTER PAINT/PLASTER PLUMBING Plumbing
Street Conditions	Derelict Bicycle Derelict Vehicle Derelict Vehicles Dirty Conditions Graffiti Overflowing Litter Baskets Root/Sewer/Sidewalk Condition Sanitation Condition Sidewalk Condition Street Condition Squeegee Sweeping/Inadequate Sweeping/Missed Sweeping Missed/Inadequate Unsanitary condition Overflowing Recycling Baskets
Corruption	City Vehicle Placard Complaint
Public Safety	Disorderly Youth Drinking Emergency Response Team (ERT) Hazardous Materials Non-Emergency Police Matter Other Enforcement Special Enforcement Urinating in Public Violation of Park Rules Drug activity Safety
Environment/Water Quality	Drinking Water Recycling Enforcement Sewer Water Quality Water System Air Quality
Homelessness	Homeless Encampment Homeless Person Assistance Panhandling
Noise	Noise Noise - Commercial Noise - Helicopter

	Noise - House of Worship Noise - Park Noise - Residential Noise - Street/Sidewalk Noise – Vehicle
Vermin	Rodent
Schools	School Maintenance
Seniors	Senior Center Complaint
Other	Remaining complaint types

3. Definitions

The parts “Trends in homeless person complaints (spanning 2011 - now)”, “Trends in non-emergency property damage-related complaints (spanning 2011 - now)”, and “Trends in non-emergency quality of life complaints- (spanning 2011 - now)” required a different arrangement of the categories originally set in the 311 dataset. *Homeless person complaints* were already tagged in the dataset, so we did not need to process it any further. As for n*on-emergency property damage-related* complaints or simply p*roperty damage*, we defined this as a complaint that was related with the deterioration of the value of any infrastructure item or zone. As for *non-emergency quality of life* complaints, or simply *quality of life*, we defined it as any complaint related with the people’s perception of appropriate environment. Thus, we defined *property damage* and *quality of life* as two sets composed by the following tags:

Category	Sub-categories
Property damage	Discipline and Suspension, Drug Activity, Illegal Tree Damage, Open Flame Permit, Smoking, UNSANITARY CONDITION.
Quality of life	Adopt-A-Basket, Animal Abuse, Animal Facility - No Permit, Animal in a Park, Asbestos, Asbestos/Garbage Nuisance, Beach/Pool/Sauna, Complaint, Benefit Card Replacement, Bike Rack Condition, Bike/Roller/Skate Chronic, Blocked Driveway, Boilers, Bottled Water, Building Condition, Building/Use, Buildings_Housing, Calorie Labeling, Collection Truck Noise, Construction, Consumer Complaint, Damaged Tree, Day Care, Dead Tree, Dead/Dying Tree, Dot_InfrastructureConditions, ELEVATOR, Electronics Waste, Environment_WaterQuality, Fire Alarm - Addition, Fire Alarm - Modification, Fire Alarm - New System, Fire Alarm - Reinspection, Fire Alarm - Replacement, Food Establishment, Food Poisoning, For Hire Vehicle Complaint, For Hire Vehicle Report, Gas Station Discharge Lines, Harboring Bees/Wasps, Health, Healthcare Facilities, Highway Sign - Damaged, Illegal Animal Kept as Pet, Illegal Animal Sold, Illegal Fireworks, Illegal Parking, Industrial Waste, LEAD, Lifeguard, Maintenance or Facility, Municipal Parking Facility, New Tree Request, Noise, Noise Survey, Overgrown Tree/Branches, Portable Toilet, Public Payphone Complaint, Public Toilet, Public_Safety, Radioactive Material, Snow, Stalled Sites, Street_Conditions,

	Traffic, Transportation Provider Complaint, Unsanitary Animal Facility, Unsanitary Animal Pvt Property, Vermin, WATER LEAK.

We defined **spikes** based on the average increase during the next 3 months. Based on that, we defined three types of spikes:

- *small spike* is the average increase of 50% or above during the next 3 months.
- *Big spike* is the average increase of 300% or above during the next 3 months.
- *Large spike* is the average increase of 500% or above during the next 3 months.

Reoccurrence: every complaint type that occurred again after first occurrence was cleared and closed in the system. The reoccurrence was bounded to an event that occurred at least one day after the previous complaint of the same category was closed, but before seven days. We assumed any complaint to occur after seven days an event not associated with the previous occurrence (assumed to have happened by chance).

Propuesta de

Programa de trabajo para la Dirección en Inteligencia de Datos

Por César Rentería Marín

Secretaría Ejecutiva
Sistema Estatal Anticorrupción de Jalisco

El presente plan de trabajo se basa en el perfil del puesto de la Dirección de Inteligencia de Datos, que es establecer mecanismos de producción, transmisión y análisis de información relevante para la fiscalización y control de recursos públicos. El plan de trabajo debe contribuir a la prevención, control y disuasión de faltas administrativas relacionadas con actos de corrupción. Adicionalmente, el presente plan de trabajo toma en consideración dos principios que recupero de mi formación académica y profesional en la implementación de tecnologías de la información en organizaciones:

1. La adopción de tecnologías de la información en organizaciones no pude ignorar los marcos institucionales, formales e informales, mediante los cuales opera cada organización (DeSanctis & Poole, 1984; Gil-Garcia & Pardo, 2005). Asimismo, la resistencia al cambio es un problema conductual de adopción de tecnologías que representa el principal reto en la implantación de cambios organizacionales (Erwin & Garman, 2010; Markus & Robey, 1988). [redacted]
2. Los puntos de partida de cada estrategia del plan de trabajo son problemas de actos de corrupción. En lo competente a la Dirección de Inteligencia de Datos, las tecnologías representan las principales soluciones, pero no los puntos de partida de la estrategia.

Uno de los factores críticos de éxito de intervenciones tecnológicas es la incorporación de factores no tecnológicos en el plan de trabajo. Por ejemplo, adecuaciones al marco regulatorio, la incorporación de colaboración interorganizacional, y el desarrollo de una estrategia compartida por los actores clave del SEAJ y de las dependencias gubernamentales involucradas. Estos son los factores críticos para la maduración de cualquier sistema de información en entidades gubernamentales (Fath-Allha, 2014).

Considerando los puntos anteriores, este plan de trabajo parte de cuatro retos de trabajo que percibo como factores clave para que la inteligencia de datos contribuya al combate a la corrupción dentro del marco del Sistema Estatal Anticorrupción de Jalisco:

1. ¿Qué tipo de información necesitan las instancias del Sistema Estatal Anticorrupción de Jalisco y los Órganos Internos de Control para mejorar la efectividad de sus labores? ¿Y qué tipo de datos se pueden producir para proveer dicha información?
2. ¿Como se puede integrar la información contenida en diversas plataformas de datos (p. ej. Plataforma Nacional de Transparencia) para su uso en las labores del Sistema Estatal Anticorrupción de Jalisco?
3. ¿Como se puede garantizar la protección de datos personales y prevenir la filtración de datos al expandir la infraestructura de datos de las entidades públicas?
4. ¿Como se puede incorporar la participación ciudadana (incluyendo ciudadanos, periodistas, empresarios y otros actores clave) como agentes monitores en contra de actos de corrupción?

Mi propuesta de programa de trabajo para la Dirección en Inteligencia de Datos contempla seis ejes estratégicos. Debido a la limitación de extensión de este documento, cada estrategia se aborda de manera general. Los siete ejes estratégicos son:

1. Infraestructura de datos
2. Interoperabilidad de plataformas de datos públicos
3. Desarrollo de métodos y software para el análisis de datos
4. Evaluaciones de ciberseguridad
5. Participación ciudadana en el combate a la corrupción
6. Fortalecimiento institucional de organismos anticorrupción municipales
7. Alianzas estratégicas e *investigación y desarrollo*

Aunque cada uno de los siete ejes estratégicos brinda distintas fortalezas al Sistema Estatal Anticorrupción de Jalisco, los dos ejes estratégicos que son la base del trabajo de inteligencia de datos para el combate a la corrupción son la producción y disponibilidad de información de calidad para las labores anticorrupción (la infraestructura de datos) y la capacidad de hilvanar toda la información contenida en distintas plataformas de datos a través de sus metadatos. Los ejes estratégicos del tres al seis representan trabajo complementario a los dos primeros ejes estratégicos para garantizar la seguridad de los datos, analizar y comunicar la información de manera efectiva, incorporar a la ciudadanía en el combate a la corrupción y proveer asistencia técnica a otros organismos anticorrupción. Finalmente, el eje estratégico numero siete representa una visión de mejora continua para capitalizar los avances tecnológicos y, eventualmente, colocar al Sistema Estatal Anticorrupción de Jalisco como un referente nacional en el uso de la inteligencia de datos para el combate a la corrupción.

1. Infraestructura de datos. La estrategia de infraestructura de datos contempla varios pasos. En primer lugar, llevar a cabo una auditoria de datos en las dependencias gubernamentales sujetas a la Ley del Sistema Anticorrupción del Estado de Jalisco. La auditoría de datos proveerá información sobre las necesidades de disponibilidad y calidad de datos en cada dependencia. En segundo lugar, a partir de dicha información, se propone elaborar un plan de desarrollo de infraestructura de datos que permita al Sistema Estatal Anticorrupción de Jalisco realizar sus labores de manera más efectiva. Debido a que un plan de estas características requiere el involucramiento de los 570 sujetos obligados del estado en la producción, almacenamiento y uso de los datos, el plan deberá ser acompañado de acuerdos y mecanismos de colaboración interinstitucional para la compartición de datos. Se propone utilizar el marco referencia de la Organización para la Cooperación y el Desarrollo Económicos (OCDE) denominado "The OECD Framework for the Governance of Infrastructure".

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En tercer lugar, se propone la elaboración y publicación de una Evaluación de la Disponibilidad e Integridad de Datos, mediante la cual se evalúe y reporte la calidad de la información producida y procesada digitalmente en cada dependencia de gobierno para su utilización como insumo para evidencia, evaluaciones y recomendaciones, por ejemplo, del Sistema Estatal de Fiscalización. La integridad de datos se refiere a la precisión, completitud y utilidad de los datos que produce cada sujeto obligado, de acuerdo con necesidades de información del Sistema Estatal Anticorrupción de Jalisco para realizar sus actividades de manera más efectiva. Un ejemplo de referencia son los lineamientos de producción y uso de datos para la fiscalización de los recursos públicos que utiliza la Government Accountability Office en Estados Unidos para facilitar las labores de fiscalización de la cuenta pública.[1] Estos reportes (acompañados de asistencia técnica) sirven como mecanismos para exhortar a las dependencias gubernamentales a mejorar la calidad y disponibilidad de su información en formatos digitales.

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[1] Vease GAO (2009) "Assessing the Reliability of Computer-Processed Data."

En cuanto a la tecnología, la mayor parte del esfuerzo en la gestión de tecnologías de un Chief Information Officers (CIO) se realiza en tecnologías estables, relativamente viejas y de bajo perfil mediático, pero que representan el mayor reto desde el punto de vista de la gestión administrativa (Remenyi et al., 2005). Por lo tanto, para el fortalecimiento de la infraestructura de datos se propone priorizar el fortalecimiento de sistemas de información (p. ej. *data warehouses*, tableros de control y plataformas de integración de datos). Asimismo, se propone focalizar la inversión en infraestructura de datos en cuatro capacidades tecnológicas que mas pueden contribuir al combate de la corrupción:

1. La producción de metadatos que permita integrar múltiples fuentes de datos.
2. La automatización de procesos basada en aprendizaje de máquina.
3. La producción de datos no estructurados y en tiempo real.
4. La aplicación de técnicas de visualización de datos para la comunicación efectiva de la información a los tomadores de decisiones o audiencias más amplias (p. ej. ciudadanos o periodistas).

2. Interoperabilidad de plataformas de datos públicos. Actualmente, la administración pública, tanto a nivel nacional como estatal cuenta con una vasta infraestructura de datos en la Plataforma Nacional de Transparencia (perteneciente al Sistema Nacional de Transparencia) y la Plataforma Digital Nacional (perteneciente al Sistema Nacional Anticorrupción). También, la reciente aprobada Ley General de Archivos requiere del desarrollo del Sistema Nacional de Archivos. Tan solo estos tres repositorios nacionales de datos son una herramienta fundamental para las labores de combate a la corrupción. Para capitalizar mejor el potencial que brindan este tipo de plataformas, es necesario desarrollar un sistema de interoperabilidad de plataformas. Se propone una estrategia de desarrollo y estandarización de los metadatos de cada una de estas plataformas para permitir su interoperabilidad. La posibilidad de hilvanar datos de diferentes fuentes confiables de información aumenta considerablemente la capacidad de las instituciones de "darle significado" a los datos, así como realizar procedimientos de investigación mas precisos, eficientes y oportunos.

3 [redacted]

3. Desarrollo de métodos y software para el análisis de datos. Se propone desarrollar una estrategia de inteligencia de datos que contribuya a la labor anticorrupción de las entidades del Sistema Estatal Anticorrupción de Jalisco. La estrategia se fundamenta en tres componentes: (1) infraestructura para el análisis de datos, (2) métodos de análisis de datos, y (3) capacidades humanas. La infraestructura para el análisis de datos se refiere a la adquisición de software para el análisis de datos. Se propone priorizar los softwares abiertos R y Python, que son los dominantes en la ciencia de datos.

A partir de un conocimiento preciso de los mecanismos de operación de cada acto de corrupción, se propone desarrollar algoritmos o programas que permitan identificar y señalar dichos actos de manera más eficiente y efectiva. El diseño de las estrategias de inteligencia de datos para el combate a la corrupción parte de una clasificación básica de actos de corrupción. De acuerdo con Nieuwbeerta et al. (2003), los actos de corrupción se pueden dividir en dos grandes categorías: (1) corrupción política (funcionarios públicos de alto nivel o funcionarios electos que son responsables por decisiones sobre transacciones gubernamentales mayores) y (2) corrupción burocrática (acto de corrupción hecho por un funcionario público cuya rutina involucra la interacción con ciudadanos). Cada categoría de acto de corrupción opera bajo mecanismos distintos, por lo que el tipo de datos y de técnicas de análisis de datos para cada acto de corrupción en función de los actos de corrupción a observar. Una incorporación de tecnologías efectiva requiere un conocimiento preciso sobre como estos mecanismos de corrupción operan, cuáles son los datos clave para identificar un acto de corrupción y cuáles son los datos que sirven de evidencia para el señalamiento y sanción de actos de corrupción por parte de las autoridades.

Finalmente, se propone incorporar una agenda de entrenamiento técnico para desarrollar las capacidades humanas, tanto en la Dirección de Inteligencia de Datos, como en las oficinas gubernamentales relevantes (p. ej. sistemas anticorrupción municipales).

En términos de tecnologías, se propone trabajar con las herramientas de programación dominantes en el campo de la ciencia de datos (R y Python). En términos de metodologías, se propone utilizar técnicas de aprendizaje de maquina y *deep learning* para el análisis de datos. Estas técnicas sirven para identificar patrones de actos de corrupción, para anticipar o señalar los mismos o para automatizar procesos administrativos (minimizar las áreas de oportunidad de actos de corrupción). Se propone también la incorporación de técnicas de análisis de texto para datos no estructurados y análisis de redes.

4. Evaluaciones de ciberseguridad. La protección de privacidad de datos personales y de filtración de datos es un componente esencial en el desarrollo de infraestructura de datos, en particular en el resguardo de información que pueda conllevar a sanciones por faltas administrativas. Por lo tanto, se propone complementar el plan de desarrollo de infraestructura de datos con una estrategia de protección de privacidad de datos personales y de filtración de datos. Para lograr esto, se propone realizar lineamientos para el Análisis de Riesgos de Ciberseguridad de la Infraestructura de Datos para el combate a la corrupción.

De manera general, un análisis de este tipo requiere tomar en consideración el nivel de riesgo involucrado en la producción y uso de datos para el Sistema Estatal de Fiscalización. El objetivo de dicho análisis es reportar a cada dependencia gubernamental, en acompañamiento a la Evaluación de la Disponibilidad e Integridad de Datos, las vulnerabilidades en sus controles de seguridad informática y los retos a considerar en el fortalecimiento de dicha estructura.

5. Participación ciudadana en el combate a la corrupción. Se plantea apostar por el desarrollo de plataformas tecnológicas denominadas crowdsourcing e inteligencia colectiva. Crowdsourcing es un modelo de plataformas de Internet que pueden utilizar las organizaciones para capitalizar las habilidades, conocimiento u otros recursos que tienen las personas fuera de la organización para realizar una tarea organizacional. Por sus características, el crowdsourcing es una tecnología que facilita y potencia la participación ciudadana. Por su parte, inteligencia colectiva es un término para referirse al uso en conjunto de plataformas de crowdsourcing o Internet de las cosas—para la producción de datos—más inteligencia artificial—para el análisis de dichos datos.

6. Fortalecimiento institucional de organismos anticorrupción municipales. Con el objetivo de fortalecer los organismos anticorrupción municipales, se propone desarrollar formatos de autoevaluación en (1) infraestructura de datos y (2) análisis de riesgos, así como sus respectivas guías para el mejoramiento de aspectos susceptibles de mejora. Asimismo, se propone establecer mecanismos de comunicación directa para proveer asistencia técnica para el fortalecimiento de capacidades humanas en la producción y gestión de datos.

7. Alianzas estratégicas e *investigación y desarrollo*. En términos generales, las tecnologías y metodologías relacionadas con la disciplina denominada "inteligencia de datos" son relativamente nuevas, por lo que sus aplicaciones son un área de desarrollo y experimentación. Asimismo, creo firmemente que, a partir de una estrategia de mediano plazo, el Sistema Estatal Anticorrupción de Jalisco tiene la posibilidad de convertirse en un referente nacional en cuanto al uso de infraestructura de datos e inteligencia artificial para el combate a la corrupción. Para ello, se propone incluir en el plan de trabajo una línea de trabajo que incorpore alianzas estrategias con instituciones de investigación especializadas en tecnologías en gobierno y la apuesta por investigación y desarrollo dentro de la institución.

En términos generales, se propone establecer alianzas con instituciones universitarias nacionales y extranjeras para la colaboración y compartición de conocimiento en inteligencia de datos para combate a la corrupción. Por ejemplo, algunas instituciones que tienen o han tenido proyectos relacionados con sistemas de información y corrupción son el Centro Latam Digital del Centro de Investigación y Docencia Económicas (CIDE), Center for Technology in Government (CTG) de la State University of New York (SUNY), el Insight Centre for Data Analytics de la National University of Ireland (NUI) y el Berkman Klein Center for Internet & Society de Harvard University. A través de dichas alianzas se pueden desarrollar talleres de capacitación, establecer convenciones de colaboración, realizar coloquios para el intercambio de conocimiento entre académicos y funcionarios públicos o entre funcionarios públicos de diversas instituciones en espacios universitarios.

5 [redacted]

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Se eliminan los datos 1, 2, 3, 4, 5 (firma). Por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Guadalajara, 6 de agosto de 2019
Asunto: carta de postulación e idoneidad

Secretaría Ejecutiva
Sistema Estatal Anticorrupción de Jalisco
PRESENTE

Tengo el agrado de dirigirme a ustedes con el fin de presentar mi postulación para ocupar la **Dirección de Inteligencia de Datos** del **Sistema Estatal Anticorrupción de Jalisco**.

Considero que mi perfil es apto para ocupar dicha dirección debido a que cuento con una formación especializada de 7 años en tecnologías de la información en organizaciones y en infraestructura de telecomunicaciones. Además, soy candidato a doctor en Administración y Políticas Públicas por la Universidad Estatal de Nueva York con especialización en tecnologías de la información en organizaciones (en particular, plataformas de participación ciudadana e inteligencia artificial para la toma de decisiones).

El programa de la Universidad Estatal de Nueva York es reconocido a nivel internacional por su especialización en tecnologías de la información en gobierno. Además de contar con investigadores líderes en gobierno digital, la universidad cuenta con el Center for Technology ini Government (CTG), instituto reconocido a nivel internacional que vincula la investigación con la práctica. Durante mi formación académica, tuve la oportunidad de trabajar en CTG, así como en el Columbia Center for Tele-Information y el Insight Centre for Data Analytics en el uso de tecnologías de la información emergentes para la gestión gubernamental y el análisis de políticas públicas (p. ej. inteligencia artificial, *Internet of Things*, *blockchain* y *crowdsourcing*).

Previo a mis estudios de doctorado, trabaje en el CIDE en regulación y políticas de telecomunicaciones, especialmente en infraestructura de telecomunicaciones. Durante esta etapa, no solo me especialice en el sector de las tecnologías de información en gobierno, sino que desarrolle capacidades de gestión de proyectos. En el CIDE, fui investigador principal en dos proyectos de investigación con financiamiento internacional y formé parte del equipo de investigación en cinco proyectos de investigación con financiamiento nacional e internacional. Asimismo, fui contratado como consultor principal para tres organizaciones internacionales (entre ellas el Banco Interamericano de Desarrollo) y una nacional (Secretaria de Desarrollo Social). También formé parte del equipo consultor en 17 consultorías para organizaciones internacionales (entre ellas, el Banco Interamericano de Desarrollo, Banco de Desarrollo de America Latina e International Development Research Centre) y nacionales (entre ellas, el Instituto Federal de Telecomunicaciones, Secretaria de Comunicaciones y Transporte, y Secretaria de Planeación Jalisco).

Una de las mayores ventajas de mi formación para el puesto directivo al que aplico es mi formación en administración publica. En la implementación de tecnologías de la información en organizaciones, los factores determinantes para su exitoso aprovechamiento son la armonización entre las tecnologías y el marco institucional, así como la gestión de los comportamientos humanos emergidos de la resistencia al cambio. Mi experiencia laboral, publicaciones y mis grados académicos avalan mi preparación para enfrentar estos retos desde puestos directivos. Por ejemplo, he publicado artículos de investigación en el uso tecnologías de la información de nueva generación para la implementación de políticas públicas y la toma de decisiones. Asimismo, colabore en el CTG en la evaluación de los sistemas de información que sustentan las plataformas de gobierno electrónico de los Emiratos Árabes Unidos, así como en la coordinación de reuniones intermunicipales entre los Chief Technology Officers (CTO) del estado de Nueva York.

En el ámbito de las tecnologías, mis fortalezas técnicas son la programación y la estadística. Soy experto en programación en R, Stata y Latex, y nivel intermedio en Python. Por ejemplo, recientemente desarrollé un software para la gestión de proyectos estadísticos del INEGI en R, mismo que está publicado en el repositorio oficial de R, CRAN. Tengo una sólida formación en estadística, en la cual he enseñado a nivel posgrado en los últimos siete años. Asimismo, he recibido formación escolar y he aplicado técnicas de aprendizaje de máquina en trabajos académicos relacionados con análisis cuantitativo de texto y *remote sensing*. Finalmente, conozco los fundamentos de otras técnicas como análisis de redes, *natural language processing*, *deep learning* y minería de datos.

En mi tesis de doctorado, estudio el uso de las plataformas de crowdsourcing para la participación ciudadana. Como resultado de mis productos de investigación en este campo, he desarrollado conocimiento en el diseño de mecanismos de participación ciudadana basadas en plataformas de Internet.

Por otro lado, tengo experiencia evaluando sistemas de información en organizaciones. Por ejemplo, en colaboración con profesores afiliados al CTG, desarrollé una metodología para la evaluación del nivel de madurez de los sistemas de gobierno electrónico (denominados *maturity models*) para el estudio de los Emiratos Árabes Unidos arriba mencionado. Dicha metodología fue patentada por el CTG y esta siendo implementada en otros países del medio oriente. Dicho trabajo nos valió una nominación como mejor articulo de investigación del año en la conferencia International Conference on Theory and Practice of Electronic Governance del 2019.

Complementariamente, he tenido diversas experiencias profesionales en del desarrollo de sistemas de indicadores y evaluación del desempeño. Por ejemplo, en 2013 me desempeñe como Director de Evaluación de la Subsecretaria de Planeación del gobierno del Estado de Jalisco, donde desarrollamos e implementamos diversas herramientas de monitoreo y evaluación. En 2016, formé parte del equipo de trabajo del Columbia Institute for Tele-Information para el desarrollo de un Observatorio de Ecosistema Digital para el Banco de Desarrollo de América Latina.

Con la presente carta y breve exposición de mi experiencia y aptitudes, respetuosamente les solicito que mi perfil sea valorado para asumir el cargo de Director de Inteligencia de Datos del Sistema Estatal Anticorrupción de Jalisco.

ATTE.

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Cesar Rentería Marin

Se elimina la firma (1) por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su

quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.

Escrito de aceptación de los términos de la convocatoria y publicidad

Secretaría Ejecutiva del Sistema Estatal Anticorrupción.
Presente.

Quien suscribe, con el carácter de candidata/to para ocupar el puesto vacante de Director de Inteligencia de Datos, dentro del proceso de reclutamiento y selección convocado por esta Secretaría el día 11 de junio de 2019 dos mil diecinueve, manifiesto por este medio que acepto los términos de la convocatoria, las bases y los lineamientos que regularan este proceso, mismos que son de mi pleno conocimiento en cuanto a su contenido y alcance.

Así mismo, manifiesto de manera libre, voluntaria, previa, especifica, informada e inequívoca que doy mi consentimiento expreso para que sean tratados mis datos personales para los fines que se me informan en el *Aviso de Privacidad Integral para el Reclutamiento y Selección del Personal de la Secretaría Ejecutiva del Sistema Estatal Anticorrupción* el cual he leído en su integridad, así mismo, expreso mi voluntad para que (si) (no) SI se publique mi nombre, y los documentos en versión pública relativos a mi candidatura, así como la demás documentación y resultados generados en torno a mi participación en cada una de las etapas del proceso de reclutamiento y selección al que acudo, y en los que se vean reflejados datos o información que tengan que ver con mi persona, hasta la conclusión del proceso.

Lo anterior, de conformidad con lo dispuesto por el artículo 14 numerales 1 y 4 de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; así como lo referido en el artículo 8 fracción V inciso d de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios.

Guadalajara, Jalisco a 6 del ~~mes de~~ Agosto de 2019.

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Cesar [illegible] Marin

Nombre y firma del candidata o candidato

Se elimina la firma (1) por ser considerados un dato personal identificable.
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AVISO DE PRIVACIDAD INTEGRAL

PARA EL RECLUTAMIENTO Y SELECCIÓN DEL PERSONAL DE LA SECRETARÍA EJECUTIVA DEL SISTEMA ESTATAL ANTICORRUPCIÓN

Domicilio del responsable del uso y protección de sus datos personales.
Avenida Arcos número 767, en la colonia Jardines del Bosque, en la ciudad de Guadalajara, Jalisco, con código postal 44520.

Datos personales que serán sometidos a tratamiento, identificando aquellos que son sensibles.

Se entiende por datos personales a cualquier información concerniente a una persona física identificada o identificable, es decir, cualquier tipo de datos que pueden ser utilizados para identificar de forma directa o indirecta a una persona, siendo los datos que serán sometidos a tratamiento por este sujeto obligado los siguientes:

Nombre, fecha de nacimiento, nacionalidad, edad, estado civil, domicilio, correo electrónico particular, clave de elector, cédula única de registro de población "CURP", firma, fotografía, número de teléfono celular, número de teléfono de casa, registro federal de contribuyentes "RFC", número de afiliación al Instituto Mexicano del Seguro Social "IMSS", número de pasaporte, grado máximo de estudios, formación académica, trayectoria educativa, calificaciones, títulos, certificados, reconocimientos, número de cédula profesional estatal, número de cédula profesional federal, nombramientos, datos sobre procedimientos administrativos, referencias personales, referencias laborales, actividades extracurriculares, capacitaciones, hojas de servicio, información fiscal, cuentas y números de cuentas bancarias, cuenta clabe interbancaria y datos socioeconómicos.

Además de los anteriores, se recabarán por este sujeto obligado, datos personales **SENSIBLES**, entendiéndose por aquellos que se refieran a la esfera más íntima de su titular, o cuya utilización indebida pueda dar origen a discriminación o conlleve un riesgo grave para éste, que de acuerdo al artículo 14 punto 4 de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios, requieren el consentimiento expreso y por escrito del titular para su tratamiento, a través de su firma autógrafa; salvo en los casos previstos en el artículo 15 del citado ordenamiento legal, siendo éstos los siguientes:

[redacted]

Huellas decadactilares, estado de salud, tipo de sangre, enfermedades, datos sobre antecedentes en archivos criminalísticos.

Los datos personales podrán ser recabados por la Secretaría Ejecutiva del Sistema Estatal Anticorrupción de Jalisco, directa o indirectamente, por escrito, a través de medios electrónicos o tecnológicos o de manera física. Los datos personales proporcionados a esta Secretaría Ejecutiva, serán única y exclusivamente utilizados para llevar a cabo su objetivo, fines y en cumplimiento de sus atribuciones, previstos en el artículo 25 de la Ley del Sistema Anticorrupción del Estado de Jalisco y artículos 3 y 10 último párrafo del Estatuto Orgánico de la misma.

Fundamento legal que faculta al responsable para llevar a cabo el tratamiento.
El tratamiento de sus datos personales, se realiza con fundamento en lo establecido en el artículo 6, Apartado A, fracción II y III y 16 segundo párrafo de la Constitución Política de los Estados Unidos Mexicanos, 4 y 9 fracciones V de la Constitución Política del Estado de Jalisco; en el artículo 31 punto 1, 32, punto 1, fracción III, VI, y VII 35 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; y en el artículo 3. 1. fracciones III, XXXII, 10, 19.2, 24, 87.1. fracciones I y X, y 88 punto 1, fracción II y III de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados Del Estado de Jalisco y sus Municipios. Y el fundamento legal, que faculta en lo particular, a la Secretaría Ejecutiva del Sistema Estatal Anticorrupción, para llevar a cabo el tratamiento de sus datos personales, en cumplimiento de su objeto y atribuciones, se lo confieren los artículos 107 Ter de la Constitución Política del Estado de Jalisco, 24 y 25 de la Ley del Sistema Estatal Anticorrupción del Estado de Jalisco, y artículo 3 y 10 último párrafo del Estatuto Orgánico de la misma, quien protegerá los datos que nos proporcione y se encuentra obligado a cumplir con los principios y deberes enmarcados en la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios.

Las finalidades del tratamiento para las cuales se obtienen los datos personales, son las siguientes:
Los datos personales serán recabados para cumplir con los objetivos y atribuciones de esta Secretaría Ejecutiva; para crear, revisar y valorar expedientes de las personas que pretendan ocupar un puesto vacante en la Secretaría Ejecutiva, derivados de los procedimientos de reclutamiento y selección; para publicar en cualquier medio de difusión el currículum y evaluación documental en versión pública de los candidatos y candidatas a ocupar las plazas vacantes de los puestos con la jerarquía administrativa inferior, a la del Secretario Técnico, esto es, Directores y Coordinadores, a que hace referencia el artículo 18, fracción IV del Estatuto Orgánico de la Secretaría Ejecutiva del Sistema Estatal Anticorrupción de Jalisco; para crear e integrar los expedientes personales de quienes laboran o prestan sus servicios profesionales, su servicio social o prácticas profesionales en esta Secretaría Ejecutiva; para el pago de la nómina, a través de transferencia

electrónica a las cuentas bancarias respectivas, o en su caso, para la apertura de cuentas bancarias para dichos efectos; para mantener el control de las asistencias del personal; para la atención de requerimientos judiciales, resoluciones o mandatos fundados y motivados por autoridades competentes; para realizar certificaciones de documentos que obran en los expedientes del personal de esta Secretaría Ejecutiva; para realizar informes requeridos por las autoridades judiciales sobre datos contenidos en los expedientes del personal de la Secretaría Ejecutiva; para realizar los resguardos de los bienes muebles e inmuebles en posesión y/o propiedad de la Secretaría Ejecutiva; para llevar el registro de incidencias del personal; para atender y tramitar las solicitudes del derecho de acceso a la información y protección de datos personales; para tramitar y realizar el pago de personas físicas bajo el régimen de asimilados a salarios; para enviar las declaraciones informativas respectivas al Sistema de Administración Tributaria del personal que labora o presta sus servicios profesionales en la Secretaría Ejecutiva; para llevar a cabo la revisión de auditorías; y para la identificación, integración y seguimiento de los procedimientos de investigación administrativa, de los procedimientos de separación y de las quejas entabladas por ciudadanos.

Las finalidades del tratamiento de datos descritas en el presente aviso en las que se requiere el consentimiento de su titular, con las excepciones previstas en el artículo 15 de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios, serán las siguientes:
Cuando se realice el tratamiento de datos personales sensibles para la apertura e integración de los expedientes personales, para el caso de los candidatos y candidatas a los puestos vacantes de esta Secretaría Ejecutiva de jerarquía inmediata inferior al Secretario Técnico, en el desarrollo de las etapas correspondientes reconocidas en los *Lineamientos de Reclutamiento y Selección de Personal de la Secretaría Ejecutiva del Sistema Estatal Anticorrupción* y en lo relativo a la publicación en cualquier medio de su nombre, y los documentos en versión pública relativos a su candidatura, así como la demás documentación y resultados generados durante el proceso de correspondiente que para el caso apliquen y acorde a lo establecido en el artículo 14, punto 4 de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco.

Asimismo, se informa que los datos personales recabados en los sistemas de datos personales de la Secretaría Ejecutiva del Sistema Estatal Anticorrupción, podrán ser tratados sin consentimiento del titular, siempre en respeto a sus derechos; teniendo como supuestos de excepción a los principios que rigen el tratamiento de datos, disposiciones de orden público, o en su caso, para proteger los derechos de terceros, según lo establece el segundo párrafo del artículo 16 de la Constitución Política de los Estados Unidos Mexicanos, concatenado con lo dispuesto en el artículo 15 de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios.

Los mecanismos, medios y procedimientos disponibles para que los titulares de datos puedan ejercer sus derechos ARCO son los siguientes:
El titular de los datos personales puede ejercer sus derechos de acceso, rectificación, cancelación y oposición de datos personales (**Derechos ARCO**), de conformidad con el artículo 16 párrafo segundo de la Constitución Política de los Estados Unidos Mexicanos, y a lo que señala el Título Tercero, Capítulos I y II de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios, mediante escrito libre presentado en la Unidad de Transparencia de la Secretaría Ejecutiva del Sistema Estatal Anticorrupción, que se ubica en la avenida Arcos número 767, en la Colonia Jardines del Bosque, en Guadalajara, Jalisco, con código postal 44520, en un horario de atención de Lunes a Viernes de 9:00 nueve a 15:00 quince horas.

El domicilio de la Unidad de Transparencia.
Se ubica en la avenida Arcos número 767, en la colonia Jardines del Bosque, en la ciudad de Guadalajara, Jalisco, con código postal 44520, con un horario de atención de Lunes a Viernes de 9:00 nueve a 15:00 quince horas.

Los medios a través de los cuales el responsable comunicará a los titulares los cambios al aviso de privacidad.
El presente Aviso de Privacidad puede sufrir modificaciones y/o actualizaciones derivadas de nuevos requerimientos legales, de las necesidades de esta Secretaría Ejecutiva del Sistema Estatal Anticorrupción, por mejora de sus procedimientos internos y sus prácticas de privacidad, o por otras causas.

Usted puede consultar este Aviso de Privacidad Integral, en su última versión, directamente en las oficinas que ocupan esta Secretaría Ejecutiva del Sistema Estatal Anticorrupción, ubicadas en la avenida Arcos número 767, en la colonia Jardines del Bosque, en la ciudad de Guadalajara, Jalisco, con código postal 44520, en su página *web*, disponible en la dirección electrónica http://seajal.org, así como en su Portal de Transparencia, particularmente en su artículo 8, fracción IX de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios.

Reconozco haber leído en su totalidad el presente aviso de privacidad y otorgo mi consentimiento expreso para el tratamiento de mis datos personales y datos personales sensibles.

4 [redacted]

Cesar Renteria Marin
(Nombre y firma)

Se eliminan los datos 1,2,3,4 (firma) por ser considerados un dato personal identificable.
Fundamento legal: Artículo 21.1 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Jalisco y sus Municipios; Artículos 2 y 3 incisos IX y X de la Ley de Protección de Datos Personales en Posesión de Sujetos Obligados del Estado de Jalisco y sus Municipios; y de los Lineamientos Generales en materia de Clasificación y Desclasificación de la Información, así como, para la Elaboración de Versiones Públicas emitidos por el Consejo Nacional del Sistema Nacional de Transparencia, Acceso de la Información Pública y Protección de Datos Personales en su quincuagésimo sexto, quincuagésimo séptimo y quincuagésimo octavo, por tratarse de un dato personal identificativo.