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Online Appendix for: Monitoring Corruptible Politicians

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Appendix A: *Examples – Content of Audit Reports*

AUCTIONS

Report Number: M-00-08
Municipality: Maunabo
Unit: 4049
Audited Period: July 1st, 1996 – December 31st, 1998
Authorized by: Manuel Díaz Saldaña
Report Date: October 28th, 1999
Press Release Date: November 1st, 1999

Report pages: 12-16

"Hallazgo 1 – Cotizaciones cuya autenticidad no se pudo corroborar; contratación de obras sin subastas; compras y servicios sin solicitar cotizaciones, y compras en mercado abierto sin la autorización de la Asamblea Municipal

a. No se pudo corroborar la autenticidad de cuatro cotizaciones sometidas a nombre de dos contratistas. Dichas cotizaciones fueron consideradas para la adjudicación de cuatro contratos para la repavimentación de calles y caminos en varios sectores por $137,689 entre febrero y marzo de 1997 (véase el Apartado b). En las cotizaciones se indicaban direcciones y números de teléfono que no correspondían a los contratistas a nombre de quienes se sometieron las mismas. Los funcionarios municipales tampoco pudieron ofrecer información sobre el particular que nos permitiera corroborar la autenticidad de dichas cotizaciones.

[…]

Esta situación nos impidió verificar la corrección y legalidad de dichas cotizaciones. Además, propicia la comisión de irregularidades con las mismas. El Alcalde no cumplió con las disposiciones citadas ni protegió adecuadamente los intereses del Municipio.

b. El Alcalde fraccionó los costos de la repavimentación de caminos y calles en varios sectores del Municipio por $137,689 en cuatro contratos formalizados con dos contratistas en febrero y marzo de 1997 (véase el Apartado a). Esto evitó que el costo individual de éstos excediera de $40,000 y se obvió la celebración de las subastas públicas requeridas. A continuación presentamos los detalles:

Descripción	Fecha del contrato	Importe
Varios caminos en el Sector Baerga del Barrio Palo Seco	24 feb 97	$39,945
Varios caminos en el Sector Los Montaña	"	39,800
Camino Antonio Rodríguez	13 mar 97	22,742
Caminos Alejo Torres y José L. García	"	…….35,202
		…..$137,689

Una situación similar se comentó en el informe de auditoría anterior."

Report Number:M-00-06

Municipality: Vieques
Unit: 4075
Audited Period: July 1st, 1994 – June 30th, 1998
Authorized by: Manuel Díaz Saldaña
Report Date: September 30th, 1999
Press Release Date: October 5th, 1999

Report pages: 16, 18-20

"Hallazgo 1 – Compras, servicios y obras sin celebrar subastas y sin solicitar cotizaciones; perjuicio ocasionado al Municipio por el rechazo de las ofertas en una subasta; subastas adjudicadas a licitadores que no presentaron las mejores ofertas, y compras en mercado abierto sin la autorización de la Asamblea Municipal

[…]

e. En octubre de 1995 la Junta de Subastas celebró una subasta para la construcción de cuatro salones en la Escuela de Playa Grande. A dicha subasta comparecieron dos contratistas con ofertas por $225,000 y $340,000, las cuales cumplían con las especificaciones requeridas. La Junta de Subastas no adjudicó dicha subasta. En las actas de ese organismo no se indicaron las razones, si algunas, para dicha decisión.

En noviembre de 1995 la Junta de Subastas celebró una segunda subasta para la adjudicación de dicha obra con las mismas especificaciones de la subasta anterior. A esta subasta solamente concurrió el contratista que cotizó $340,000 en la subasta anterior, pero en esta ocasión con una oferta por $325,000. Esta oferta excedió por $100,000 la presentada por el otro contratista en la subasta de octubre de 1995. La Junta de Subastas adjudicó la segunda subasta por $325,000 al único licitador.

En diciembre de 1995 la Alcaldesa formalizó el contrato para la construcción de la obra por $285,000. Dicho importe era $40,000 menor que el monto por el cual se adjudicó la obra. Para dicha diferencia no se ofrecieron las razones, si algunas. Por otra parte, el importe contratado excedía por $60,000 el importe cotizado por el licitador que ofreció la cotización más baja en la subasta celebrada en octubre de 1995.

Esta situación ocasionó que el Municipio pagara en exceso $60,000 en la construcción de la referida obra.

f. En abril de 1997 y mayo de1998 la Junta de Subastas adjudicó dos subastas para la compra de cinco vehículos por $134,082 a tres licitadores cuyas ofertas excedieron por $25,081 las presentadas por otros licitadores que cumplieron con las especificaciones establecidas en las subastas. A continuación presentamos el detalle:

Descripción	Adjudicada	Oferta más baja	Exceso
Vehículo 4 x 4	$28,188	$25,456	$2,732
"Pick-Up" 150 (2)	34,216	32,322	1,894
"Pick-Up" pequeña	15,751	13,725	2,026
Ambulancia Categoría II	55,927	37,498	18,429
	$134,082	$109.001	$25.081

En las actas de la Junta de Subastas no se indicaron las razones que justificaban dichas adjudicaciones.

Esta situación ocasionó que el Municipio pagara en exceso $25,081 en la adquisición de dichos vehículos, recursos que pudieron utilizarse para atender otras necesidades.

La Alcaldesa y la Junta de Subastas no cumplieron con la disposición citada ni protegieron los intereses del Municipio."

PATRONAGE JOBS

Report Number: M-00-25
Municipality: Cidra
Unit: 4021
Audited Period: July 1st, 1995 – June 30th, 1998
Authorized by: Manuel Díaz Saldaña
Report Date: March 16th, 2000
Press Release Date: March 17th, 2000

Report pages: 18-21

"Hallazgo 3 – Nombramiento de un familiar del Alcalde y de otro funcionario a puestos de carrera y de confianza sin cumplir éstos con los requisitos establecidos ni el Municipio cumplir con otros requisitos

a. En septiembre de 1993 el Alcalde emitió un nombramiento a un familiar suyo para ocupar el puesto de carrera de Supervisor de Forestación y Ornato con un sueldo de $1,222 mensuales. Para dicho nombramiento no se cumplió con los siguientes requisitos básicos: la publicación de una convocatoria, el suministro de examen y el establecimiento de un Registro de Elegibles. Además, los documentos sobre la Convocatoria y el Registro de Elegible relacionados con el referido nombramiento, tenían fechas de un año después de que se le emitió el mismo.

[…]

Las situaciones mencionadas en los apartados "a" al "c", no permite una administración adecuada y de excelencia del personal de carrera y de confianza sobre las bases del sistema de mérito.

El Alcalde, la Asamblea Municipal y el Director de Recursos Humanos no cumplieron con las disposiciones de ley citadas."

Report Number: M-00-40
Municipality: Toa Baja
Unit: 4070
Audited Period: January 1st, 1996 – December 31st, 1998
Authorized by: Manuel Díaz Saldaña
Report Date: June 14th, 2000
Press Release Date: June 16th, 2000

Report pages: 15-21

"Hallazgo 1 – Nombramientos de familiares del Alcalde y de legisladores municipales que no tenían la preparación académica y demás requisitos mínimos requeridos para ocupar los puestos, y sueldos pagados ilegalmente a otros funcionarios y empleados en exceso de la retribución máxima establecida

(1) De febrero de 1985 a octubre de 1997 el Alcalde nombró en el Municipio a 22 empleados que eran sus parientes. También nombró a 11 empleados que eran parientes de 5 legisladores municipales. De estos 11 empleados, 4 eran parientes de la Presidenta de la Asamblea Municipal.

(2) Veintiuno de los empleados parientes del Alcalde y de legisladores municipales, nombrados de septiembre de 1991 a octubre de 1997 no poseían la preparación académica y los requisitos mínimos exigidos para la clase de puesto en los cuales fueron nombrados.

(3) De agosto de 1994 a septiembre de 1996 el Alcalde reclasificó en dos ocasiones a dos empleadas familiares de éste, a puestos para los cuales éstas no cumplían con la preparación académica y los requisitos mínimos de los puestos.

(4) De abril de 1990 a enero de 1997 el Alcalde aprobó 17 reclasificaciones de puestos y concedió 27 aumentos de sueldo a 2 funcionarios y a 9 empleados de los que se indican en el Apartado (1), cuyos nuevos sueldos asignados a los puestos que ocupaban excedieron de $39 a $1,051 la retribución máxima fijada en el Plan de Clasificación y Retribución Uniforme del Municipio. Como consecuencia, de abril de 1990 a julio de 1997 el Municipio pagó sueldos en exceso e ilegales por $128,434 a dichos funcionarios y empleados parientes del Alcalde y de legisladores municipales.

[…]

Las situaciones comentadas en los apartados "a" y "b" se las informamos al Director Ejecutivo de la Oficina de Etica Gubernamental por carta del 25 de junio de 1999.

[…]

En el Artículo 6-A del Reglamento de Etica Gubernamental se establece, entre otras cosas, que todo servidor público deberá evitar tomar acción, esté o no específicamente prohibida por este Reglamento, que pueda resultar en o crear la apariencia de:

- Dar trato preferencial a cualquier persona, salvo justa causa.

- Perder su completa independencia o imparcialidad.

- Afectar adversamente la confianza del público en la integridad y honestidad de las instituciones gubernamentales.

- Promover una acción oficial sin observar los procedimientos establecidos.

[…]

El nepotismo es contrario al sistema democrático, el cual supone que todos aquéllos que reúnan los requisitos compitan en igualdad de condiciones al momento de optar por un empleo gubernamental. Los procedimientos de selección de personal tienen que ser imparciales para lograr reclutar el mejor talento disponible. El nepotismo derrota estos principios.

Estas situaciones ocasionaron lo siguiente:

- Crean una percepción negativa de la Administración Municipal de Toa Baja.
- Se utilizó el sistema de personal para favoritismos.
- Se pagaron indebidamente sueldos por $262,194,
- Se pudo propiciar la comisión de irregularidades porque se debilitan los controles internos al nombrarse a parientes en los puestos.
- Se pudo afectar el Municipio, ya que al nombrar en los puestos a familiares del Alcalde y de legisladores municipales se corre el riesgo de que surjan conflictos y situaciones que

pudieran degenerar en actos de corrupción.

El Alcalde y la Presidenta de la Asamblea Municipal se aprovecharon de sus cargos para beneficiar a familiares allegados a éstos, en perjuicio de otras personas cualificadas que estuvieran interesadas de participar en las funciones públicas del Municipio."

Report Number: M-01-50
Municipality: Maricao
Unit: 4048
Audited Period: January 1st, 1997 – December 31st, 1999
Authorized by: Manuel Díaz Saldaña
Report Date: June 14th, 2001
Press Release Date: June 15th, 2001

Report pages: 37-40

"Hallazgo 6. – Puesto ocupado ilegalmente por un pariente del Alcalde

a. En enero de 1997 el Alcalde nombró a un pariente suyo en el puesto de Director de Recreación y Deportes. En julio de 1997 el Alcalde sometió el nombramiento de dicho funcionario a la Asamblea Municipal para su confirmación. A esta fecha había transcurrido el período permitido por ley para someter a la Asamblea Municipal el nombramiento. Dicho organismo rechazó el nombramiento porque la persona no poseía la preparación académica requerida para el puesto. En enero y marzo de 1998 el Alcalde sometió nuevamente el nombramiento de dicha persona a la Asamblea Municipal para su confirmación, pero dicho organismo lo rechazó en esas ocasiones por la misma razón. A pesar de la determinación de la Asamblea Municipal, el referido funcionario continuó en el puesto y en abril de 2000 renunció al mismo. A continuación presentamos el detalle de los períodos en que dicho funcionario ocupó ilegalmente el puesto y los sueldos por $55,519 pagados:

PERÍODO	**SUELDOS**	**RAZÓN**
abr. a jul. 97	$5,236	No se sometió el nombramiento a confirmación dentro de los 90 días siguientes al mismo
sep. 97 a ene 98	7,975	Nombramiento rechazado por la Asamblea Municipal, pero continuo en el puesto
abr. 98 a abr. 00	42,308	"
TOTAL	**$55,519**	

[…]

El nepotismo es contrario al sistema democrático, el cual supone que todos aquéllos que reúnan los requisitos compitan en igualdad de condiciones al momento de optar por un empleo gubernamental.

Los procedimientos de selección de personal tienen que ser imparciales para lograr reclutar el mejor talento disponible. El nepotismo derrota estos principios.

Esta situación resulta perjudicial al Municipio, ya que el funcionario indicado ocupó el puesto sin cumplir con los requisitos del mismo. Además, los actos de nepotismo crean una percepción negativa de favoritismo. Por otra parte, son ilegales los sueldos pagados por $55,519.

El Alcalde y el funcionario indicado no cumplieron con las disposiciones citadas y actuaron en perjuicio del Municipio."

OVERINVOICING

Report Number: M-01-50
Municipality: Maricao
Unit: 4048
Audited Period: January 1st, 1997 – December 30th, 1999
Authorized by: Manuel Díaz Saldaña
Report Date: June 14th, 2001
Press Release Date: June 15th, 2001

Report pages: 22-27

"**Hallazgo 1 - Facturación de recogido de escombros en exceso de los estimados de FEMA; contrato enviado con tardanza a la Oficina del Contralor, y otras deficiencias relacionadas con la contratación de estos servicios**

a. En octubre de 1998 el Alcalde formalizó con un contratista un contrato por $4,200,000 para el recogido de escombros, corte de árboles, disposición de éstos y el barrido de calles y aceras, como consecuencia del paso del Huracán Georges. El contrato se pagaría con fondos provenientes de la *Federal Emergency Management Administration* (FEMA). En el contrato se estableció que la tarifa por yarda cúbica recogida sería de $28. Además, se acordó en el contrato que el Municipio se hacía responsable del pago total del contrato en caso de que FEMA no realizara los desembolsos correspondientes.

De noviembre de 1998 a enero de 1999 el contratista facturó al Municipio, mediante certificaciones de trabajos realizados, $4,344,603 por 155,164 yardas cúbicas de escombros recogidos. Las referidas certificaciones estaban firmadas por empleados del Municipio como que los servicios se recibieron de conformidad. A diciembre de 1999 el Municipio había pagado $2,598,595 de dicho importe por 92,807 yardas cúbicas. Las facturas sometidas y pagadas al contratista estaban firmadas como correctas por el Alcalde. Del importe pagado, $1,027,831 provinieron de fondos aportados por FEMA, $67,500 de fondos administrativos de programas federales y los restantes $1,503,264 de fondos del **Programa CDBG** asignados para la construcción de 10 proyectos.

FEMA determinó que el contratista recogió y depositó en los centros de acopio 50,157 yardas cúbicas de escombros, en lugar de las 155,164 facturadas al Municipio. A diciembre de 1999 FEMA había aprobado fondos al Municipio por $1,404,396 para el recogido de escombros, correspondientes a las 50,157 yardas cúbicas de escombros recogidos. Esto representó una diferencia entre lo facturado al Municipio por el contratista y lo aprobado por FEMA de $2,940,207 (105,007 yardas cúbicas). También representó un pago en exceso de $1,194,199 (42,650 yardas cúbicas) respecto al importe aprobado por FEMA y lo desembolsado por el Municipio al contratista. El Municipio apeló la determinación de FEMA. A junio de 2000 la reclamación estaba pendiente de resolución por FEMA. El Municipio no había pagado los restantes $1,746,008 facturados por el contratista.

[…]

Nuestro examen de los viajes realizados por 15 camiones reveló que el contratista facturó en exceso $261,884. Esto, porque la capacidad de los camiones figurada en los informes excedía las medidas de éstos, según nos informaron los dueños de los mismos. Además, se incluyeron camiones como prestando servicios, lo cual era incorrecto según la evidencia obtenida.

[…]

El Alcalde y los demás funcionarios concernientes no cumplieron con las disposiciones citadas ni protegieron los intereses del Municipio respecto a la situación señalada."

Report Number: M-02-29
Municipality: Hormigueros
Unit: 4035
Audited Period: July 1st, 1998 – June 30th, 2000
Authorized by: Manuel Díaz Saldaña
Report Date: December 26th, 2001
Press Release Date: January 15th, 2002

Report pages: 20-24

"Hallazgo 1. – Facturación y pagos en exceso por servicios de recogido de escombros por los daños ocasionados por el Huracán Georges

a. En octubre de 1998 el Alcalde formalizó un contrato por un costo estimado de $3,692,000 con una persona para el recogido de escombros causados por el paso del Huracán *Georges*, el 21 de septiembre de dicho año. **[**Véase el **Hallazgo 2]** El contrato se pagaría con fondos provenientes de la *Federal Emergency Management Agency* **(FEMA)**. En dicho contrato se estimó el recogido de escombros hasta un máximo de 142,000 yardas cúbicas a una tarifa de $26 la yarda cúbica.

De noviembre de 1998 a marzo de 1999 el contratista facturó al Municipio, mediante certificaciones de trabajos realizados, $1,676,818 por 64,493 yardas cúbicas de escombros recogidas. Los funcionarios municipales certificaron como correctas dichas certificaciones. El desglose de las certificaciones es como sigue: $256,360 correspondían a 9,860 yardas cúbicas depositadas en el Vertedero del Municipio de Mayagüez, $1,343,758 por 51,683 yardas cúbicas depositadas en un centro de acopio ubicado en el Municipio de Añasco el cual tenía la autorización del Cuerpo de Ingenieros del Ejército de los Estados Unidos, y los restantes $76,700 por 2,950 yardas cúbicas que se transportaron al referido centro de acopio, pero que no fueron depositadas en el mismo porque estaban contaminadas. Éstas fueron depositadas en un vertedero.

A mayo de 1999 el Municipio había pagado $1,151,317 del importe facturado por 44,282 yardas cúbicas de fondos de **FEMA**. De dicho importe, $818,257 correspondían a 31,508 yardas de escombros recogidos en el centro de acopio ubicado en el Municipio de Añasco y los restantes $333,060 a las 12,810 yardas depositadas en el Vertedero del Municipio de Mayagüez y los escombros contaminados. A la fecha de nuestra auditoría, febrero de 2001, el Municipio no le había pagado al contratista los restantes $525,501 correspondientes a 20,175 yardas cúbicas de escombros.

El Cuerpo de Ingenieros del Ejército de los Estados Unidos certificó que las yardas cúbicas de escombros recogidos en el centro de acopio ubicado en el Municipio de Añasco fueron de 22,983**, en

** Se depositaron 16,776 yardas cúbicas, pero se le adicionó un 37 por ciento por el asentamiento y compactación de los escombros una vez depositados en el Vertedero.

lugar de las 51,683 facturadas al Municipio. A base de dicha certificación, a mayo de 1999 **FEMA** había aprobado fondos al Municipio por $597,558 correspondientes a ese renglón. Las yardas cúbicas facturadas al Municipio por el contratista en ese renglón excedían por 28,700 a las certificadas por el Cuerpo de Ingenieros. Esto representa una facturación en exceso de $746,200. Con relación al importe pagado, representa un pago en exceso al contratista de $221,635. A febrero de 2001 el Municipio no había pagado los restantes $525,501 facturados en exceso por el contratista.

b. Con relación a los procesos de supervisión y facturación de dichos servicios se determinó lo siguiente:

1) El Municipio no realizó una supervisión adecuada de los trabajos contratados para asegurarse que se habían rendido en las fechas y por las cantidades facturadas. A estos efectos se determinó que el contratista facturó que los camiones realizaron 2,502 viajes, pero el Cuerpo de Ingenieros certificó que se realizaron 917 viajes. Esto representa un exceso de 1,585 viajes, lo cual forma parte del importe facturado en exceso.

2) En las facturas sometidas al Municipio por el contratista éste certificó los viajes de los camiones a base de la capacidad máxima en yardas cúbicas de los mismos, y no por la cantidad real de yardas cúbicas de escombros depositados por cada camión.

El 5 de noviembre de 2001 le entregamos a los funcionarios del Departamento de Justicia, a solicitud de éstos, toda la evidencia obtenida relacionada con los hechos señalados. En ese mismo mes la Secretaria de Justicia solicitó al Panel del Fiscal Especial Independiente la designación de un Fiscal Especial Independiente (FEI) para investigar estos hechos y los señalados en el **Hallazgo 3,** entre otros, y la radicación de los cargos criminales correspondientes contra el Alcalde.

[…]

Esta situación propició la comisión de irregularidades y de pagos indebidos. Además, puede afectar al Municipio, ya que existe la posibilidad de que tenga que asumir algunos costos si **FEMA** decide no reembolsar los fondos.

El Alcalde y los demás jefes de las dependencias municipales concernientes no protegieron los intereses del Municipio respecto a la situación señalada."

Appendix B: *Measures of Deviation from Pre-Determined Audit Order, Correlates and Robustness Tests*

B.1. Measures

To measure the extent to which the OCPR follows the pre-specified audit order, we construct variables that capture deviations from the expected order (see Section III.A in the paper). The two measures are:

(a) the deviation from the expected number of other municipality audits (77) between each pair of audits for each municipality for a sample of 220 sequential municipal audit pairs:

$$Dev_{mt} = \left(N_{mt}^{oth\ reports} - 77\right)$$

where $N_{mt}^{oth\ reports}$ denotes the number of audits of other municipalities disseminated between these two audits for municipality *m* in electoral cycle *t*;

(b) the *absolute value* of the deviation from the expected number of audits from other municipalities between a pair of audits for each municipality:

$$AbsDev_{mt} = \left|N_{mt}^{oth\ reports} - 77\right|$$

where $N_{mt}^{oth\ reports}$ is defined as above. The second measure captures the degree of dispersion of the deviation from the rule. In the case that there are multiple audits in one cycle, we take the average of this measure across each pair of audits in each cycle. As robustness check, we also construct two alternate variables that measure the maximum of this deviation, instead of the mean (in case of multiple reports within a term).

B.2. Correlates and Robustness Tests

We document correlates of our measures of deviation from the pre-determined audit order based on our data on audit characteristics, municipal socio-economic and political characteristics, and characteristics of mayors. We report these correlations in Appendix Table I.

The first measures (average and maximum deviation) are strongly correlated with certain political variables (whether the mayor is a member of the PPD, and whether the mayor is in the opposition to the party of the governor who appointed the Comptroller). The second, stronger correlation implies that a one standard deviation increase in the deviation measure predicts a 16.4-17.4 percent decrease in the likelihood that the mayor's party affilitation differs from the party affiliation of the Governor who appointed the Comptroller (Appendix Table I, columns 3 and 6). The second set of measures (average and maximum of the absolute value of the deviation) is similarly correlated with these political characteristics. In addition, a one standard deviation increase in these measures of deviation predicts a 26.4-28.6 percent decrease in the mayor's win margin in the previous election, as well as a 33.7-37.9 percent increase in the probability of being in the opposition to the governor (Appendix Table II, columns 3 and 6). Due to this correlation, we need to worry about the potential endogeneity of the timing of the audit and whether this affects our main estimates.

We estimate models in which we control for our measures of deviation from the pre-determined audit order (among the subsample for which we can construct these measures), to examine whether deviations from the rule affect our estimates of the effects of timely audits. We report estimates from our preferred measure of findings referred to the P.R. DoJ in the main text (see Section VII; Table VI). In this appendix, we report comparable estimates for all other measures (see Appendix Tables III, IV). Controlling for these measures does not affect our estimates of short-run and longer-run effects of timely

audits. In addition, the implied relationship between the deviation measures and the findings of corruption is small. In sum, the deviation from the predetermined order is correlated with certain political variables, but it is not strongly correlated with the timeliness of the audit. Furthermore, controlling for these measures does not affect our estimates of the short-run and longer-run relationship between the timing of the audits and rent-seeking levels.

Appendix C: *Politician Selection Effects based on Elected Mayors' Pre-Candidacy Earnings*

C.1. Data and Empirical Methodology

We employ an additional dataset compiled from publicly available state-level income tax returns for the four year period preceding each of the 2000 and 2004 elections (available from the P.R. State Electoral Commission (CEE)). All candidates were required by law to submit these documents to the CEE in order to be certified, and they subsequently become part of the public record. We use this data to examine, for this sub-sample, whether the audits induce positive selection of politicians based on their pre-incumbency earnings – 5 years before the relevant election.

To identify whether the timely audit dissemination generates selection in the types of politicians who win office, we estimate a model analogous to equation (2) that uses as dependent variable the household per capita earnings five years before the election of the mayor elected in period t (denoted y_{mt}). The model captures the average effects of the audits and their dissemination on a measure of income/socio-economic status of the elected mayor (whether it is the re-elected mayor or the challenger).[††] To the extent that pre-determined income is correlated with competence, managerial or campaigning ability, finding evidence of a correlation would represent evidence of information inducing politician selection. We also test whether the audit-induced politician selection is heterogeneous across municipalities with zero reported corruption and among those whose executives were shown to have engaged in corruption. We thus estimate models (analogous to equation (5)) to uncover this potential heterogeneity in politician selection.

$$y_{m,t} = \theta_{Y1}A_{m,t} + \theta_{Y2}A_{m,t}c_{m,t} + \beta_{Y1}c_{m,t} + \beta_{Y2}X_{m,t} + \gamma_t + \alpha_m + \varepsilon_{m,t}, \qquad \text{(A.C.1)}$$

Our model predicts that $\theta_{Y1} > 0$ and $\theta_{Y2} < 0$. Additionally, since the information on post-election audits are (by definition) not available at the time of the election, the content of these audits should have no effect on the probability of re-election of the incumbent mayor. Therefore, an ancillary prediction in the empirical model is that $\beta_{Y1} = 0$.

C.2. Results

We start the discussion with a graphical analysis. Appendix Figure I depicts the elected mayor's household per capita earnings five years preceding the respective election as a function of the reported corrupt violations per report in the municipality, again distinguishing between municipalities whose audit reports were published in the two-year period prior to the election (solid red line) and those whose reports were published in the two-year period following each election (dashed green line).[‡‡] Among municipalities with no reported violations or with moderate corruption (up to two violations per report), the data suggests that elected mayors have lower pre-candidacy earnings in municipalities which had a

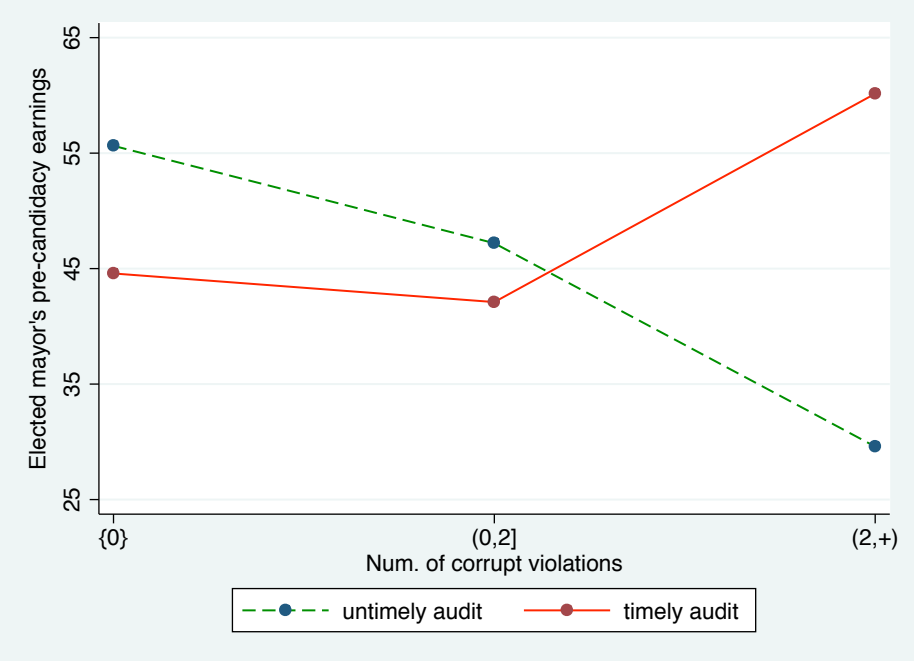
[††] This analysis is analogous to estimates of policies and institutions on politician selection based on the educational attainment of candidates and elected politicians, as in Besley (2004), Diermeier, Keane, and Merlo (2005), Ferraz and Finan (2010), Fisman et al. (2012) and Gagliarducci and Nannicini (2012).

[‡‡] The reported differences between timely and untimely audit municipalities are regression-adjusted for election period fixed effects. The graphical relationship and parametric estimates are qualitatively similar for the overall sample of municipalities (including municipalities in which mayors do not run for re-election).

timely audit (not statistically significant). We see a reversal and strengthening of this relationship among municipalities with high corruption (more than two violations per report). We find a difference of approximately $30K USD in the pre-candidacy earnings of individuals across municipalities with timely and untimely audits. This is indicative of significant positive politician selection among municipalities where voters receive information about negative audit outcomes.

The point estimate from a parametric empirical model of the average effect of timely audits shows a slight degree of positive selection of politicians with previously higher earnings; it suggests that, on average, elected mayors following timely audits have earned an additional $6,680 USD (15 percent), although it is imprecisely estimated (Appendix Table III, column 1). However, there is a significant positive earnings-selection effect of timely audits among municipalities with non-zero levels of corruption, as captured by parametric estimates of the reduced-form relationship following empirical model (5). The point estimate indicates that the difference between the earnings of newly elected or re-elected mayors in timely versus untimely audit municipalities increases by $10,910 USD (25 percent) for each additional finding per report (column 2). Overall, the estimates support the hypothesis that information about corrupt violations induces a degree of pre-incumbency earnings-based selection.

APPENDIX FIGURE I:
RELATIONSHIP BETWEEN REPORTED CORRUPTION LEVELS AND ELECTED MAYOR'S PRE-CANDIDACY EARNINGS FOR MUNICIPALITIES AUDITED BEFORE AND AFTER ELECTIONS



Notes: The figure shows the adjusted (by election intercepts) relationship between pre-incumbency earnings of the mayors who were elected in the election in period *t* and the number of corrupt violations per report in the audits for municipalities with timely and untimely audits around election the election period *t*.

APPENDIX TABLE I:
CORRELATES OF MEASURES OF DEVIATION FROM THE PRE-DETERMINED AUDIT ORDER

	Correlation coefficient			Correlation coefficient			
	Mean Deviation (1)	Δ1SD(X) × Corr. (2)	%Δ (3)	Maximum Deviation (4)	Δ1SD(X) × Corr. (5)	%Δ (6)	N (7)
Number of audit reports	-0.0030 (0.0054)	-0.05	-2.8%	-0.0001 (0.0063)	0.00	-0.1%	220
Start of audit period in reports (years from election)	-0.0131 (0.0100)	-0.22	-3.6%	-0.0161 (0.0098)	-0.29	-4.7%	220
End of audit period in reports (years from election)	0.0006 (0.0076)	0.01	0.9%	-0.0001 (0.0068)	0.00	-0.2%	220
Time span of audited period (years)	-0.0136 (0.0099)	-0.23	-4.6%	-0.0159 (0.0101)	-0.29	-5.7%	220
Mayor, member of PNP (1/0)	-0.0036* (0.0021)	-0.06	-11.6%	-0.0032 (0.0020)	-0.06	-11.0%	220
Mayor's win margin in previous election (years)	0.0003 (0.0004)	0.01	4.6%	0.0003 (0.0004)	0.01	4.9%	220
Terms in office	-0.0038 (0.0061)	-0.06	-4.2%	-0.0032 (0.0056)	-0.06	-3.7%	220
Member of opposition party to Governor (1/0)	-0.0040 (0.0029)	-0.07	-21.2%	-0.0026 (0.0027)	-0.05	-14.6%	220
Member of opp. party to Governor appointing Comptroller (1/0)	-0.0051* (0.0027)	-0.09	-16.4%	-0.0051** (0.0025)	-0.09	-17.4%	220
Share of pop. high school education or more (1990)	0.0001 (0.0004)	0.00	0.4% [a]	0.0002 (0.0004)	0.00	0.8% [a]	220
Share of pop. College education or more (1990)	-0.0001 (0.0003)	0.00	-1.6% [a]	0.0001 (0.0003)	0.00	1.7% [a]	220
Poverty rate (1990)	0.0000 (0.0005)	0.00	0.0% [a]	-0.0002 (0.0004)	0.00	-0.6% [a]	220
Household median income (1,000 USD) (1990)	0.0008 (0.0082)	0.01	0.2% [a]	0.0030 (0.0082)	0.05	0.7% [a]	220
Election Year & Municipality FEs	Yes			Yes			
SD (Deviation Measure)	16.9			17.9			

Notes: Correlations estimated in OLS regression models, regression-adjusted for municipality and electoral term fixed effects, (a = except pre-audit municipality characteristics differences (data available from 1990 decennial census)). Robust standard errors are reported in parentheses; differences statistically significant at (*) 90%; (**) 95%; (***) 99% confidence levels, respectively.

APPENDIX TABLE II:
CORRELATES OF MEASURES OF DEVIATION FROM THE PRE-DETERMINED AUDIT ORDER
(CONTINUED)

	Correlation coefficient Mean of Abs. Val. (Deviation)	Δ1SD(X) × Corr.	%Δ	Correlation coefficient Maximum Abs. Val. (Deviation)	Δ1SD(X) × Corr.	%Δ	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Number of audit reports	0.0178 (0.0112)	0.19	10.6%	0.0112 (0.0089)	0.14	7.4%	220
Start of audit period in reports (years from election)	0.0121 (0.0227)	0.13	2.1%	0.0015 (0.0204)	0.02	0.3%	220
End of audit period in reports (years from election)	-0.0045 (0.0103)	-0.05	-4.2%	-0.0019 (0.0095)	-0.02	-2.0%	220
Time span of audited period (years)	0.0166 (0.0191)	0.18	3.6%	0.0034 (0.0175)	0.04	0.8%	220
Mayor, member of PNP (1/0)	0.0074*** (0.0028)	0.08	15.4%	0.0057** (0.0026)	0.07	13.2%	220
Mayor's win margin in previous election (years)	-0.0029*** (0.0007)	-0.03	-28.6%	-0.0024*** (0.0007)	-0.03	-26.4%	220
Terms in office	0.0021 (0.0096)	0.02	1.5%	0.0011 (0.0093)	0.01	0.9%	220
Member of opposition party to Governor (1/0)	0.0099*** (0.0035)	0.11	33.7%	0.0100*** (0.0034)	0.12	37.9%	220
Member of opp. party to Governor appointing Comptroller (1/0)	0.0091** (0.0045)	0.10	18.8%	0.0052 (0.0042)	0.06	12.0%	220
Share of pop. high school education or more (1990)	-0.0001 (0.0001)	0.00	-0.2% [a]	-0.0001 (0.0001)	0.00	-0.3% [a]	220
Share of pop. College education or more (1990)	0.0000 0.0000	0.00	0.0% [a]	0.0000 0.0000	0.00	0.0% [a]	220
Poverty rate (1990)	0.0001 (0.0001)	0.00	0.2% [a]	0.0001 (0.0001)	0.00	0.2% [a]	220
Household median income (1,000 USD) (1990)	-0.0085 (0.0084)	-0.09	-1.1% [a]	-0.0079 (0.0077)	-0.10	-1.2% [a]	220
Election Year & Municipality FEs							
SD (Deviation Measure)	10.9			12.1			

Notes: Correlations estimated in OLS regression models, regression-adjusted for municipality and electoral term fixed effects, (a = except pre-audit municipality characteristics differences (data available from 1990 decennial census)). Robust standard errors are reported in parentheses; differences statistically significant at (*) 90%; (**) 95%; (***) 99% confidence levels, respectively.

APPENDIX TABLE III:
ROBUSTNESS TESTS OF DEVIATION OF AUDIT TIMELINE FROM PREDETERMINED ORDER – LONG-TERM EFFECTS

	Dependent variables:											
	Number of corrupt violations per report, in current audit (*t*)						Share of findings classified as corrupt violations in current audit (*t*), findings					
	All			by Mayor/Vice-mayor			by Mayor/Vice-mayor			referred to DOJ		
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)	OLS (11)	OLS (12)
Timely audit (period *t*)	-1.72***	-1.77***	-1.59***	-0.84***	-0.85***	-0.85***	-0.116*	-0.117*	-0.117*	-0.270***	-0.269***	-0.271***
	(0.35)	(0.35)	(0.35)	(0.20)	(0.20)	(0.20)	(0.059)	(0.060)	(0.060)	(0.080)	(0.082)	(0.081)
Mean deviation from expected num. of reports (period *t*)		-0.035*			-0.012			0.000			0.001	
		(0.018)			(0.012)			(0.003)			(0.004)	
Mean of abs. value of deviation from expected num. reports (*t*)			-0.028*			-0.008			-0.001			0.000
			(0.015)			(0.009)			(0.003)			(0.004)
Municipality Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Election Year & Municipality FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	220	220	220	220	220	220	220	220	220	220	220	220
Mean of dep. variable (untimely audits)	2.43	2.43	2.43	1.08	1.08	1.08	0.25	0.25	0.25	0.39	0.39	0.39

Notes: Coefficient estimates and standard errors from OLS regressions are presented; disturbance terms are clustered at the municipality level. Coefficient estimates statistically significant at (*) 90%; (**) 95%; (***) 99% confidence levels, respectively. Other controls are the number of municipality government reports, the number of municipal public corporation or consortium reports; indicators for New Progressive Party membership, for incumbent in the opposition party to the state-level executive government, and for incumbent in the opposition party to the governor who appointed Comptroller; the vote share for the incumbent in the previous election (t-1); and the incumbent's number of terms in office (at time t). For description of the sample, see text.

APPENDIX TABLE IV:
ROBUSTNESS TESTS OF DEVIATION OF AUDIT TIMELINE FROM PREDETERMINED ORDER – LONG-TERM EFFECTS

	Dependent variables:											
	Number of corrupt violations per report, in current audit (*t*)						Share of findings classified as corrupt violations in current audit (*t*), findings					
	All			by Mayor/Vice-mayor			by Mayor/Vice-mayor			referred to DOJ		
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)	OLS (11)	OLS (12)
Timely audit (period *t*)	-0.150	-0.116	-0.157	0.014	0.029	0.012	0.068	0.068	0.069	0.076	0.069	0.078
	(0.339)	(0.351)	(0.343)	(0.195)	(0.206)	(0.200)	(0.059)	(0.061)	(0.059)	(0.083)	(0.082)	(0.082)
Mean deviation from expected num. of reports (period *t*)		0.024			0.011			0.000			-0.005	
		(0.020)			(0.013)			(0.003)			(0.004)	
Mean of abs. value of deviation from expected num. reports (*t*)			0.020			0.006			-0.001			-0.004
			(0.019)			(0.011)			(0.002)			(0.004)
Municipality Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Election Year & Municipality FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	198	198	198	198	198	198	198	198	198	198	198	198
Mean of dep. variable (untimely audits)	1.80	1.80	1.80	0.79	0.79	0.79	0.20	0.20	0.20	0.37	0.37	0.37

Notes: Coefficient estimates and standard errors from OLS regressions are presented; disturbance terms are clustered at the municipality level. Coefficient estimates statistically significant at (*) 90%; (**) 95%; (***) 99% confidence levels, respectively. Other controls are the number of municipality government reports, the number of municipal public corporation or consortium reports; indicators for New Progressive Party membership, for incumbent in the opposition party to the state-level executive government, and for incumbent in the opposition party to the governor who appointed Comptroller; the vote share for the incumbent in the previous election (t-1); and the incumbent's number of terms in office (at time t). For description of the sample, see text.

APPENDIX TABLE V:

THE EFFECTS OF THE AUDITS ON POLITICIAN SELECTION BASED ON PRE-DETERMINED EARNINGS

	Dependent variable:			
	Elected mayor's earnings (5 years before election) (000's)			
Sample	Mayors running for re-election (period t) 2000 and 2004 elections			
	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Timely audit	6.68	-4.63	0.57	3.31
	(11.80)	(13.67)	(11.25)	(11.22)
Timely audit × Num. violations		10.91*		
		(5.74)		
Num. of violations		-3.67		
		(3.35)		
Timely audit × Incumbent's party has won in previous 3+ elections			27.85*	
			(15.48)	
Timely audit × terms in office				2.24
				(6.92)
Municipality Controls	Yes	Yes	Yes	Yes
Election Year & Municipality FEs	Yes	Yes	Yes	Yes
Timely audits F-statistic	-	2.18	3.11	0.18
[p-value]		[0.12]	[0.05]	[0.84]
Observations	96	96	96	96
Mean of dep. variable (untimely audits)	44.0	44.0	44.0	44.0

Notes: Coefficient estimates and standard errors from OLS regressions are presented; disturbance terms are clustered at the municipality level. Coefficient estimates statistically significant at (*) 90%; (**) 95%; (***) 99% confidence levels, respectively. Controls are the number of municipality government reports, the number of municipal public corporation or consortium reports; indicators for New Progressive Party membership, for incumbent in the opposition party to the state-level executive government, and for incumbent in the opposition party to the governor who appointed Comptroller; the vote share for the incumbent in the previous election (t-1); and the incumbent's number of terms in office (at time t). The sample is composed of all municipalities that had a first audit during 1987-2002. The reported "Timely audits F-statistic" refers to a test of joint significance on the timely audit coefficient and its interactions (p-value in brackets).

Appendix D: *Relationship to Theories of Political Agency - Reputation and Accountability*

In Section VI of the paper, we argue that our empirical results have implications for the theory of political agency because they provide (context-specific) empirical support for some classes of models over others. While a full characterization of political agency models consistent with our results would be a complex undertaking and is beyond the scope of the paper, in this Appendix we support our claims in two ways:

- We clarify the intuition behind the claim that many commonly used models of political agency do not generate predictions consistent with our empirical findings.

- We formulate and analyze a model of political agency with sanctioning and selection that builds on Banks and Sundaram (1993) and generates predictions consistent with our empirical results.

The following table summarizes the predictions of three alternative models of political agency (including the model we present below).[§§] Several things stand out, but perhaps the most notable is that different models generate qualitatively different predictions about both the short- and long-term effects of audits, underlining the importance of model selection.

APPENDIX TABLE VI:
EFFECTS OF AUDITS IN THREE POLITICAL AGENCY MODELS

Outcome	**Model**	**Comparison:** (E[Outcome | audit at $t = 1$] – E[Outcome | no audit at $t = 1$])	
		***t* = 1**	***t* = 2**
Re-election rate	**Political agency with congruent politicians** [(a)]	Negative effect [(c)]	Positive effect
	Career concerns [(b)]	No effect	No effect
	Bobonis-Cámara-Schwabe	Positive effect [(d)]	Positive effect
Corruption	**Political agency with congruent politicians** [(a)]	Negative effect	Negative effect
	Career concerns [(b)]	Positive effect	No effect
	Bobonis-Cámara-Schwabe	Negative effect	No effect

Notes:
(a) = Model based on ch. 3 of Besley (2006). Results are consistent for finite and infinite horizon versions of this model.
(b) = Model based on Alesina and Tabellini (2007). Results presented are for a three period version of the model.
(c) = Result depends on assumed voter behavior in case of indifference.
(d) = Result depends on proposed game structure; see footnote 9.

In what follows, we provide some basic intuition for the results described in Appendix Table VI. A full description of these models and their equilibria are available from the authors upon request.

[§§] The models were chosen to exemplify common approaches to modeling political agency and corruption, and not necessarily because they are particularly appropriate for the current setting.

In the political agency model with congruent politicians, some politicians are intrinsically motivated to work in the voters' interest (congruent types) while others are opportunistic and enjoy the rents derived from corruption (dissonant types). Audits enable voters to make re-election decisions based on politicians' actions in office, which are not observable without an audit. In the short-term, audits motivate some dissonant politicians to work in the voters' favor, lowering expected corruption. Audits also enable voters to re-elect a higher proportion of 'good types' than they would have otherwise. In the long-term, since 'good types' never engage in corruption, this means that there will be less corruption, on average.

This is a good example of the type of models featuring behavioral types that are 'good', 'bad', 'honest' or 'corrupt'. In these models, a politician's type is inextricably linked to their actions in office; a congruent politician never engages in corruption. This implies that tools that enable voters to use elections to ensure that a good type is in office with higher probability will also lead to an improvement in expected performance. In other words, one cannot have selection effects without performance effects because type is directly linked to performance. Our empirical results violate this relationship because selection effects are evident in the long-term effect of audits on re-election rates but there are no long-term effects on corruption.

In the career concerns model, politicians differ in their competence, a valence term that benefits voters independent of the politician's actions in office. Incumbents may also engage in corruption, which is costly to voters. Politicians do not know their own true competence so that, on the equilibrium path, voters infer their equilibrium corruption strategies. Therefore, when audits publicly reveal actual levels of corruption, they are effectively telling voters what they already know and selection on types is not improved. Because of this, there is no long-term effect of audits on corruption. There is, however, a surprising positive (more corruption) short-term effect. This is because the transparency afforded by audits removes the possibility of signaling high ability by not engaging in corruption.

The model that we present below allows for selection effects without performance effects by incorporating politician types that differ in their ability to refrain from corruption (*i.e.*, their responsiveness to incentives), but whose performance is not predetermined by type. In this context, the same short-term incentive effect, which leads to less corruption in the political agency model with congruent politicians is active and leads to a similar short-term effect. Similarly, audits enable the selection of 'good' politicians. However, the link between type and performance is severed so that long-term effects of audits on corruption are not a foregone conclusion. In fact, in the equilibria we focus on, selection leads to higher re-election rates but no change in average corruption, as in our data.

D.1. Model of Reputation and Accountability in Repeated Elections

In this section we present and analyze the theoretical model described in Section VI of the paper and prove the results contained therein. The model has the following empirical implications:

(i) the expected dissemination of the audit reports decreases the number of corrupt violations by incumbent politicians in the short-run (Proposition 2);

(ii) re-election rates at time t should be negatively correlated with the number of corrupt violations (Proposition 1);

(iii) politicians in office at time $t+1$ will engage in *the same number of corrupt violations*, on average, irrespective of whether the municipality's audit at time t was timely or untimely (Proposition 3); and,

(iv) on average, re-election rates at time $t+1$ should be higher in municipalities that experienced a timely audit at time t relative to those that did not (Proposition 4).

Reputation and Accountability in Repeated Elections

Consider a discrete-time, infinite horizon model of municipal politics. In each period, indexed by $t \in \{1,2, ...\}$, a representative voter must select a politician to administer local public affairs. Once in office, the elected politician engages in corruption $\kappa \in [0,1]$. Political corruption is bad for voter utility $u \in \{0,1\}$, but its effects cannot be distinguished from other negative shocks which happen with exogenous probability $1-\gamma$. The voter's expected utility in the stage-game is $E(u|\kappa) = \gamma(1-\kappa)$.

The parameter γ measures the severity of the monitoring problem faced by the voter.[***] When $\gamma = 0$, the voter cannot tell whether the politician was corrupt or not in any given period, and can thus provide no incentives for good behavior. If $\gamma = 1$, on the other hand, the incumbent's actions have an unmitigated effect on the probability of observing high voter utility.

Politicians are one of two types – responsive or corrupt – with μ denoting the proportion of responsive types in the infinite pool of potential candidates. Responsive politicians decide how much corruption to engage in; their action set is $\kappa \in [0, 1]$. Their per-period utility while in office is $u_p(\kappa) = E + R(\kappa)$, where $E > 0$ measures ego-rents, salary, and other fixed benefits of holding office and $R(\kappa)$ are rents derived from corrupt acts. We assume that R is strictly increasing, differentiable, strictly concave and $R(0) = 0$. Payoffs outside of office are normalized to 0. In contrast, corrupt politicians always engage in all-out corruption ($\kappa = 1$).[†††] This may be because the payoffs to corruption are too large (i.e., R is very large for them), because other interests such as organized crime have the ability to punish them if they do not extract rents, or due to incompetence or an inability to manage government funds effectively. The high rents (i.e., large R) interpretation is analogous to a prohibitively high cost of effort in the Banks and Sundaram (1993) framework, whereas our responsive types correspond to a type with intermediate cost of effort. Each politician is infinitely lived and may serve for as many periods (i.e., terms) in office as the voter asks him to. However, once replaced by a randomly selected challenger, a politician cannot return to office. Politicians and the voter share a common discount factor $\delta \in (0,1)$.

The parameter μ measures the severity of the selection problem facing the voter. When $\mu = 1$, all politicians are responsive and the voter can focus all of his efforts on the moral hazard problem – providing incumbents with incentives to avoid corruption. However, as μ becomes small, incentives will rarely work and the voter will find it more important to identify and keep responsive politicians.

To help remedy the voter's monitoring problem the OCPR conducts periodic audits in which the financial activities of the government are scrutinized and any irregularities are reported to voters. We interpret audits as making politicians' corruption, κ, publicly observable. We write $a_t = A$ to denote an audit at time t, and $a_t = NA$ otherwise. An audit will take place before any given election with probability $p \in (0,1)$. To match the context, we assume that politicians know whether they will be audited when making their corruption decisions.[‡‡‡] An audit in the model corresponds to a timely audit in our empirical

[***] It also measures the impact of political corruption on voter utility. This interpretation is less relevant to the present context, however, as voters always prefer to limit corruption.

[†††] In this setup, the voter is indifferent among politician types when responsive politicians choose full corruption (κ=1). Schwabe (2011) shows, in a more general setting, that the analysis goes through when there is a small advantage to having a responsive type in office even if he is expected to show no restraint.

[‡‡‡] Theoretical results are qualitatively similar in a model with random audits. In general, the relative welfare effects of predetermined vs. random audits depends on politicians' and voters' preferences. With pre-determined audits, there is alternation between high and low corruption, while random audits lead to a steady level of equilibrium corruption somewhere in the middle. Politician's risk aversion determines the relative level of corruption with random audits, while the curvature of voters' utility functions determines the costs of variability in corruption.

framework, while $a_t = NA$ corresponds to untimely audits not observed by the voter at the time of the election.

In each period t, the voter assigns a probability μ_t that the incumbent is a responsive type; this is the politician's *reputation*. New politicians are selected randomly (the standard approach in the literature) so that the reputation of a politician at the beginning of his first term is μ. Thereafter, the incumbent's reputation is updated according to Bayes' rule each time the voter observes u or κ.

The timing of the infinitely repeated stage game is as follows. At the beginning of each period, the OCPR announces whether there will be an audit during the current period. Taking this into account, the politician chooses a level of corruption, after which voters observe their payoffs and audit results when available, and update their beliefs regarding the incumbent's type. Finally, voters decide whether to re-elect the incumbent or select a challenger who has been drawn at random from the pool of potential politicians.

When making re-election decisions, the voter has information on all past realizations of u, audits (κ), and election results, which we call a t-history h_t. A re-election strategy is a function from the set of all such possible t-histories to the incumbent's probability of re-election: $\sigma : H \rightarrow [0,1]$. Similarly, a politician's corruption strategy is a function from all possible histories of outcomes, as well as whether there will be an audit ($a_t \in \{A,NA\}$), to a level of corruption: $\kappa : H \times \{A,NA\} \rightarrow [0,1]$.

Equilibrium

We focus on perfect Bayesian equilibria. As is common in infinitely repeated games, there are many candidate equilibria. For instance, the strategy profile in which politicians always engage in all out corruption ($\kappa=1$) and the voter never re-elects them is a perfect Bayesian equilibrium. On the other hand, trigger strategies using this "bad equilibrium" as a punishment for deviation can support a variety of equilibrium behaviors. However, the credibility of equilibrium punishments that hurt both the voter and the incumbent politician is questionable – they are not renegotiation-proof. This idea is fleshed out in Schwabe (2011), where a class of equilibria meeting a stringent test of credibility while leaving room for the voter to provide incentives in a simple manner is proposed. In these reputation-dependent performance cutoff (RDC) equilibria, the voter makes re-election decisions using a performance threshold that varies with reputation, making the best-response expected level of corruption the same for incumbents of all reputations. This, in turn, makes the voter indifferent between keeping the incumbent and electing a challenger. The voter's indifference makes his re-election strategy credible. We further restrict our attention to the RDC equilibrium yielding the highest feasible payoffs to the voter. We call these *voter-optimal* RDC equilibria.

Definition 1: A voter-optimal RDC equilibrium with value V is a perfect Bayesian equilibrium in which:

(a) The voter's re-election strategies depend only on the observable outcome and the incumbent's reputation: we denote them as $\sigma_A(\mu_t,\kappa_t)$ and $\sigma_{NA}(\mu_t,u_t)$.
(b) Politicians follow a corruption strategy $\kappa(\mu_t,a_t)$ that satisfies voter-indifference: the present discounted value of the voter's utility equals V whenever the incumbent's reputation is at least μ ($\mu_t \in [\mu,1]$).
(c) The voter's constant per-period expected utility $(1-\delta)V$ is maximal subject to these constraints.

Point (a) states that re-election strategies will depend only on observed corruption or voter utility, depending on whether there was an audit, and the incumbent's reputation. Point (b) states that incumbents will vary the intensity of corruption in a way that perfectly offsets the risk to the voter of having a corrupt-type incumbent. Point (c) narrows our focus to the equilibria giving the highest possible utility to

the voter, subject to the constraints imposed by the first two points. Point (b) has the following key implication:

$$\mu\gamma(1 - E(\kappa(\mu,a_t)) + \delta V = \mu'\gamma(1 - E(\kappa(\mu',a_t))) + \delta V,$$

which holds if and only if the expected level of corruption is equal at reputations μ and μ':

$$(1 - \mu) + \mu[p\kappa(\mu,A) + (1 - p)\kappa(\mu,NA)] = (1 - \mu') + \mu'[p\kappa(\mu',A) + (1 - p)\kappa(\mu',NA)] \quad \text{(A1)}$$

It is clear from (A1) that, in expectation, responsive incumbents with better reputations engage in more corruption than those with worse reputations.

These equilibrium selection criteria play an important role in generating predictions. Voter optimality rules out equilibria in which available incentives are not used, leading to the natural prediction that corruption will be lower during audited periods. RDC equilibrium's appeal to renegotiation-proofness leads to the prediction that the expected level of corruption does not depend on the incumbent's reputation, and thus, does not depend on whether an audit was conducted during the previous period.

Along with equilibrium selection, two restrictions on the model's parameters will allow us to present a clean analysis. Specifically, we will assume that both the monitoring and selection problems are economically important (i.e. γ and μ sufficiently below one), in a way that will be specified below.

Proposition 1 describes the voter's re-election strategy in a voter-optimal RDC equilibrium when the selection problem is significant. The voter displays no tolerance of bad outcomes for first-term incumbents (the reputation-μ incentive constraints are binding). This greatly simplifies the analysis as incumbents of only two reputations, μ and 1, will hold office on the equilibrium path. During audited periods, the incumbent's action is perfectly observed, so incumbents are re-elected when observed corruption equals equilibrium corruption for responsive types. During non-audited periods, incumbents are re-elected when voter utility is high, although the voter will occasionally re-elect a high-reputation incumbent who does not deliver high utility.

Proposition 1: There exists $\mu^* \in (0,1]$ such that if $\mu < \mu^*$, in a voter-optimal RDC equilibrium, the voter's re-election strategy is of the form:[§§§]

a) When a reputation-μ incumbent is audited:

$$\sigma_A(\mu,\kappa_t) = \begin{cases} 1 & \text{if } \kappa_t \le \kappa(\mu, A) \\ 0 & \text{otherwise} \end{cases}$$

b) When a reputation-μ incumbent is not audited:

$$\sigma_{NA}(\mu,u_t) = \begin{cases} 1 & \text{if } u_t = 1 \\ 0 & \text{otherwise} \end{cases}$$

c) When a reputation-*1* incumbent is audited:

$$\sigma_A(1,\kappa_t) = \begin{cases} 1 & \text{if } \kappa_t \le \kappa(1, A) \\ 0 & \text{otherwise} \end{cases}$$

d) When a reputation-*1* incumbent is not audited:

$$\sigma_{NA}(1,u_t) = \begin{cases} 1 & \text{if } u_t = 1 \\ k & \text{if } u_t = 0 \end{cases}$$

[§§§] Only reputation 1 and μ are ever in office on the equilibrium path. For completeness, we specify voter re-election strategies off the equilibrium path as: $\sigma_A(\mu',\kappa_t) = \sigma_{NA}(\mu',u_t) = 0$ when $\mu' \neq 1$ or μ.

where $k \geq 0$.

Proof: See Proofs Section (below). ■

Short-Run Accountability Effects of the Audits

Because audits provide additional information about a politician's actions, they should enable the voter to punish high corruption and reward restraint more accurately, making incentives more effective. Thus, we should expect that corruption be lower during audited periods than during non-audited periods. The following proposition supports this intuition, when the monitoring problem is significant.[****]

Proposition 2: There exists $\gamma^* \in (0,1]$ such that, in a voter-optimal RDC equilibrium, $\gamma < \gamma^*$ and $\mu < \mu^*$ imply that there is less corruption during audited periods than during non-audited periods: $\kappa(\mu_t,NA) > \kappa(\mu_t,A)$.

Proof: See Proofs Section (below). ■

Effects of the Audits on Political Corruption in Future Periods

In equilibrium, politicians of all reputations will perform equally well (or poorly) in expectation so that the voter is indifferent between re-electing them and electing a new politician with reputation μ.[††††] This implies that politicians with a high reputation will pocket the benefits of their accumulated reputation by engaging in more corruption than responsive politicians of lower reputation. Interestingly, this implies that reported corruption from future audits should be, on average, constant across municipalities that faced an audit in an earlier period and those that did not.

Proposition 3: In the voter-optimal RDC equilibrium, a period t audit has no effect on period t+1 expected corruption: $E[\kappa_{t+1}|a_t=A] = E[\kappa_{t+1}|a_t=NA]$.

Proof: Corruption strategies are functions of reputation and a_t. Audits are determined independently each period. By equation (A1), expected corruption is not affected by expected reputation. Therefore, $E[\kappa_{t+1}|a_t=A] = E[\kappa_{t+1}|a_t=NA]$. ■

Effects on Electoral Outcomes and Politician Selection

$q_{t \mid i,j}$	Incumbent politician's reputation	
	μ	1
Audit ($a_t = A$)	μ	1
No audit ($a_t = NA$)	$\mu\gamma(1 - \kappa(\mu,NA))$	$\gamma(1 - \kappa(1,NA)) + (1 - \gamma(1 - \kappa(1,NA)))\sigma_{NA}(1,0)$

[****] By ensuring that reputation-μ incentive constraints are binding, Proposition 1 ensures that first-term incumbents will engage in more corruption during non-audited periods than during audited periods. However, it leaves open the possibility that the reverse is true for incumbents with high reputation. Indeed, because more corruption is allowed of high reputation incumbents there is slack in their incentive constraints and, for some parameter values, it may be optimal for the voter to be more lenient during audited periods in order to increase re-election rates and the value of holding office. However, this makes little sense if the monitoring problem is significant, considerably reducing the implementable level of restraint during non-audited periods.

[††††] This type of voter indifference is a part of any renegotiation proof equilibrium. See Proposition 3 in Schwabe (2011).

We can use the model's predictions about re-election rates (summarized in the table above) [‡‡‡‡] to draw conclusions about the effect of audits on politician selection. Specifically, incumbents are more likely to be responsive types following an audited period compared to a non-audited period.[§§§§] This leads to the empirical implication that re-election rates will be higher in periods following a timely audit. Denote by $q_{t+1|A}$ and $q_{t+1|NA}$ the re-election probability of the incumbent in period t+1 given an audit and no audit in period t, respectively.

Proposition 4: Assume $\mu < \mu^*$ and $\gamma < \gamma^*$. In the voter-optimal RDC equilibrium $q_{t+1|A} > q_{t+1|NA}$.

Proof: See Proofs Section (below). ■

The proposition formalizes the following logic: conducting an audit means that voters will be more likely to re-elect responsive politicians, and these politicians are more likely to do well enough to get re-elected in subsequent periods – there is a selection effect on re-election rates. Moreover, although higher reputation implies lower effort by the incumbent, in equilibrium voter re-election thresholds (k) are lower and thus easier to meet. Thus, both selection and sanctioning effects influence period t+1 re-election rates in the same direction.

Proofs

The proof of Proposition 1, which describes equilibrium re-election strategies, begins with some preliminary analysis of the model in which we describe the incumbent's problem, derive an expression for his reputation-*1* value function, and describe the relevant incentive constraints. In the process, we draw conclusions about what the voter's equilibrium re-election strategy looks like. The final piece of the proof comes in the form of Lemma 1, which shows that, when the selection problem is significant, reputation-μ incentive constraints will be binding.

The proof of Proposition 2, which shows that corruption is lower during audited periods, builds on Lemma 1. Proposition 3, on the null dynamic effects of audits on corruption, is proven in the body of the paper and is not discussed here. We end the appendix with a discussion of equilibrium re-election rates and the proof of Proposition 4.

Proof of Proposition 1

Proposition 1 describes re-election strategies for incumbents with reputations which will be observed on the equilibrium path (Lemma 1 below ensures that only reputation-μ and *1* incumbents are ever in office). Off the equilibrium path, strategies are $\sigma_A(\mu',\kappa_t) = \sigma_{NA}(\mu',u_t) = 0$ and $\kappa(\mu',A) = \kappa(\mu',NA) = 1$ when $\mu' \neq 1$ or μ.

Any positive outcome observed by the voter, be it restraint from corruption ($\kappa < 1$) or high voter utility (u =1), will fully reveal the incumbent as a responsive type. Because of this, the politician's motivation for limiting the extent of his corruption will be based on the value of being re-elected with a good reputation (μ_t = 1). For a given strategy profile (σ, κ), this value can be written recursively as:

$$Q = E + pR(\kappa(1, A)) + (1 - p)R(\kappa(1, NA)) +$$

[‡‡‡‡] The model predicts that re-election rates will be higher after audited periods than non-audited periods. However, this prediction depends on our assumption that restraint may still lead to low voter utility, but all-out corruption will never lead to high voter utility. This assumption is made for convenience as it limits the number of cases that must be addressed (only reputation 1 incumbents are re-elected). Therefore, this particular prediction should not be taken literally.

[§§§§] It is also worth noting that the probability of having a responsive type in office during period t+1 is higher when there is a responsive type in office during period t. This means that the selection effects of audits are persistent: for any integer n, the probability of having a responsive type in office during period $t+n$ is higher if there was an audit during period t than if there was not.

$$\left(p\sigma_A(1,\kappa(1,A)) + (1-p)\left[\gamma(1-\kappa(1,NA))\sigma_{NA}(1,1) + (1-\gamma(1-\kappa(1,NA)))\sigma_{NA}(1,0)\right]\right)\delta Q,$$

where the first three terms represent the expected utility in the stage game, and the term in parenthesis is the ex-ante probability of re-election.

Because politicians' motivation for abstaining from corruption is based on the value of staying in office (Q), voter-optimality requires that Q be maximized subject to the level of expected voter utility provided. This insight allows us to narrow the set of strategies under consideration by noting that not re-electing incumbents who deliver high voter utility is an inefficient way to dampen incentives (the same can be achieved by re-electing incumbents who *do not* deliver high voter utility, but this increases rather than decreases Q), so that $\sigma_{NA}(1,1) = 1$. Similarly, not re-electing incumbents who extract rents in the expected quantities lowers the value of holding office without any additional benefit, so $\sigma_A(\mu_t, \kappa(1,A)) = 1$. Using these observations, and solving for Q, we have:

$$Q = \frac{E + pR(\kappa(1,A)) + (1-p)R(\kappa(1,NA))}{1-\left(p + (1-p)\left[\gamma(1-\kappa(1,NA)) + (1-\gamma(1-\kappa(1,NA)))\sigma_{NA}(1,0)\right]\right)} \tag{A2}$$

When there is an audit, the incumbent's *incentive compatibility constraint* is:

$$E + R(\kappa(\mu_t, A)) + \delta Q \geq E + R(1) \tag{A3}$$

The incumbent avoids absolute corruption whenever rents forgone are less than the value of expected future office-related benefits:[*****]

$$R(1) - R(\kappa(\mu_t, A)) \leq \delta Q \tag{IC-A}$$

During periods when there is no audit, the incumbent politician must trade off marginal increases in rents against marginal decreases in the probability of re-election. The incumbent's problem is:

$$\max_x E + R(x) + \gamma(1-x)\delta Q + (1-\gamma(1-x))\sigma_{NA}(\mu_t,0)\delta Q'$$

where $Q' > 0$ is the value of holding office when reputation is $\hat{\mu}(\mu_t, u_t = 0)$. At the optimum ($x = \kappa(\mu_t, NA)$), the following first order condition holds:[†††††]

$$R'(\kappa(\mu_t, NA)) = \delta\gamma(Q - \sigma_{NA}(\mu_t, 0)Q') \tag{IC-NA}$$

The negative effect of the monitoring problem on incentives is evident in the appearance of the parameter γ on the right-hand-side of the equality. By lowering the expected value of avoiding corruption, it raises the minimum implementable level of corruption, which is achieved when $\sigma_{NA}(\mu_t,0) = 0$.

The preceding arguments establish the basic structure of re-election strategies in the voter-optimal RDC equilibrium. It remains to be proven, however, that the reputation-μ incentive constraints are binding. We do that in the following lemma, which completes the proof of Proposition 1.

Lemma 1: There exists a $\mu^* \in (0,1]$ such that, in a voter-optimal RDC equilibrium, $\mu < \mu^*$ implies $\sigma_{NA}(\mu,0) = 0$ and (IC-A) holds with equality when the incumbent's reputation is $\mu_t = \mu$.

[*****] The assumptions that $R(0) = 0$, R continuous and $E > 0$ ensure that incumbents can show some restraint during audited periods.

[†††††] The expression is $R'(\kappa(\mu_t,\text{NA})) \geq \delta\gamma(Q - \sigma_{NA}(\mu_t,0)Q')$ for corner solutions at $\kappa(\mu_t,NA) = 1$, and $R'(\kappa(\mu_t,NA)) \leq \delta\gamma(Q - \sigma_{NA}(\mu_t,0)Q')$ for corner solutions at $\kappa(\mu_t,NA) = 0$. Strict concavity of R ensures that the FOC identifies a global maximum.

Proof: Equations (IC-A) and (IC-NA) show that incentives for both reputation-μ and *1* incumbents are derived from the reputation-*1* value function Q, as politicians are revealed as responsive types when it becomes known that they have avoided corruption. Thus, feasible levels of voter utility are linked to Q.

Recall the connection between corruption strategies and Q in equation (A2). We write:

$$Q(x) = \max_{\hat{\kappa}(1,A),\hat{\kappa}(1,NA),\hat{\sigma}(1,0)} \frac{E + pR(\hat{\kappa}(1,A)) + (1-p)R(\hat{\kappa}(1,NA))}{1-\left(p+(1-p)\left[\gamma(1-\hat{\kappa}(1,NA)) + (1-\gamma(1-\hat{\kappa}(1,NA)))\hat{\sigma}_{NA}(1,0)\right]\right)}$$

such that

$\gamma\left[p(1-\hat{\kappa}(1,A)) + (1-p)(1-\hat{\kappa}(1,NA))\right] = x$, (IC-A), and (IC-NA) hold, and $\hat{\kappa}(1,A), \hat{\kappa}(1,NA), \hat{\sigma}_{NA}(1,0) \in [0,1]$

The function $Q(x)$ traces the reputation-*1* value function derived from efficient allocation of effort across audit and no-audit states, for a given level of expected voter utility x. Its domain X is implicitly defined as the set of voter utility levels for which $Q(x)$ is well-defined; at some level of x the decrease in the politician's continuation value due to the lower rents he expects to extract makes implementing higher voter utility infeasible. Thus, there is an upper bound on feasible reputation-*1* voter utilities $\bar{x} = max\{X\}$.

A second constraint on the level of voter utility comes from the restraint implementable for reputation-μ incumbents. If the highest feasible voter utility when $Q = Q(\bar{x})$ and the incumbent's reputation is μ is weakly lower than $\bar{x}$, then the reputation-μ incentive constraints must be binding at the voter optimal RDC equilibrium. That is, if:

$$\bar{x} \geq \gamma\mu\left[p(1-\hat{\kappa}(\mu,A)) + (1-p)(1-\hat{\kappa}(\mu,NA))\right] \tag{A4}$$

where $R(1) - R(\hat{\kappa}(\mu,A)) = \delta Q(\bar{x})$; $R'(\hat{\kappa}(\mu,NA)) = \gamma\delta Q(\bar{x})$ (or the corner solution conditions described in footnote 17 hold); and $\hat{\kappa}(\mu,A), \hat{\kappa}(\mu,NA) \in [0,1]$, then, we must have $\sigma_{NA}(\mu,0) = 0$ and (IC-A) holding with equality at the voter optimal RDC equilibrium. Because μ enters multiplicatively in the expression for expected voter utility when the incumbent's reputation is μ, there exists a μ^* such that inequality (A4) holds for all $\mu < \mu^*$. ■

An implication of Lemma 1 is that corruption is lower during audited periods than during non-audited periods when the incumbent's reputation is μ. This is because incentive constraints are binding in this situation, and available incentives are stronger when there is an audit. To see this, note that a necessary condition for (IC-NA) to hold is $R(1) - R(\kappa(\mu, NA)) \leq \delta\gamma Q$. This is identical to (IC-A), except for the presence of γ on the right-hand-side. Thus, we have that $R(1) - R(\kappa(\mu, NA)) \leq R(1) - R(\kappa(\mu, A)) = \delta Q$, or $R(\kappa(\mu, NA)) \geq R(\kappa(\mu, A))$, which implies $\kappa(\mu, NA) \geq \kappa(\mu, A)$ since R is strictly increasing.

Proof of Proposition 2

Lemma 1 proves that $\kappa(\mu,NA) > \kappa(\mu,A)$. The RDC equilibrium refinement demands that $\mu[p(1-\kappa(\mu,A)) + (1-p)(1-\kappa(\mu,NA))] = p(1-\kappa(1,A)) + (1-p)(1-\kappa(1,NA))$ (equation A1). By Lemma 1 $\sigma_{NA}(\mu,0) = 0$ so that (IC-NA) implies $\kappa(1,NA) \geq \kappa(\mu,NA)$. Therefore, if

$$\mu[p(1-\kappa(\mu,A)) + (1-p)(1-\kappa(\mu,NA))] > 1-\kappa(\mu,NA),$$

it must be that $\kappa(1,NA) > \kappa(1,A)$. This sufficient condition can be rewritten as $\frac{1-\kappa(\mu,NA)}{1-\kappa(\mu,A)} < \frac{\mu p}{1-\mu(1-p)}$. Examination of equation (IC-NA) reveals that $\lim_{\gamma\to 0}\kappa(\mu,NA) = 1$, while, given $Q > 0$, γ does not affect

feasible restraint during audited periods. Therefore, $\lim_{\gamma \to 0} \frac{1-\kappa(\mu,NA)}{1-\kappa(\mu,A)} = 0 < \frac{\mu p}{1-\mu(1-p)}$ and we may find a γ^* such that $\gamma < \gamma^*$ implies that corruption is lower during audited periods. ■

Proof of Proposition 4

We now turn our attention to the model's predictions about re-election rates, derived from Proposition 1. We use $q_{t|i,j}$ to denote the re-election rate during period t when incumbent reputation is i and $a_t = j$, and drop the i or j subscript when we average across its possible values. For instance, $q_{t|\mu} = p\mu + (1 - p)\,\mu\gamma(1 - \kappa(\mu,NA))$ averages the values in the first column of the table below. In order to study the dynamic effects of a period t audit, Proposition 4 looks at average re-election rates the following period $q_{t+1|j}$.

In state μ, if an audit is conducted, the incumbent will be re-elected with probability $q_{t|\mu,A}=\mu$; all responsive politicians are re-elected because their restraint from corruption reveals them to be responsive. When there is no audit, the incumbent's re-election rate is $q_{t|\mu,NA} = \mu\gamma(1 - \kappa(\mu,NA))$; the voter must experience a good outcome in order to re-elect the incumbent. In state 1, when an audit is conducted, the re-election rate is $q_{t|1,A}=1$. When there is no audit, the re-election rate is $q_{t|1,NA}= \gamma(1 - \kappa(1,NA)) + (1 - \gamma(1 - \kappa(1,NA)))\sigma_{NA}(1,0)$; the voter re-elects incumbents who deliver high utility, but also occasionally re-elects an incumbent who does not. The following table summarizes these results.

$q_{t\,|\,i,j}$	Incumbent politician's reputation	
	μ	1
Audit ($a_t = A$)	μ	1
No audit ($a_t = NA$)	$\mu\gamma(1 - \kappa(\mu,NA))$	$\gamma(1 - \kappa(1,NA)) + (1 - \gamma(1 - \kappa(1,NA)))\sigma_{NA}(1,0)$

For incumbents in their first period, only responsive types are re-elected, and they are re-elected with higher probability during audited periods. Specifically, the probability of having a responsive incumbent during period $t + 1$, conditional on having a reputation-μ incumbent during period t is $\mu + (1 - \mu)\mu$ if there was an audit conducted during period t, and $\mu\gamma(1 - \kappa(\mu,NA)) + (1 - \mu\gamma[1 - \kappa(\mu,NA)])\mu$ if there was not. Similarly, there will be a responsive incumbent at $t + 1$ with probability 1 following audited periods, and only with probability $\gamma(1 - \kappa(1,NA)) + (1 - \gamma(1 - \kappa(1,NA)))(\sigma_{NA}(1,0) + \mu(1 - \sigma_{NA}(1,0)))$ following non-audited periods.

As we argue in the text above, the probability of having a high reputation incumbent is higher after an audited period: $Pr(\mu_{t+1} = 1|a_t = A) > Pr(\mu_{t+1} = 1|a_t = NA)$. Thus, we need only show that high reputation incumbents are re-elected more often. This is the case if the following inequality holds:

$$p(1 - \mu) + (1 - p)[\gamma(1 - \kappa(1,NA)) + (1 - \gamma(1 - \kappa(1,NA)))\,\sigma_{NA}(1,0) - \mu\gamma(1 - \kappa(\mu,NA))] > 0 \qquad \text{(A5)}$$

To derive a sufficient condition for this inequality, set $\sigma_{NA}(1,0) = 0$. Rearranging equation (A1):

$$\gamma(1 - p)[(1 - \kappa(1,NA)) - \mu(1 - \kappa(\mu,NA))] = \gamma p[\mu(1 - \kappa(\mu,A)) - (1 - \kappa(1,A))]$$

Substituting into inequality (A5) and simplifying:

$$p(1 - \mu) > \gamma p[(1 - \kappa(1,A)) - \mu(1 - \kappa(\mu,A))],$$

which holds if and only if:

$$(1 - \mu)(1 - \gamma) > \gamma(\mu\kappa(\mu,A) - \kappa(1,A))$$

By Lemma 1 and (IC-A), we know that $\kappa(\mu,A) \leq \kappa(1,A)$. Therefore, the inequality holds. ■