CITIZEN SERVICE CENTERS IN BRAZIL- EVIDENCE FROM THE POUPATEMPO REFORM

ANDERS FREDRIKSSON

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ANDERS FREDRIKSSON

CRED — Centre of Research in the Economics of Development, Département de Economie, Université de Namur, Rempart de la Vierge 8, Namur B5000, Belgium
CORS — Center for Organization Studies, FEA-USP, Universidade de São Paulo, Av. Prof. Luciano Gualberto, 908, São Paulo CEP 05508-900, SP, Brazil

anders.fredriksson@unamur.be

Abstract

This paper evaluates a large-scale bureaucracy reform, Poupatempo ("Savetime"), in the state of São Paulo, Brazil. We chose one common procedure at the government bureaucracy – renewal of driver's license, and interviewed 729 individuals in 31 municipalities. We estimate the impact of these Citizen Service Centers on the resources – time and money – that individuals spend in licensing, and on other variables. We find a large and significant reduction in the time spent, and we provide details on how it comes about. The collected data is combined with a unique dataset on the universe of all driver's license renewals, in order to estimate the overall gain of the reform for the procedure that we study. Citizen Service Centers have been advocated as a tool to reduce bureaucracy and improve the citizen-state interaction. The project conducts a unique evaluation in Brazil's most populous state, and the study can provide input to similar reforms and evaluations in other settings.

Keywords: Bureaucracy, Bureaucracy reform, Citizen Service Center, Poupatempo, Intermediary

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1. Introduction

This paper studies Poupatempo, a Citizen Service Center reform, in the state of São Paulo, Brazil. The main goal of the paper is to evaluate the impact of Poupatempo on the time- and monetary costs faced by citizens when conducting a typical errand at the government authorities. We chose renewal of driver's license, a compulsory procedure for all drivers, and interviewed 729 individuals in 31 different municipalities. The first hand data collection, combined with an econometric strategy to evaluate the impact of a bureaucracy reform is, to the best of my knowledge, the first of its kind.

The study makes three main contributions. First, it evaluates a large scale bureaucracy reform in Brazil's most populous state, of interest in itself. Second, it suggests a method for how to evaluate the impact of "one stop shop" Citizen Service Centers. Reforms similar to Poupatempo, which means Savetime, are implemented in many countries and advocated by governments and donor agencies, and are therefore of interest to evaluate. In so doing, a novel questionnaire was designed and applied in treatment and control locations, pre- and post reform, for a Difference-in-Difference estimation of the reform's impact on citizen-centered variables, such as the time spent when conducting a typical errand at the authorities. In addition, register and survey data from the authorities is used both to gauge the representativeness of the first-hand collected data, as well as an input to an overall cost-benefit analysis. Third, the paper explicitly incorporates all bureaucracy-related time costs faced by citizens, which has implications for how public sector performance should be evaluated.

1.1 Background

Citizen Service Centers have been implemented in many countries. Such centers, among other services provided, are typically responsible for the issuance of personal documents, and are therefore an integral part of the citizen-state interaction. Possessing a birth certificate, identity card, tax registry, voter registry, employment booklet, passport, driver's license etc., are prerequisites, at different stages of life, for participation in society and to exercise basic citizen rights. Examples are going to school, entering university, using healthcare, getting employment, voting, opening a bank account, etc.[2] Reforms in how documents are issued,

[2] See e.g. Corbacho et al., 2012, for a study of the impact of lacking a birth certificate on schooling outcomes.

and in the bureaucracy more generally, may be driven by technological developments and economies of scale. Many developing countries have instead implemented reforms as an explicit recognition of a malfunctioning front-line bureaucracy for attending to the needs of its citizens. Although the implementation of Citizen Service Centers typically does not imply a change in the laws for how citizens obtain documents such as an ID, nor implies a unification of national registries between different authorities, they do promise faster service delivery through the physical co-location of offices from different government bodies. A citizen getting a personal document may previously have had to visit the authorities involved on different physical locations and on different days, with varying opening hours, with re-visits, etc., in addition to resorting to auxiliary services such as getting copies, photos, etc. These entities are now instead co-located and a common back-office should assure that errands are handled expediently.[3]

An evaluation of the extent to which Citizen Service Centers manage to serve the citizenry is ultimately related to the broader literature on access and quality of public goods and services, and this paper proposes such an evaluation in the Brazilian context, which is described next.[4]

Most in-depth studies of Brazil will discuss its complicated government bureaucracy. The international press and local media produce special reports on a regular basis.[5] The academic literature has focused mainly on the effects of bureaucracy on firms. It has been inspired by the discussion of informality – Brazil has had a large unofficial sector - and the literature on "the regulation of entry", with Brazil currently ranking 120th out of 189 on the World Bank Doing Business ranking (de Soto, 1989; Djankov et al., 2002; World Bank, 2015). It is well established that also citizens face complicated procedures when undertaking errands at the

[3] Unified registries could ultimately reduce the number of documents needed as well as make procedures to obtain documents simpler, but this issue is beyond the scope of the paper. Historical, administrative, legal, political, institutional, integrity and other factors will explain why some countries have highly centralized systems (Scandinavia) and other countries face difficulties in establishing a unified system for identifying citizens (e.g. Brazil).

[4] The 2004 World Bank Development report was dedicated to public goods and services provision in developing countries, as was a section in "The Economic Lives of the Poor" by Banerjee and Duflo (2007). A number of access and quality issues are recognized as obstacles to development, among which are remote public services, uncertainty as to whether schools/hospitals are open, teacher/doctor absenteeism, lack of equipment, bribes requested to be attended, red tape, etc. Other issues concern citizens' lack of information about rights to basic services and how to go about in exercising such rights. A large political economy literature is dedicated to explicitly modeling the political process and the incentives of politicians and voters, thus providing insights on redistribution and public goods allocations (see e.g. Persson and Tabellini, 2000).

[5] Recent examples include two Financial Times special reports on Brazil (Dec 2, 2014; March 25, 2015) and a section in the daily Estado de São Paulo (http://www.ft.com/intl/reports/new-trade-routes-brazil, http://www.ft.com/intl/reports/brazil-competitive-profile, http://topicos.estadao.com.br/burocracia).

government bureaucracy, with many colorful/vivid/tragicomical accounts of queueing, unresponsive bureaucrats and an inability to resolve errands through the supposed means. Some such evidence is even integrated into Brazilian folklore and language. The existence of the "jeitinho" (roughly a fix or work-around that can "resolve a situation"), and the despachante profession (a bureaucracy intermediary), can be seen as two societal adaptations which are used in the citizen-bureaucracy interaction (Rosenn, 1971; Fredriksson, 2014). There are very few empirical studies, however. The present paper conducts a unique and detailed data collection on one specific licensing procedure, and combines it with official data and an empirical strategy to identify the effect of a bureaucracy simplification program on how citizens go about in their interaction with the authorities, and on the resources they expend.

The first Brazilian state to implement Citizen Service Centers was Bahia in 1995, with Poupatempo in São Paulo established in 1997.[6] A 1995 federal white paper listed improvements to be made in the citizen-state interaction and in 1998 there was an explicit federal intention to join local governments in establishing Citizen Service Centers in all states that had yet not implemented such reforms (Ministry of Federal Administration and State Reform, 1995 & 1998). The vision of these reforms was to increase citizens' information about, and access to, public services, re-establish the state/public sector as the entity to which citizens would turn, as opposed to professional/private intermediaries, simplify the bureaucracy and increase efficiency, improve the service given to citizens and treat all citizens in a dignified and equitable manner, increase transparency, and so forth. Three concrete Poupatempo objectives were to reduce citizens' dependence on bureaucracy intermediaries/despachantes, reduce the time that citizens spend resolving errands, and provide citizens with information about procedures prior to their actual visit (Governo do Estado de São Paulo, 2005). These objectives are all evaluated in the present project.

Before the Poupatempo reform and the data collection project are described in detail, a few different interpretations of Citizen Service Centers are suggested. From a pure economic perspective, there may be economies of scale in the joint location of activities. Somewhat differently, and important for the social impact of Poupatempo-like reforms, is that they internalize citizens' costs of displacement. More specifically, instead of citizens themselves picking up a document at one office, and handing it in at a different office (as part of the

[6] Scharff (2013) describes the development of the Bahia program, and Paulics (2003) and Mota Prado and da Matta Chasin (2011) discuss the origins of Poupatempo and challenges in its implementation.

same procedure, and potentially on a separate trip/day), this is now taken care of internally. Another example is that photos and copies are taken at the Poupatempo offices, instead of citizens re-locating themselves to a photographer or a photo- or copy machine. An opportunity cost of time analysis of the potential gains of such co-location is made in the paper. A third interpretation of Citizen Service Centers is that they reduce transaction costs. North (1990) discusses "hard-to-measure costs that include time acquiring information, queuing, bribery and so forth" (p. 68), and "long queues and waiting time to get permits" (p. 69). In the paper I analyze various aspects of such transaction costs when discussing the impact of Poupatempo on how citizens acquire information. A fourth perspective is that the reform constitutes a shift from an individual-state interaction based on personal contacts (DaMatta 1979, 1984), to that of a more "Weberian" handling of citizen-errands. Poupatempo units have physical and organizational features such as open spaces, low walls between employees, a first-come first-served one-per-errand queueing number system, and a non-acceptance of intermediaries. These features were designed to engender neutrality and transparency, rather than fostering the development of personal contacts (Paulics, 2003; Governo do Estado de São Paulo, 2005; Annenberg, 2006; Mota Prado and da Matta Chasin, 2011). I evaluate whether the fraction of citizens reporting that they know someone at the entity where they conduct their errand falls as a result of the Poupatempo introduction, and whether personal contacts are conducive to a faster resolution of errands.

The paper proceeds as follows: Sections 1.2-1.4 describe the features of the Poupatempo reform which are important for the evaluation at hand, the procedure and possible means for renewing a driver's license, and the bureaucracy intermediary sector. Section 1.5 describes a dataset which is used in addition to the data collected. In section 2 I outline the data collection itself and the identification strategy (with further details in the appendix). The main analysis is in section 3, with robustness tests in section 4. Section 5 discusses the results.

1.2 Poupatempo reform

Poupatempo is, as described above, a government service "one stop shop" for issuance of personal documents and other citizen-related errands. It co-locates many different authorities and is a São Paulo state government program. Examples of agencies located at Poupatempo are DETRAN (the Department of Transit), IIRGD (the Institute for civic identification), SERT (the Secretary of Labor and Labor Relations), public utility companies, the consumer

complaints bureau, the post office, a public bank, etc. It was first implemented in São Paulo city in 1997, and then expanded with additional metropolitan area units. As of 2006, there were also units in four populous municipalities in the interior of the state, but the geographical coverage was limited. In 2008-2011, an expansion program implemented new units in 16 municipalities in the interior. It is this expansion into the interior of the state that the present project is concerned with. The 16 units were not randomly allocated, but rather implemented in (some of) the largest and economically most important cities. Geographical coverage was also assured, instead of a concentration in the highest population density regions only. The left panel of figure 1 displays the 16 new units of the 2008-2011 expansion on a state map.[7]

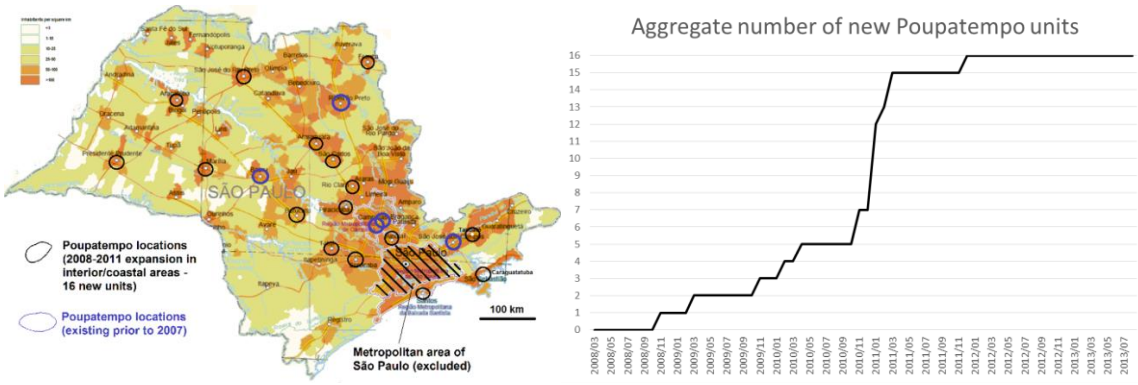

Figure 1. (left) São Paulo state map with the pre-existing units (blue) and the new units (black). The area is 250.000 km2, with 43 million inhabitants and 38 million yearly Poupatempo visits (in 2014). Around half of the population lives outside the metropolitan area, which is our area of interest. The right panel shows the evolution of the number of new units. The horizontal axis corresponds to the interview sample interval of renewal dates.

The Poupatempo reform does not change rules and regulation per se, for instance in how to renew a driver's license. It instead co-locates offices from the traditional authorities, and there is a common back-office to speed up and coordinate internal handling of processes. Opening hours are longer than in the pre-existing bureaucracy. The reform implies a duplication of government bureaucracy offices over the time period of the project, as the "old" structure of offices/agencies still exists, thus effectively giving citizens one more option

[7] The municipalities of Bauru, Campinas, Ribeirão Preto and São José dos Campos already had Poupatempo units, and are excluded from the study (blue circles on the map, with two Poupatempo units in Campinas). The area targeted by the 2008-2011 expansion was thus the interior and coastal areas of the state, excluding the metropolitan area and these four municipalities. I will refer to it as "the interior of the state of São Paulo".

of where to conduct errands. As an example, a municipality with a Poupatempo unit, inside of which there is a DETRAN office, will also have the "old" DETRAN municipality office in place. A São Paulo citizen can use any Poupatempo unit.[8]

1.3 Driver's license renewal

All holders of a driver's license in Brazil should go through a medical examination every five years, which effectively implies a five year renewal obligation. With around 15 million licensed drivers in São Paulo, there is an average of three million renewals per year. As such, it is one of the most common errands at the government authorities. The compulsory medical visit should include tests of vision, hearing, reflexes, pulse, heart and lung auscultation, blood pressure, hand muscle strength, and also administer a health status questionnaire. A second requirement is a 2005 regulation stating that those with their original license from before 1999 should get defensive driving and first aid training in their first post-2005 renewal, as this was not part of their original curriculum. The course should be 15 hours if the classroom option is chosen, followed by a test, or a self-study course, followed by a test. These two components, and a regularization of potential fines, are the "social" components of the renewal procedure. The other parts are largely administrative (handing in, paying and picking up the application/license).

Driver's licenses are administered by DETRAN, and the traditional/official procedure is to renew it at the DETRAN office in one's home municipality.[9] The second alternative is to use a driving school. Apart from providing driving lessons, these act as intermediaries for services such as undertaking the administrative steps of the renewal on behalf of the license holder, regularizing fines, etc. Driving schools also provide the 15h theoretical course discussed above, compulsory for some in our interview sample. The third way to renew a driver's license is at a despachante, a professional intermediary specializing in conducting errands at the authorities, discussed below. The establishment of Poupatempo implies that a fourth renewal option is introduced, for those living close to a unit (anyone can use these Poupatempos, but it involves long travel distances for individuals living far away).

[8] Mota Prado and da Matta Chasin (2011) discuss the duplication of costs and characterize the reform as an "institutional bypass", rather than as a mere replacement of the existing structure. Scharff (2013) notes that also in the Bahia case were services continued in the "old" bureaucracy.

[9] These offices are called CIRETRANs (Circunscrição Regional de Trânsito) but I will use DETRAN throughout.

1.4 The despachante

The origins and history of the Brazilian despachante, which translates roughly as "expediter", is largely absent in the literature on bureaucracy and public administration in Brazil. It is likely to have been around since the advent of a colonial administration in Brazil.[10] I know of no empirical study, historical or modern, detailing how common it is to use them. The data collection project here presented is likely the first to collect information on how big a fraction of a population sample that uses bureaucracy intermediaries, among many other variables, for a common licensing procedure.[11]

At DETRAN, despachantes can traditionally represent citizens and conduct errands on their behalf. They also have access to some of the computer systems/registries, which should allow for time saving (Fredriksson, 2014). This holds also for driver's license renewals, and the individual need traditionally not visit DETRAN. Driving schools and despachantes therefore have a similar intermediary function with respect to the administrative steps of the license renewal, although there have been gradual changes over the last years.[12]

1.5 Driver's license data from PRODESP

Apart from the data collection described below, the project also makes use of information from the anonymized DETRAN São Paulo population database of all drivers' licenses, which is administered by the São Paulo state data entity (PRODESP in its Portuguese acronym).[13] The database is a March 2014 "snapshot", containing information about the last interaction with the authorities of each holder of a driver's license. Importantly, it contains the date of the last medical visit, and a few other dates, which means that I have access to renewals occurring in the five year interval leading up to March 2014, representing an 80% overlap

[10] Damião de Góis (2001), with the original text from 1554, describes a profession that can be broadly interpreted as a combination of despachante and scribe, in downtown Lisbon. The function thus existed, in one form or the other, in 15/16th century Portugal, and probably earlier. Although the transfer of institutions from Portugal to Brazil has been widely studied, the case of despachantes is less documented.

[11] There is some household level survey data from IBGE (Statistics Brazil) on despachante spending, but the data can neither be used to infer how common is usage, nor what the intermediary is used for. In addition, the DETRAN driver's license database does not register separately if an individual has used a despachante when renewing the license, the case is registered as a DETRAN renewal. For studies from outside Brazil, Bertrand et al (2007) collect data on the use of intermediaries when obtaining the original driver's license in Delhi, India.

[12] There have been some changes and there is an ongoing reorganization (from 2011/2012) of DETRAN, part of which could have implications for the use of intermediaries. I discuss the changes, which have some overlap in time with the study, to the extent that they could potentially affect the impact evaluation, in the appendix.

[13] Companhia de Processamento de Dados de São Paulo.

with the time period covered by the interviews. It also has information on where the license was renewed (identifying a DETRAN or a Poupatempo unit) and residence zip code, and can be used to check how well the (quasi-) random selection of interview individuals worked (for gender, age, residence, and time of renewal). In addition, I use it to analyze the take-up of the Poupatempo reform itself, and in the cost-benefit analysis, where I assess the de facto geographical coverage of Poupatempo, probably a unique exercise for a public sector reform. In the area of study, i.e. "the interior of São Paulo", there were 6.7 Million renewals in the five year period leading up to March 2014. I typically work with a subsample of this data, depending on the treatment group definition, time period analyzed, etc.[14]

2. Data collection and identification strategy

The interview project was conducted in March-August 2013. It was set up to take advantage of the five year renewal obligation, and the reform timing, to get pre- and post-reform data, in treatment and control locations. We interviewed adults, screening on if they had a driver's license and had renewed it at least once. We inquired about the last renewal, and interviewed those who had renewed since March 2008. With a (quasi-) random selection of individuals, we should then get a distribution of renewal dates over March 2008 – August 2013 that roughly maps the population distribution, and, given the treatment timing, a division into those that had, and had not, access to Poupatempo. The right panel of figure 1 shows the reform timing. The average implementation date is Aug 8, 2010, which is about in the middle of the period that the interview project covers.

The treatment interview municipalities are the 16 cities, in the interior of the state, where Poupatempo was implemented in 2008-2011. The interview municipalities for the control group were chosen using propensity score matching. We had previously obtained from Poupatempo the "technical" criteria that were important in the decision where to implement a unit (population etc.) We added other variables that were also significant in explaining the

[14] The PRODESP database is very useful in that it contains all individuals with a driver's license, and thus constitutes the population, rather than a sample. It also highlights the need for the data collection project, however. It was constructed to keep track of driver's licenses and their status, rather than for socioeconomic impact evaluations. There is no information about how many visits were required to renew a license, the time spent in the procedure, how information was obtained, monetary payments, etc. I obtained the PRODESP data in March 2014, six months after the end of the data collection. The ideal interview sample, for geographical and socioeconomic representativeness, would have been to randomly draw individuals from the PRODESP database, but this was rejected for integrity reasons (I started inquiring about this issue in May 2012).

Poupatempo dummy, and that we hypothesized could affect the reform impact, following Caliendo and Kopeinig (2008). Thus we selected 15 control group interview municipalities.

One aspect of the data collection is that we did not screen out individuals living outside the 31 (16+15) interview municipalities, and 18% of the sample indeed lives in other locations. This was done for three reasons. First, an individual living close to a treatment municipality is likely to use the Poupatempo there implemented, and an individual living close to a control municipality would have been likely to use the corresponding unit, had it been implemented. Such surrounding municipalities therefore fall naturally into the treatment and control groups. Second, the data can be used as a first indication of how reform take-up depends on distance. Third, it can be used to estimate if the reform effect depends on the distance to a unit. These extensive and intensive margin effects, which are potentially important components in a cost-benefit analysis of public sector reforms, are further discussed below. In the case a substantial intensive margin effect is found, it can be combined with the PRODESP data, where we have the spatial distribution of all renewals, to ameliorate the cost benefit calculation.

In the baseline specifications I consider all individuals living less than 20km (as the crow flies) from a Poupatempo municipality as treated, and everyone else as control (also those living more than 20km away from a Control municipality). In the robustness section, I restrict the control group using the same 20km distance cutoff as for the treatment group (thus respecting the initial control group selection, with only minor changes in the estimated effect).[15] A few other treatment/control group specifications are also discussed.

A total of 729 interviews were conducted, aiming to reach a representative sample of holders of a driver's licenses in the interior of the state. When comparing with official data, it seems a representative sample was indeed obtained, at least along the dimensions for which we can compare. Figure 2 shows that the income distribution is very similar to the Statistics Brazil data, and the temporal distribution of renewals is similar to the PRODESP data. This holds also for age and gender. The details of the data collection are in the appendix.

[15] A 25 minute car travel time cutoff is also used, i.e. both criteria should be fulfilled, for an individual to be considered as "living close".

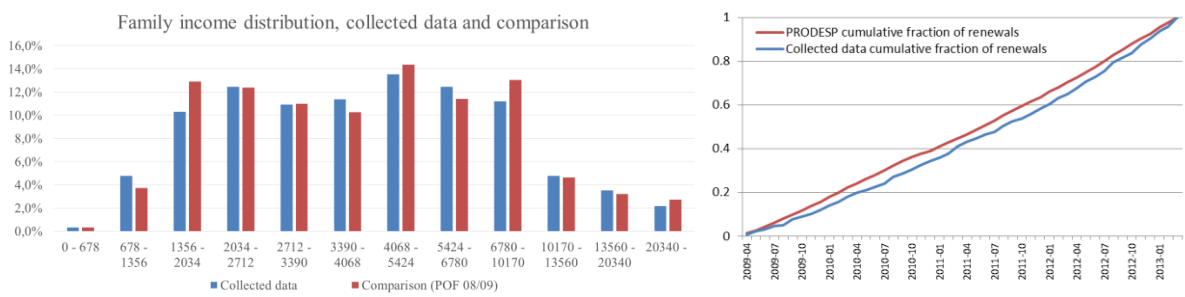

Figure 2. (left) Family income distribution, interview project and POF 08-09, for urban areas in the interior of São Paulo (inflated to 2013 using the IPCA index). Families with at least one car. 678R$ is the 2013 minimum wage. The POF sample weights were not used. (right) Cumulative fraction of renewals, for the period of overlap between the data collection and the PRODESP data. (1USD=1.9R$, average 2008-2013)

The questionnaire was designed to capture all aspects of the driver's license renewal, in particular all different steps that the individual went through in order to complete the procedure. It included questions about the time spent, at visit(s) to the bureaucracy (DETRAN/Poupatempo) and/or the intermediary (driving school/despachante) and transport times. A standard set of questions were first asked to all interviewees, to capture the different steps an individual had followed. We recorded if and how the respondent informed herself about the procedure (e.g. internet or a visit); how the procedure was started; if a doctor was visited; if the course/test was made; if a copy store, photo machine, photographer, bank or internet café was visited; if the application was handed and if/how the renewed license was picked up. If an individual had pursued a specific step (e.g. a visit to get information), more detailed questions about this step were asked (e.g. trips made, time spent and payments).[16] The numerical values of the main outcome variables – time spent, trips made, days elapsed and payments, were calculated by the enumerator at the end of the interview.[17]

[16] There was typically variation in which such detailed questionnaire pages were filled in, for instance between individuals using Poupatempo and despachantes. The questionnaire needed to be flexible enough to capture these differences. Still it should not presume a certain "route" was followed (e.g. that a license renewal at Poupatempo was done according to the stipulated procedure), but rather ask what was done. Additional pages were available for ad-hoc/non-standard/extra visits (ophthalmologist, notary public, store, re-visits, etc.).

[17] The questionnaire is, to the best of my knowledge, the first to consistently record and detail information about how citizens undertake a licensing procedure that encompasses a large fraction of the population. Most questionnaires on contacts with the government bureaucracy have concerned firms. We instead study a citizen procedure, and the questionnaire is more detailed in certain aspects. Compared to the Doing Business project at the World Bank, we identify a "de facto"- rather than a "de jure" procedure. Differently from firm questionnaires such as those applied by Zylbersztajn and co-authors (2003, 2007) and Yakovlev and Zhuravskaya (2013), we ask questions about the number of trips made and travel times. Inspired by these studies, the questionnaire specifically records and distinguishes between the time spent ("minutes") at different entities, in transport etc., from the time ("days") elapsing from start (getting information) to the

The underlying assumption of the Difference-in-Difference method is that the treatment group would have followed, for the outcome variables of interest, a time trend parallel to that of the control group, absent the reform. As discussed above, Poupatempo was not randomly allocated. The treatment municipalities are typically larger and somewhat richer than the control group interview municipalities, as shown by the first set of municipality indicators in Table 1. Next, the three growth indicators show no difference for population, but faster GDP growth in the treatment municipalities, and the opposite for automobiles/capita. To the effect that e.g. income affects interactions at the bureaucracy, the differential growth rates might pose a threat to the identification strategy. The last two rows show insignificant differences in two bureaucracy related indicators, the fraction of individuals with no birth certificate and the frequency of driver's license renewals.

Figure 3 plots the control/treatment ratio of the number of monthly driver's license renewals, using the PRODESP data, for the period 2009/04-2010/10. The graph indicates a very similar renewal trend in the treatment and control groups, lending initial support to the parallel trends assumption. Table 2 contains data from the interview project, summarizing some of the earlier discussion. Income/education differences are in line with table 1, although not significant.

Municipal data (N=31)	Year	All	Treatment (N=16)	Control (N=15)	p-value	significant at 5(10)%	Data source
Population	2007	203k	260k	141k	0.004	YES	SEADE
Household head income (R$)	2000	972	1063	875	0.001	YES	SEADE
Human Development Index	2000	0.822	0.832	0.811	0.005	YES	SEADE
Education (years)	2000	7.5	8.02	7.34	0.001	YES	SEADE
GDP/capita (R$)	2003	11054	12325	9699	0.065	(YES)	SEADE
# businesses/1000 inhabitants	2007	23.6	25	22.1	0.093	(YES)	SEADE
Autombiles/capita	2007	0.264	0.287	0.239	0.046	YES	DENATRAN
Inhabitants/bank branch	2003	9216	8606	9865	0.124	NO	SEADE
Population growth (%, yearly)	2003-2007	1.051	1.05	1.052	0.794	NO	SEADE
Nominal GDP/capita growth (%, yearly)	2003-2009	9.76	10.7	8.79	0.012	YES	SEADE
Automobiles/capita growth (%, yearly)	2003-2007	9.73	8.9	10.6	0.005	YES	DENATRAN
Driver's license renewals/capita	2008(Q1-2)	2.68%	2.73%	2.62%	0.646	NO	DETRAN
No birth certificate	2010	0.55%	0.46%	0.64%	0.322	NO	IBGE

Table 1. Municipality data, treatment and control. DETRAN/DENATRAN are state/national traffic authorities. SEADE/IGC are state data/cartography entities. IBGE is the national statistics authority. The renewal variable is (#Jan-June 2008 renewals)/(2007 population). This data was obtained through DETRAN, prior to the PRODESP dataset.

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completion of the procedure (renewed driver's license ready for pick-up). Muralidharan et al. (2014) study the impact of the biometric/smartcard technology in India and record the time (in minutes) it takes to collect payments from two large welfare programs (public works and pensions). The lag (in days) is also recorded for the public works program.

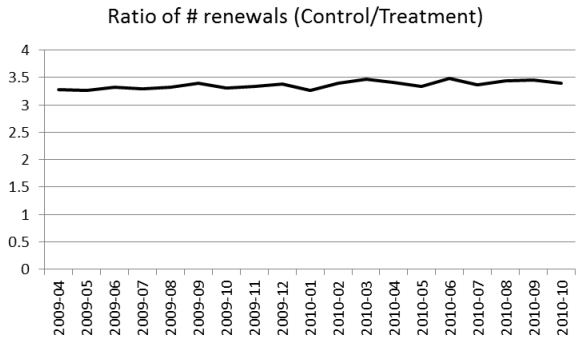

Figure 3. Pre-reform data on the number of driver's license renewals, for treatment and control, 2009/04-2010/10, from the PRODESP data. The graph contains the entire control group. The treatment group excludes those Poupatempo units implemented during the time period shown (5 of the 16 new units, plus surrounding municipalities, according to the <20km definition).

Interview data	All	Treatment	Control	p-value
# Interviews	729	362	367	-
# Interview locations	31	16	15	-
% of sample living in interview location	82%	93%	72%	-
# municipalities where interviewees live	117	31	86	-
Interview-weighted municipality population (2007)	185k	252k	120k	-
Age	42.3	43	41.7	0.157
Fraction men	0.62	0.599	0.64	0.256
Individual income (2013 R$)	3016	3186	2850	0.161
Fraction with college/university education	0.44	0.459	0.425	0.363
Hours worked/week	37.8	37.5	38.1	0.707
Critério Brasil	28.5	28.7	28.3	0.349
Fraction household with car	0.91	0.901	0.913	0.57

Table 2. Interview data, treatment and control. Critério Brasil is a socioeconomic (education/assets) index.

Table 3 shows summary data for the main outcome variables, as a function of the means of renewal (DETRAN, Poupatempo, driving school, despachante). The variables are the total time in minutes to renew the license (always excluding the time spent on the course/test, for comparability reasons, with and without "idle time", explained below), the number of return trips (excluding course/test trips and to "adjacent" places[18]), the time in days (in total, and the days to process the application), and the sum of all payments. Panel A contains all the data, panel B excludes individuals that did the course/test, and panel C excludes also those that did any other errand while renewing the license (the potential "other" errands are transfer of municipality, regularization of fines and change/addition of category).[19]

[18] Adjacent places are those where the individual was already at e.g. DETRAN, left the physical unit, walked one minute to a copy store, and then back. We count the time involved, but do not consider it a separate trip.
[19] There are no significant differences between the treatment and control groups in the fraction of individuals doing the course/test, or the other additional errands.

	Average	#	DETRAN	#	Poupatempo	#	Driving school	#	Despachante	#
3A: All data										
Minutes	268	727	321	183	253	266	241	122	244	126
Minutes, without idle time	259	721	321	183	228	260	241	122	244	126
Trips	4.1	729	5.48	184	2.4	266	4.78	122	4.8	127
Days	19.4	721	25.7	181	7.72	265	29.4	119	23.8	127
Days to process	10.5	719	13.6	181	3.66	264	16	119	14.3	126
Payment, discounted to 2013, R$	189	581	168	147	121	217	284	94	268	97
3B: Sample w/o. course/test takers										
Minutes	266	517	323	124	251	241	242	57	238	78
Minutes, without idle time	255	512	323	124	226	236	242	57	238	78
Trips	3.79	519	5.55	125	2.28	241	4.83	57	4.68	79
Days	14.8	516	21.7	123	5.22	240	25.3	57	23.4	79
Days to process	8.53	514	12.8	122	2.09	239	14.6	57	15.7	79
Payment, discounted to 2013, R$	146	433	130.6	106	106	197	210	50	222	65
3C: Sample w/o. course/test takers and w/o. Individuals doing transfer/regularization/alteration										
Minutes	258	431	298	95	251	213	242	50	230	62
Minutes, without idle time	245	426	298	95	224	208	242	50	230	62
Trips	3.67	432	5.46	95	2.24	213	4.89	50	4.59	63
Days	12.8	431	19.9	94	4.65	213	24.3	50	18.4	63
Days to process	7.25	429	11.9	93	1.78	212	15	50	11.3	63
Payment, discounted to 2013, R$	136	361	127	81	105	176	190	43	197	51

Table 3. Summary interview data for the main dependent variables. "Minutes" is the sum of all times, e.g. waiting, in attendance at the counters/desks and in transport, for all trips that the individual did (e.g. information, handing in documents, making copies, taking photos, doctor, final application, retrieval), excluding the course/test component. Use of internet etc. is also included. "Idle time" is the (voluntary) time spent waiting to retrieve the renewed license, once all steps were completed, rather than returning in a different trip. "Trips" is the amount of return trips (A-entity-A), which could also mean an inbound displacement from e.g. home followed by an outbound displacement to e.g. work (A-entity-B), as well as half-trips (A-entity), excluding course/test trips (and to "adjacent" places). "Days" is the number of days elapsing from the individual starting the procedure (typically getting information) until the renewed license was available. "Days to process" is the number of days elapsing at the entity between the handing in of the complete application, until the renewed license is available. "Payment" is the sum of all payments.

Although table 3 hides the time dimension, it illustrates important points guiding the subsequent analysis. The top left column shows that an average renewal consumes 4½ hours over a 19 day period, involving 4.1 return trips at a total cost of 190 R$ (averaging 100 USD, for 2008-2013). Using an intermediary (driving school or despachante) means less time in minutes and fewer trips than using DETRAN, is more common over the period, and is more costly. The time spent using Poupatempo is similar to using an intermediary, but involves less trips/days/cost. Poupatempo can sometimes have the renewed license ready the same day as the entity is first visited and some individuals "just wait", once the application has been completed, instead of making another trip. Such "idle time" is the difference between each panel's first two rows.

Around 29% of the sample (210 of 729) did the course/test. These individuals are excluded in panel B. In going from panel A to B there is a more than proportional reduction in the number of individuals using driving schools (from 17% to 11% of the total). Expressed differently, the course/test takers have an additional incentive to undertake the entire renewal at a driving school, as the course/test is typically offered in situ. The number of days and payments are lower in panel B, as the course/test component cannot be netted out from these variables in panel A. Going from panel B to C illustrates that there is also some selection in that individuals that e.g. transfer the municipality of the license (the most common "other" errand, occurring in eight percent of cases) typically (have to) use DETRAN. The reduction in the number of renewals at DETRAN is more than proportional. In sum, table 3 shows cross sectional averages of the main outcome variables, hints at a time saving function of both Poupatempo and intermediaries, and suggests relevant control variables or data subsamples for the subsequent analysis.[20]

Figure 4 shows pre-reform data for two of the dependent variables, minutes and trips. Renewals for the years 2008-2010 roughly coincide with the pre-reform period. For the treatment group, a municipality is removed from this data, as soon as Poupatempo is implemented. For the control group, the (very few) individuals that take-up the reform in those treated municipalities are also removed.[21] The graphs display averages for the raw data (upper panels) and conditional means (lower panels), and indicate slightly more time/trips in the treatment group, but that the differences remain largely constant over time, pre-reform. Figure 4 thus suggests that the parallel trends assumption holds for these variables, important when estimating the impact of the Poupatempo reform. Figure 5 shows the same variables, with separate trends fitted to the 2008-2010 and 2011-2013 data. The graphs hint at the reform impact, which I analyze in detail below, but neither substitute figure 4 in justifying the parallel trends assumption, nor show the precise impact (see figure 5 table caption).

[20] The number of individuals on each row do not sum up. Three percent of cases cannot be classified in terms of one entity only (entity of application/handing in documents + picking up renewed license). Most of these involve a DETRAN+intermediary or a driving school+despachante renewal, and are excluded from the table.

[21] There are two issues with displaying the pre-reform data: the time period for which I have PRODESP data and the staggered nature of the reform (see figure 1B). In figure 3, using the PRODESP data, information is only available from 2009/04. I choose to exclude from the treatment data not only the two locations where Poupatempo had already been implemented, but also the three locations where it was implemented shortly after. I thus get a pre-treatment graph for the 11 (out of 16) treatment locations where the reform was implemented after 2010/10. In figure 4, using the interview data, I instead include each individual treatment municipality, until treated. As most locations get the reform late 2010/early 2011, it is natural to plot the pre-treatment graph for 2008-2010.

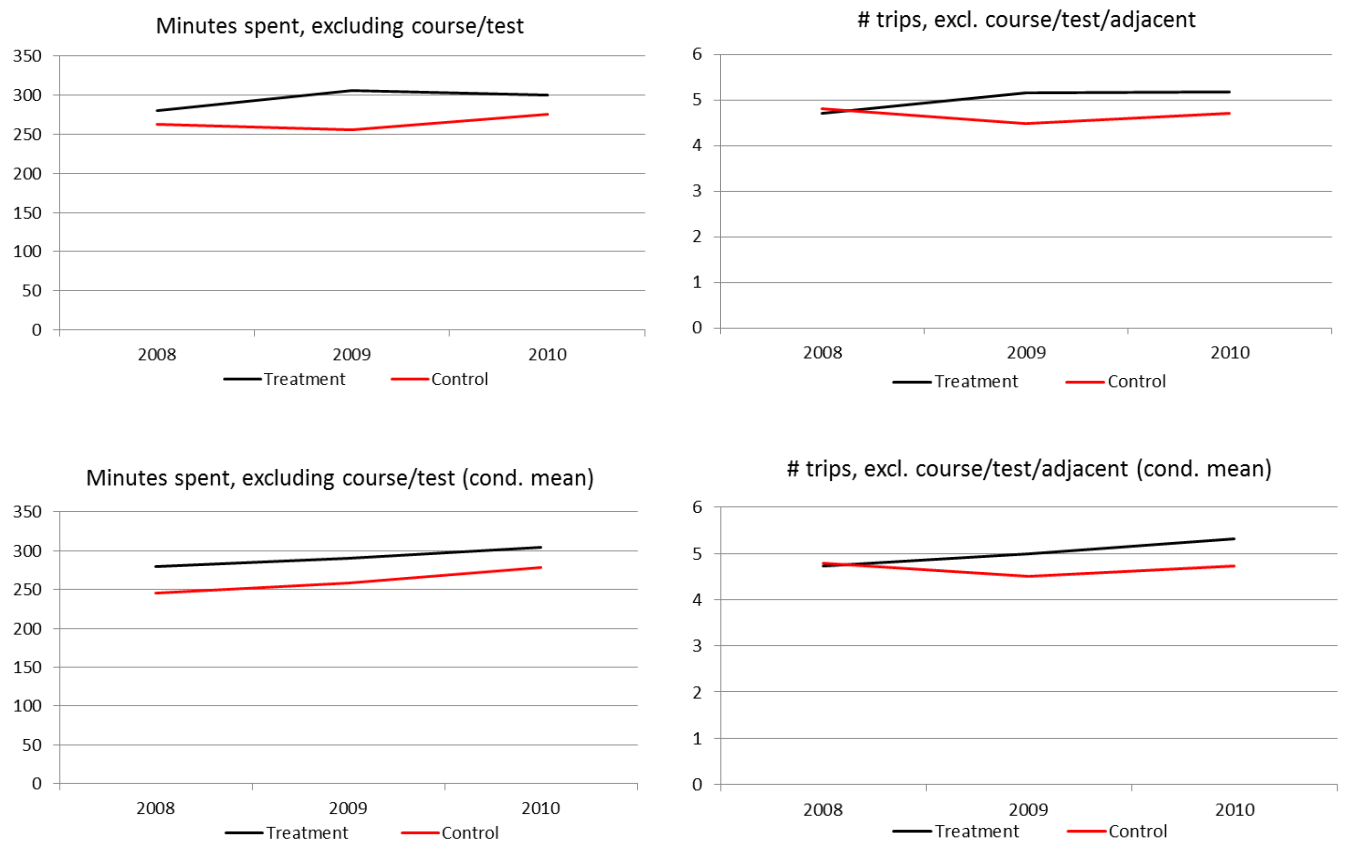

Figure 4. Pre-treatment averages for the time spent in the licensing procedure (left), and the number of return trips (right), excluding time and trips related to the course/test. In the lower panels the dependent variable was regressed on a set of controls, for each year and for treatment and control separately, showing the predicted dependent variable at each year's average value of these controls (age, gender, income and dummies for if the course/test, transfer of municipality, regularization and change/addition of category of the license was made). The 2008-2010 Poupatempo municipalities are excluded once treated, and eight control observations were excluded due to take-up. Six outliers and seven observations where individuals did not do the medical visit were also excluded.

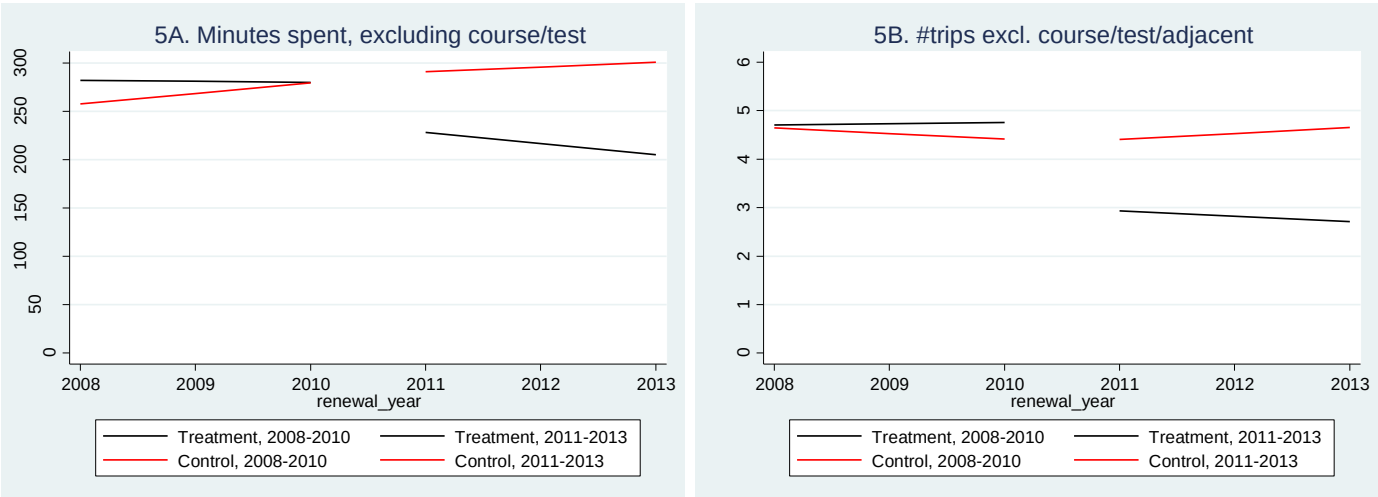

Figure 5. Estimated linear time trends, for 2008-2010 and 2011-1013 separately, for treatment and control. Differently from figure 4, these graphs contain all the data, i.e. include the already treated individuals in 2008-2010, and the control individuals that take up the reform. The left panel shows minutes spent in the procedure, i.e. the same variable as in figures 4A and C. The right panel shows the number of return trips (as in figures 4B and D). Six outliers and seven individuals that did not do the medical visit are excluded from the graphs. As in Figure 4, the data excludes time and trips related to the course/test.

3. Impact of the Poupatempo reform

This section analyses the impact of Poupatempo on various aspects of the citizen-bureaucracy interaction, starting with the take-up of the reform itself. As can be guessed from the number of Poupatempo users in table 3, the reform has changed the way in which individuals go about in their errands at the government bureaucracy. The upper left panel of figure 6 shows the fraction of renewals made at Poupatempo, in the data collection project, and the upper right panel plots the same ratio for the universe all driver's license renewals, in the treatment and control areas (see the figure caption for details).

Several points should be made. First, there is a massive move into using Poupatempo, at least for the licensing procedure that the project is concerned with. Poupatempo was known at the time it was introduced (due to its prior existence in metropolitan São Paulo, Campinas, etc.), and had very high approval ratings. Yet a take-up of 60-70%, i.e. the change in the treatment-control difference pre- and post- reform, when the "old bureaucracy" and intermediaries still exist, is substantial. A second point is that the fraction of Poupatempo users stabilizes around 70-80%, rather than converging to 100%. One of the reasons is that Poupatempo does not offer all services, and there are some limitations in who can renew a driver's license at Poupatempo. Some of these limitations are not fully justifiable from a technical or administrative perspective, while some errands may require technical DETRAN expertise not available at Poupatempo. I return to this issue in the discussion. Third, the fraction using Poupatempo in the data collection project is slightly higher than in the population database. This may be because our sample, collected on weekends in shopping environments, potentially differs in the renewal behavior (in particular, individuals might be more likely to use "malls", including "Citizen Shoppings", a name sometimes used for Poupatempo). The appendix has more details. Fourth, the control group is quite stable at around 20-25% of renewals occurring at Poupatempo. This is use of the pre-2007 units, in Campinas, etc., and some reform take-up.

Panels C and D show the gender and age composition, from the PRODESP data. Women use Poupatempo to a somewhat larger degree than men, as do younger individuals. There is a similar pattern in the collected data, together with a slightly higher take-up ratio for individuals with below median incomes (83%, vs. 75% for those with income equal to or above the median). At

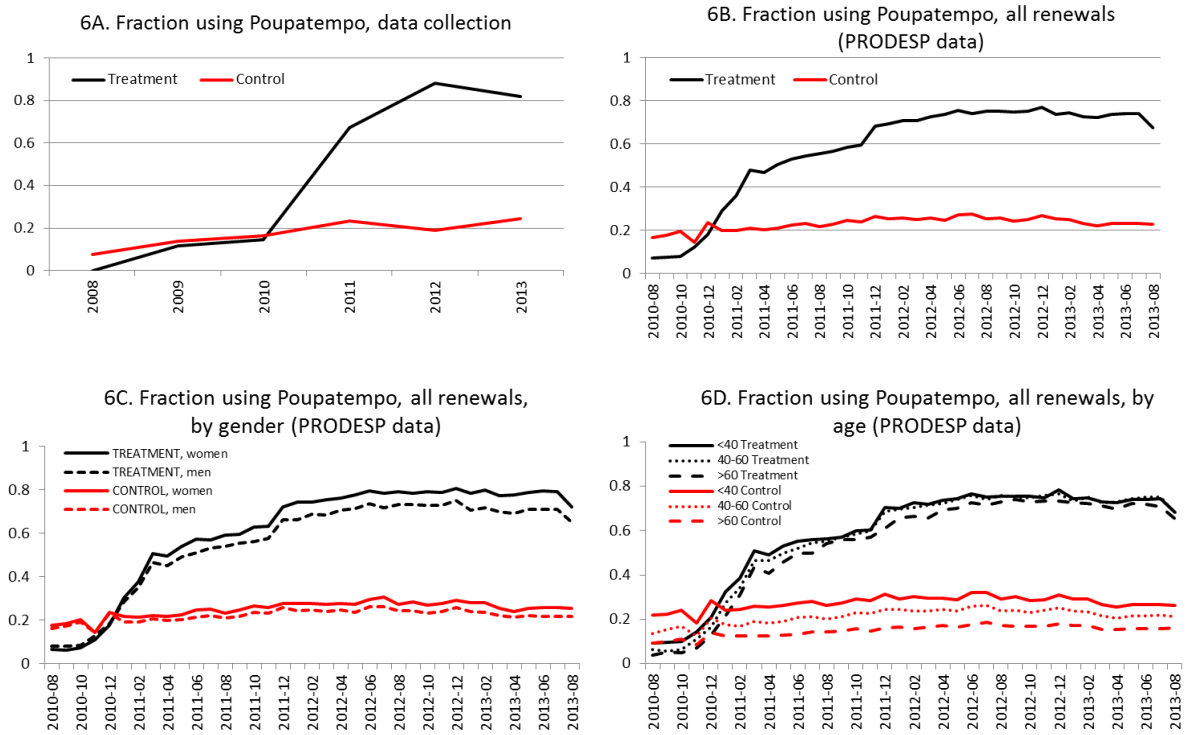

Figure 6. (Panels A and B) Fraction of driver's license renewals at Poupatempo, sample and population data. Treatment is based on the <20km definition, and all other individuals are in the control group. As in figure 3, the treatment group excludes the Poupatempo units implemented before 2010/10 (five of the 16 new units, plus surrounding municipalities, according to the <20km definition). The time interval differs between the two graphs. Prior to 2010/08 the PRODESP database does not allow for a separation of whether an individual renewed at Poupatempo or DETRAN. Panel A looks similar when the sample is restricted to those not taking the defensive driving/first aid course/test, with a minor increase in the Poupatempo usage ratios. (Panels C & D) Gender and age composition of Poupatempo take-up (with three age groups), based on the same data as in panel B.

least two of these three patterns can be rationalized by pre-reform renewal times: both younger individuals and below median income earners spent somewhat more time in the renewal procedure. This is not true for treatment group women (similar renewal times to men). Overall, the socioeconomic differences are small. Related to the increase in the fraction of citizens using the official procedure, there is a corresponding drop in the use of intermediaries (figure 7). The Poupatempo reform thus seems to imply a switch out from the intermediary sector, into using the official procedure. Combined with table 3 it also indicates that intermediaries had a time-saving function that Poupatempo now fulfills, a topic further discussed below.

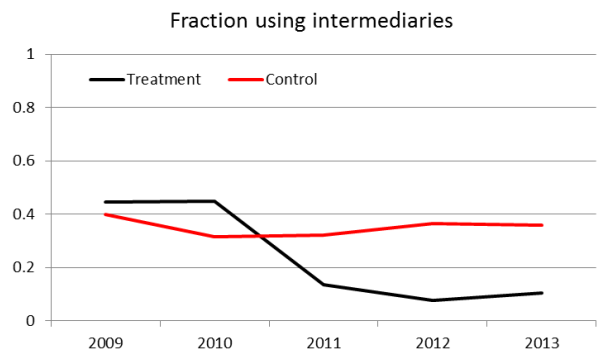

Figure 7. Fraction using intermediaries. Data as in figure 6A, but excluding also individuals doing the course/test. Year 2008 is excluded, due to too little data.

3.1 Estimating the impact of the Poupatempo reform on the main variables

In this section I estimate the impact of the Poupatempo reform on the main outcome variables of interest, i.e. the six variables that were reported in table 3, using the following regression:

$$y_{ist} = \alpha_s + \eta_t + \delta T_{st} + \beta X_{ist} + \varepsilon_{ist} \quad (1)$$

The sub-indices are *i* for individual, *s* for the different treatment/control locations (typically referred to as "group") and *t* for time. I thus regress the dependent variable on dummies for the different treatment/control locations, α_s, time dummies, η_t, and a dummy T_{st} indicating whether the Poupatempo reform has been implemented in location *s* at time *t*. ε_{ist} is an error term. The coefficient δ ("aftertreatment") is the reform impact of interest, with results in table 4.[22] Columns 1A-5 use the full sample (as in table 3A), whereas the last column includes only individuals who did neither the course/test nor other errands (as in table 3C). I also run the

[22] In a standard Diff-in-Diff setting, there are two groups (Treatment/Control), two time periods (Before/After), and the effect of interest is the coefficient on the interaction term, Treatment×After. Here, there are multiple groups (i.e. multiple treatment and control locations) and a staggered reform (figure 1B), and T_{st} is constructed such that it switches from 0 to 1 in the moment the reform is implemented in location *s*. This is the multiple groups, multiple time periods generalization of Difference-in-Difference. It assumes a constant treatment effect across treatment locations, and is discussed by e.g. Bertrand et al. (2004), Angrist and Pischke (2008) and Imbens and Wooldridge (2009). I run the regressions with 32 treatment/control location dummies, being indicators for the 16 treatment municipalities + surrounding municipalities (within 20km of each respective location), the 15 control municipalities + surrounding municipalities, and an indicator for all other control municipalities (≥20km from both treatment and control municipalities). I use time dummies that correspond to the periods between implementations of additional Poupatempo units and for the last two years (2012-2013) there is a new time dummy every four months (thus equaling the average number of months for each of the preceding time dummies). Replacing the 16 time dummies with month dummies makes very little difference for the parameter estimates.

regressions with a set of controls X_{ist} (dummies for course/test/other errands, and age, gender, income). The impact on the δ-estimates is typically small, and the result is shown only for the main "time spent" variable (column 1B), used in the below cost-benefit analysis.

	(1A & Minutes w/o course	1B) Minutes w/o course	(2) Minutes w/o course/idle	(3) Return trips w/o course/adjacent	(4) Days total	(5) Days to process	(6) Payment in R$
aftertreatment	**-77.6*** (3.4)**	**-66.8***(2.7)**	**-86.0*** (3.8)**	**-1.63*** (6.4)**	**-5.95* (1.8)**	**-5.70*** (2.4)**	**-15.0 (1.2)**
Treatment/control dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls:							
-Course/test and other errands	No	Yes	No	No	Yes	Yes	-
-Socioeconomic	No	Yes	No	No	No	No	Yes
N	727	691	721	729	684	682	358
R-sq	0.119	0.158	0.127	0.242	0.321	0.252	0.266
t statistics in parentheses, * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors, clustered on treatment/control locations.							
Estimated impact in % of treatment pre-reform average							
Average	294 minutes	294 minutes	289 minutes	4.98 return trips	17.2 days	11.3 days	165 R$
Reduction	26%	23%	30%	33%	35%	50%	--

Table 4. Intention-to-treat (ITT) estimates on minutes, trips, days and payment to renew a driver's license, where the first row is the Difference-in-Difference (DiD) estimate of interest. In columns 1A, 2 and 3, the full sample is used, without controls for course/test, transfer, regularization and change/addition of category (see the discussion of table 3). In columns 4-5, these controls are always included, as the "days" variables by construction cannot net out these components. Six outliers and seven observations where individuals did not do the medical visit were also excluded from columns 4-5. In column 6, due to much noisier data, I restrict the sample to those renewals that did nothing else than the "basic renewal" itself (table 3C). Three outliers, those not doing the medical visit, and individuals paying for the medical visit through an insurance policy are excluded from the payments data. Column 1B includes both course/test/other errands- and age/gender/income controls, and is used in the below cost-benefit calculation.[23] The treatment averages (second line from below) in columns 1-3 are for all pre-reform renewals, whereas in col. 4-6 they exclude individuals doing course/test/other errands.

There is a significant and sizeable estimated reform impact. For an average holder of a driver's license in the treatment locations, the reform reduces the total time spent with 67 minutes, involving 1.6 return trips and 5.95 processing days less (columns 1B, 3, 5). The last two rows

[23] The sample in column 1B is smaller than in 1A. We did not ask the question related to change/addition of category in the first round of interviews, which took place in two Poupatempo locations. Around 5% of the sample is therefore dropped. Leaving out the change/addition control variable, and thus maintaining the full sample, gives a DiD estimate of 74.7 minutes (t=3.0, N=716). Although the coefficient on change/addition is not significant, and the 66.8/74.7-difference rather seems driven by a small selection effect, I choose to use the estimate from table 1B, as the control variable may be significant in other regressions. Including the full set of controls in column 2 has a similar effect on the estimate as in going from column 1A to 1B, and for column 3 the difference is negligible (results not shown).

report the estimates as percentages of the pre-reform level.[24] These estimates are non-negligible and provide a justification for the positive perception of Poupatempo. They suggest that Poupatempo is indeed a time-saver, and that this comes at no monetary cost to the individual, who instead is likely to spend less than before the reform (the payment data is much noisier, and the coefficient is not significant, however).

I next undertake a cost-benefit calculation of Poupatempo. The estimates in table 1 are the average impacts on individuals living in, or close to, the treatment locations. If the spatial distribution of the population differs much from our sample, and if the reform impact depends on distance, we may have over-/underestimated the reform impact. As shown in Table 5A, however, the averages of "distance to Poupatempo" in the collected data and the population/PRODESP data are similar, and I proceed with the cost-benefit calculation, based on column 1B above, without any distance correction. I further analyze the distance variable in section 4.

	5A. Average distance for users of new Poupatempo units		**5B. Number of total renewals**
	PRODESP data	Collected data	PRODESP data
All	9.7km	5.2km	4092359
From Treatment	2.4km	1.0km	1448175

Table 5. Distance to Poupatempo and total amount of renewals (for 2010/08-2013/08).

Table 5B shows the total amount of renewals from 2010/08 (Poupatempo renewals can be separated in the PRODESP data), until 2013/08 (end of the data collection project). There are 1.45 Million treatment group renewals over this 37 month period, or around 470000 per year. With an estimated time saving of 67 minutes (table 4, column 1B), we get an aggregate time saving of 31.5 Million minutes per year. As for the opportunity cost of time of individuals, I use the average treatment individual income of 3186 R$, weekly work hours 37.5, and 4.3 weeks/month to get an average minute opportunity cost of time of $3186/(4.3 \times 37.5 \times 60) = 0.33$ R$. The average renewal opportunity cost of time then becomes $294 \times 0.33 = 97$R$, and the value of the São Paulo-wide time saving 10.4MR$ per year.[25]

[24] The last row in table 4 is an approximation (only) of the treatment group percentage reduction, as the DiD estimate also takes into account any change in the control group.

[25] These calculations do not take into account that Poupatempo has more flexible opening hours than the traditional bureaucracy (including Saturdays), which would decrease the value of time spent, post reform. We did not inquire about which weekdays individuals renewed the license.

Ideally, one would like to compare the social costs and benefits of different means of renewal. Due to lack of detailed data on the costs of renewal, I instead compare the above estimated time gain to the cost of the Poupatempo operation per se, which can give an idea of the relative importance of the time saving obtained.[26] The cost calculations are based on assumptions and somewhat incomplete data, and should be taken as suggestive. I first estimate that 7% of Poupatempo errands, for the units evaluated, are driver's license renewals. I next estimate that the yearly operational costs for the 16 units concerned are around 75MR$ per year, with an additional 33 MR$ in general overhead, and that installation costs for the units were 29 MR$ per year over a 5 year period. Importantly, I also assume that the cost per errand at Poupatempo is the same, irrespective if it is a DETRAN-, Identification-, Public Housing-, Employment booklet errand, etc., and equal across all Poupatempo units. Based on these assumptions and numbers, the cost accruing to drivers' license renewals becomes between 7 and 9 MR$, depending on if the (5 year) annualized installation costs are included or not.[27] In comparison with these numbers, the time saving of 10.4MR$ is non-negligible.

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[26] Ferrer (2006) found an overall social benefit of Poupatempo in a Pre-Post study of the emission of certificates of criminal record, relying on a conjectured pre-reform service level. The study used an Activity Based Costing (ABC) approach to assess the costs for the "old" (the Identification Institute) and the new (i.e. Poupatempo) procedure.

[27] I use data from 2011 and 2012 to estimate the costs of the Poupatempo operation related to driver's license renewals, among these the 2012 budget of 358 Million R$ (available at http://www.planejamento.sp.gov.br). The 7% usage figure is calculated by dividing the number of Poupatempo renewals from the PRODESP data, with the total amount of errands at Poupatempo, excluding municipal errands. This ratio calculation is done for 2011/01-2011/07, for which I have disaggregate Poupatempo data and when all new 16 units except Sorocaba were or had been implemented. In doing the calculation, I considered bank errands, which are registered as a separate category, as being linked to the other types of errands that individuals undertake (such as paying for the renewal of driver's license), and did not count these as errands proper (the same for attendance over telephone). The Operations and Maintenance (O&M) and installation costs are based on (some of the) contract values published in the official government gazette (Diário Oficial da União, available at https://www.jusbrasil.com.br/diarios/DOU/). All units evaluated in the present study are operated, in the front office, by third party contractors, whereas most of the earlier units are run by Poupatempo/the public sector itself. The different components of the contract value are not always separable from each other, and are sometimes also not separable per Poupatempo unit. The typical contract is Installation + 60 months O&M, and I considered 28% of contract values as Installation costs, a figure taken from one individual contract. Having estimated yearly O&M costs for the 16 new units at 75 MR$, I then impute O&M costs for the other (typically larger) units based on the total number of errands and assuming equal costs per errand (one third of 2012 Poupatempo errands are at the 16 new units, I thus assume 150MR$ of O&M costs for the other units). In addition, I also assign some installation costs to the São Paulo metropolitan area units (for those units, in 2012, that were built less than 60 months prior). Based on the total Poupatempo budget of 358MR$, I then proportionally assign the residual Poupatempo cost as overhead (gestão). Due to the uncertainty in these numbers, which are preliminary, I chose to not make 2011/12 inflation corrections. At present it is also not known if other entities, such as DETRAN and PRODESP, have Poupatempo-related costs.

The estimates in table 4 are Intention to Treat (ITT) estimates, which is the appropriate measure for the cost-benefit analysis, as it also considers those treatment individuals that do not take up the reform (see e.g. Duflo et al, 2008). In table 6 I remove from the sample those treatment individuals (23%) that did not take-up the reform, to estimate the impact on those actually using Poupatempo (Treatment on the Treated, TT). Control group individuals that took up the reform (around 11%), i.e. "spill-overs", are also removed. The time saving estimate in column 1 is 90 minutes, or 34% higher than in the corresponding ITT-regression (table 4, column 1B).[28] Adding interaction terms between "aftertreatment" and dummies for gender, being above median age, and having above median income, to the regression in column 1, gives insignificant interaction terms (added separately or together). I thus find no significant treatment differences between men/women, older/younger, and above- vs. below median income. Overall, table 6 indicates large effects of the Poupatempo reform, and the decrease in total payments is now significant. In sections 3.2-3.4 I analyze additional reform effects and then use TT estimates.

	(1) Minutes w/o course	(2) Minutes w/o course/idle	(3) Return trips w/o course/adjacent	(4) Days total	(5) Days to process	(6) Payment in R$
aftertreatment	**-89.9*** (3.9)**	**-102.7*** (4.5)**	**-2.41*** (9.2)**	**-11.3*** (3.6)**	**-9.00*** (3.8)**	**-29.6*** (2.6)**
Treatment/control dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Controls:						
-Course/test and other errands	Yes	Yes	Yes	Yes	Yes	-
-Socioeconomic	Yes	Yes	Yes	Yes	Yes	Yes
N	610	605	611	594	593	321
R-sq	0.183	0.215	0.401	0.383	0.325	0.372

t statistics in parentheses, * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors, clustered on treatment/control locations.

Table 6. Treatment on the Treated (TT) estimates for minutes, trips, days and payment to renew a driver's license.

Table 7A provides further details on the "mechanics" of the "one stop shop" and helps explain the coefficient estimates. The percentage of individuals doing a separate trip to a copy-store or to

[28] There is a concern that removing the spill-overs introduces selection bias. The differences in socioeconomic characteristics are minor, but there is a higher fraction of men, young, and individuals with slightly higher incomes, for those taking up Poupatempo (no difference is significant at 10%, however). To the extent that the estimated effect depends on these characteristics, the TT estimate would be biased, and I therefore use the course/test/ other errand and socioeconomic controls in all TT regressions (the same reasoning applies to treatment non-compliers). The difference between the ITT and TT estimates is explained by, first, the "mechanical" effect of adjusting for the take-up ratio. Second, the non-compliers in the treatment group have a slightly longer renewal time than the pre-reform average, their removal will therefore increase the estimate more than expected by the take-up ratio adjustment. Third, the control group individuals using the new Poupatempo units have longer travel times (and longer renewal times), their removal will instead adjust the TT estimate downwards.

a photo machine/photographer is higher for non-Poupatempo renewals. The same holds for separate information trips, further discussed in section 3.2. The numbers for the doctor are as expected, as it is done inside Poupatempo, but outside, at an accredited unit, for the other means of renewal. The percentage of individuals with extra or "non-standard" trips is lower for Poupatempo renewals. Around a sixth of renewals at Poupatempo are resolved in one single trip, and around a sixth in zero days (from getting information until the renewed license is available for pick-up). Panel 7B shows a lower standard deviation for each of the six main outcome variables, which can be interpreted as the reform increasing predictability/reducing uncertainty when renewing a driver's license, an issue which is further discussed in the next section.

7A. Percentage of renewals, different aspects of services co-location	**Copy store (Outside and non-adjacent)**	**Photo**	**Doctor outside**	**Extra/Non-standard trips**	**One trip only**	**Zero days**
Non-Poupatempo	28.9%	22.6%	99.1%	17.3%	0.0%	0.0%
Poupatempo	7.8%	3.2%	6.4%	3.2%	17.4%	16.4%
7B. Standard deviation, main variables	**Minutes**	**Minutes, w/o idle**	**Trips**	**Days**	**Days to process**	**Payment (2013 R$)**
Non-Poupatempo	139	139	1.46	15.5	10.4	74.9
Poupatempo	134	122	0.91	9.63	3.29	35.2

Table 7. Different aspects of services co-location (panel A) and standard deviation of the outcome variables (panel B). The sample is the same as in table 3C, i.e. excluding course/test takers and individuals conducting other errands. In the copy/photo columns I exclude "trips" to adjacent locations (e.g. walk 1 min from DETRAN/Poupatempo to a copy store, then back). The column for extra/non-standard trips include additional trips to schedule e.g. the doctor or get examination results, additional information trips or handing in missing documents, attempts to pick up a license that was not yet ready, re-visits due to computer/system failure, etc.

3.2 Information, transaction costs and the impact of Poupatempo

This section analyses the impact of Poupatempo on how citizens obtain information about the renewal procedure. As argued by Rosenn (1971), such information was traditionally lacking and was one reason to resort to a despachante, and the Poupatempo reform explicitly aims to address this issue.[29] Conceptually, obtaining information about how to resolve an errand (e.g. renew a driver's license) can be interpreted as a transaction cost incurred by the citizen (North, 1990). In general, transaction costs occur along the different phases of a transaction, including search costs (find a used car to buy), measurement costs (evaluate the quality and determine the subjective

[29] Fredriksson (2014) discusses the lack of information in the Brazilian bureaucracy and analyses red tape, a form of which could be the non-provision of information, in order to extract rents. An alternative explanation for the lack of information is unmotivated employees due to weak incentives in a Weberian-style bureaucracy (see for instance Williamson, 1999 or Secchi, 2009).

value), negotiation/bargaining costs (conducting the purchase and establishing a contract) and policing/enforcement costs (ex-post costs related to contract fulfillment). The frequency and degree of uncertainty of transactions determine the effects of such costs on economic outcomes.[30]Applying the logic to the present paper, the main transaction cost likely lies in the first category, i.e. the process of finding out how to renew the driver's license. Even if the procedure would traditionally have been transparent, the five-year renewal interval means that changes are likely. It could be whether appointments should be scheduled, opening hours, payments, or regarding the course/test requirement. It is also true, however, that most "standard" interactions with the Brazilian authorities require three documents (ID card, tax registration number and proof of address), here complemented with the driver's license, and some individuals will be aware thereof. The interest here is in the impact of Poupatempo on the effort citizens exert in order to obtain information about the procedure.

In the questionnaire, we inquired about the use of internet, telephone, conversations in loco with family/friends/colleagues, if trips were made for information purposes, and the time spent in these activities. Three proxy variables to measure transaction costs were constructed: the total time spent to obtain information, a dummy for whether an information trip was done, and a dummy for whether there was any information activity at all. In principle, information-related monetary costs for internet/telephone usage, gasoline and bus tickets also belong to the category. What is the expected reform impact on the three variables? Although no formal model is posited, there are several effects. First, telephone and internet information services for Poupatempo users should reduce the need to undertake trips exclusively for information. Second, information retrieval at the units themselves should be better at Poupatempo, but these units will, on average, be further away, and the total effect on time spent is perhaps ambiguous.[31] Third, the fact that

[30] Asset specificity is the third attribute completing the Williamsonian characterization of transactions (e.g. Williamson 2005). Rather than studying the effect of transaction costs on organizational forms (the existence of the despachante could potentially be rationalized this way), our focus is on the magnitude of such costs.

[31] The Difference-in-Difference method will net out changes that occurred in both the treatment and control groups. In terms of citizen reception at the physical units, it is clear that Poupatempo not only had information leaflets but also established a screening and front office reception of individuals, probably resulting in a much more efficient information procedure (conditional on visiting a unit). The internet and telephone services established by Poupatempo are more troublesome from an identification perspective, as all citizens, treatment and control alike, in principle can access these. The DiD strategy will then estimate the differential impact from the Poupatempo web/phone services in the treatment vs. the control group, for instance due to the fact that treatment individuals could effectively use the information obtained. That is, the treatment group individual lived in a Poupatempo city, i.e. knew, from the information obtained, what to do at the place of renewal. The control

many individuals used intermediaries should result in lower pre-reform information search costs, than if only DETRAN had been available. This raises an important question: If individuals resorted to an intermediary instead of using DETRAN, why bother? I argue that the intermediary can then appropriate some of the surplus the individual obtains from renewing the driver's license, and we should expect such individuals to pay more (which is the case, table 3). Fourth, and as argued above, individuals probably have to get some information, irrespective of the Poupatempo reform.[32] Table 8 shows averages of the three information variables, and pairwise significant differences. Much in line with the above, the differences between DETRAN and Poupatempo are significant: Users of Poupatempo spend less time acquiring information and a smaller fraction makes an information trip. The same holds for the fraction getting information, one way or the other (third line in table 8). As expected, those resorting to an intermediary also spend less time than those using the "old" bureaucracy.

The information data, corresponding to one individual item of the renewal procedure, is noisier than the data for all items combined, and outliers have a larger impact. Notwithstanding, figure 8 below suggests that Poupatempo had some impact on how citizens obtain information. Panels A & B first show the time spent getting information, for individuals that undertake an information trip, and for those that get information through other means. There is a substantial difference in time spent in the information activity but no marked differences between treatment and control. Panels C and D instead indicate a treatment group reduction in the fraction undertaking an information trip and the average time spent getting information.[33] Columns 1-3 of Table 9 show Diff-in-Diff regressions with information as the dependent variable (Treatment on the Treated, as in table 6). Columns 1 and 2 suggest a 40% reduction in time spent getting information for those using Poupatempo (11.9 out of 29.7 minutes pre-reform treatment average), and a 22 percentage point reduction in the fraction undertaking a specific information trip (pre-reform value of 0.48),

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group individual did not live in a Poupatempo city, i.e. could perhaps get a general orientation about the procedure but not a full instruction what to do at the place of renewal. In the study, there are only two individuals renewing outside Poupatempo that claim to have obtained phone/internet information through Poupatempo.

[32] Another effect, on the extensive margin (and hence not captured by the study), would be that lack of information may previously have induced individuals to not renew their license at all.

[33] Panels C and D show all the data, i.e. includes treatment individuals that do not take-up the reform, and control group individuals that use the new Poupatempo units (similar to figure 5, and differently from figure 4). The size of any treatment effect, can thus not be directly inferred from the graph.

	Public sector bureaucracy		Intermediary			
	"Old"	"New"				
Transaction cost proxies	**DETRAN**	**Poupatempo**	**Driving School**	**Despachante**	**Significant pairwise differences (at 5%)**	**# obs**
Time getting information (minutes)	29.8	20.6	22.4	23.8	DETRAN larger than Poupatempo and Driving School (DETRAN - Despachante difference: t=1.61)	675
Dedicated information trip (fraction)	0.46	0.25	0.39	0.45	Poupatempo smaller, for all three pairwise comparisons	675
Some information activity (fraction)	0.88	0.75	0.65	0.72	DETRAN larger, for all three pairwise comparisons (Poupatempo - Driving school difference: t=1.93)	675

Table 8. Summary data on variables related to obtaining information. Time getting information is the average of all activities related to information. It includes information retrieval over internet/telephone, from friends/family/colleagues etc., time waiting and at the counter of the public bodies or at the intermediary, and the travel time to those places, in case there was a *dedicated information-only trip*. If a respondent searched for information over the internet and scheduled an appointment, we considered it as "starting the procedure" and not as "getting information" (unless times can be separated). The same holds for trips in which the individual started the procedure (i.e. handed in documents), although the trip was originally intended for information purposes. If a respondent made a displacement to get information, and then continued the trajectory to e.g. a copy store (as part of the procedure), the trip is not counted as a dedicated information trip, and only the time inside the entity is considered. Time spent to compare prices, for instance between driving schools, were coded as information. Overall, the information variables are a conservative lower bound on the effort dedicated to obtaining information. Three outliers are excluded. There is virtually no difference in information time between those that did the course/test and those that did not, and all individuals (also those with transfer/regularization or change/addition of category) are included (as in table 3A). The last column corresponds to all renewals classified as having taken place at one of the four entities (i.e. excludes "mixed" cases, as discussed in conjunction with table 3), and where the information variables can be constructed.

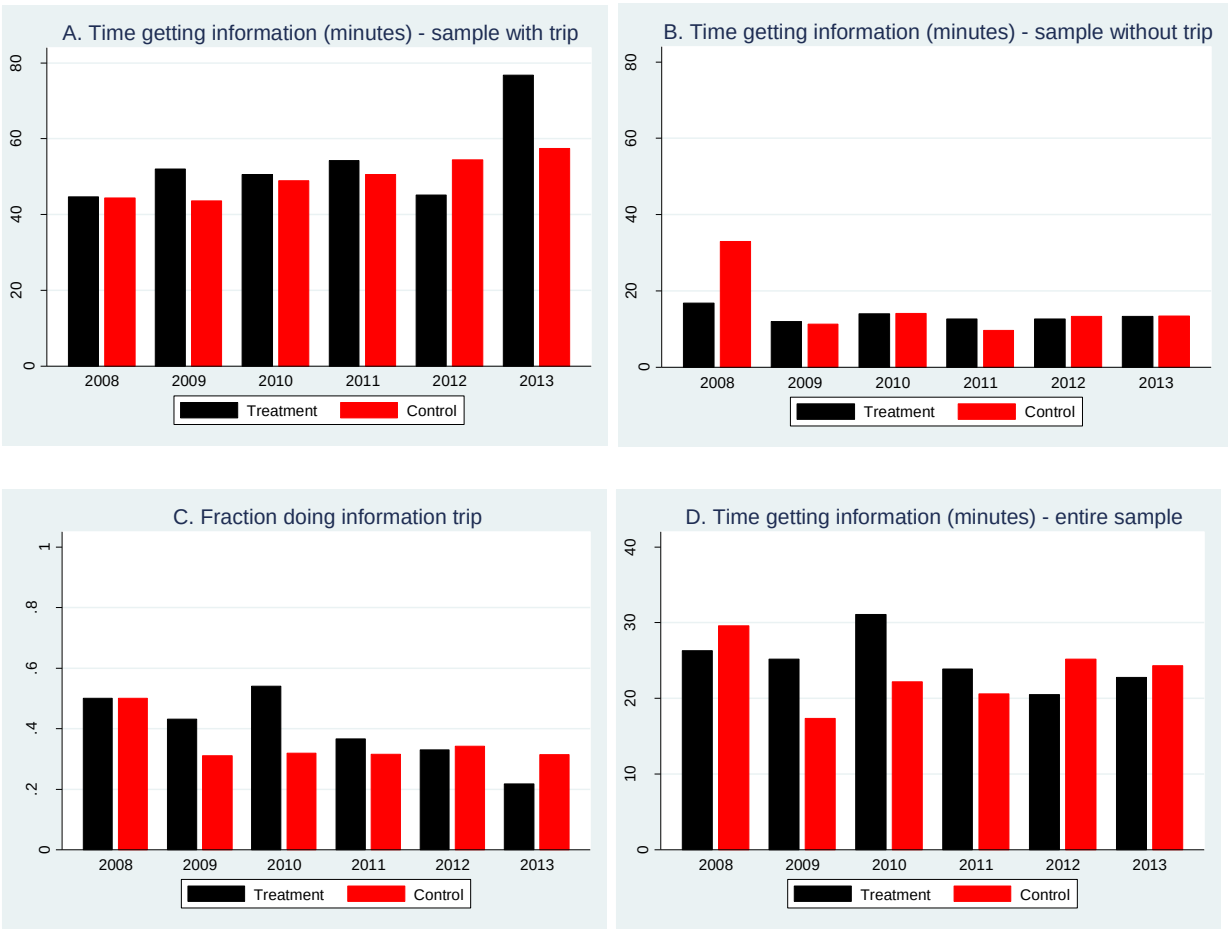

Figure 8. Information variables, by year, for treatment and control. Time in obtaining information for the subsample that undertakes a trip for such purposes (panel A), time in information for those individuals that do some other activity, but not a dedicated trip (B), fraction doing a dedicated information-only trip (C), and average time in information activities, for all respondents (D). These graphs contain all interviews with non-missing data, including "mixed cases", and excludes three outliers (#obs=704). Panel A has 10-34 observations/bin and panel B has 8-44 observations/bin. The 2013 treatment individuals in panel A contain some "complicated cases", but no obvious outliers (#obs=10). The 2008 control group data in panel B has one individual outlier, doubling the average (#obs=9).

respectively.[34] These estimates are noisier than those of tables 4 and 6. The impact on the fraction doing any information activity at all is insignificant (column 3).

	(1) Time getting information	(2) Dedicated information trip	(3) Any information activity	(4) # Medical controls	(5) Length in min. of medical exam	(6) Subj. evaluation of test of vision	(7) Personal contacts
aftertreatment	**-11.9*** (2.4)**	**-0.221*** (2.7)**	**0.077 (1.1)**	**0.391 (0.97)**	**-0.785 (0.63)**	**0.083 (1.0)**	**-0.22** (2.2)**
Treatment/control dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls:							
-Course/test and other errands	Yes	Yes	Yes	Yes	Yes	Yes	Yes
-Socioeconomic	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	594	594	594	593	600	600	409
R-sq	0.109	0.123	0.148	0.170	0.156	0.127	0.173
t statistics in parentheses, * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors, clustered on treatment/control locations							
Estimated impact in % of treatment pre-reform average							
Average	29.7 minutes	0.48	--	--	--	--	0.31
Reduction	40%	46%					73%

Table 9. Treatment on the Treated (TT) estimates for the three information variables, three medical exam variables (discussed in section 3.3), and on a dummy for having personal contacts (section 3.4). Column 6 concerns the fraction of "Yes"-responses to if the vision test was done correctly. We also asked if the "capacity to drive" was evaluated correctly, also without any significant Poupatempo effect (regression not shown).

In a context of transaction costs in developing countries, North (1990) discusses waiting times to get permits. Table 4 shows that both the total number of days (column 4), and the days it takes to process a driver's license, once the complete application is handed in, until it is ready for pick-up (column 5), diminish as a result of the reform. The kernel density estimates for the latter variable, for DETRAN and Poupatempo renewals, are shown in figure 9. Embodied in the numbers are cases where the license was not ready on the day stipulated, and where the individual sometimes visited the entity several times in order to pick it up, etc.

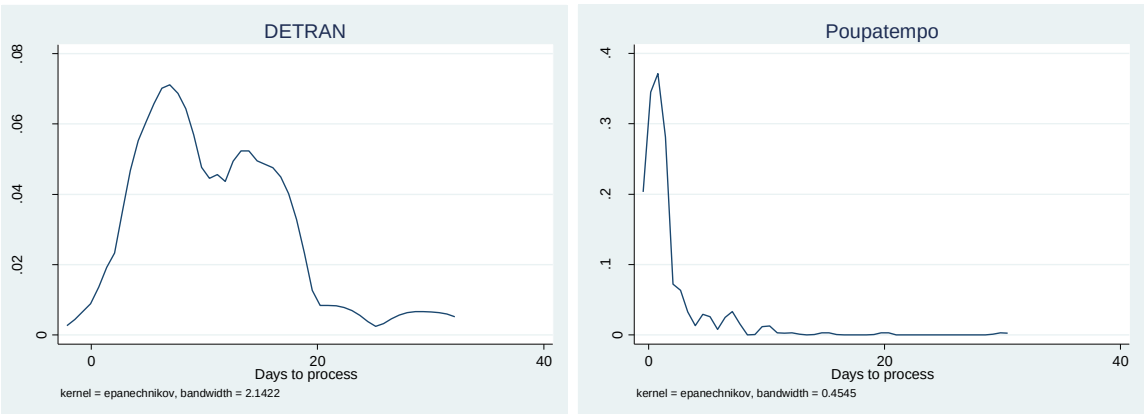

Figure 9. Kernel density estimates of the number of days to process a driver's license application, once handed in, at DETRAN and Poupatempo (based on the data of table 3C, i.e. renewals without course etc.).

[34] The percentage reductions in table 9 are approximate, as the DiD estimates also consider the control group.

The higher average and standard deviation for DETRAN processing times indicate that the Poupatempo reform reduced not only the time to complete the transaction, but also the uncertainty of when the driver's license will be ready. As there is a legal time window of two months for the renewal (from 4 years, 11 months to 5 years, 1 month of the old license), there is some impact in assuring that the renewal can be finalized before the old license expires.

3.3 Medical exam and defensive driving/first aid course

The medical exam requirement is the reason that a Brazilian driver's license comes with a limited validity.[35] This de-jure requirement is stricter than in many other countries, and the medical exam should assure that drivers are physically and mentally apt for driving motor vehicles. It is therefore of interest to evaluate how well the legislation is followed, and if Poupatempo had any effect on how the medical exam is conducted. A first result is that 99% of our sample report having done the medical exam.

We based the questionnaire on the detailed legislation of what the medical exam should contain, extracting from these documents the compulsory medical tests, and thus asked respondents if these were done by the doctor. There are eight compulsory parts, which, except for vision, are hearing, reflexes, pulse, heart and lung auscultation, blood pressure, hand muscle strength, and in addition the administration of a health status questionnaire. The legislation contains further requirements, such as neurological and behavioral tests, but these cannot be considered strictly compulsory.[36] We also asked respondents about the length in minutes of the medical exam, and if they considered that their vision and capacity to drive had been correctly evaluated.

Overall, the results point to that the medical exams are done too fast and with less content than there should be. Although 98% report that their vision was controlled, there is an average of 2.8 other tests done by the doctor (out of the remaining seven compulsory parts), and about a third of the sample report a medical exam that lasts five minutes or less. The following graphs detail these aspects, and the regressions in columns 4-6 of table 9 indicate that Poupatempo has no effect on the quality aspects of the medical exam. Figure 10A plots

[35] The validity is three years for those above 65 years of age.

[36] The tests are described in Resolução CONTRAN No. 267 from 1998, which is reproduced on pages 452-469 in the Brazilian Code of Transit (CONTRAN), available from DENATRAN (the federal traffic authority), at http://www.denatran.gov.br/publicacoes/download/ctb_e_legislacao_complementar.pdf

the distribution of the amount of controls, excluding vision, showing that only in 10-15% of cases are all compulsory controls made. There are no significant age differences in the amount of controls, which should perhaps have been expected. There may be measurement error in these numbers, but not large enough to explain the differences from the statutory requirement. Figure 10B shows that the more controls the doctor makes, the longer time takes the visit, which is to be expected. A visit with all seven other controls takes on average 14.5 minutes, which is 27% more than the average of 11.4 minutes.[37] Figure 10C shows that the two subjective impressions of the medical exam (Yes/No-answers to if vision/driving capacity was correctly evaluated) are more positive the longer the time of the exam. Figure 10D suggests that medical visits are, if anything, faster at Poupatempo, and the amount of controls made is similar to those renewing through other means.

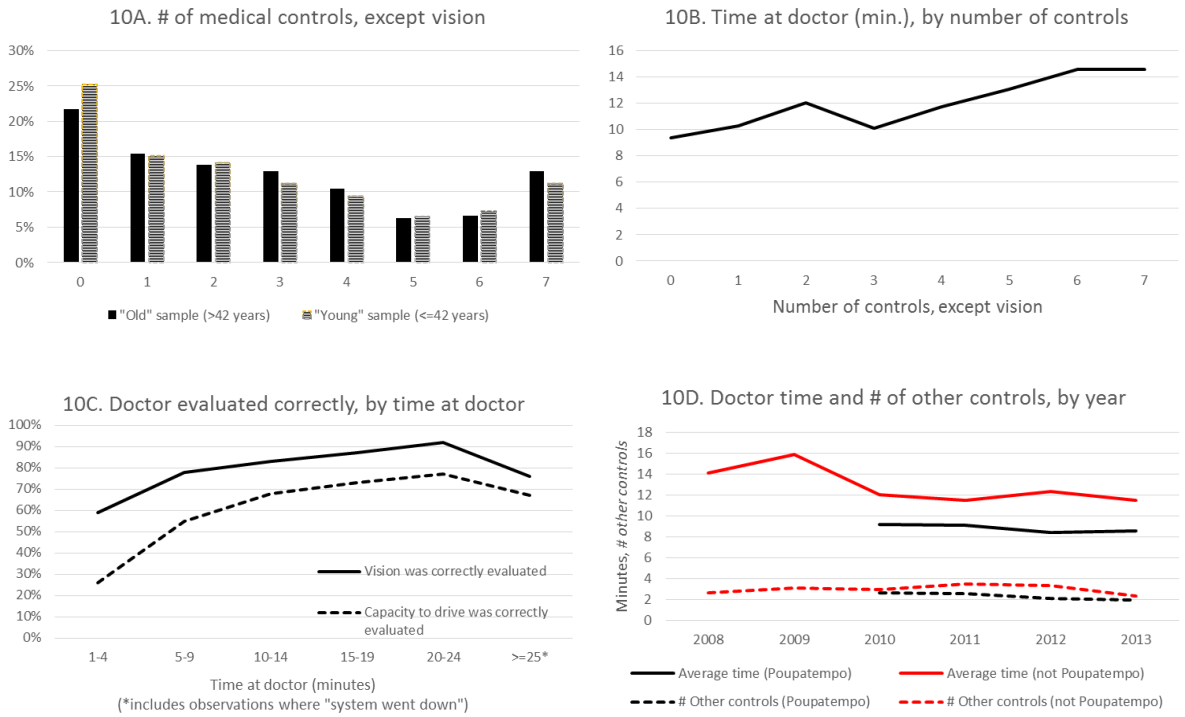

Figure 10. Medical examination. (Panel A) Distribution of the number of controls (except vision), by age, (B) length of medical exam in minutes, by number of controls made by the doctor, (C) fraction responding that vision and driving capacity was correctly evaluated, by time at doctor, (D) length of exam in minutes and number of controls made, by year and means of renewal.

Columns 4-6 of table 9 show that Poupatempo itself has no impact on the number of controls, length or subjective impression of the medical exam. Whereas one of the overall objectives of Poupatempo is to save time, this clearly does not apply to the medical exam itself. In practice

[37] The time difference of 5 minutes between the medical exams that contain all seven other tests and those with no other tests than vision is strongly significant (t-stat≈5, with and without the inclusion of controls).

however, Poupatempo does not seem to have changed the fact that a de jure rigorous system of medical examinations, in practice only partially complies with legislation, which I discuss further in section 5.[38]

The second "social" component of the renewal procedure is a defensive driving and first aid course/test requirement for individuals who did not have it as part of their original curriculum (original license from before 1999/12, course/test in first post-2005/10 renewal). One of the findings in the interview project was that there were two different interpretations of the requirement, and I therefore calculate compliance with the requirement for both "versions".[39] The timing and uncertainty of the regulatory requirement makes it difficult to evaluate the impact of Poupatempo. In addition, the course is administered by driving schools, which is different from the evaluation of the medical exam. I therefore present cross sectional averages. In our sample, 76-85% of the interviewees concerned did the course/test, and 25% of those who chose the classroom option of the course instead of the test (65%) did too short a course, if we use 500 minutes as the cutoff for the compulsory 15 hour course, thus allowing for measurement error. Table 10 shows the numbers for different means of renewal. The table suggests that driving schools undertake the procedures more correct, compared to the other means of renewal. The fact that individuals that should do the course seek out driving schools implies a selection effect that likely exaggerates the extensive margin differences in the third/sixth columns. There are few course/test individuals renewing at Poupatempo, but the table shows that, from this small group, a higher fraction of those that should do the course/test, and renew at Poupatempo, do not fulfill the requirement. There is also a higher fraction of those renewing their license at Poupatempo that report having done (too) short courses.

[38] The spontaneous comments of respondents corroborate the numbers. 12 out of 16 comments on the subjective vision question are negative with respect to quality, and 37 out of 40 comments on the subjective "capacity to drive" question are also negative or say that such a control was not made.

[39] We started the interviews expecting to encounter individuals that, if "old enough" (original license from before 1999/12), would have to do the course/test in the first renewal after 2005/10 (we would thus capture such individuals in the 2008/03-2010/10 renewal window). This is "version 1". We encountered such cases, but also individuals insisting that they had instead done a course prior to 2005 and therefore did not need to do the course/test ("version 2"). We also interviewed individuals saying they do the course/test in every renewal. We decided to add interview questions about all post-1999 courses/tests, not only for the "current" renewal. This adaptation to the questionnaire was done after a third of the interviews. Consistent with what we had found in the field, there was ambiguity also in versions of the course/test requirement from DETRAN. In addition, as of early 2015 the DETRAN webpage read as "version 1" of the requirement, whereas the Poupatempo webpage specifically listed, among the exceptions to the requirement, pre-2005 renewal courses (thus "version 2"). We also found, as of early 2015, driving schools with slightly different requirements. Although there is (most likely) only one rule "on paper", we found (at least) two in the field. This is the reason we present two estimates of the degree of irregularities.

	1	2	3	4	5	6	7	8	9
	Should do course/test ("version 1")			Should do course/test ("version 2")			Classroom course takers		
	# should do course/test	**# no course/test**	**% no course/test**	**# should do course/test**	**# no course/test**	**% no course/test**	**# classroom course**	**# course <500 min**	**% course <500 min**
DETRAN	47	11	23%	29	4	14%	28	6	21%
Poupatempo	22	10	45%	18	10	56%	17	7	41%
Driving School	53	7	13%	41	3	7%	47	8	17%
Despachante	52	13	25%	29	2	7%	33	8	24%
Average			24%			15%			25%

Table 10. Extensive and intensive margins for the course/test requirement. The first interpretation of the course/test requirement, "version 1", is that individuals with the original license from before 1999/12 should do the course/test in the first renewal after 2005/10. We therefore include all such renewals up until 2010/10, and calculate the fractions in the third column. The alternative interpretation, "version 2", is that original licenses from before 1999/12 should do the course/test (at least) once. We construct the latter measure by excluding from the sample of pre 1999/12-individuals those that have done some course/test since 2000, then exclude also individuals that did regularization or change/addition of category in the current renewal (as this typically includes courses), then calculate the fraction that did not do a course/test in the current renewal (sixth column). For both measures, we exclude police and other professions that are fully/partly exempt from the requirement.

3.4 Personal contacts

As discussed in the introduction we inquired about if respondents knew someone at the entity where they renewed (Yes/No), also referred to as "personal contacts" below. The question was asked for the last two thirds of interviews, and the below discussion should be taken as suggestive, for several reasons. The sample size is smaller than in most of the other regressions. Knowing someone at an intermediary is common, and in one way this is natural, as individuals typically use the same entity for several services (renewal, family member takes his/her driver´s license, paying vehicle-related taxes, traffic fines, etc.). We also did not inquire about the function of the personal contact, or if the person helped in any way. In some cases individuals spontaneously stated "I know this or that person, but he/she did not help me", and very few individuals explicitly said they were helped by knowing someone at the entity of renewal. The fraction knowing someone is, for DETRAN, 15%, Poupatempo, 6%, Driving school, 56% and Despachante, 60%. Column 7 in table 9 estimates a 22 percentage point reduction in the fraction with such personal contacts, which is 73% of the pre-reform level, as a result of the Poupatempo reform. The objective of minimizing personal contacts thus seems to have been successful, although it may be too early to fully evaluate, as Poupatempo has been in place for much shorter time than the other three means of renewal.

Having personal contacts is correlated with less time spent in the procedure. In table 11 I run separate DETRAN/Poupatempo/Driving school/Despachante regressions with minutes spent as the dependent variable, and a dummy for "personal contacts" as an explanatory variable, First I use treatment and time controls only, then add the other standard controls. There is some evidence, for DETRAN, Poupatempo and driving schools, that personal contacts at the entity is indeed conducive to a faster resolution of errands (columns 2, 4 and 6, significant at the 10% level). The estimated magnitudes are quite large, at 45-64 minutes faster renewals. Perhaps surprisingly, there is no effect for despachantes.[40]

	DETRAN		Poupatempo		Driving school		Despachante	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable: Minutes w/o course								
Personal contact	**-72.0*** **	**-64.2***	**-46.8***	**-55.3***	**-41.6***	**-44.7***	**-10.0**	**-0.25**
	(2.5)	(1.9)	(1.7)	(1.7)	(1.9)	(1.8)	(0.30)	(0.0)
Treatment dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls:								
-Course/test and other errands	No	Yes	No	Yes	No	Yes	No	Yes
-Socioeconomic	No	Yes	No	Yes	No	Yes	No	Yes
N	114	112	149	149	89	88	77	76
R-sq	0.091	0.151	0.265	0.293	0.080	0.095	0.058	0.186

t statistics in parentheses, * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors, clustered on treatment/control locations

Table 11. Effect of personal contacts (here defined as those answering Yes to if they know someone at the entity of renewal) on the time in minutes to renew a driver's license (cross sectional evidence). Separate regressions for each means of renewal, without and with controls (treatment/control location dummies, year dummies, course/test/other errands and socioeconomic controls). Six outliers and seven observations where individuals did not do the medical visit are excluded.

I also ran regressions to study if the above effect operates through the information channel. I first repeated the regressions from table 11, but netting out from the dependent variable the time spent in obtaining information. The significance levels then go down somewhat (new t-stats 1.0-1.5), although this "net-of-information" estimate is just significant for DETRAN (51.9 minutes, t=1.56, regressions not shown). When "time getting information" is instead used as the dependent variable, the "personal contact" variable has the expected sign (10-15 minutes of reduction in time getting information), and is significant for Poupatempo and driving schools. In addition, the fraction of individuals doing some information activity, for Poupatempo renewals, is significantly lower, for those knowing someone at the entity (these latter results at 5% significance level or better, regressions not shown). Together the results

[40] I chose to use one treatment dummy and year dummies, instead of the full set (α_s, η_t), as there are fewer data points. In alternative specifications, the Poupatempo/Driving school results are sometimes insignificant, whereas the DETRAN estimate retains its significance level.

suggest that at least part of any time saving obtained from having personal contacts goes through less effort to obtain information, although there are potentially other parts of "knowing someone" that generates time saving, at least at DETRAN.

4. Robustness

In Table 12 I replicate the regressions from column 1A in table 4, for different restrictions of the treatment and control areas. In the baseline specification individuals living close to the treatment municipalities are considered as treated, and everyone else as control (also individuals not living close to the control group interview locations). The table shows that the estimated time saving varies little when the sample is restricted from the full sample (column 1), to using the <20km (and <25 min travel time) definition for the control group as well (col. 2) and to only those individuals that live in the interview municipalities (col. 3). In addition, in columns 4-5 I restrict the sample to those individuals living in the municipalities within the common support (from the control group selection, see table A1), which is about half of the sample. Columns 4-5, in turn, show coefficient estimates similar to those obtained from a matching regression, as the matching procedure reduces the sample to fewer municipalities, within or close to the common support. Column 6 excludes from the original regression those control group interview locations that themselves are close to the treatment locations (here I use a 30 km cutoff).[41] Column 7 instead excludes the two control group municipalities that were selected through other means than matching. Also these latter estimates are similar.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	<20km & <25 min	<20km & <25 min	Interview municipalities	Common support (CS) +<20km & <25 min	CS	<20km & <25 min	<20km & <25 min
Control	All other	<20km & <25 min	Interview municipalities	Common support (CS) +<20km & <25 min	CS	>30km from treatment	All other excl. "ad hoc"
Dependent variable: Minutes w/o course							
aftertreatment	-77.6***	-83.3***	-84.5***	-84.5**	-76.5*	-81.6***	-81.7***
	(3.4)	(3.3)	(3.1)	(2.2)	(1.8)	(3.7)	(3.6)
N	727	639	599	335	316	664	689

Table 12. Intention-to-treat estimates for minutes spent, for different definitions of the treatment/control areas.

For the other significant estimates in table 4, I get only minor variation, except for estimates corresponding to columns 4 and 5, with larger treatment effects for "trips" and "days".[42]

[41] This basically amounts to excluding the control interview locations in the "Baixada Santista" (Guarujá, Praia Grande) and surrounding municipalities, all close (in kms, but not in travel time) to Santos (part of the treatment), and a few other locations, for a total of 63 excluded interviews.

[42] This seems to be driven mainly by a larger Poupatempo take-up in the four common support treatment municipalities, and potentially a larger influence of outliers due to a small (treatment group) sample size. The four Poupatempo units are in small treatment municipalities and potentially the most efficient.

I next analyze the distance variable. I estimate the DiD reform impact as a function of distance, by adding an interaction term between the "aftertreatment" indicator T_{st}, and the distance (in km) to the closest Poupatempo, for each observation, to get:

$$y_{ist} = \alpha_s + \eta_t + \delta T_{st} + \phi d_{ist} + \beta X_{ist} + \varepsilon_{ist} \quad (2)$$

The interaction term d_{ist} is positive for the treatment group observations in municipalities close to the treatment locations and where the renewal occurred after the respective Poupatempo implementation (and equals the distance to that Poupatempo unit). Otherwise it is zero. Corresponding to column 1A in table 4, I get a slightly larger coefficient on "aftertreatment" (-81 minutes, i.e. the effect on those living in the 16 treatment locations), and a ϕ-coefficient of (+)3.8 minutes/km, thus implying a treatment effect that decreases with distance (as expected). The ϕ-estimate varies little when including control variables and is significant at 5 or 10%, depending on the specification (regressions not shown).

To conclude this section, I conduct a different analysis altogether, in that I use the "distance to Poupatempo" as a continuous measure of treatment, for all observations, and analyze how the renewal time depends on this distance. I then compare the pre- and post- reform average distances, to construct an alternative measure of the aggregate time saving. I thus regress the "minutes spent" variable on municipality dummies (instead of treatment/control dummies), year dummies and distance (table 13, column 1). I also add other controls (course/test/other errands, then socioeconomic controls). Table 13 shows that each extra kilometer to the closest Poupatempo, is associated with a 0.4-0.5 minutes additional renewal time.

	(1)	(2)	(3)
Dependent variable: Minutes w/o course			
distance to closest Poupatempo	**0.526*** **	**0.421** **	**0.417** **
	(3.0)	(2.3)	(2.2)
Municipality dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Controls:			
-Course/test and other errands	No	Yes	Yes
-Socioeconomic	No	No	Yes
N	727	702	691
R-sq	0.232	0.266	0.274

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

Table 13. Estimates of the impact of distance to Poupatempo on the time spent with the renewal.

In 2008, before the reform, the average distance to the closest Poupatempo for an inhabitant, in the interior of São Paulo, was 98 kilometers. In 2012-2013 it was 40 kilometers, the

reduction is thus 58 kilometers. Multiplying this difference with 0.417 minutes, from table 13 (column 3), gives 24.2 minutes saved, or a total of 32.1 million minutes saved (using the total amount of yearly renewals from table 5B). This alternative estimate is very close to the previously calculated time saving. The average wage in the full sample is similar to the treatment group wage, and the two methods thus arrive at similar aggregate reform impacts.

5. Discussion

The paper evaluates a large bureaucracy reform in Brazil's most populous state, and shows that it reduces the time and resources that citizens expend in interactions with the government bureaucracy. The original objectives set up by the state of São Paulo seem to have been reached, at least for the licensing procedure and time period concerned. Tables 4 and 6 report substantial reductions in the time spent, the number of trips, the days from start to finish, and in total payments made, although this latter measure is much noisier. Transaction costs are inherently difficult to measure, but there is suggestive evidence that Poupatempo also improves upon how citizens inform themselves. Those renewing at Poupatempo undertake fewer trips for information purposes, which results, on average, in less time spent in obtaining information. The degree of uncertainty in the undertaking of the renewal also diminishes. The evidence also points to that Poupatempo is relatively "equitable", in that different gender/age/income groups all use it and present no significant differences in the time saving obtained. There is a slight underrepresentation of men/elder/more affluent in use of Poupatempo, potentially because these individuals already had access to other means of conducting errands.

The Poupatempo reform has served as inspiration and received visits from countries in Asia, Africa and Latin America. This paper suggests an evaluation method, relevant variables and evidence on the type of gains that can be expected from Citizen Service Center reforms similar to Poupatempo. The present project also gauges the data collected against a dataset containing the entire population of driver's license renewals, thus lending credibility to the method applied. One important aspect of the evaluation is that it incorporates citizens' time costs into evaluations of public sector performance, and the reduction in "total minutes spent" is used in a cost-benefit analysis based on opportunity cost of time. Without detailed information about travel times, waiting times etc., it is difficult to get the full picture of such potential social benefits. A general policy implication is that, when contemplating

expansions, spatial redistributions or reductions of public services, a mapping of where users live and their travel times are crucial. Electronic systems registering waiting and at-the-counter times should thus be complemented with travel patterns and the number of visits needed to resolve errands. E-government instead of presence-based systems can perhaps replace some of the physical visits over time, for most errands this is still not the case in São Paulo, however.[43]

A limitation of the study is that it does not evaluate internal organizational changes, but only the citizen aspect. An ongoing government project in Colombia that aims to increase efficiency in citizen services indeed has two separate components relating to Service Centers, an internal processes part and a citizen part (coined "window in" and "window out").[44] Interestingly, the citizen-related public service diagnosis is very similar to the above described Brazilian case: limited access, long waiting/travel times, several physical visits to undertake one errand, unnecessary burdens on citizens, insufficient quality, lack of citizen satisfaction, and uncertainty (Interamerican Development Bank, 2014). An integral part of the five year project is an impact evaluation for which a Difference-in-Difference study is suggested, potentially combined with matching. The present study suggests a combination of variables, data and identification strategy needed for such an evaluation. The Colombia project also stresses the importance of spatial access and the selection of physical locations/municipalities, an issue I analyze further for the Poupatempo case in a parallel project (Fredriksson, 2015). The Brazilian and Colombian cases also seem similar in their current focus on physical buildings/access, rather than e-government as the primary tool.

Over the time period of the study, there were some limitations in what services Poupatempo could offer, among these a transfer of the driver's license from one municipality to another. If such a transfer was needed, at the time of renewal, due to a new residence/address, the renewal could not be done at Poupatempo. This example illustrates that Poupatempo does not change the legislation in place (in this case a, perhaps, outdated system of drivers' licenses "belonging" to local municipality DETRAN units, that has an unclear motivation). It has also

[43] The reduction in days from start to finish could in principle also be converted into a monetary measure, based on the cost of waiting for a permit. In the present study there is an 11 day reduction, within a legal window of 60 days, to renew the driver's license. It is probably much more convenient for the individual to pick up the renewed license in the same visit, and it may play a practical role in some cases, but the ceteris paribus welfare gains of the reduction are likely modest on average, and difficult to quantify. Other types of reforms may have more direct effects from reduced waiting times, such as getting one's salary earlier due to a new payments technology (Muralidharan et al, 2014).

[44] Scharff (2013) and Majeed (2014) discuss internal organization aspects of the Citizen Service Center reforms in Bahia and Minas Gerais, respectively.

been argued, however, that Poupatempo was successful due to its limited scope, as it did not try to replace the existing bureaucracy (Mota Prado and da Matta Chasin, 2011).

In the preliminary cost-benefit analysis made of the Poupatempo reform, there is a lack of detailed data from the state of São Paulo. More information on the authorities' costs to handle a renewal is needed to provide a social benefits and costs analysis of each means of renewing a driver's license. The initial estimate suggests, however, that the time-saving obtained from Poupatempo translates into an (opportunity cost) value that is in the same range, or potentially larger, than the operational costs related to driver's license renewals.

The renewal procedure contains two "social" components, a medical visit and a defensive driving and first aid course/test. Although the data collected suggests that virtually everyone does the medical visit, the examination itself is only partially complied with, as the number of controls made is less than what is stipulated, and exams seem to be "too fast" to be rigorous. As suggested by the graphs in figure 10, the subjective evaluations of respondents are also in line with these findings. A 2006 interview with the head of the Brazilian Association of Traffic Medicine states that 6-8 minutes is enough to undertake a correct evaluation.[45] This study instead finds that the average time for those examinations that comply with the statutory requirements is 14.5 minutes. Although these results are general, rather than Poupatempo specific, it is interesting that Poupatempo does not have an impact in the direction of a more rigorous control. It needs to be studied if incentives of doctors, inside as well as outside of Poupatempo, are such that they speed up medical exams, rather than make them rigorous. Although most individuals are probably content with a quick exam, it is not the social optimum. As for the course/test, we find a medium compliance with the statutory requirements, and different interpretations of the legislation seem to have led to different renewal requirements in different places. These results are not Poupatempo specific, but we also do not find that those obliged to do the course/test fulfill regulation to a higher extent when renewing at Poupatempo.

In this context it should be said that the Brazilian de jure legislation is ambitious in comparison with other countries. It is also true however, that traffic accidents are very high (40-60 thousand deaths per year, or 2-10 times per capita of most developed countries), and an efficiently implemented renewal procedure can be part of a much needed change.

[45] Published at "Portal da Oftalmologia", a web channel about ophthalmic diseases, for practitioners and the general public (http://www.portaldaretina.com.br/home/noticias.asp?cod=631).

There have been many attempts of bureaucracy reform in Brazil, and Citizen Service Centers like SAC in Bahia and Poupatempo in São Paulo, are generally regarded as reforms that work, with high approval ratings. In the context of many other reforms, the implementation of Citizen Service Centers is indeed a success (see e.g. Castor, 2002, for a history of bureaucracy reform). Still, we do not observe a convergence of the Poupatempo usage ratio to 100%, and it is probably too early to argue that despachantes, and similar services – part of an institutional framework of long standing, will vanish. In a parallel project I study more in detail the impact of Poupatempo on the intermediary sector.

As briefly discussed in the paper, a reform of DETRAN is underway, starting in the metropolitan area of São Paulo. A new mode of implementation was applied in 2014, when a large number of merged Poupatempo-DETRAN units were implemented, in a second wave of expansion into the interior of São Paulo. These changes came about after changes in the DETRAN presidency in 2011/2012, and were not previously planned. As Poupatempo reaches ever smaller cities, and as DETRAN is being reformed, a joint operation is likely to provide cost benefits. This is of interest to evaluate in a future project.

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Appendix A. Identification strategy, method used and data collection

In order to identify the effect of Poupatempo on outcome variables of interest, such as the time that citizens spend in licensing, we need data from before and after the reform was implemented. We also do not want to attribute to the Poupatempo reform such variation that occurs as a result of other reforms/changes. These considerations made us opt for a Difference-in-Difference (DiD) strategy, with the aim of collecting pre- and post- reform data in many treatment and control locations. These locations would all have to be in the interior of São Paulo state, as there could be no pre-reform data in metropolitan São Paulo, where Poupatempo had already existed for 15 years. We thus decided to interview in all sixteen municipalities, in interior São Paulo, that had a Poupatempo implemented in the 2008-2011 period.

Selection of licensing procedure

Simultaneously to choosing the DiD strategy, we opted for a licensing procedure that, post-reform, should be available at Poupatempo, and that would allow for before/after data to be collected in Treatment and Control. As discussed in section 1, it is compulsory to renew the driver's license every five years. The renewal date will ultimately depend on when one first got the license, together with renewal rule changes that have occurred over time (and how these rules have been followed and enforced). The nature of the renewal legislation and the timing of the Poupatempo implementation, assures a division of the sample into pre- and post Poupatempo, for a DiD analysis on repeated cross sections.

Selection of control group

The control group municipalities were selected using a Propensity Score Matching procedure, following Caliendo and Kopeinig (2008). I first obtained from Poupatempo the "technical" considerations that were important when choosing where to implement a unit. These criteria (primarily municipality population and a dummy for how dense a region is, and potentially whether a city was a regional capital) explain 50-60% of the variation in the Poupatempo dummy.[46] I added to the (linear probability/logit) regression other variables that were also

[46] I discuss these criteria further in a parallel project (Fredriksson, 2015).

significant, and that could simultaneously have an impact on outcome variables such as the time spent in licensing. This gave a list of thirteen control municipalities, to which I added one small capital city (Registro) and a populous city (Guarujá). Table A1 shows the control group regression, and the municipalities selected.[47] In general, the region of common support is rather limited, as Poupatempo was targeted towards larger municipalities. The most crucial part of DiD is the parallel trends assumption, discussed in the main text.

Interview locations, pre-study, interviews and sample representativeness considerations

The study aimed to interview a representative sample of holders of a driver's license in the interior of São Paulo state. It was early on decided to interview primarily inside shopping malls, as these gather a large and diverse public. We interviewed on weekends, when population representativeness further increases. The malls are typically reached by car, which was in line with the objective. A list was made of all shopping malls in the interview municipalities, if there was more than one a random selection was made, the mall was contacted by phone, a letter of the study sent, if denied, another mall in the same municipality was contacted, and so forth. This finally resulted in permissions to interview in malls in 21 municipalities, out of around 25 Treatment/Control municipalities that had a mall. These permissions were crucial, in order to be able to interview inside the mall during 4-6 hours. It also resulted in an understanding of the project, both at senior management and security personnel. Mall employees were not interviewed.

A pre-study was conducted, comprising 25 live interviews. Enumerators were then hired and trained extensively, including live test interviews, and had the opportunity to give feedback on the questionnaire design. A typical interview day consisted of 5-6 interviews for each of four enumerators, in a given municipality. Enumerators were assigned a physical interview location and had been trained to approach "every x-th" adult individual coming from a specific direction (think of a corridor inside a shopping mall, or a busy shopping street), where x would depend on the amount of people around, and introduced the project, and asked if an interview could be conducted. The project leader was present at interview days and controlled that this rule was followed. When there was little people, the instruction was to

[47] The regressions were run for all municipalities, in interior São Paulo, with more than 67.000 inhabitants, non-adjacent to pre-existing Poupatempo municipalities. This gave a candidate list of 58 municipalities. Poupatempo informed a lower population threshold of 100.000, which was slightly counterfactual, as Caraguatatuba, with 94.000 inhabitants, had had a Poupatempo implemented.

approach every adult individual. There may exist minor deviations in how well the rule was followed, but, at large, these deviations should be minor, and the enumerators remained committed to the project throughout. On a few occasions, interview locations were changed ad-hoc, if there was too small a flow of people.

Based on a classification of malls in terms of the socioeconomic characteristics of the public attracted, there was a concern that we would get a slightly "too rich" sample. Mid-project, we compared family income data of those individuals that had a car within the family (91%), to the corresponding individuals in urban areas in interior São Paulo, from the Statistics Brazil household budget survey (Pequisa Orçamental Familiar - POF, 2008-2009). The deviation was not very large, as some malls cater to the lower-end of the spectrum, and as we had also interviewed, since project start, in shopping streets (calçadão), public squares and parks. The fraction of such interviews was increased somewhat, in the remaining interview municipalities. Towards the end of the interview project, a typical municipality interview day consisted of first interviewing "in the street" (8-12 interviews), then in the mall (8-12 interviews). The final sample consists of 50% mall interviews, and 50% from other environments, mainly shopping streets.[48]

The collected data has age- and gender averages (42.4 years, 63% men) similar to those of the PRODESP data (43.9 years, 66% men).[49] Figure 2 in the main text shows that the family income distribution is very similar to the Statistics Brazil data, and the temporal distribution of renewals is similar to the PRODESP data.

After interviews, the project leader controlled questionnaires for completeness and consistency and enumerators sometimes contacted interviewees by phone to gather missing information or correct mistakes. 729 interviews were conducted in 31 municipalities. A typical interview took 25-30 minutes, and interviewees were given, upon completion, a 20 R$ gift card for participating in the study. These gift cards were presented, at the start of the

[48] It cannot be ruled out that "Saturday/Sunday shoppers", which is our sample, somehow are different in terms of their driver's license renewal behavior, than other individuals. Going to the mall on a weekend is very common, however. There has been a massive build-out of commercial spaces, corresponding to popular demand, and Brazil is typically characterized as a society centered on private consumption (as reflected by its share in GDP, and by a multitude of government subsidies and programs). The state of São Paulo typically leads developments in terms of new consumer habits, and the interior of the state has many features similar to the metropolitan area. It is also well-established that the lower end of the emerging middle class (often referred to as "a nova classe C"), has acquired many consumer habits of the upper classes. The development includes shopping malls catering to different socioeconomic classes, which the interview project covered. The current (2015) economic crisis in Brazil began after the interview project conclusion.

[49] These comparisons are for the period of overlap between the two datasets.

interview, as a compensation for the time that interviewees spent with enumerators. The percentage of individuals that accepted being interviewed, of those that stopped to listen to the first introductory phrases of the project, was around 60%.

Interviews were conducted March 23-August 31, 2013, during 20 weekends. Individuals were interviewed if they had made their last driver's license renewal in São Paulo state, after March 2008, and lived in the interior of the state ("São Paulo interior e litoral"). We excluded individuals living in the four municipalities that had Poupatempo prior to 2007, i.e. Baurú, Campinas, Ribeirão Preto and São José dos Campos. We excluded professional drivers, as these have a different renewal procedure.

Appendix B. Reforms at DETRAN

Reforms at DETRAN started in 2011/2012. Changes consisted in both internal organizational changes and in front line attendance. During the time of the interview project, a few "New DETRAN" physical units were implemented, mainly in the metropolitan area. Three units were implemented in or close to control group municipalities (Americana – 2011/09, Limeira – 2012/08, Indaiatuba 2012/12). Differently from Poupatempo, these units only attend to citizens of the municipality itself. A total of 15 interviews in these municipalities are from post-implementation. Excluding these observations change the table 4 estimates very little, as does exclusion of the municipalities altogether. Other changes which have gradually been implemented is a new DETRAN website and information over the phone. Another requirement, implemented before the re-organization (2010-), was a requirement to visit the public entity to leave one's fingerprints, which may affect the incentive to use an intermediary.[50] These state-wide changes will be picked up by the time dummies. In a subsequent reform development, around one year after the interviews (2014-), joint Poupatempo-DETRAN units started to be implemented.

[50] The legislation was only partially complied with, but more so over time. There is no marked drop in intermediary usage, or increase in its counterpart, use of the public entity, in the control group (figure 7). In practice, intermediaries seem to have adapted to the legislation, for instance by offering, in the larger cities, bus transport back and forth to/from DETRAN, where individuals would sometimes get preferential access.

Municipality	Population 2007	Poupatempo	Predicted score	Treat/Control	Common support	Interviews conducted
Registro	54380	0	-	C[1]		YES
Várzea_Paulista	102575	0	1.19e-06	T[2]		
Americana	202406	0	4.80e-06	C[3]		
Bebedouro	75218	0	.000021			
Cubatão	115882	0	.0000466			
Guarujá	283414	0	.0000487	C[4]		YES
Salto	101814	0	.0000633			
Cruzeiro	76133	0	.0000715			
Itapira	67137	0	.0000987			
Lorena	81224	0	.0001577			
Jaboticabal	70627	0	.0003934			
Leme	88568	0	.0004194			
Votorantim	105210	0	.0005091	T[5]		
Ubatuba	75484	0	.0005866			
São_Sebastião	69024	0	.0005995			
São_João_da_Boa_Vista	81984	0	.0008171			
Matão	75613	0	.0008273			
Assis	92686	0	.0011368			
Guaratinguetá	110004	0	.0014903			
São_Vicente	324003	0	.0038767			
Pindamonhangaba	140881	0	.0067888			
Itapeva	86966	0	.0091502			
Lins	69815	0	.0092215			
Mogi_Guaçu	133497	0	.0100733	C[6]		YES[6]
Itapetininga	139055	0	.012338			
Avaré	80992	0	.013691			
Birigui	104238	0	.0156181			
Araras	114237	0	.0196408			
Itatiba	95324	0	.020914			
Itu	148619	0	.0249879			
Praia_Grande	240918	0	.0570719	C	CS	YES
Catanduva	110733	0	.0871529	C	CS	YES
Santa_Bárbara_d'Oeste	177202	0	.0965	C	CS	YES
Moji_Mirim	85006	0	.1010544	C	CS	YES
Itanhaém	82610	0	.1156586	C	CS	YES
Pirassununga	68502	0	.1430318	C	CS	YES
Barretos	109525	0	.1946175	C	CS	YES
Bragança_Paulista	140374	0	.2157976	C	CS	YES
Limeira	268419	0	.2567883	C	CS	YES
Ourinhos	100350	0	.3499769	C	CS	YES
Votuporanga	81953	0	.3753468	C	CS	YES
Indaiatuba	184663	0	.407775	C	CS	YES
Jaú	125364	0	.4778276	C	CS	YES
Rio_Claro	180672	1	.0495706	T	CS	YES
Tatuí	103231	1	.3287283	T	CS	YES
Caraguatatuba	94099	1	.3580895	T	CS	YES
Botucatu	121534	1	.4287498	T	CS	YES
Santos	420107	1	.8401568	T		YES
Presidente_Prudente	202480	1	.9797015	T		YES
Araçatuba	178059	1	.991703	T		YES
Araraquara	200588	1	.9948919	T		YES
Taubaté	268360	1	.9973184	T		YES
São_Carlos	213169	1	.9995571	T		YES
São_José_do_Rio_Preto	392682	1	.9996492	T		YES
Marília	211119	1	.9997252	T		YES
Jundiaí	355627	1	.9999726	T		YES
Piracicaba	354214	1	.9999956	T		YES
Franca	309996	1	.9999979	T		YES
Sorocaba	558377	1	1	T		YES

Table A1. Treatment and control.
Notes 1. Registro is an Administrative region capital, and all other such capitals were included in the study, 2. Várzea Paulista is a "twin city" to Jundiaí. Residents are always classified as those of Jundiái, 3. Americana is a "twin city" to Santa Bárbara d'Oeste, and residents are classified accordingly, 4. Guarujá is a large city excluded by the algorithm where we still chose to interview, 5. Votorantim is a twin city to Sorocaba. Residents are always classified as those of Sorocaba, 6. Twin city to Moji_Mirim. Interviews in the Mogiana region were divided between the two cities.

Regression: logit

Dependent variable

Poupatempo	Dummy for if a municipality has a Poupatempo or not

Independent variables

Capital_Adm	Dummy for administrative capital
Renewals08q12	Number of renewals pre-reform, from DETRAN data.
despachantes_AREA	Number of despachantes per area unit (proxy for regional density)
Pop_growth0307	Municipality (pre-reform) population growth
PSDBlast8	Number of election periods with PSDB in power between 2000-2008 (0, 1 or 2)

Explanation of variables The amount of renewals is highly correlated with municipality population, but is a more precise measure, as it indicates actual pre-reform demand. The regional density discussed above is here proxied with the municipality density of bureaucracy intermediaries, on which we have pre-reform data (using regular businesses gives a similar result, i.e. the probability of having a Poupatempo is less, the higher the density). This holds also if we use regional density variables, such as the number of municipalities above a population threshold within a certain distance of the municipality center, which is negatively correlated with having a Poupatempo (and is line with what Poupatempo argued, that the units should be spread out, rather than all concentrated in high-density regions. The municipality political variable is included as the state government is from the PSDB party (Social Democrat), and having a PSDB mayor is correlated with having Poupatempo.