Identifying the Rich:
The Political Economy of Civil Registration in Tanzania[1]

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Abstract

Much of the world's poor remain invisible and uncounted by their governments. What affects the willingness of governments to register their citizens, and the decision by citizens to be seen? I argue that an exclusionary logic underpins civil registration in much of the developing world due to fiscal and political incentives to prioritise registering the rich over the poor. The rich will only select into registration, however, when the returns to identity formalisation are structured to provide benefits by gatekeeping access to 'regressive' goods and services. This results in striking inequalities in formal identification and *de facto* access to the state. Drawing on evidence from Tanzania and using a combination of archival sources and modern household surveys, I leverage a natural experiment arising from historical district-level reforms to compulsory birth registration. In a difference-in-differences framework I show these reforms led to substantial increases in registration, especially among elites. Then, using these reforms as an instrument for the possession of a birth certificate, I provide causal evidence on the returns to registration. These are substantial but narrowly targeted: registered citizens are more likely to work in the formal economic sector, have higher education, bank accounts, and pay taxes.

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1 Introduction

The modal transaction between citizens and their governments across much of the developing world is not fiscal, but informational. Citizens supply information about themselves – their identities, origins and incomes – in exchange for formal documents that mediate access to public goods and the state. According to Afrobarometer Round 6, a remarkable 51% of citizens had attempted to obtain an identity document in the previous year. This demand, especially applied to birth registration, is understandable. Birth registration is regarded as a 'gateway' document – even if other forms of legal identification exist, the possession of a birth certificate is generally viewed as the most important single document ensuring recognition by the state (AbouZahr, De Savigny, Mikkelsen, Setel, Lozano and Lopez, 2015). Possessing a certificate is frequently required for access to healthcare, education, social welfare, the formal economic sector, voting and inheritance (Hunter and Brill, 2016).

Governments, too, benefit from comprehensive civil registration for the generation of accurate vital statistics and demographic data at a much more regular interval than the census[3]. Such information is useful for the allocation of public goods and facilitating the extraction of taxes from formalised citizens. In spite of this demand for legal identity from citizens and a rationale for its supply by governments, the possession of formal identity documents remains stubbornly low: in 2017 it was estimated that 1.5 billion people across the world lack proof of legal identity (World Bank, 2017). The overwhelming majority reside in developing countries, which some authors have gone so far as to call "The single most critical failure of development over the past 30 years" (Horton, 2007) representing a "scandal of invisibility, which renders most of the world's poor as unseen, uncountable, and hence uncounted" (Setel et al., 2007).

In this paper, I argue that an exclusionary political logic lies at the heart of this failure to count the world's poor. Formalising the identity of citizens facilitates their access to the state, both by directly facilitating access to particular services and indirectly by lowering transaction costs they face when making other demands. While governments may indeed benefit from universal registration, alternative information technologies impose fewer demands on administrative capacity while serving similar statistical ends (Breckenridge, 2014). Formalising identities, in other words, is expensive. Resource-constrained governments *do*, however, derive benefits from the selective registration of citizens. The manipulation of registration infrastructure occurs through two instruments: setting the barriers to obtaining identity documents and the distributive utility of their possession. This distributive utility comes from the selection of which services are 'gatekept' by demanding proof of legal identity for citizens to access them – for example, demanding birth certificates to prove eligibility for primary education may lead to a progressive incidence of citizens who select into registration while demanding them only for university access is likely to be regressive.

Through these instruments, civil registration acts as a way for resource-constrained governments

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[3]As one Tanzanian newspaper wrote in 1982, "A census is a herculean exercise that entails long-term planning and fairly high financial and manpower resources; hence its "once-after-so-many-years" feature." Therefore, birth registration is a "cheap, and administratively convenient means" of "ensuring that we have a ready source of reference all the time, to set our priorities right and conduct our social and economic affairs intelligently". (Daily News, 1982).

to target access to the state to some and screen out access to others. The setting of these tools affects the willingness of citizens to be seen by the state: citizens supply information about their identities in exchange for access to public goods, services, and economic formalisation but risk taxation and expropriation. Such decisions are irreversible – one cannot deregister from the state. Given these policy instruments of the state, and the preferences of citizens, I suggest several distinctive patterns should follow. Most importantly, the state-building process provides strong incentives for governments to prioritise registering the rich over the poor. While the poor have more to gain from making demands on the state, compliance and visibility of the rich in society is needed to generate a fiscal – and often political – base. The mechanics of civil registration frequently represent an informational bargain to allocate towards this group.

Since the returns to registration are especially fraught for the wealthy, this implies that 'regressive' transfers are needed to engender their visibility and avoid an adverse selection dilemma. Governments therefore set high barriers guarding against the visibility of the poor and gatekeep access to public goods and services of particular value for the fortunate in society. This gatekeeping has been viewed as a defining feature of postcolonial African states (Cooper, 1996, 2002). For states at a sufficiently low level of development, the capacity of the state to gatekeep access to valuable public services and goods will be low. As such few citizens, rich or poor, select into identity formalisation. For states at higher levels of development, the state has more capacity to coercively register citizens such that the decision to register becomes less consequential. Governments therefore expand registration fully – to support redistributive programmes targeting the poor or towards electoral ends[4]. The implication is that the dynamics of registration for this universalist policy tend to be most regressive in countries at intermediate levels of economic development.

I apply this theory to Tanzania. In spite of demonstrated capacities to project power throughout its territory in the post-colonial era, the formal recognition of citizens is remarkably low – just 13% of citizens in the 2012 Census possessed a birth certificate. This, however, masks considerable heterogeneity by income level – from 65% registered in the richest quintile to 8% in the poorest. I provide descriptive evidence of the striking barriers to civil registration that differentially cost the poor and the relatively narrow set of services which officially require legal identity documents to access. Empirically identifying the returns to registration – where they accrue, and their magnitude – is generally confounded by very strong selection effects.

Therefore, to more rigorously test implications of the theory, I leverage a set of historical district-level reforms making birth registration compulsory based on a compilation of archival sources. These reforms combined legal obligation with high-powered financial incentives to register shortly after birth. Consistent with the fiscal targeting of elites, the reform was targeted at relatively urban, wealthy districts with underperforming tax capacity. In a difference-in-differences setup using a set of modern household

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[4]Many examples exist of the connection between civil registration and electoral access. Two examples come from July 2018. In Zimbabwe, birth certificates have been denied to individuals born in opposition areas to mitigate the registration of next generation's voters (Financial Times, 2018). In Cambodia, citizens who cannot prove voting for the dominant party have been threatened with losing access to land titles, birth certificates and family registers (Radio Free Asia, 2018).

survey datasets for outcome measures, I show that the reform led to up to a 10 percentage point increase (over a 50% effect size) in the probability of possessing a birth certificate today. There is strong support for the relevant identifying assumptions and for the robustness of this effect across specifications and datasets. I then characterise the compliers who were induced to register by the reform and show they were differentially individuals born into the elite.

This demonstrates that the rich selected into registration following a shock to the cost structure of civil registration but does not provide evidence on the regressivity of the returns to identity formalisation. To test this, I exploit the reform in a panel IV setting to instrument for the possession of legal identity documents. I provide preliminary evidence of birth registration leading to the possession of other identity documents – passports, voter cards and national ID cards. Then, I demonstrate the narrowly targeted consequences of being registered at birth. These are substantial but focus on access to the formal economic sector: registered citizens are much more likely to be employed by formal firms, less likely to work in agriculture, more likely to have bank accounts, and more likely to have rental contracts. There are few effects on primary education and access to healthcare, consistent with the regressivity of gatekeeping, but suggestive effects on higher education. Further, consistent with theory, there are substantial effects on tax compliance. Compared to OLS estimates confounded by the selection of the rich into registration, the causal estimates of the returns to birth certificate possession point to a narrow, targeted set of benefits which is of particular benefit for the elite and motivates their legibility.

In so doing, this paper speaks to three literatures. First, it positions the development of civil registration as serving strategic purposes at the core of state-building: fiscal, political and eventually towards the development of welfare states (Bates, 1983; Tilly, 1985). The informational bargain underlying registration is implicit in key works in political economy, but rarely explicitly explored even in contexts where states struggle to project their power (Herbst, 2000). Scott (1998, 2009), in his seminal analyses of legibility, points to the fraught decision facing citizens when deciding whether to be seen by the state. Through histories of expropriation, the fear of taxation, and concerns over persecution, citizens in developing states often gain little from visibility – generally construed through censuses – and risk much. But the aggregate returns to getting this right can be large: more recent work demonstrates a relationship between the state's quality of information about its citizens and its capacity to extract taxation and provide public goods (D'Arcy and Nistotskaya, 2017; Driscoll, 2016; Lee and Zhang, 2017; Muralidharan, Niehaus and Sukhtankar, 2016). It also lies at the core of what Foucault, Faubion and Hurley (1998) call biopower as part of the 'documentary state': the control of population as the core justification of government itself.

Speaking to this classic literature, the argument presented in this paper suggests three nuances. First, while civil registration has been regarded equivalently to census enumeration in some previous work, the underlying mechanisms are distinct (Cohn and Dirks, 1988). Registration, while it may serve similar eventual ends, affords agency on the part of citizens to select in beyond the command-and-control logic of the census. Second, obviously, that information about certain citizens is more important from

the perspective of the government than others. Third, given the imperatives of state-building and the importance of registration for key public goods and taxation outcomes, a sequencing of building compliance with formal registration processes is necessary: first the rich, then the poor.

This sequencing necessitates credible, regressive distributive returns to registration. This speaks to a broader literature on the causes and consequences of welfare states. Much research in developing countries describes the 'truncation' of welfare states which regressively benefit the wealthy and the middle class at the expense of the poor, generally on the basis of their exclusion from the formal economic sector (Bastagli, 2009; Ferguson, 1999; Holland, 2018). By focusing simultaneously on how the construction of administrative barriers induces a pro-rich selection of citizens able to use important public services, the argument presented here draws on an older literature on self-targeting in the vein of Nichols and Zeckhauser (1982). In turn, recent work argues that progress in universal civil registration is driven by the needs of administering redistributive welfare programmes targeting the poor (Groebner, 2007; Hunter and Brill, 2016). Complementing these accounts of progress in registering the poor, the distributive dynamics outlined in this paper suggest a set of conditions that must be met before civil registration is advanced to the full population.

Finally, the results presented have implications for significant international policy debates. Tremendous international policy pressure has attempted to boost rates of civil registration in the developing world. These include landmarks in international law, such as the International Covenant on Civil and Political Rights and the Convention on the Rights of the Child, and policy initiatives including one of the UN's Sustainable Development Goals. Progress, however, has been stagnant for many decades (Dahan and Gelb, 2015). It is possible that such slow progress is due to the alignment of political incentives argued here which stymies the expansion of universal registration. In spite of this effort, there have been scarce efforts to provide credible causal estimates of the impact of birth registration on individual-level outcomes. This is important since, given the mechanisms of selection emphasised here, any observational analysis will be heavily confounded and RCTs are improbable. The results in this paper provide perhaps the most credible empirical evidence on the lifetime consequences of registration[5]. In turn, a recent explosion of identification systems have attempted to universally register citizens following technological shocks to the cost of registration (Gelb and Clark, 2013). The rollout of one-off biometric registers are far cheaper than the continuous, evolving registration of civil events (Breckenridge, 2014). Understanding the causes and consequences of civil registration – through selection and regressivity – provides a foundation for understanding whether, and how, biometric technologies are likely to affect economic and political outcomes in the developing world.

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[5]Extensive work looks at the correlates of functioning civil registration systems at the national-level (Phillips et al., 2015). Those authors, indeed, claim that "difficulties in identification of valid measurement instruments rule out strong analytic designs for causal inference, such as quasi-experimental approaches or instrumental variables". Perhaps the only prior work attempting identification is Corbacho and Osorio (2013), who instrument for child birth registration using distance to registration centre and mother registration status in the Dominican Republic. Either instrument is likely to be biased substantially by rurality and income, respectively, and their outcomes are restricted to early-life healthcare access.

2 Theory

2.1 Government uses of registration

To frame the problem, I consider civil registration to be an irreversible informational transaction which involves two actors: a government which faces costs and benefits to registering different groups of citizens, and citizens which face a decision to register with often uncertain returns to being seen by a weak state. First, governments face significant costs in projecting their authority to induce the mass registration of citizens, especially when populations are sparse (Herbst, 2000). These costs are likely to take three related forms: resource-based, expectation-based and demand-based. Obtaining information from citizens carries direct financial resource costs. Civil registration, in particular, requires the construction of a large administrative apparatus – to continually register and certificate vital events – in contexts where bureaucratic capacity is frequently thin (Breckenridge and Szreter, 2012). Requesting this information, through directly interacting with citizens, will affect citizen expectations of public service delivery. This, in turn is likely to increase claim-making on scarce public resources (Kruks-Wisner, 2018). As authors back to Huntington (1968) have argued, such increased expectations and demands without institutional development can lead to political instability.

Recognising these costs, authors have often argued that governments register citizens in pursuit of specific policy goals. Slater (2008) points to the role of electoral administration in driving the mass registration of citizens in South-east Asia, while Hunter and Brill (2016) and Lund (2008) show how the spread of redistributive programmes has driven progress towards universal birth registration, and Doyle (2006) shows how fears of demographic collapse drove civil registration in Uganda. Put simply: it is hard to run an election without information on the eligibility of citizens, to redistribute income without information on their poverty, or to target health interventions without knowing the burden of disease. The development of civil registration is typically associated with the generation of demographic information for public administration. However states have other, often cheaper, strategies to solicit this information than the administrative infrastructure needed to continually register their populations. These notably include the census and demographic surveillance sites, which authors have suggested have substituted for comprehensive vital registration systems in Sub-Saharan Africa (Powell, 1981; Rommelmann et al., 2005; Ye et al., 2012). The logic of registration, as historians have long noted, differs from that of enumeration

What, then, do governments gain from registering the legal identity of their citizens? I argue that, in the context of developing states that may lack the capacity to coercively register their entire populations, civil registration represents an allocative tool to apportion access to the state to some and to screen out others. Governments possess two policy instruments to this end. First, they set the barriers to obtaining legal identity documents: these barriers may be geographical, bureaucratic or financial. The setting of these barriers often reflects resource constraints – for example, reducing the cost of a large bureaucratic apparatus or trying to maximise revenues from registration processes. Second, they set the instrumental

utility of registration for different citizens by restricting access to particular public goods, services, and sectors if citizens lack the relevant documentary proof of their eligibility. Cooper (2002) calls this the 'gatekeeper' property of postcolonial African states: with limited control over their own populations, their primary exercise of power is to apportion access to whatever valuable resources they may have available. Governments, as Cooper writes, vary in their ability to maintain the gate.

2.2   Citizen calculus

The manipulation of these instruments by governments can be used to induce a selection of particular subsets of the population into legibility. I suggest in this paper that states face strong incentives to prioritise registering the rich before the poor. Classic perspectives in both the state-building and the African political economy literatures suggest that governments face stronger incentives to learn about the rich than the poor: the rich are both more likely to pose threats to political stability and serve as the foundation for a fiscal apparatus (Bates, 1983; Tilly, 1985). Recent empirical evidence congruently points to how the quality of information about citizens – through cadasters and the census – links to tax capacity (D'Arcy and Nistotskaya, 2017; Driscoll, 2016; Lee and Zhang, 2017). However, citizens face a fraught decision in deciding to supply information about themselves to developing states (Scott, 1998, 2009). As demographers have long noted, "the reality is that many individuals who have historical reasons to fear the negative consequences or abuse of identity registration ... will simply not comply and will risk the consequences." (Setel et al., 2007). While the census has generally been perceived according to Scott's logic of social control, the logic of registration systems are different: citizens are afforded much more agency in deciding whether to enroll (Cohn and Dirks, 1988).

These returns to visibility are often marginal in contexts where the delivery of public goods is stochastic, and especially grave when there are justified fears over the consequences of registration or uncertainty exists over the future consequences of supplying information to the state. These fears could take several forms: "identity registration was typically an instrument of nasty exactions - of taxes, rents, conscription and confession" (Breckenridge and Szreter, 2012). These are likely to differentially affect the rich: as Iliffe (1987) shows, historical taxation in Africa was highly regressive – which perhaps explains classic accounts in African political economy stressing the differential incentives facing the rural poor to avoid 'capture' by the state (Hydén, 1980). However, the shift away from agriculture and towards wage labour has dramatically changed the incidence of taxation towards the rich and motivates their political engagement across the developing world (Kasara and Suryanarayan, 2015).

2.3   Regressive gatekeeping

Attempting to learn about all citizens simultaneously will induce a damaging adverse selection problem where the poor are more likely to select into registration: expectations and demands on the state may increase with no fiscal capacity to meet them. This poses a significant strategic challenge: how to

induce the visibility of the rich, who often face the strongest reasons to avoid being seen. To do this governments must generate credible, regressive returns of differential value for elites. This is consistent with the argument of Ferguson (1999): social assistance in Africa has typically benefitted an elite class of formal-sector wage employees. In exchange, the rich found the fiscal base of the state – either through direct effects on formal employment and tax payments or indirectly through higher income levels – and become easier to tax in the future. Further, initially targeting the rich, who tend to live in more densely-populated areas, also maximises short-term revenues for resource-constrained governments: the costs of constructing administrative structures for registration are lower, and (with appropriately constructed returns) the revenues are higher.

Governments generate these implicit transfers through manipulation of the two policy instruments they have available – barriers and gatekeeping. To induce a selection of the rich into registration we should expect to see high barriers to registration combined with a specific pattern of gatekeeping. Governments structure selection into identity formalisation through the use of barriers to services. Obstacles to registering for social welfare transfers, for example, can help improve the efficacy of redistributive transfers through an 'ordeal' mechanism (Nichols and Zeckhauser, 1982; Alatas et al., 2016). International organisations point to an array of public goods and services where citizens depend on formal identification: access to schooling, formal labour contracts, property rights, healthcare and social transfers are a few (UNICEF, 2013). But these requirements are not universal and vary considerably across Africa (DLA Piper, 2016). Existing evidence, for example, ties South Africa's recent dramatic improvements in civil registration to the introduction in 1998 of the Child Support Grant, where registration of both parent and child were needed to access pro-poor social welfare transfers (Ferguson, 2015). Applied here, by requiring proof of identification for activities that differentially benefit the rich – while maintaining financial barriers to identity formalisation – a regressive selection mechanism induces the registration of the rich over the poor.

In general, therefore, we should observe meaningful requirements for formal identity documents in areas which are both important for the rich and relatively easy to guard: for example traveling internationally, receiving higher education, and access to the formal financial sector. Other, more progressive public goods and services – such as primary education or healthcare – should be less likely to require formal identification. Combined with financial barriers to registration, only the rich are likely to have net positive returns – the poor have deeper constraints on access to many public services than the possession of an identity document (AbouZahr, De Savigny, Mikkelsen, Setel, Lozano, Nichols, Notzon and Lopez, 2015). This underlines what the International Institute for Vital Registration and Statistics (IIVRS) found in a 1981 survey: the principal reason for low registration rates in most developing countries was simply that the benefits of registration were only useful for a small subset of the population (Powell, 1981).
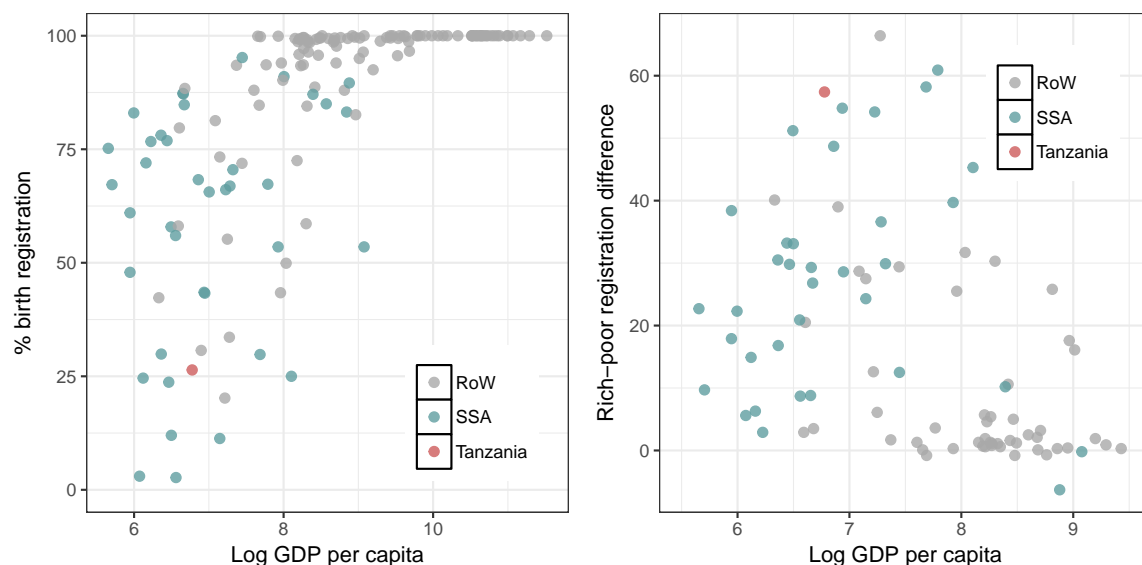
Figure 1: Registration levels and inequality

2.4 Implications

This argument has several broad implications. Most importantly, if it holds, it suggests that we should observe inequality in the possession of formal identification documents at intermediate levels of economic development. In contexts where state capacity is sufficiently low, we should expect that the state is unable to meaningfully gatekeep access to valuable public goods and services which causes a failure in the selection process into registration. At high levels, it is much harder for the rich to escape, or generate income, outside the formal sector net and so their decision becomes less fraught. With their compliance, the expansion of legibility towards the poor is feasible in pursuit of electoral returns or redistribution. Figure 1 provides some cross-national support for this relationship. On the left, I plot the relationship between GDP per capita and birth registration rates. While the most developed countries generally have universal coverage, substantial variation exists across developing countries and particularly within Africa. Elucidating this relationship, on the right I plot GDP per capita against the differences in registration rates between the richest and poorest quintiles in each country. There is a striking paucity of countries where the poor register in higher numbers than the rich, and suggestive evidence of the inverted-U relationship posited: registration inequality is highest in countries at intermediate levels of economic development, and the path to legibility is brokered through transitional pro-rich inequality. Tanzania, the focus of this paper, lies at the peak of this inverted-U with overall low registration rates but stark disparities by income level.

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3 Context

3.1 History

Tanzania offers an appropriate case to explore and test this theory. Birth registration initiatives stretch back to the colonial period, with ordinances to register non-native populations beginning in 1894 (Kuczynski, 1948). The literature on African historical demography points to the ways that colonial governments viewed birth registration as a tool for tracking public health and demography, with a view to social control of indigenous populations and specific connections to tax capacity (Ittmann, Cordell and Maddox, 2010). Walters (2016) argues that this interest in Tanzania was directly tied to taxation motives: "officials pointed to the conflation in people's minds of the registration of birth and the collection of taxes.".

In spite of substantial funding and attention from international agencies, registration rates remain extremely low today – just 13% of citizens had a birth certificate in 2012 – and there has been scant progress in recent decades. This lack of process echoes the experience of many countries in Sub-Saharan Africa (Shibuya and Gilmour, 2015). Nonetheless, it remains the most common form of legal identity document[6]: Tanzania rolled out a national ID card in 2008 but issuance rates are even lower than for birth certificates (ITU, 2015). Strikingly, UNICEF data suggests that one out of every three unregistered children in the world live in Tanzania, Ethiopia or the Democratic Republic of the Congo (UNICEF, 2013).

These low levels of registration are surprising for three reasons. First, modern Tanzanian history points to numerous demonstrations of the strength of its infrastructural power. Compulsory villagisation under *ujamaa* from 1974 onwards involved the wholesale, forcible resettlement of rural populations. The government repeatedly was able to register and identify relevant subsets of the population: examples include the coercive registration of voters in the 1965 election (Lodge and Pottie, 2002) and the 1983 *Nguvu Kazi* Act, whereby informal workers in urban areas were issued with identity cards and forced to resettle in rural areas (Diouf and Fredericks, 2014; Tripp, 1997). Second, these policies took place in a period generally portrayed as socialist and highly progressive under Nyerere (Hydén, 1980). And third, the broad eradication of ethnic identity as a salient cleavage might be expected to reduce citizen fears regarding their legibility (**?**).

Given demonstrated capacities to register the population and commitments to redistributive policy, these enduringly low rates of birth registration are somewhat puzzling. Importantly, however, historians of postcolonial Tanzania have pointed to the basic adverse selection problem described above: "peasants tried every step of the way to extract all they could from the state in terms of public goods and services, while evading Government pressures" (Tripp, 1989). Consistent with theory, both the costs of birth registration and the returns to doing so are structured to induce a selection of the rich into identity formalisation rather than increasing exposure to these demands from the rural poor.

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[6]A substantially higher share of citizens possess voter cards, but their utility in accessing the services I discuss here is very limited.

3.2 Barriers and uses of birth certificates

In this section I provide descriptive evidence on the barriers to registration and the utility of doing so. Wood (2016) identifies four barriers that affect the cost of birth registration in Tanzania: time spent working through the bureaucracy, distance of families to registration centres, the actual cost of birth certificates including frequent fines, and lack of citizen information on how proof of identification has value. While we could expect that time-based hurdles differentially dissuade the rich, the other obstacles are clearly pro-rich in their implications for the distributive costs of formalisation. Registration follows a three-step process[7]. First, the receipt of a notification from a health facility or village executive officer (VEO) depending on the location of birth. Second, parents must travel to district capitals to register the birth with the district registrar. Third, several weeks later, they must collect the issued certificate[8].

These bureaucratic costs of registration were worsened by the inaccessibility of registration centres for much of the population. Evidence from Makannah (1981) and Moriyama (1988) shows that just 88 birth registration centres existed in Tanzania in 1980, corresponding to a population of 239,000 citizens per centre – the second lowest across Sub-Saharan Africa. Direct financial costs, too, are high: birth certificates presently cost Tshs. 3500 TSh within 3 months of birth, 4000 TSh between 3 months and 10 years, and 20,000 TSh ($9) for individuals older than 10 years. The historical evidence I discuss in Appendix A.3 shows that that these costs used to even higher – as much as $33 for individuals registered late. Nor has the government directed substantial resources towards the expansion of civil registration across the country: in the 1990s, around $30 million was spent on health information in Tanzania with barely any of it directed towards birth registration (Rommelmann et al., 2005).

Lower barriers to visibility for the rich will only induce their selection into registration if there are commensurate returns for doing so. Birth certificates are *de jure* required for access to a broad set of public goods and services. But, as a legal review from 2016 makes clear, their *de facto* uses are much more limited (DLA Piper, 2016). The authors find ambiguous policy provisions demanding birth registration for primary education or general healthcare and several other forms of public service delivery. However, sources point to a more targeted set of services whose access is gatekept by the possession of formal identity documents. Access to university depends on possession of a birth certificate (UNICEF, 2013). Certificates are needed for coverage of health insurance but not for access to general healthcare (Adgie, 2017). Obtaining a passport strictly requires the possession of a birth certificate. They are officially needed for applying to government jobs, for proof of citizenship for many private sector jobs and employment contracts, and for access to public sector pensions (Registrar General's Office, 2005; Adgie, 2017). Lastly, they are officially required for opening bank accounts and gatekeep access to the formal financial sector.

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[7]There have been recent reforms to this process to decentralize it further. This recent push towards civil registration in Tanzania, indeed, is consistent with the government finally starting to target the poor through tying registration to the receipt of social transfers as per Hunter and Brill (2016).

[8]I provide more details on this process in Appendix **??**

3.3 Descriptive evidence

Both the hurdles to formal identification and services which officially require them suggest a strongly pro-rich selection mechanism. The rich are more likely to receive notifications in health facilities, live close to the urban registration centres where registration takes place, and more financially able to pay relevant costs either at birth or later in life when their instrumental utility is greater. Services which demand formal identification to access are differentially useful for the rich, such that formal identification is not the binding constraint preventing the poor from their use. For example, 95% of citizens in the National Panel Survey (described below) stated that the primary reason they didn't have a bank account was because they had no money to save. Just 0.25% stated the lack of formal identity documents as their main reason.

The theory posited, however, argues that registration decisions involve active decisions by the wealthy in selecting into identity formalisation – not just that they passively select in as a function of where they are born or their financial resources. The reforms leveraged for the empirical design of this paper demonstrates that a legal reform which made registration compulsory in parts of the country differentially induced individuals born into better educated families to be registered at birth, and generates causal estimates of the value of registration for this subpopulation. This is consistent with legal reforms increasing the net returns to registration for the targeted subset of the population where formal identity is relevant for social outcomes.

Descriptively, there is evidence that other shocks have induced similarly differential responses by elites consistent with theory. Canonical models in political economy suggest that the rich lose from democratic transitions through exposure to higher tax rates (Acemoglu and Robinson, 2005). Such transitions are also likely to be marked by substantial uncertainty, both of which might differentially reduce the incentives of the wealthy to formalise their identities: first, to reduce their exposure to higher threats of taxation and second, due to risk aversion when the consequences of registration become more uncertain. Using Tanzania's transition to a multiparty democracy – still under dominance of the CCM party – in 1992, we should expect that this change affected the registration decisions only of the rich.

Descriptive empirical evidence suggests that this is the case. Using the National Panel Survey (NPS) which I describe in Section 4.2, in Figure 2 I plot the share of individuals possessing a birth certificate by their year of birth for the 10 years before and after this transition. Parent income is unobserved in the dataset, but their education level is observed which should strongly correlate. In the left panel I compare registration rates among citizens where at least one parent completed primary education (61% of the sample) to those where neither did. In the right panel I do the same for secondary education, representing a much more elite subset of the population (8.7% of the sample). Both plots provide graphical evidence for the proposed relationship: individuals born into relatively more educated families are less likely to have been registered after 1992 compared to before, while the rates for those born into less educated families stay relatively flat. Such a pattern is consistent with registration decisions for the rich being the outcome of a decision with agency, not simply a passive selection into formalisation.
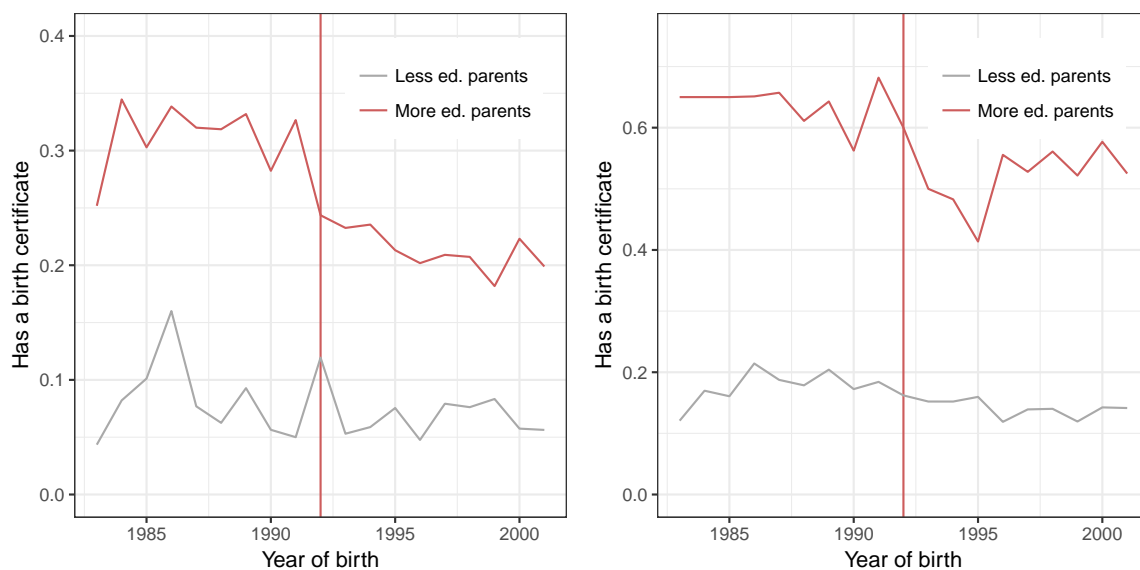
Figure 2: Registration responses to democratisation
Left: primary education, Right: secondary education.

As such, government structuring of the returns to identification provides descriptive evidence of barriers to registration which serve to screen out the poor, and regressive benefits which induce the rich to actively select into identity formalisation. Empirically, however, precisely this selection makes it hard to understand whether becoming visible has meaningful economic returns consistent with regressive benefits for the rich and its broader state-building consequences. In other words, to provide substantive evidence for the underlying theory of registration it remains to be shown that these benefits causally flow from the possession of formal identification. It is neither obvious that the stated need for birth certificates in the narrow areas described above is actually enforced, nor that the possession (or lack thereof) of a certificate represents a meaningful constraint to accessing them. In the next section I leverage a legal reform to compulsory registration to empirically demonstrate both selection *into* registration and the causally identified consequences of doing so.

4 Research design

4.1 Compulsory birth registration

The empirical strategy leverages staggered district-level legal reforms making birth registration 'compulsory' which took place over a period of 60 years from 1949 to 2009. First, I use archival information on the rollout of birth registration regulations in Tanzania. The primary source for this is the complete archive of Tanzanian law, where I use supplemental legislation relating to Chapter 108, The Births and Deaths Registration Act first passed in 1920[9]. In particular, Section 27 enables the government to make

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[9]I exclude Zanzibar throughout and focus on mainland Tanzania. Zanzibar has had an autonomous system of civil registration for over a century and birth registration has been compulsory since 1909 (Kuczynski, 1948). Rates are far above the mainland,

birth registration compulsory for individuals born after a certain date in a given district. These reforms are issued formally in legal supplements to the Government Gazette, which I use to construct a time series of the expansion of compulsory registration. In Appendix A.3 I provide a comprehensive account of these reforms over time.

For this paper I focus on the initial wave of reforms that took place in 1966[10]. These reforms made registration compulsory for Tanzanians, for the first time, in an initial subset of districts: first to the districts comprising Dar es Salaam for individuals born after March 1, 1966 and then to an additional 14 districts for individuals born after July 1, 1966 in those districts. This was accompanied by changes to the price structure of registration. Individuals born in non-compulsory districts *or* born before registration was made compulsory in their district paid 5 Tanzanian shillings (TSh) if registered within five years, 10 TSh if registered between five and ten years, and 30 TSh above 10 years. Individuals born in compulsory districts *after* the reform paid 5 TSh within three months and 30 TSh if registered more than three months after birth. 30 TSh in 1966 is equivalent to more than $30 today. Changes were also made to the enforcement of registration through the threat of both fines and short-term imprisonment for failing to register children[11]. The reform, therefore, combined legal obligation with high-powered financial incentives to register shortly after birth.

The affected districts comprised those with "major towns" (Wood, 1971). Jensen and Mkama (1968) provide socioeconomic data on Tanzanian districts during this period which helps understand which districts had registration made compulsory. In Figure 3 I show their spatial distribution, and plot balance between districts which had the reform for compulsory registration in 1966 to those which did not. The data shows that selection was clearly non-random: treated districts are denser and richer. Reform districts have populations around 1 standard deviation (s.d.) larger than non-reform districts, with similar effects on population density, district GDP and district GDP per capita. There is no imbalance in the share of the population paying 'rates' (formal and informal taxes), enrolled in primary education, nor hospital beds.

There is little evidence that these districts selected into the reform, nor that they were chosen on the basis of their birth registration rates. Indeed, birth registration rates were not even published in the government's statistical abstract in the period leading up to this reform. Further, there is no evidence of other contemporaneous legal reforms taking place which apply to this set of districts[12]. I am currently in the process of coding up an original dataset of every directive issued by the government in this period

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around 80%, largely explained by citizens needing a birth certificate to acquire a passport to travel off Zanzibar (Registrar General's Office, 2005).

[10]As fully explained in Appendix A.2, there is evidence that reforms beginning in the 1980s specifically targeted districts on the basis of their registration rates and there is little evidence that these reforms, in the context of a major recession, had much impact on registration rates. The final wave, in 2009, is too late to enable an analysis of the consequences of registration.

[11]A final change, made shortly afterwards, also made it extremely onerous to obtain a certificate more than five years after birth: through a long process of examination by district magistrates and the local Branch Executive Committee and involving multiple trips to the capital.

[12]This period was certainly marked by major events in Tanzania: including independence in 1961, becoming a one-party state under Nyerere in 1965, and the Arusha Declaration of 1967 which signalled the start of Tanzania's socialist period. However, there is no evidence in the complete archive of Tanzanian law or any reforms taking place in this period specifically targeted at this set of districts, nor in any way related to civil registration (JUTA, 2002).
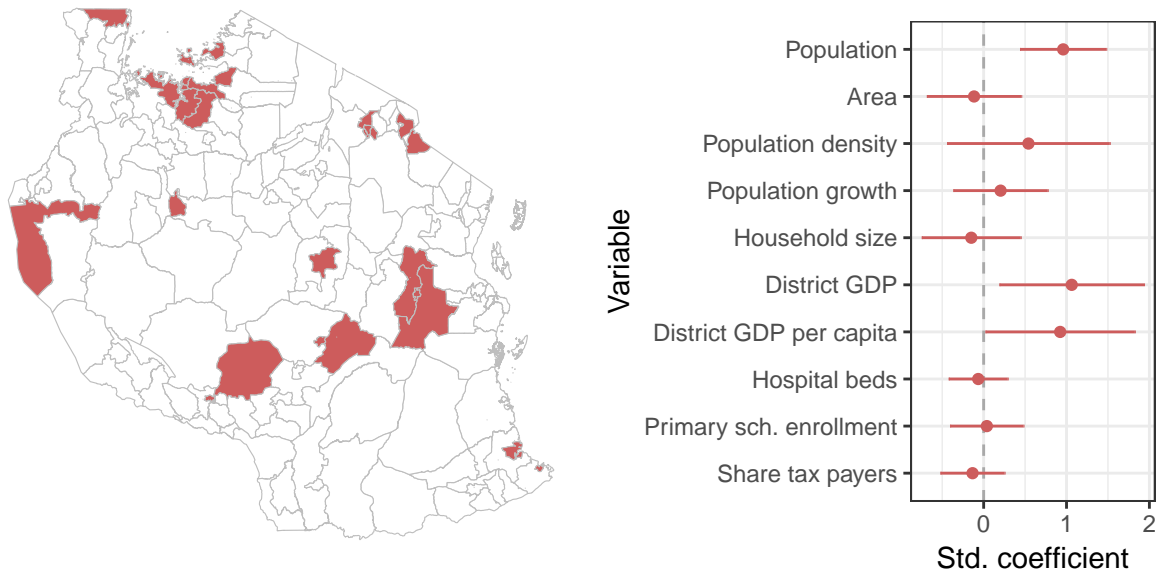
Figure 3: Characteristics of the 1966 compulsory registration districts

to further validate this claim. Rather, the geographical targeting of the reform is consistent with the targeting of districts with relatively higher densities of the rich and relatively less area to cover with a bureaucratic apparatus.

4.2 Outcome data

This reform generates potential spatial variation in birth registration. I then combine this spatial variation with temporal variation depending on whether individuals were born before or after registration was made compulsory in their district. For sources of this temporal variation I employ several modern household survey datasets. Since treatment is defined at the district of birth-year of birth level this places restrictions on the possible sources of data where both of these are observed along with evidence on birth registration status[13]. Two data sources fit these criteria. Primarily, I use survey data from the National Panel Survey (NPS). The NPS has tracked a panel of nearly 4,000 randomly selected households across four waves between 2008 and 2015. Every wave contains sets of questions on education, employment, assets, health and food security. Here, I employ data from Round 2, which contained a richer set of questions on political engagement than any other round, with data on around 20,000 citizens. Second, I use the IPUMS extract from the 2012 Population and Housing Census. This provides data from over 4 million citizens with a limited set of socioeconomic outcome variables relating to education, employment and asset ownership. 2012 was the first census in which information on birth registration was systematically collected. I am in the process of integrating several other data sources for auxiliary outcomes. These include a nationally-representative survey panel run by Twaweza, where Round

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[13]Substantial administrative unit proliferation has taken place over time, with 169 districts today compared to 61 in 1966. These districts have been created overwhelmingly by splitting existing districts into two or more, consistent with Grossman and Lewis (2014). I use several datasets to track district splitting over time in order to assign treatment based on modern district boundaries.

25 asked a battery of questions on the possession of identity documents, and several rounds from Afrobarometer to deepen the outcomes relating to political engagement[14].

5 Hypotheses

These reforms to the incentive structure of civil registration provide a clean empirical setting to test elements of the theory outlined in Section 2 using the empirical framework described in Section 6. In this section I describe key hypotheses.

H1. The reform to birth registration led to increases in the probability of possessing a birth certificate today.

First, most simply, we should expect that the reforms led to increases in birth registration – in other words, that a first stage exists. While obvious, this hypothesis is non-trivial. Many reforms to civil registration, including those which followed in the 1980s as described in Appendix A.2, had little effect. However, both the targeting of relatively prosperous, urban districts and the strong incentives to register shortly after birth should be expected to lead to increases in registration rates.

H2. The reform particularly induced rich individuals to register.

Next, we should expect that the reform differentially induced individuals born into elite, wealthy families to be registered at birth. This is for two reasons. First, the narrow instrumental utility of birth certificates (with respect to passports, higher education, and so on) are of differential value for such citizens. Second, the reform substantially increased the cost and difficulty of registration a significant time after birth, which is likely to *de facto* screen out relatively poorer individuals – who may be less aware, and further away, from administrative headquarters – from registration.

H3. Possession of a birth certificate increases the likelihood of possessing other legal identity documents.

Third, I test for evidence of the 'gateway' status of birth registration. The importance of birth registration is often justified in its foundational role determining access to other legal identity documents. Even though the direct uses of birth certificates may be limited they are often needed to access national IDs, passports, voter cards and other elements of the documentary state.

H4. The returns to registration are targeted at areas of particular utility for the rich.

To be consistent with theory – that the setting of barriers to registration and the returns to formal identity induce a self-selection of the rich into registration – we should observe that, for the complier population who do formalise their identities, there are congruently targeted benefits. These benefits

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[14]DHS surveys have placed increasing focus on birth registration since 1999. However, these surveys only ask for the registration status of children under 5 rather than their parents.

accrue through the selective gatekeeping of access to services and public goods which are of particular value for the wealthy. Such benefits include access to the formal labour market, the financial sector, and higher education. Evidence of these targeted returns is critical to underpin the instrumental model of citizen registration underpinning the theoretical discussion.

H5. Registered individuals pay more tax.

Finally, while governments may have multiple incentives pushing towards the preferential registration of elites, at least one is fiscal. Wealthier individuals face greater potential downside from engendering their own visibility and, if the informational bargain proposed in this paper is correct, the targeted benefits they receive are sufficient to offset the tax-related risks of being formalised. As such, we should observe a causal connection between the registration of citizens and the incidence of their taxation.

6 Estimation

6.1 First stage

To evaluate the first stage impact of the compulsory reform on registration I implement a difference-in-differences specification. In this, I combine spatial variation in whether individuals were born in a reform district with temporal variation in whether they were born before or after the reform. Treatment, therefore, is defined as:

$$\text{Treat}_{itd} = \mathbb{1}(t > 1966 \ \cap \ d \in d^{reform})$$

where individual i is treated if they are born in year $t > 1966$ and in district d in the set of districts affected by the reform, d^{reform}. The baseline equation I estimate to evaluate the impact of the reform on registration is, therefore, the following:

$$\text{Certificate}_{itd} = \beta_1 \text{Treat}_{itd} + \eta_d + \mu_t + \epsilon_{itd}, \tag{1}$$

where an indicator for individual i born in year t in district d possessing a birth certificate is regressed onto an indicator for treatment. As is standard with this kind of fixed effects approach, I use district of birth fixed effects, η_d to control for time-invariant characteristics of individuals across districts and year of birth fixed effects, μ_t to control for temporal changes that affect individuals in all districts equally in a given year. In additional, more demanding, specifications I add linear region of birth-year of birth linear time trends ($\gamma_r t$) and district of birth-year of birth linear time trends ($\gamma_d t$) to accommodate differential trends in registration rates by region or district over time. Standard errors are clustered at the district of birth-level.

The coefficient of interest is β_1. Interpreting β_1 as the causal effect of the reform on registration does not require us to assume that the timing of the reform was random: rather, we need that conditional on

the fixed effects, the timing of the reform is not correlated with time-varying district-level characteristics that affect birth registration rates through channels other than the legal reform. This is equivalent to a form of the parallel trends assumption. Descriptive evidence in Section 4.1 suggests the qualitative plausibility of this, and I provide extensive empirical evidence further justifying this assumption. Under this identifying assumption we can view β_1 as causal.

6.2 IV

If we can consider the above to be identified then this suggests its availability to use in what constitutes a panel IV regression. This implies a specification as follows, where I use Equation 1 as a first stage (where Treat_{itd} is the excluded instrument) to predict the possession of a birth certificate using 2SLS.

$$y_{itd} = \beta_1 \widehat{\text{Certificate}}_{itd} + \eta_d + \mu_t + \epsilon_{itd} \tag{2}$$

Under the relevant identifying assumptions, this identifies the LATE: the causal effect of birth certificate possession on the subset of compliers who were induced to register. The relevant assumptions for this regression are the classic instrumental variables assumptions. Conditional on having a viable first stage, relevance is satisfied. Conditional on the plausibility of the identification of this first stage, exogeneity is satisfied. Monotonicity is assumed and reasonable in this setting.

The exclusion restriction, here, means that being born in a reform district after 1966, conditional on all controls, only affects outcomes through the increased probability of having a birth certificate it implies. The clearest violation to exclusion would, therefore, be any simultaneous reforms taking place in districts aside from the passage of orders to make registration compulsory. A thorough analysis of the Government Gazette and all supplemental notices, acts and orders issued by the Tanzanian government during this period suggests that there were no other reforms applied to this set of districts. I am in the process of coding up an original dataset of all such notices to further validate the feasibility of the exclusion restriction. To be conservative I also report reduced form (RF) specifications. I additionally report naive OLS specifications, where I do not instrument for Certificate_{itd}, to demonstrate the relative magnitude of selection into the possession of formal identity documents relative to estimating the impact of their possession.

The characteristics of the complier subpopulation in this IV setup are theoretically relevant. Birth registration becoming compulsory should only affect birth registration decisions for relatively wealthy, educated individuals for whom a legal reform meaningfully affects the returns to formal identification. Such individuals are likely to be the compliers with the instrument. Given a binary instrument, the first stage coefficient on Treat_{itd} reflects the relative proportion of these compliers in the overall population. Then, following Abadie (2003) and Angrist and Fernandez-Val (2013), I characterise the complier characteristics ratio as follows:

$$\frac{P(x = 1 \mid D(1) > D(0))}{P(x = 1)} = \frac{E(D \mid z = 1,\ x = 1) - E(D \mid z = 0,\ x = 1)}{E(D \mid z = 1) - E(D \mid z = 0)},$$

where we compare the probability of a complier with the instrument, $D(1) > D(0)$, having binary covariate $x = 1$ to the population probability. This is given by the ratio of the Wald first-stage coefficient for the subgroup with $x = 1$ to the overall first stage. Then, as per Abadie's kappa-weighted means, we can simply multiply by $P(x = 1)$ to recover complier subpopulation characteristic means.

7 Results

7.1 Impact of the reform on registration

To test H1, in Table 1 I provide regressions to estimate the effect of the legal reform in 1966 on the possession of a birth certificate in 2010. Column 1, with the baseline specification of Equation based on Equation 1, suggests that the reform led to a 8.5 percentage point increase in the probability of possessing a birth certificate. Compared to an outcome mean of 16.4 percent in the full dataset, this represents a substantively large effect size of 52%, and an F-statistic on the treatment coefficient of 24.5. This treatment effect is robust to the addition of linear region of birth-year of birth time trends (Column 2) and linear district of birth-year of birth time trends (Column 3). In Columns 4 to 6 I add five years of lead terms to provide evidence on the plausibility of the parallel trends assumption and sequentially replicate the addition of linear time trends. No lead terms are significant across any specification and the treatment effect remains at a similar magnitude. That the coefficient is relatively small in absolute magnitude is unsurprising: treatment is simply being born after the change in law, and imperfect compliance is possible for two reasons: the reform was relatively weakly enforced, and individuals born before the reform were still able to obtain a certificate (albeit at a higher cost).

Next, I assess the robustness of this first stage relationship. In Figure 4 I sequentially drop each of the districts which were treated with the reform to check for the presence of outlier districts driving the results. In Table 3 I provide additional robustness checks for the first stage by presenting modifications of the baseline specification. In Column 1 I restrict just to adults in the NPS dataset and in Column 2 I add individual-level controls. Either specification replicates the treatment effect. In Columns 3-5 I replace the district of birth FE with (sequentially) current district, current ward, and household-level FE. While the standard errors increase, the point estimate remains stably estimated at a similar magnitude. The results show that measurement error in district of birth is not driving results, and the results with household FE suggest that even *within* a given household, being born after the reform induces the possession of a birth certificate compared to being born before. This is consistent with the structure of the reform being applied only to individuals born after a given date.

In Column 6 I replicate the first stage using the IPUMS 10% extract of the 2012 Population and

Housing Census. The coefficient is smaller, with a treatment effect of 4.3 percentage points which still corresponds with a 33% effect size and is associated with an F-statistic of 15.3. The comparatively smaller coefficient size may be due to higher measurement error in the national census compared to the much more detailed NPS survey. Finally, in Table 4 I use placebo outcomes which should not be affected by the treatment. No placebo outcomes are either substantively large nor approach conventional levels of statistical significance. Overall the results provide strong support for the first stage relationship between the reform and subsequent registration.

7.2   Complier characteristics

Following H2, I provide evidence towards characterising the subpopulation of compliers who were induced to register due to the reform. The interpretation of the first stage means that around 8.5% of the population are compliers. Since treatment is defined by year of birth, the set of pre-treatment covariates to assess complier characteristics is restricted. Fortunately, for all individuals in the NPS dataset the educational attainment of their parents is observed. Using the procedure outlined in Section 6.2, I produce summary statistics to characterise the compliers in Table 2[15]. Across each variable measuring parent education levels, compliers have a higher mean than the overall population. The differences are most striking with respect to higher levels of education: the mothers (fathers) of compliers are 3.99 (3.49) times more likely to have completed secondary education. The complier characteristics are consistent with the reform inducing individuals born into relatively richer families to acquire a birth certificate.

7.3   Access to additional identity documents

To be added following new data recently received.

7.4   Returns to registration

In Table 5 I provide evidence on educational outcomes. Predictably, in Panel A the OLS specifications reveal systematic differences across every outcome between registered individuals and non-registered ones: they are more literate, started school younger, and completed more education. Panels B and C, where I exploit the legal reform, suggest a much more narrowly targeted set of consequences of identification possession. In particular, the only significant identified is on English literacy in Column 2, indicative of further education. This effect is substantively large: on the population of compliers, registration is associated with a 41 percentage point increase in the probability of English literacy. While there is no causal effect on university education in Column 7, using the census instead of the NPS data generates a statistically significant effect on university access. These effects are consistent with the direct utility of formal identification being targeted towards elite educational activities rather than more progressive ones, such as access to education at all.

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[15]I pool the completion of university education across parents due to the extremely low number of individuals whose mothers have completed university education (just 77 in total).

This pattern is replicated in Table 6 where I provide employment-related outcomes. The results suggest a significant causal effect of registration on access to the formal employment sector where proof of identity is frequently required for labour contracts: the IV estimates suggest substantively large and statistically significant causal effects on working in the private sector and working as a paid employee. There are null effects on other employment outcomes, consistent with formal identification being used as a device to specifically gatekeep the formal economic sector. Results on 7 support a similar interpretation to those on education – there are no causal effects on accessing basic health services. In the reduced form there is some evidence of registered citizens being less likely to receive free healthcare (Column 3) or receiving a free bednet (Column 4). These effects are likely explained by the income-related consequences of formal identification – Table 6 implies that registration leads to higher income.

That formal identification leads to higher income is supported by Table 8, where I provide evidence on outcomes around internal migration. Here, the only significant causal effect is on the probability of respondents living in an urban locality (Column 1) where there is a substantial effect. Though noisily estimated, there is borderline significant evidence of registration facilitating internal migration in Column 2 as measured by citizens living in a different district to where they were born. The urbanisation results are potentially related to the consequences of the aforementioned *Nguvu Kazi* scheme in the mid-1980s – registered citizens were more likely to be in the formal sector and so less likely to be forcibly resettled in the countryside. The overall high levels of internal migration are consistent with levels found in Wenban-Smith (2015). To provide further evidence on the economic returns to registration, in Table 9 I show a causal effect on the probability of having a bank account – where descriptive evidence suggests formal identification is needed – and weaker evidence on having mobile money. The LATE in Column 2 shows that registration is associated with a 47.7 percentage point increase in the probability of someone in the respondent's household possessing a bank account. We should only expect the possession of identification to be a binding constraint on access to banking for those with enough money to justify one. Finding an effect here, therefore, is further evidence of the narrowly regressive areas where the rich gain from visibility.

7.5 Costs of registration

Finally, the threat of taxation is the driving force behind the potential costs of registration faced by citizens posited in the theoretical section. In Table 10 I show that registration increases the amount of tax that citizens pay – either mediated through indirect income effects or through formal employment. Column 1 suggests significant effects on the probability of paying taxes to local councils, while Column 2 shows the amount actually paid to be far higher among registered citizens. The treatment effect suggests compliers are 22.9 percentage points more likely to pay council taxes at all, and the actual amount they pay is 240% higher than untreated compliers. The null effects on the payment of income taxation in Columns 3 and 4 are consistent with evidence on the relative difficulty of using income tax as a fiscal instrument across developing countries (Gordon and Li, 2009). Since registered compliers

are demonstrably wealthier, any effects on political attitudes are mediated through an income channel. In Table 11 I provide results on attitudes towards government: local government in Columns 1-3 and respondents' MPs in Columns 4-6[16]. The results suggest a negative causal effect of formal registration on approval towards local government officials as well as a higher probability of not knowing their competence. Effects on attitudes towards MPs are a similar magnitude and direction, but more noisily estimated. These results are potentially consistent with a 'deliberate disengagement' mechanism (Croke et al., 2016).

8   Conclusion

In this paper I have advanced a theory to explain persistently low levels of civil registration in much of the developing world, with a focus on Sub-Saharan Africa. Motivated by classic arguments in the state-building literature, I suggest that governments face fiscal incentives to induce the identity formalisation of the rich before the poor. Given both limited infrastructural power and the fraught decision facing citizens in supplying information about themselves to the state, governments can only induce the registration of the rich if they appropriately structure the returns to identification. They do this by structuring the costs of registration to screen out the poor, and the benefits to be sufficiently regressive to incentivise the rich to self-select in. These benefits are constituted by gatekeeping access to certain public goods and services to require the possession of formal identity documents. In so doing governments both minimise the short-term costs of registration, by avoiding the construction of a large administrative apparatus to continually register citizens, and bring relatively wealthier citizens into the formal economic net who become easier to tax in the future. A credible sequencing of registration is needed before legibility can be expanded fully, and in its absence governments risk a destabilising adverse selection problem.

Applying this argument to the case of Tanzania, striking disparities in the possession of birth certificates by income inequality provide initial descriptive support for the theory. Qualitative evidence on the costs faced by citizens in obtaining birth certificates – both today and historically – suggest that the poor face differentially higher hurdles to formal identification. Further descriptive evidence points to a relatively narrow set of public goods and services where birth certificates are needed. However, precisely the determinants of selection into birth registration make the credible identification of its regressive returns difficult. To obviate this, I leverage a natural experiment stemming from the 1966 legal reform making birth registration compulsory in a set of Tanzania's districts. These districts are richer and denser, consistent with governments maximising the expected returns to civil registration. With strong evidence, in a difference-in-differences design, suggesting a robust causal effect of the reform on possessing a birth certificate today, I find these compliers to be born into relatively more educated families. For this complier group, the economic returns to birth registration are narrowly targeted but substantial: with

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[16]The section on attitudes towards governance was only asked to a subset of the overall NPS sample, which is why the number of observations is lower here.

causal evidence on English literacy, formal employment, urban residence, and possession of a bank account. It is precisely this relatively elite complier group that the government seeks to register first, and in turn they pay more tax. The pattern of identified results shows that formal identification has meaningful returns for this subpopulation.

In so doing, this paper draws on literatures from state-building, African politics, demography and public health to articulate the underlying distributive, political dynamics of civil registration. Both theory and empirics have implications for policy. The results provide perhaps the first credibly identified empirics on the causal impact of formal identification on individual-level social and economic outcomes – perhaps surprising, given the tremendous amount of effort dedicated to boosting registration rates in the international community. While limited to a particular institutional context, they suggest a focus on the regressivity of the returns to formal identification is needed to understand the determinants of its expansion. The theory has broader implications for the rollout of novel biometric identification systems across much of the developing world. By focusing on the strategic citizen-level decision to acquire formal identification, attempting to universally enroll citizens may induce an adverse selection of the poor into legibility unless there are sufficiently credible returns for the wealthy to enroll as well. An increased focus on these distributive dynamics is crucial for understanding the potential political economic impact of registering the world's poor.

9 Tables

Table 1: First stage (NPS)

	(1)	(2)	(3)	(4)	(5)	(6)
Treat	0.085***	0.099***	0.098***	0.077***	0.085***	0.064
	(0.018)	(0.019)	(0.034)	(0.020)	(0.019)	(0.039)
Lead 1				0.012	0.016	0.015
				(0.025)	(0.026)	(0.027)
Lead 2				0.026	0.025	0.028
				(0.031)	(0.030)	(0.030)
Lead 3				-0.053	-0.051	-0.054
				(0.036)	(0.036)	(0.036)
Lead 4				0.027	0.028	0.031
				(0.033)	(0.033)	(0.033)
Lead 5				0.006	0.002	0.002
				(0.023)	(0.023)	(0.024)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.164	0.164	0.164	0.164	0.164	0.164
Observations	17573	17573	17573	17572	17572	17572

Outcome variable is whether respondent has a birth certificate.

All specifications are estimated using OLS and include district of birth and year of birth fixed effects. Treatment is defined as being born in after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 2: Complier characteristics

Variable	Population mean (1)	Complier mean (2)	Ratio (3)
Ever educated (mother)	0.465	0.571	1.229
Ever educated (father)	0.670	0.951	1.420
Completed primary (mother)	0.455	0.883	1.942
Completed primary (father)	0.509	0.904	1.774
Completed secondary (mother)	0.035	0.141	3.992
Completed secondary (father)	0.074	0.260	3.494
Completed university (either)	0.017	0.028	1.670

Column 1 is mean for each (binary) variable in the full dataset. Column 2 is the kappa-weighted mean for each variable for the complier subgroup. Column 3 is the ratio of Column 2 to Column 1, simply given by the ratio of the first stage coefficient for each subgroup divided by the overall first stage estimated by Equation 1.
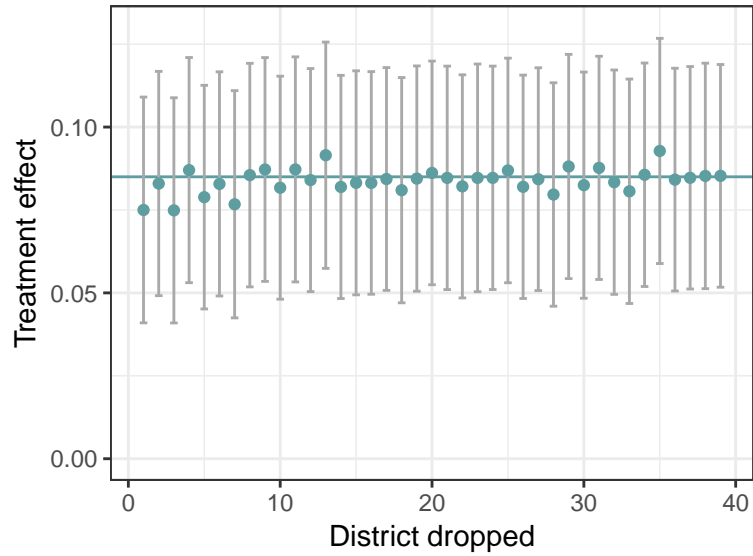
Figure 4: Sequentially setting treated districts to be untreated

Table 3: First stage robustness

	(1)	(2)	(3)	(4)	(5)	(6)
Treat	0.091***	0.084***	0.088***	0.091***	0.099***	0.043***
	(0.019)	(0.018)	(0.031)	(0.028)	(0.030)	(0.11)
Controls	No	Yes	No	No	No	No
Modified FE	Unchanged	Unchanged	Current district	Current ward	Household	Unchanged
Dataset	NPS Adults	NPS	NPS	NPS	NPS	Census
Outcome mean	0.150	0.165	0.164	0.164	0.164	0.132
Observations	8671	17430	17573	17573	17573	4331868

Outcome variable is whether respondent has a birth certificate. Column 1 restricts to individuals 18 or over. Column 2 adds individual controls for gender, mother alive, father alive, mother education, father education. Column 3 uses year of birth and current district fixed effects. Column 4 uses year of birth and current ward fixed effects. Column 5 uses year of birth and household fixed effects. Column 6 uses the baseline specification on the IPUMS 10% extract of the 2012 Census.

All specifications are estimated using OLS and include district of birth and year of birth fixed effects. Treatment is defined as being born in after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 4: First stage placebo outcomes

	(1)	(2)	(3)	(4)	(5)
Treat	0.021	-0.005	-0.003	-0.021	0.031
	(0.021)	(0.020)	(0.025)	(0.023)	(0.029)
Outcome mean	0.483	0.289	0.190	0.509	0.455
Observations	17573	17434	17432	17572	17573

Outcome variables: (1) is male (2) father is dead (3) mother is dead (4) father has primary education (5) mother has primary education.

All specifications are estimated using OLS and include district of birth and year of birth fixed effects. Treatment is defined as being born in after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 5: Education outcomes (NPS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. OLS							
Birth certificate	0.119***	0.191***	0.085***	-0.609***	0.015*	0.082***	0.013***
	(0.008)	(0.012)	(0.007)	(0.049)	(0.009)	(0.006)	(0.002)
B. Reduced form							
Treat	-0.002	0.035**	-0.011	-0.106	-0.013	0.004	-0.003
	(0.027)	(0.015)	(0.036)	(0.148)	(0.028)	(0.014)	(0.004)
C. 2SLS							
Birth certificate	-0.020	0.411**	-0.132	-1.115	-0.157	0.049	-0.031
	(0.319)	(0.185)	(0.422)	(1.541)	(0.332)	(0.161)	(0.048)
Outcome mean	0.589	0.099	0.670	8.058	0.292	0.038	0.003
Observations	17573	17573	17573	11760	17573	17573	17573

Outcome variables: (1) is literate, (2) is literate in English, (3) has had any education (4) age of school entry (5) primary educated (6) secondary educated (7) university educated.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 6: Employment outcomes (NPS)

	(1)	(2)	(3)	(4)	(5)
A. OLS					
Birth certificate	-0.137***	0.029***	0.040***	0.007	0.075***
	(0.017)	(0.005)	(0.005)	(0.005)	(0.008)
B. Reduced Form					
Treat	-0.014	0.027**	0.000	0.006	0.042**
	(0.033)	(0.010)	(0.012)	(0.008)	(0.016)
C. 2SLS					
Birth certificate	-0.162	0.313**	0.000	0.070	0.495**
	(0.389)	(0.125)	(0.136)	(0.098)	(0.193)
Outcome mean	0.300	0.041	0.017	0.026	0.070
Observations	17573	17573	17573	17573	17573

Outcome variables: (1) works in agriculture, (2) works in private sector, (3) works for the government (4) is unemployed (5) is a paid employee.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 7: Health outcomes (NPS)

	(1)	(2)	(3)	(4)	(5)
A. OLS					
Birth certificate	0.039***	0.017**	0.010**	-0.094***	0.025***
	(0.009)	(0.008)	(0.005)	(0.015)	(0.008)
B. Reduced Form					
Treat	-0.002	-0.022	-0.015*	-0.049*	-0.019
	(0.021)	(0.016)	(0.009)	(0.030)	(0.015)
C. 2SLS					
Birth certificate	-0.021	-0.257	-0.179	-0.582	-0.224
	(0.249)	(0.185)	(0.111)	(0.371)	(0.185)
Outcome mean	0.158	0.102	0.042	0.480	0.107
Observations	17573	17573	17573	17573	17573

Outcome variables: (1) visited a hospital in last year, (2) visited a government hospital, (3) healthcare financed for free (4) received free bednet (5) used a medical exemption.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 8: Migration outcomes (NPS)

	(1)	(2)	(3)	(4)	(5)	(6)
A. OLS						
Birth certificate	0.165***	0.128***	0.039***	0.048***	-0.003	0.013
	(0.018)	(0.019)	(0.007)	(0.006)	(0.004)	(0.008)
B. Reduced form						
Treat	0.090***	0.049	-0.010	0.005	0.008	0.025
	(0.030)	(0.031)	(0.022)	(0.012)	(0.013)	(0.017)
C. 2SLS						
Birth certificate	1.068***	0.581	-0.122	0.058	0.091	0.292
	(0.333)	(0.368)	(0.256)	(0.141)	(0.152)	(0.198)
Outcome mean	0.307	0.211	0.076	0.026	0.043	0.099
Observations	17573	17573	17573	17573	17573	17573

Outcome variables: (1) lives in an urban locality (2) lives in a different district to district of birth (3) moved district for services (4) moved district for work (5) moved district for marriage (6) moved district for family.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 9: Finance outcomes (NPS)

	(1)	(2)
A. OLS		
Birth certificate	0.101***	0.262***
	(0.018)	(0.020)
B. Reduced Form		
Treat	0.017	0.040*
	(0.016)	(0.021)
B. 2SLS		
Birth certificate	0.209	0.477**
	(0.186)	(0.244)
Outcome mean	0.147	0.217
Observations	17558	17558

Outcome variables: (1) someone in household has mobile money (2) someone in household has a bank account.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 10: Tax outcomes (NPS)

	(1)	(2)	(3)	(4)
A. OLS				
Birth certificate	0.029***	0.312***	0.078***	0.837***
	(0.007)	(0.074)	(0.013)	(0.145)
B. Reduced Form				
Treat	0.019**	0.205**	-0.002	-0.053
	(0.008)	(0.088)	(0.012)	(0.135)
B. 2SLS				
Birth certificate	0.229**	2.424**	-0.030	-0.631
	(0.099)	(1.017)	(0.144)	(1.598)
Outcome mean	0.023	0.241	0.062	0.666
Observations	17563	17573	17564	17573

Outcome variables: (1) paid council tax last year (2) log amount of council tax paid (3) paid income tax last year (4) log amount of income tax paid.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

Table 11: Government outcomes (NPS)

	(1)	(2)	(3)	(4)	(5)	(6)
	Local government			**MP**		
A. OLS						
Birth certificate	-0.076***	-0.075***	0.066***	-0.017	-0.039	0.020
	(0.021)	(0.023)	(0.021)	(0.031)	(0.036)	(0.030)
B. Reduced Form						
Treat	-0.057*	-0.065**	0.065**	-0.074*	-0.039	0.025
	(0.034)	(0.027)	(0.029)	(0.043)	(0.042)	(0.041)
B. 2SLS						
Birth certificate	-0.707	-0.818**	0.808**	-0.908	-0.486	0.314
	(0.481)	(0.393)	(0.395)	(0.621)	(0.539)	(0.498)
Outcome mean	0.441	0.532	0.344	0.376	0.484	0.345
Observations	3372	3372	3372	3373	3373	3373

Outcome variables: (1) has contacted local government (2) approves of local government (3) does not know local government competence (4) has contacted MP (5) approves of MP (6) does not know MP competence.

OLS specifications include district of birth and year of birth fixed effects as per Equation **??**. Reduced form specifications are estimated using OLS and include district of birth and year of birth fixed effects as per Equation 1. IV specifications are estimated using 2SLS where possession of a birth certificate is instrumented by treatment as per Equation 2, which has a first stage F-statistic of 24.5. Treatment is defined as being born after 1966 in one of the reform districts. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the district of birth-level in parentheses.

A Appendix

A.1   Legal history of compulsory birth registration in Tanzania

The legal framework for birth registration in Tanzania is provided through Chapter 108 of the Tanzanian legal code. Chapter 108, the Birth and Death Registration Act, was originally passed in 1920 and came into force on 1 April, 1921. The act has been repeatedly amended since then. No provision for the compulsory registration of any births was made until 1949, when the *Births (Non-Native Compulsory Registration) Order* amended Section 26 of the act to read:

> "The registration of the birth of a child shall be compulsory if either one or both parents are of European or American origin or descent or, in the case of a child born out of wedlock and not recognised by its father, if the mother is of European or American origin or descent."

The registration of Tanzanians across the country remained voluntary. In 1962 the act was amended as per Government Notice (G.N.) 478/62[17] to state the following in Section 28:

> "The Minister may, by order published in the Gazette, extend, from a date to be named in the order, the provisions of this Act relating to the compulsory registration of births and deaths to all persons in Tanzania of any particular race, class, tribe or other group, or to all or some of the inhabitants of any particular town, district, or other area, and from and after the said date the registration of births and deaths shall, in such cases, be compulsory instead of being optional."

Applying this amendment, the provisions relating to compulsory registration were first extended to the districts comprising Dar es Salaam. Under G.N. 58/66, published 9 February 1966, the *The Births and Deaths Registration (Dar es Salaam Municipality) Order*, the registration at birth of all individuals born after 1 March 1966 was made compulsory. Compulsory registration was then extended to a further set of districts under G.N. 175/66 published on 11 June 1966, the *The Births and Deaths (Compulsory Registration) Order*, to all individuals born in those districts after 1 July 1966. These districts are listed in the order as Arusha, Bukoba, Dodoma, Iringa, Kigoma, Lindi, Mbeya, Morogoro, Moshi, Mtwara, Musoma, Mwanza, Tabora, and Tanga[18].

This extension of compulsory registration was accompanied by changes to the price of registering births under G.N. 275 on 18 September 1966, the *The Registration of Births and Deaths (Amendment) Rules*. Under this notice, the cost of registration for individuals born *either* in a district without compulsory registration *or* before the date when registration became compulsory in a given district were set at 5 TSh for individuals under 5 years, 10 TSh for individuals between five and ten years old, and 30 TSh

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[17]I follow the standardized syntax of the *African Law Digest* where the initial digits reflect the relevant Government Notice number in a given year and the final two digits reflect the year.

[18]Some sources suggest that birth registration was made compulsory in Tanga in 1952 and Arusha in 1956. However, inspection of the relevant Government Gazettes suggests that this was through amendments to the *Registration of Persons Ordinance* under G.N. 348 to 353 of 1952 which required certain population groups to obtain identity cards rather than through birth registration.

for individuals above 10 years. For those individuals born in *after* registration had become compulsory in a given district, the cost of registration was 5 TSh for individuals registered within three months of birth and 30 TSh for individuals registered more than three months after their birth. 30 TSh was equal to approximately $4 in 1966 and approximately $33 today[19].

Compulsory birth registration was not extended to any more districts until 1981, under the decentralized reforms discussed in the paper. This sequence of extending compulsory registration comprised the *Births and Deaths Registration (Kinondoni, Ilala, Temeke, Bagamoyo and Moshi Rural District) Order* (1981), the *Births and Deaths Registration (Morogoro Rural District) Order* (1982), the *Births and Deaths Registration (Specified Districts) Order* (1982), the *Births and Deaths Registration (Specified Districts) Order* (1986), the *Births and Deaths Registration (Specified Districts) Order* (1988), the *The Births and Deaths (Compulsory Registration) Order* (1994) and the *Births and Deaths Registration (Mufindi District) Order* (1996)[20].

Even after these reforms birth registration remained voluntary in a substantial amount of the country. Birth registration became *de facto* compulsory for all births in 2002 under the UNICEF-sponsored *Compulsory Registration Programme* (Registrar General's Office, 2005). However, the law to enforce compulsory birth registration across the whole country was only finally amended under the *Written Laws (Miscellaneous Amendments) Act* of 2009. This amendment changed Section 26 of the act to read:

> "The registration of birth and death shall be compulsory."

Regarding punishments for violation, Section 29 of the act states that:

> "Any person who, being under an obligation to register the birth or death of any person, refuses to register or to state any of the prescribed particulars, shall be guilty of an offence and shall be liable on conviction to a fine not exceeding five hundred shillings or to imprisonment for a term not exceeding one month, or to both such fine and imprisonment..."

In Figure A1 I plot this sequential expansion of compulsory birth registration across the districts of mainland Tanzania from 1950 to 2018. I plot the cumulative share of districts where birth registration was compulsory in a given year, demonstrating the remarkably staggered expansion of compulsory regulations.

A.2 Evidence on 1980s reforms

In this section I provide descriptive evidence on the reforms to birth registration that took place in the 1980s. Following a UN Mission to discuss progress relating to the 1978 Census, the improvement of civil registration across the country was identified as a key issue. This was codified under project URT/79/P05 "Reorganization and Expansion of the Civil Registration System" by UNFPA. Four districts were initially

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[19]U.S. Treasury (1966) cites an exchange rate of 7.133 TSh per USD on 30 September 1966.

[20]It should be noted that some districts listed in the 1966 reforms are also listed in this later wave. This is because some of the districts where birth registration was made compulsory in 1966 were used in the pilots of the decentralized system of the 1980s. In any such cases, I use the first date where a district has Section 26 of the law applied to it.
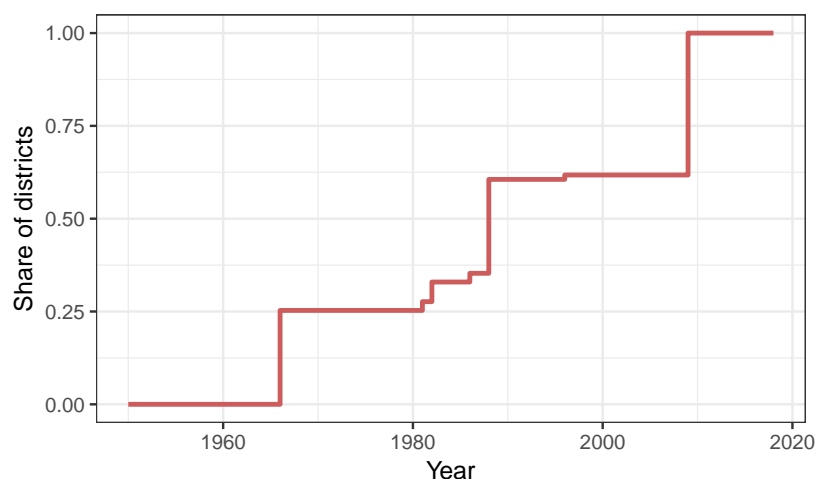
Figure A1: Expansion of compulsory registration across districts over time

selected in 1981, with an initial plan to expand the reform to an additional 21 randomly-selected districts (UNFPA, 1983). Due to resource constraints, the expansion was reduced first to eight additional districts and eventually to just four. These districts, according to a later evaluation of the UNFPA Tanzania country programme, were specifically chosen on the basis of their birth registration rates and their ease of accessibility (Edouard, 1987; Padmanabha, 1993). Accordingly, difference-in-differences estimates of the impact of these reforms on the probability of registration provide evidence of non-parallel pre-trends.

At the core of these reforms was the decentralization of administration which had been proposed in the early 1970s (Wood, 1971). Specifically, responsibility for the registration of births was assigned to 'ten-cell leaders' in a given community:

> "Registration of births and deaths will be re-organised such that the registration process starts at village level. In villages with village governments, the village managers will be appointed registration officers." (**?**)

Compliance with these new responsibilities, however, was limited – one progress report pointed to the "reluctance of village managers and village secretaries to complete registration forms as they do not consider such function as being part of their duties." (UNFPA, 1982). Additionally, relatively fewer citizens in the more rural districts affected by the reforms were aware of the need to register, nor the uses of registration. This was facilitated by limited publicity or informational campaigns around the project along with high rates of personnel turnover (Edouard, 1987).

As a result of these challenges, reports indicated that "a sharp decline in the number of registered events was evident in all project areas in 1983 when compared with the number of events in 1982" (UNFPA, 1982). The project effectively ended in 1987 and saw little improvement during that time. From 1987, in the midst of a deep recession, the government expanded compulsory registration to a large set of additional districts under G.N. 842/88 with little effect. A 1993 review concluded that "A review of the implementation of the project would support the view that it has not made a significant impact on

the system" (Padmanabha, 1993).

A.3 Administration of birth registration

The description of birth registration processes provided here applies to the years preceding 2012, when major reforms to the administration of civil registration under the Registration and Insolvency Trusteeship Authority (RITA) with substantial involvement of UNICEF. At the central government level, a Registrar General was appointed ultimately responsible for birth registration across the country. In each district a District Registrar was appointed either by district leaders or by the central government. These registrars were responsible for keeping a register of all births registered in their district.

For majority of the period under study, birth registration was a three-step process involving notification, registration and certification. If born in a health facility, health workers were responsible for issuing a notification of birth to parents. If born outside a health facility, village executive officers (VEOs) had this responsibility. After receiving the notification, individuals had to travel from their place of birth to their district administrative capital to initially register the birth using the notification document. Then at least one more trip was required, several weeks later, to collect the certificate.

Citizens registered within 90 days of birth paid 3,500 Tanzanian shillings (TSh), those registered between 90 days and 10 years paid 4,000 TSh, and those above 10 years paid 10,000 TSh. These direct costs were added to the substantial time and financial costs incurred by repeated travel to district capitals. In the absence of birth notification forms, obtaining a birth certificate was only possible through the administrative intervention of the VEO of the individual's village of birth affirming that a given individual was born there at a particular time.

Act 11 of 1976 added a new Section 21 to specify the procedure for obtaining a birth certificate more than five years after birth. Among other requirements, individuals seeking birth certificates had to:

- Report details to the Branch Executive Committee of the Party which has jurisdiction over the area where the birth took place and obtain a written certification that the Committee confirms.

- Apply and obtain a declaration from a Resident Magistrate that the details of birth are correct.

- Accept an investigation by the Branch Executive Committee into the details of birth.

- Submit a copy of all documents and affadavits to the Registrar-General in Dar es Salaam who is expected to cross-examine relevant evidence.

- Pay the fees prescribed above along with all associated court fees.

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