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Human Development without Democratic Accountability: How Regressive Taxation Contributes to Human Development through State Capacity*

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Abstract

State revenue production since the third wave of democratization contrasts sharply with the experiences of the first and second waves of democratization. The late democratizers tend to adopt and raise revenue from a regressive tax on consumption (the value-added tax: VAT), which is more compatible with economic development in global markets but is considered as unequal taxation. How does the weak redistributive (i.e., regressive) effect of this form of taxation affect the welfare of people? We build on conventional wisdom that democratic accountability through multiparty contestation improves human development. Focused on taxation, we argue that an increasing state financial capacity contributes to an increase in human development, even when electoral contestation is absent. Empirical analyses employed a reduction in infant mortality as an indicator for the improvement of human development and demonstrate the counter-intuitive effect of the VAT on human development. Despite the effect of weak redistribution, the VAT contributes to human development in countries with less democratic accountability. The results also show that the state's financial capacity to secure tax compliance, rather than a mere increase in tax revenue, intervenes critically in such development in countries since the third wave. We conclude that the increased state financial capacity with regressive taxation is expected to promote human development in newly emerging democratic states.

Introduction

Human development depends largely on the distribution of public services. In particular, how much services are distributed, how effective the distribution is, and how they are distributed are key in affecting human development (Hanson, 2015). According to previous studies, both democracy and state capacity are expected to positively affect these three aspects of the distribution and thus promote human development. The theoretical expectations are, in fact, confirmed by empirical analyses (Gerring et al, 2012; McGuire, 2010 for democracy; and Hanson, 2015 for state capacity).

However, the literature fails to examine another important variable as a possible correlate of human development that affects all three aspects of the government's distribution: taxation. The level of government revenue, the effective extraction and distribution of revenue, and the degree of distribution are all related to taxation. This strong association with the distribution of public services by the government implies that taxation should also affect human development. Yet, we know little about the relationship between taxation and human development. This paper provides a novel theoretical argument about the relationship between taxation and human development and conducts systematic quantitative analyses.

The focus on taxation is particularly relevant in the contemporary world because the value-added tax (VAT), instead of an income tax, has played a critical role in financing the emerging contemporary state (Bird and Gendron 2007; Bräutigam, Fjeldstad and Moore

2008; Kato and Tanaka, 2018). Unlike progressive income taxation, regressive taxation on consumption (i.e., the VAT) facilitates economic adjustments in developing economies, but it applies a flat-rate, i.e., a regressive levy. Thus, it is considered to hinder socioeconomic equality together with the absence of effective progressive taxation (for example, see Bräutigam, Fjeldstad, and Moore 2008; Corbacho, Cibils, and Lora 2013).[1] In this sense, the introduction of regressive taxation can possibly increase the level of socioeconomic inequality in society, thereby directly and indirectly hurting or stagnating human development, in particular for the poor.[2]

However, by closely examining the impact of regressive taxation on human development, this paper argues that the VAT improves human development through increasing state financial capacity. Consistent with Hanson (2015), we claim that state capacity contributes to the improvement of human development. However, this paper provides a more detailed mechanism that begins with regressive taxation. The introduction of the VAT enhances state capacity and thereby improves human development. The VAT can increase the capacity to raise revenue for human development as well as increase tax compliance, which, in turn, makes the state apparatus more effective in distributing resources.

Focusing on infant mortality, which the existing literature considers one of the primary proxies for human development, this study conducts a time-series, cross-national analysis and examines whether and how regressive taxation affects human development in the contemporary world. Our focus on regressive taxation and state capacity qualifies the conventional wisdom about the association between human development and democratic accountability (Gerring et al., 2016; McGuire, 2010). More specifically, the analysis explores an interaction between democratic accountability and regressive taxation and provides a novel finding: even when democratic accountability is low, the introduction of regressive taxation can improve human development through enhancing state capacity. In other words, in autocracies without electoral contestation, we find that the VAT contributes to decreasing infant mortality. However, when a country enjoys high democratic accountability, as the existing studies expect (e.g., Gerring et al., 2016), electoral contestation decreases infant mortality and furthers human development, whereas the VAT has a negligible, albeit positive, effect on infant mortality. This suggests that the introduction of regressive taxation can generally improve human development through state financial capacity, but the size of its effect hinges on the presence and absence of democratic accountability.

To explore more detailed causal mechanisms through which the VAT promotes human development, we also disaggregate state financial capacity into those that raise revenue and those that secure compliance. Using a mediation analysis, our empirical analyses find that the state financial capacity to secure compliance rather than its capacity to raise revenue critically intervenes in the effect of the VAT on human development. This indicates that the strength of the VAT lies in ensuring that the state regulates markets, thereby making the state apparatus more effective.

Recent literature has renewed an interest in the role of taxation in democratization and examined how differences in who pays how much are associated with different paths of democracy (Baskaran, 2014; Timmons, 2010; Kato and Tanaka, 2018). In particular, Kato and Tanaka (2018) find that regressive taxation goes hand-in-hand with contemporary democratization: the VAT, which was introduced under autocracies, is a critical correlate of democratization since the third wave. Taken together with this finding, this paper ultimately suggests that regressive taxation not only promotes human development in autocracies in the short-term, but can also contribute to people's welfare in the long-run by increasing the likelihood of a democratic transition over time.

Human development, democracy, and the VAT

Democracy is the most popular correlate of human development (Sen, 1999) and, among a variety of aspects of a democratic institution, electoral accountability has a strong, positive impact (Gerring et al., 2016; Miller, 2015).[3] However, Hanson finds that a state's capacity, independent from democracy, improves human development (Hanson, 2015).[4] Taxation is considered a critical part of a state's capacity, and state capacity is often defined as "the ability of the state to dominate, i.e., coax compliant behavior, from the individuals of a given territory and operationalized as tax compliance" (Ottervik, 2013). Taxation also shares its historical origin with the legal capacity to support and regulate market institutions (Besley and Persson, 2009). Drawing on the recent literature but with a focus on taxation, this study closely examines a state's financial capacity and qualifies the view that democratic accountability is a primary correlate of human development. This section derives three novel hypotheses about the relationship between regressive taxation and human development in the contemporary world.

Today, most developing countries adopt the VAT without introducing progressive taxation (Kato and Tanaka, 2018). The reliance on revenue from a regressive VAT rather than from income taxation has often been considered an obstacle to reducing inequality (Swank, 2016; Genschel and Seelkopf, 2016; Gemmell and Morrissey, 2005).[5] A state financed solely by regressive taxation questions whether such countries are able to advance socioeconomic equality, which leads to a concern that regressive taxation may hurt human development, in particular, for the poor.

However, the VAT can increase state capacity, which is considered critical in human development (Hanson, 2015), thereby effectively allowing the government to pay for advancing human development. The VAT can contribute to an increase in state capacity with its revenue-increasing and compliance-enhancing features. First, many studies concur that the VAT, if implemented with a wide tax base, contributes to increased government revenues (Aizenman ad Jinjarak, 2009; Bird and Gendron, 2006; Keen and Lockwood, 2010; Rakner and Gloppen, 2003; Cnossen 2015). At the same time, the VAT is expected to increase compliance by businesses with the government, thereby making the state apparatus more effective. From this, we derive that, all else being equal, the VAT enhances state financial capacity and thus contributes to human development.

But the VAT's impact on human development has important scope conditions, because an historical contingency affects the relationship between taxation, democracy, and human development. More specifically, although they have recently adopted regressive taxation as well, early democratizers (1st and 2nd wave democratizers) relied on progressive taxation, which can lead to more revenue and more redistribution than regressive taxation, (Kato 2003; Kato and Toyofuku 2018). At the same time, such early democratizers already had strong state capacity through past wars (Scheve and Stasavage 2010; Tilly, 1990). In addition, many comparative studies find that regardless of the timing in democratization, democratic accountability, rather than the state capacity, generally improves human development (Gerring et al., 2016). In light of these studies, we may observe the VAT's greater effect on contemporary autocratic countries where democratic accountability is low and citizens cannot effectively demand public services that are key for human development. In other words, the relative effect of the VAT is conditional on the level of democratic accountability, and the VAT becomes more crucial for autocracies in improving human development.[6]

In sum, the introduction of the VAT generally increases revenue and/or improves government effectiveness, thereby contributing to human development, but its contribution to human development is expectedly mitigated by democratic accountability. Table 1 summarizes the main expectations based on the VAT's introduction and regime type. Concurring with the existing views on the pervasive effect of democracy on human development, we expect democratic accountability, regardless of the presence or absence of the VAT, to improve human development. But we argue that regardless of regime type, the VAT can ameliorate human development by strengthening state capacity. The most important expectation for our study among four outcomes is found in autocracies without electoral accountability. We expect that the VAT has the most positive impact on human development in that combination. From the discussion, we summarize the main hypothesis as follows:

HYPOTHESIS 1: The relative impact of the VAT on human development is greater when democratic accountability is lower.

[Table 1 about here]

We also examine why the VAT contributes to human development. We maintain that the VAT enhances state financial capacity through distinct channels: (1) the state's capacity to raise revenue to provide a financial source for human development; and (2) its capacity to increase tax compliance to make a more effective state apparatus. The capacities to raise tax revenue and secure tax compliance are certainly correlated, i.e., an increase in tax compliance more likely results in larger revenues. However, they are not identical, because the government's enforcement of tax compliance also requires a strong hand to regulate the economy. To focus on the first aspect of the state's financial capacity, we hypothesize that the introduction of the VAT results in human development through increased revenue.[7] The hypothesis focused on revenue-raising is thus:

HYPOTHESIS 2: A *state's financial capacity* to raise revenue intervenes in the *VAT's* impact on human development.

While contributing to greater revenue for developing countries, the VAT also serves to enhance tax compliance by businesses and traders. Unlike a direct tax (an income tax), which requires citizens to file taxes, the VAT is an indirect tax, which requires consumers to pay taxes but asks trading businesses to file tax returns only. In principle, all industries and enterprises must comply with filing a flat rate tax on all stages of transactions in the VAT system (Pomeranz, 2015). This new tax-filing obligation facilitates the government's tax enforcement and compliance effectively in developing economies that have large, informal sectors.[8] The VAT encourages businesses to abandon a shadow economy and contribute to rationalizing and modernizing developing economies. Increasing compliance in growing economies accompanies a strong hand to regulate domestic markets and rationalize economic activities, thereby generally making the state apparatus more effective in providing public services. We thus derive the following hypothesis:

HYPOTHESIS 3: *A state's capacity to ensure the compliance of tax payers intervenes in the VAT's impact on human development.*

Empirical Analyses

Data

We test the effect of the introduction of the VAT on human development with a cross-national, time-series dataset that includes 170 countries and covers the period between 1970 and 2007. Building on previous studies that focus on the relationship between democracy and human development, we compiled a dataset based on the Varieties of Democracy (V-Dem, version 6.2) database (Coppedge et al., 2016). The novelty of our analysis is that it examines how taxation affects human development through the formation of state financial capacity after the introduction of VAT. For this purpose, we add VAT-related variables to the analysis.

Following the existing literature (Gerring et al., 2016; Miller, 2015; Ross, 2006), we focus on the infant mortality rate as a dependent variable, which is measured as the number of deaths prior to age one per 1,000 live births in a year. The infant mortality data come originally from Gapminder, and missing values were imputed (see also Ross 2006 on the impact of missing values). We take the logarithm of the infant mortality rate to factor in the variable's diminishing return characteristics. Other human development measures are also available, but the infant mortality measure is better for the following three reasons. First, the variable has fewer measurement error issues, because the definition and operationalization are relatively clear compared with other popular measures, such as education variables.[9] Further, compared to composite indices, such as the Human Development Index, infant mortality rates do not have to deal with aggregation problems (see also Munck and Verkuilen, 2002). Finally, infant mortality rates usually have strong temporal and spatial coverage, partly because the data collection process can go backward in time (Riley, 2005).

The independent variable is the VAT introduction, which is coded 1 in the subsequent years after the introduction of the VAT and 0 otherwise. The variable is a reasonable proxy to test our argument when reliable revenue data of the VAT in the third wave countries are not available. Although the variable may be an indirect measure of the impact of the VAT, once introduced, the VAT has generally ensured that developing countries extract much larger revenues from consumption than before its introduction (Bird and Gendron, 2007b; Gillis, 1989; Gordon, 2010a). The introduction of the VAT is considered to capture the fiscal contribution of the VAT. We also construct a VAT (%GDP) variable as our secondary measure. This variable represents consumption tax revenue after the VAT was introduced.[10] Without reliable revenue data for the VAT, this variable is a reasonable alternative, because once adopted, the VAT constitutes most of the consumption tax revenue of the state. However, this variable still includes a large number of missing values and is thus used for a robustness check for the main analysis with the VAT introduction variable.

To represent the impact of electoral accountability, we use the Multiplicative Electoral Democracy Index (MEDI), which the literature uses to capture electoral accountability and contribute to a decline in the infant mortality rate (Gerring et al., 2016; Miller, 2015). The MEDI variable is constructed based on five components: clean elections, election of a chief executive, extensive suffrage, freedom of association, and freedom of expression (Gerring et al., 2016).[11] According to Gerring et al. (2016:16), the "index draws on indicators that tap into the institutional procedures" of polyarchy by Dahl (1989), including "the extent of responsiveness and accountability between leaders and citizens through the mechanism of competitive elections." As an alternative measure, we also use Unified Democracy Scores (UDS) (Pemstein et al., 2010). The UDS variable is constructed by using a Bayesian latent variable model with existing measures of democracy. We use an interaction term of the MEDI with the VAT introduction to examine our hypothesis about the different impacts of the VAT on human development, depending on the level of democracy (Hypothesis 1).

The analysis also includes all the covariates employed in the analyses of Gerring et al. (2016) and several additional variables that may affect both infant mortality and the introduction of the VAT. These potential confounders are: GDP per capita, GDP growth, urbanization, fertility rate, internal and external conflicts, corruption, and resource abundance. All the covariates come from the V-Dem database. See Table 2 for summary statistics.

[Table 2 about here]

Design

Our main specification is the following fixed effect models:

$$y_{it} = \alpha x_{it-1} + \beta z_{it-1} + \delta_i + \gamma_t + \upsilon_{it}$$

where y_{it} is the logarithm of infant mortality rate in country i at time t, and x_{it-1} is the VAT introduction in country i at time t-1. z_{it-1} is a vector of covariates. Following previous studies (Gerring et al., 2016; Ross, 2006), we also include country-fixed effects δ_i and year-fixed effects γ_t to control for unobserved country-specific factors and common shocks.[12] Finally, to control for the persistent nature of infant mortality, we also include a lagged dependent variable.[13]

Results

Table 3 reports our main result. Model 1 uses the VAT (%GDP) variable, and we find that as tax revenue increases after the VAT introduction, infant mortality rates tend to decrease. Model 2 employs the VAT introduction variable instead of the VAT (%GDP) variable, and we find results similar to those in Model 1, even when we control for time-invariant, unobserved heterogeneity across countries. This suggests that the VAT, once introduced, generally improves human development measured by infant mortality.

[Table 3 about here]

Model 3 adds an interaction term to Model 2 between the VAT introduction and MEDI variables and examines whether the effect of the VAT on human development varies, depending on the level of electoral accountability (Hypothesis 1). First, the result shows that the main effects of the interaction model are both negative (statistically significant, at least at the 5% level). This indicates that both the VAT and electoral accountability have an independent effect on a decline in infant mortality rates, which is consistent with our expectation. Second, we find that the interaction term is statistically significant, but the sign of the coefficient is positive. To see the interaction effect visually, we plot predicted probabilities of infant mortality rates based on the VAT introduction and MEDI variables (based on Model 2 of Table 3). Figure 1 shows a clear interaction effect: when electoral accountability is low, the VAT has a significant, negative impact on infant mortality, but, as accountability improves, the effect of the VAT diminishes, and the VAT loses a statistical significance in societies with a higher level of electoral accountability. In substantive terms, if a country introduces the VAT when the regime type is autocratic (defined here as when the MEDI is at the 25^{th} percentile), the probability of the infant mortality rate in a given year for observation decreases by 1.4%, with all other variables held at the mean values (based on Model 3).

The result above supports Hypothesis 1: the effect of the VAT on human development depends on the level of electoral accountability. First, high electoral accountability tends to decrease infant mortality as argued in Gerring et al. (2016). Second, in a society with low electoral accountability, the VAT can play a significant role in decreasing infant mortality rates. This novel finding, which is also complementary with previous studies of electoral accountability and human development, implies an alternative channel to improve human development. Thus it has a significant policy implication: policy makers can improve human development without relying on electoral accountability.

The results for covariates find that GDP growth contributes to decreased infant mortality, which is consistent with the development literature (Nishiyama, 2011).[14] The lagged dependent variable is positive and statistically significant, confirming the persistent nature of the variable and suggesting that the lagged dependent variable (t-1) accounts for some variation in the contemporaneous development variable (t).

Finally, as a robustness check, we employ a different democracy measure (UDS) instead of the MEDI variable and provide additional evidence for Hypothesis 1 (Table 4). Across all the models, results with the UDS variable (Table 4) are similar to those with the MEDI variable (Table 3), which suggests that the findings are not sensitive to particular democracy measures and specifications.

[Table 4 about here]

Mediation Analysis

Thus far, we find robust evidence that the VAT decreases infant mortality in a country with low electoral accountability. In this section, we further examine the causal mechanisms behind the relationship and how the VAT improves human capital without relying on electoral accountability. First, to measure the capacity for revenue-raising in Hypothesis 2, we use the Tax revenue variable, which represents the level of total tax revenue to capture the state's overall financial capacity to improve human development. The Tax revenue variable comes from the World Bank and employs the government's tax revenue as proportions of GDP.[15] For a state's capacity to ensure tax compliance (Hypothesis 3), we use the Shadow economy variable as a dependent variable. Although a state's capacity for compliance is considered an elusive concept (Mann, 1984; Soifer and vom Hau, 2008), recent studies regard Shadow economy as a reasonable measure for state capacity (Buehn and Schneider, 2012; Ottervik, 2013). The analysis operationalizes the Shadow economy variable using the size of the shadow economy relative to all legal economic activity.[16]

To examine the causal mechanisms proposed in Hypotheses 2 and 3, we employ a causal mediation analysis proposed by Imai, Keele and Tingley (2010) (See also Imai, Keele, Tingley and Yamamoto (2011)). The causal mediation analysis relies on a potential outcome framework to identify the indirect effects or average causal mediated effects (ACME). One first estimate models for the observed outcome and mediators and then simulates model parameters from the sampling distribution to compute the causal mediation effects in the second stage.

By using the Tax Revenue and Shadow economy variables as a mediator, we are interested in examining how the impact of the VAT on human development operates through increasing state capacity for revenue raising and tax compliance. Because the VAT, Tax Revenue, and Shadow economy variables are all observational variables, we include the same control variables as in Table 2. We use OLS for both the first and second stages of the analysis to estimate the effect of the VAT on the mediator and the effect of the VAT on infant mortality through state capacity. Because we are interested in the effect of the VAT in countries with low electoral accountability (refer to Figure 1), we limit the sample for autocratic countries by using the median cut-off of the MEDI variable. Finally, given the nature of causal mediation analysis, we transform our time-series data into cross-sectional data by aggregating all the variables. We use the latest value for infant mortality, which is our dependent variable, and the median values of each variable as a baseline.[17]

Table 5 shows the results of the causal mediation analysis. The top panel shows the estimates of the first stage, and the bottom panel reports the estimate of the indirect effect of the mediator ("ACME" on the table) as well as how much of the mediator accounts for the total effect of the VAT introduction ("% of Total via ACME" on the far right of the table). First, the top panel shows that the VAT introduction has a positive impact on tax revenue, but the relationship is not statistically significant at the 10% level. However, as expected, the VAT's introduction reduces the size of the shadow economy, and the effect is statistically significant at the 10% level. More important, the bottom panel shows the causal mechanisms – although the VAT does not affect human development through tax revenue, the VAT contributes to a decline in infant mortality by reducing the size of the shadow economy. The latter indirect effect through state capacity is statistically significant at the 10% level.[18] It also shows that the indirect effect accounts for 29.4% of the overall effect of the VAT on infant mortality. The result rejects Hypothesis 2 but is consistent with Hypothesis 3.

[Table 5 about here]

Although the analysis confirms that one of our hypothesized mechanisms is actually present, there are two potential concerns for the analysis that may affect our interpretation. First, because we aggregate our time-series data into a cross-sectional format, the analysis is subject to the researcher's arbitrary decision of how to transform the data. Second, given that a causal mediation analysis is better suited for an experimental design, our analysis may also be subject to certain omitted variable bias. Further, although observable covariates are included in the analysis for control, a mediation analysis involves the problem of possible reverse causality – countries with a larger shadow economy are more likely to introduce the VAT, thereby decreasing infant mortality. However, the possibility of the reverse causality is unlikely if we closely examine how the VAT is adopted in developing economies.[19] The strength of the VAT lies in its neutrality in economic activities, which is important for developing economies to adjust to global markets without interfering with economic development. Therefore, economic organizations, such as the IMF, have encouraged developing countries to adopt the VAT as a revenue-raising measure that is compatible with economic development. Although the VAT is expected to alleviate the adverse effects of informal sectors and this side-effect is regarded as desirable, its revenue-raising power is a driving force for the adoption of the VAT. The presence of a large shadow economy does not increase the possibility of the VAT introduction among developing and developed economies.

Autocracy and human development

We now move to a discussion of the implications of our findings to the literature of autocracy and human development. Although previous studies find a positive association between human development and democracy (Gerring et al., 2012; Gerring et al., 2016; Hanson, 2015; Ross, 2006), the recent literature argues that autocracies can also promote human development if contested elections contribute to increasing government accountability (Miller 2015).

However, our findings suggest that even with the absence of democratic pressure, autocrats can improve human development through the introduction of regressive taxation if they have an incentive to do so. Indeed, previous studies suggest that autocrats can sometimes promote the welfare of people for some strategic reasons, such as economic development and co-optation of opposition groups. In European history, for example, the authoritarian regime under Bismarck in Germany institutionalized social programs with limited political representation. Contemporary authoritarian regimes also distinguish between social programs on which to spend and which to avoid (Huber et al., 2008). Some autocrats also attempt to co-opt social groups that may become potential challengers to their own rule (Haber, 2007) and pursue a “collusive” strategy when implementing social policies (Mares and Carnes, 2009). This results in variation in non-democratic, welfare states and argues that regime type fails to predict social expenditures (Mares and Carnes, 2009). In terms of human development and specifically infant mortality, no significant difference is found between democracies and non-democracies (Dietrich and Bernhard 2016).

The existing literature has yet to examine the effect of state capacity on human development in autocratic countries.[20] One reason for the lack of research is the absence of an appropriate concept for state capacity that can be operationalized across regime types in empirical research (Ottervik, 2013). To close this gap, we focused on taxation and distinguished state financial capacity to ensure tax compliance from state capacity to raise tax revenue. Our results offer empirical support for the argument that regressive taxation, by increasing compliance with state taxation in society, can explain variation in human development in autocracies, even in the absence of democratic pressure.

Placing human development in tax-democratization linkages

The present study demonstrates that the state financial capacity with the VAT favorably affects human development in autocracies, but after regime transition, democratic accountability increases its importance at the expense of the regressive taxation. This conditional effect of the VAT in autocracies and democracies implies that there is a possible, long-run effect of regressive taxation on human development. This is the case in light of Kato and Tanaka (2018)'s quantitative study demonstrating that the introduction of the VAT increases the likelihood of democratization. If regressive taxation really induces democratization, then we can expect that state financial capacity with the VAT improves human development in autocracies (in the short run, which is our finding). Further, increased democratic accountability through regressive taxation also improves human development after a regime transition (in the long-run).[21] Building on the recent findings by Kato and Tanaka (2018), a cross-national comparison explores the long-term effect of the VAT on human development along with their tax-democratization linkage. For this purpose, we categorize both democracies and non-democracies by whether the state adopted the VAT as a revenue source under an autocracy, i.e., before democratic transition (Table 6). Each cell in Table 6 suggests potential paths for countries in terms of human development.

The first- and second-wave countries belong to the upper-right category of "democratization without the VAT introduction (under autocracy)," because they had no way to adopt the VAT under an autocracy. The VAT gave new life to modern consumption taxation in the 1950s after the two early waves consolidated their democratic regimes (see Kato and Toyofuku, 2018). Twenty-nine of the fifty-one countries in this category are stable democracies that belong to the first and second waves of democratizers. This category also includes some third-wave democratizers, such as the former socialist countries, which introduced the VAT immediately after regime transition.[22]

Most of the third wave of democratizers are included in the upper-left category (democratization with the VAT introduction (under autocracy)). In this category, twenty-nine countries were democratized within 9.8 years, on average, after the autocratic introduction of the VAT, and five autocratic countries showed clear signs of democratic transition.[23] Here, human development is expected to improve with the introduction of the VAT in autocracies, and with democratic accountability after regime transition in the long run as well.

Autocracies in the lower-right category, "no democratization without the VAT introduction," are extraneous cases. Resource-rich autocracies,[24] which could finance the state by rents from natural resources, account for the majority, i.e., thirteen out of thirty-one countries (41.9%).[25] In contrast, the cases in the lower-left category of "no democratization with the VAT introduction" pose a challenge. The absence of regime transition may plausibly nullify the positive impact of the VAT on human development under autocracies, because further improvement is not expected without an advance in democratic accountability in the long run. These countries, however, have shown a clear sign of regime transition. All but two of the forty countries that have not yet democratized 12.7 years (on average) after the VAT's introduction now show signs of democratization.[26] Therefore, a further improvement in human development is expected in non-democracies.

The VAT improves human development through increased state capacity to ensure tax compliance. However, when autocracies experience the instability of regime transition, reversion, and stagnation (please see also Figure 1), taxation can also improve human development indirectly by encouraging democratic transition. The tax-democratization linkage is confirmed in a cross-national examination and suggests that our result is consistent with the democratic effect on human development found in previous studies (Gerring et al. 2016).

Conclusion

This study argues and finds empirical evidence that the institutionalization of the VAT contributes to human development through enforcing tax compliance, even when the democratic pressure to serve the interests of citizens is absent. In other words, the presence of the VAT has a significant impact on decreasing infant mortality in autocracies with low electoral accountability, whereas higher accountability outweighs the impact of the VAT in democracies. This suggests that despite its regressive nature, the VAT facilitates rather than thwarts the welfare of the people living in autocracies that have been and are about to democratize since the third wave. A state's capacity to gain tax compliance intervenes critically in the improvement of human development in contemporary autocracies. Our comparative analysis of tax-democratization linkages further confirms that the role of the VAT in autocratic states complements the long-term effect of the state capacity on human development after a regime transition.

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[1] The taxation literature concurs that developing countries since the third wave have failed to implement progressive income taxes effectively (for example, see Bahl and Bird, 2008; Barreix, Garcimartin and Velayos, 2013; Bräutigam, Fjeldstad and Moore, 2008; Gordon, 2010a; Stiglitz, 2010).

[2] This statement assumes that there is little redistribution to the poor.

[4] This may refute the pessimistic view that democratic states support middle- and upper-income classes rather than the poor (Ross, 2006).

[5] The weakness of income taxation, which is the opposite side of the same coin, questions state financial capacity in general. For example, Rogers and Weller (2014) argue that the income tax, rather than the VAT, serves as a valid indicator of state capacity because the VAT is easier to collect than an income tax.

[6] We will discuss why autocrats have incentives to do this in Discussion.

[7] The state revenue-raising is expected to lead to more transparency and less corruption and increase democratic accountability (Baskaran and Bigsten, 2013). We discuss a long-term effect of the VAT on democratic accountability in the Discussion section.

[8] In a VAT system, for example, retailers pay a VAT on their wholesale inputs and transfer those tax amounts in charges to their customers. Retailers in informal sectors have no invoices and thus cannot transfer the tax to their customers, which reduces their competitive edge against retailers in formal sectors.

[9] For example, literacy variables face the incomparability of languages and variation in literacy standards across countries.

[10] This variable can be constructed by interacting a VAT introduction dummy variable with the consumption tax revenue. The revenue data of the consumption tax are obtained from the International Monetary Fund (IMF)'s Government Financial Statistics

[11] The index tends to score high when (a) elections are clean and not marred by fraud or systematic irregularities, (b) the chief executive of a country is selected (directly or indirectly) through elections, (c) suffrage is extensive, (d) political and civil society organizations operate freely, and (e) there is freedom of expression, including access to alternative information (Gerring et al. 2016: 16).

[12] Because the fixed-effect models lead to a loss of within-country variation, we also conduct results using the random-effect model as an alternative specification (results not reported).

[13] Although the inclusion of a lagged dependent variable can lead to an inconsistent estimator, the fixed-effect estimator should become consistent when the time span becomes larger. According to Beck and Katz (2011), an appropriate time span is twenty years or more. The average time span for our dataset is thirty-four years. In any case, the inclusion of a lagged dependent variable would lead to underestimation only, rather than to overestimation (Beck and Katz, 2011).

[14] Although Model 1 shows no significant result for the variable, we believe that the inclusion of our variable of VAT revenue as a proportion of GDP has something to do with the inconsistency.

[15] Because not all the government's tax revenue goes to ameliorating infant mortality, we also use a more specific measure - a Health expenditure variable. The results are largely similar.

[16] This operationalization also follows Ottervik (2013)'s definition, which considers state capacity to be the ability of the state to dominate, i.e. coax compliant behavior from the individuals of a given territory; he operationalizes this as tax compliance.

[17] For the Shadow economy variable, we use *ΔShadow economy*, which measures how much the VAT has improved state capacity by taking the difference between the latest and median values. Here, because the Shadow economy variable is not available at the beginning of our observation, we use the median values for the Shadow economy variable as a proxy for the baseline value.

[18] This is largely due to the relatively small sample size (N = 68).

[19] See the following literature to find out the strength of the VAT system and reasons for its adoption by developing economies. Bird and Gendron (2007b); Bräutigam (2008); Corbacho, Cibils, and Lora (2013); Ebrill et al. (2001); Gordon (2010b); Profeta and Scabrosetti (2010); Sandford (2000).

[20] Miller (2015, 1537) has argued that electoral authoritarianism plausibly increases the state's capacity, but he has neither examined directly a state's capacity nor its impact on human development under autocracies.

[21] It is also possible that instead of democratizing, the VAT can co-opt citizens by improving human development. It can help stabilize and prolong autocracies, and the enhanced state financial capacity may work against human development in the long run by keeping democratic accountability low. However, Kato and Tanaka (2018) observe the opposite trend.

[22] Some third-wave democratizers are included but constitute clear exceptions. We count three southern European counties that democratized in the 1970s, when the VAT had just started to diffuse, and ten former, socialist countries. All of them except Serbia and Montenegro are now EU member countries. Serbia and Montenegro were also candidates for EU membership as of 2016. Among the remaining nine countries in this category, five are small countries with a population below three million: Mongolia, Botswana, Cape Verde, Solomon Islands, and Comoros. Four countries - Madagascar, Philippines, El Salvador, and Paraguay - democratized in the 1990s without the VAT, but introduced it after one or two years.

[23] These countries ("Transition away from Autocracy") increased their polity scores by more than one standard deviation after the introduction.

[24] They are defined above the 75th percentile of the country-average Resource Abundance variable.

[25] The introduction of the VAT might be less likely in resource-rich countries, but the effect of its introduction can be even larger in those countries that have natural resources. For example, resource-rich countries were less likely to remain autocratic after the VAT's introduction than non-resource rich countries. In the key category of "representation with regressive taxation," for example, 32.3% (eleven out of thirty-four) of democratizers are resource-rich countries with the VAT. Among autocracies that introduced the VAT with little sign of democratic transition ("no representation with regressive taxation" countries), however, the proportion of resource-rich countries is lower, i.e., 20% (nine out of forty-one). In terms of the polity score by which democracy is defined by a larger value than 6, the positive effect of the VAT in resource-rich countries is more evident than in non-resource-rich ones. Without the VAT, the average polity score of resource-rich countries is 2.69 points lower than the score for other non-resource-rich countries. Among countries with the VAT, however, the average score of resource-rich countries is only 0.54 points lower than non-resource-rich countries. Within-country comparison before and after the VAT introduction further confirms this. Resource-rich countries increased their polity score by 7.62 points after the introduction, whereas other countries increased the score only by 6.19 points.

[26] Five countries were formerly democratized but have reverted to autocracies ("Democracy failed"). Among two exceptions that have remained stable autocracies for more than twenty years after the introduction of the VAT, Morocco has not reached even the threshold of a so-called "autocracy" (−5 or greater and +5 or less in the polity score), whereas Tunisia has been somewhere in the middle of the "autocracies" since 1987 until 2012.

Tables and Figures

Table 1: Theoretical expectations

	VAT introduction	
	Yes	No
Democracy	Infant mortality $\downarrow$	Infant mortality $\downarrow$
Autocracy	Infant mortality $\downarrow$	Infant mortality $\rightarrow$

Table 2: Summary Statistics

	Mean	SD	Min	Max
Infant mortality rate	3.628	1.029	0.79	5.37
VAT (%GDP), t-1	4.232	2.114	0.00	9.37
VAT introduction, t-1	0.367	0.482	0.00	1.00
MEDI, t-1	0.270	0.326	0.00	0.93
Mean democracy score, t-1	-0.026	0.988	-2.04	2.25
Infant mortality rate, t-1	3.661	1.021	0.83	5.41
ln(GDP pc), t-1	7.976	1.098	5.32	10.67
GDP growth, t-1	1.505	6.167	-61.49	86.95
Urbanization, t-1	0.467	0.235	0.02	0.97
Fertility rate, t-1	1.306	0.559	0.11	2.22
Internal conflict, t-1	0.160	0.367	0.00	1.00
External conflict, t-1	0.053	0.224	0.00	1.00
Corruption, t-1	0.493	0.271	0.01	0.95
Resource abundance pc, t-1	3.663	2.620	0.00	11.30

Table 3: Baseline analysis

	(1)	(2)	(3)
VAT (%GDP), t-1	-0.005**		
	(0.003)		
VAT introduction, t-1		-0.009***	-0.014***
		(0.003)	(0.004)
MEDI, t-1	0.048**	-0.009	-0.019**
	(0.022)	(0.008)	(0.008)
VAT*MEDI, t-1			0.017**
			(0.007)
Infant mortality rate, t-1	0.970***	0.982***	0.986***
	(0.028)	(0.006)	(0.005)
ln(GDP pc), t-1	-0.035	0.002	0.002
	(0.049)	(0.006)	(0.006)
GDP growth, t-1	-0.000	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Urbanization, t-1	-0.053	0.029	0.034
	(0.208)	(0.038)	(0.038)
Fertility rate, t-1	-0.070	0.014**	0.011
	(0.056)	(0.007)	(0.007)
Internal conflict, t-1	-0.004	0.001	0.001
	(0.007)	(0.003)	(0.003)
External conflict, t-1	-0.001	-0.004	-0.005
	(0.007)	(0.003)	(0.003)
Corruption, t-1	0.137**	-0.014	-0.010
	(0.061)	(0.010)	(0.010)
Resource abundance pc, t-1	0.008	0.002	0.002
	(0.005)	(0.001)	(0.001)
Constant	0.346	0.000	-0.014
	(0.397)	(0.058)	(0.057)
R-squared	0.993	0.997	0.997
Observations	406	3751	3751

Figure 1: Probability of infant mortality, by the VAT and electoral accountability

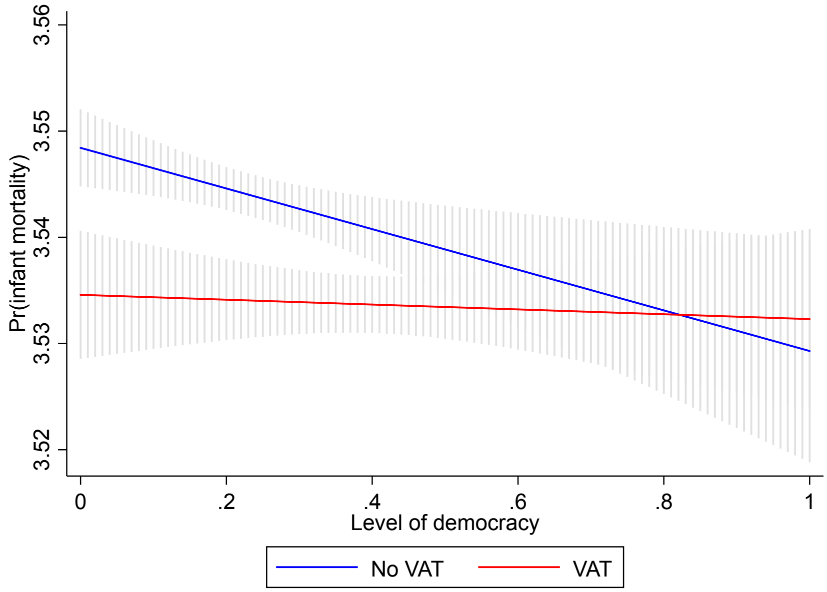

Table 4: Baseline analysis with the UDS variable

	(1)	(2)	(3)
VAT (%GDP), t-1	-0.005*		
	(0.003)		
VAT introduction, t-1		-0.009***	-0.010***
		(0.003)	(0.003)
Mean democracy score, t-1	0.007	-0.002	-0.004*
	(0.010)	(0.002)	(0.002)
VAT*UDS, t-1			0.005**
			(0.003)
Infant mortality rate, t-1	0.975***	0.982***	0.985***
	(0.028)	(0.006)	(0.006)
ln(GDP pc), t-1	-0.024	0.003	0.003
	(0.048)	(0.006)	(0.006)
GDP growth, t-1	-0.000	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Urbanization, t-1	-0.011	0.025	0.031
	(0.210)	(0.038)	(0.039)
Fertility rate, t-1	-0.067	0.014**	0.012*
	(0.057)	(0.007)	(0.007)
Internal conflict, t-1	-0.008	0.001	0.001
	(0.008)	(0.003)	(0.003)
External conflict, t-1	-0.005	-0.004	-0.004
	(0.007)	(0.003)	(0.003)
Corruption, t-1	0.077*	-0.011	-0.006
	(0.043)	(0.009)	(0.010)
Resource abundance pc, t-1	0.008	0.002	0.002
	(0.006)	(0.001)	(0.001)
Constant	0.261	-0.007	-0.022
	(0.398)	(0.058)	(0.057)
R-squared	0.993	0.997	0.997
Observations	406	3746	3746

Table 5: Mediation analysis: VAT introduction as a Treatment

	DV: Tax Revenue	**DV: Δ Shadow Economy**
VAT Introduction	3.084	-2.948**
	(1.967)	(1.205)

	DV: Infant mortality			
	ACME	Direct effect	Total effect	% of Total via ACME
Mediator: Tax Revenue	0.035	-0.104	-0.068	20.0%
Mediator: Δ Shadow Economy	-0.050*	-0.125	-0.176**	29.4%

Table 6: A New Typology of Regressive Taxation and Democratization

	With VAT Introduction under Autocracy			**Without VAT Introduction under Autocracy**			
	Democratized		*Transition away from Autocracy*	*Democratized pre-1970*		*Democratized post-1970*	
Democratization	Dominican Rep	Peru	Kyrgyzstan	Canada	Colombia	*Ex-communist*	
	Argentina	Bolivia	Niger	Jamaica	Uruguay	Czech	Mongolia
	Macedonia	Chile	Nigeria	Costa Rica	France	Slovenia	Botswana
	Estonia	Kenya	Haiti	UK	United States	Lithuania	Cape Verde
	Ukraine	Indonesia	Malawi	Ireland	Mauritius	Poland	Solomon Islands
	Benin	Nicaragua		Netherlands	Trinidad	Bulgaria	Comoros
	Zambia	Korea South		Belgium	Turkey	Latvia	Lesotho
	Moldova	Brazil		Switzerland		Slovakia	
	Romania	Lebanon		Austria		Germany	Madagascar
	South Africa			Italy		Serbia	Philippines
	Ghana			Cyprus		Montenegro	El Salvador
	Albania			Finland			Paraguay
	Mali			Sweden		*S. European*	
	Honduras			Norway		Portugal	
	Hungary			Denmark		Spain	
	Senegal			Japan		Greece	
	Mexico			Australia			
	Croatia			New Zealand			
	Guatemala			Israel			
	Panama			India			

	Democracy Failed	*Remained Autocratic*		*Remained Autocratic*	
No Democratization	Thailand	Bangladesh	Kazakhstan	Cuba	Kuwait
	Pakistan	Namibia	Cameroon	Guyana	Bahrain
	Venezuela	Russia	Gabon	Guinea Bissau	Qatar
	Belarus	CAR	Uganda	Gambia	UAE
	Armenia	Mozambique	Rwanda	Ivory Coast	Oman
		Sri Lanka	Zimbabwe	Liberia	Afghanistan
		Nepal	Eq. Guinea	Sierra Leone	Korea North
		Fiji	Burkina Faso	DRC	Bhutan
		Georgia	Tunisia	Burundi	Myanmar
		PNG	Mauritania	Somalia	Laos
		Cambodia	Congo	Djibouti	Malaysia
		Azerbaijan	Egypt	Eritrea	
		Ethiopia	Tajikistan	Angola	
		Ecuador	Algeria	Swaziland	
		Guinea	Sudan	Libya	
		Tanzania	China	Iran	
		Togo	Vietnam	Iraq	
		Chad	Morocco	Syria	
		Jordan	Turkmenistan	Saudi Arabia	
		Singapore	Uzbekistan	Yemen	

Note: Data derive from Bird and Gendron (2007) for taxation data and from the Polity IV project for regime data, respectively. The table demonstrates that a country democratizes when the polity score exceeds 6. “Polity Increased” is defined as at least one standard deviation increase in the polity score after the introduction of the VAT. “Democracy Failed” is defined as a decrease in the polity score after the introduction of the VAT. Among the countries listed in Bird and Gendron (2007), we omit countries that no longer existed in 2008 (i.e., USSR, Yugoslavia, Eritrea, and Ethiopia) and therefore have not introduced the VAT. Further, we consider the United States, Comoros, and Solomon Islands to be outliers, because they are the only three democracies without the VAT.