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Title: The Indivisible Hand of Peace? Consumption opportunities and civil war

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The indivisible hand of peace? Consumption opportunities and civil war

Abstract:

GDP is one of the most robust indicators of civil war onset. As debate continues over the mechanisms underlying the relationship between economic development and civil war, this paper scrutinizes the indicator of GDP directly, disaggregating it into its constituent components to examine whether their distinct associations with conflict onset can shed some light into the black box. Analysis of the individual correlations allows for identification of the driving force behind the aggregate statistical relationship. With this information to hand, consistency checks can be made with existing theories and a new theory presented in this paper, which draws attention to a critical structural factor that drives the supply of civil war labor, namely the lack of consumption opportunities. This factor increases the likelihood of civil war in less economically developed countries as individuals with low consumption opportunities have little to lose from reordering the economic and political system. Analysis of the correlations between components of GDP and the onset of civil war shows that this new theory is most consistent with the key drivers of the aggregate relationship. The examination also highlights a new indicator, which is arguably preferable to GDP as a measure of this relationship.

Keywords: civil war, consumption opportunities, economic development, opportunity cost, conflict trap, peace

Introduction

Economic development or lack thereof is one of the most robust indicators of civil war onset (Hegre and Sambanis 2006). However, the mechanism underlying this relationship is less clear. Explanations range from opportunity cost (Collier and Hoeffler 1998; Azam 1995; Grossman 1995) and state capacity (Fearon and Laitin 2003) to the liberal peace (Hegre, Gissinger, and Gleditsch 2003; Ricardo 2000 [1821]). This paper will add another: consumption opportunities.

The core premise of consumption opportunity theory is that people want to consume and need a realizable economic dream in order to buy into the existing political and economic order. If opportunities to consume are low and individuals have not bought into an economic dream, reordering or destroying the system represents zero loss to the dissident. Subsequently, economies which are oriented to encourage domestic consumption are inherently more peaceful.

It is impossible to tell from the indicator of GDP which mechanism – opportunity cost, state capacity, liberal peace, or consumption opportunities – can best explain the observed relationship. Therefore, this paper will help to shed light on the situation by disaggregating GDP into its constituent components and examining the unique relationships between each of these indicators and civil war onset. This analysis will show which components are driving the aggregate relationship, and further reasoning will suggest which theory is most consistent with these findings. The reader should note, however, that this is not a confirmatory analysis. No causal evidence is provided to prove or disprove any particular theory. Such evidence is outside the scope of the current study.

Nevertheless, this disaggregation is a significant step, as many previous studies of civil war onset use the composite indicator of GDP as a key independent variable (Collier and Hoeffler 1998; Fearon and Laitin 2003; Buhaug 2006); or use it as a base upon which to make

comparisons with other key independent variables (Fjelde and De Soysa 2009; Buhaug 2006). What is critical is that all of these models will give two countries that observe the same GDP the same probability of conflict, *ceteris paribus*, because they do not take into account the weight of the disaggregated components mentioned above. This paper will show that country A could have a markedly different likelihood of civil war onset from country B, if the constitution of GDP in each country differs and thus answer the research question ‘to what extent can a disaggregation of GDP shed light on the relationship between economic development and internal peace?’

The disaggregated demand components of GDP are private production, private investment, government expenditure, exports and imports. Results presented in this paper will show that the consumption opportunity maximizing elements of private production, government expenditure and imports are the most strongly correlated with peace. Whilst investment and exports add value to an economy and weigh positively on GDP, growth in these areas creates fewer direct consumption opportunities and thus is less likely to induce peaceful societies. Furthermore, whilst the component of imports weighs negatively into GDP, its impact on civil war onset is in line with the other components, which weigh positively on GDP. These findings suggest that a new indexed variable – Consumption Opportunities – should be used in preference to GDP, as the indexation of the five factors as outlined above will only lead to an averaging out of the effect of an increase in consumption opportunities (Signorino and Xiang 2009).

This research speaks to a key policy concern – how best to engage in development, and, more specifically, development for peace. At this time no conflict-affected or fragile country has achieved much more than a one or two millennium development goals (World Bank 2013, Background). The research outlined here contemplates how development and peace can be achieved concurrently.

Previous research

Private investment and production

In their model based on the work of Azam (1995) and Grossman (1995), Collier and Hoeffler (1998) argue that an increase in income leads to a reduced propensity toward conflict as the increase in wealth reflects an increase in the opportunity cost of rebellion for all potential rebel fighters. Therefore, conflict is less likely in high-income countries as the average wage rate is so high as to make rebellion restrictively expensive to entrepreneurs of violence. Using per capita income as a proxy for potential opportunity costs in the economy, Collier and Hoeffler find that the variable is statistically significantly negatively associated with the likelihood of civil war onset. Nevertheless, whilst it is true that per capita income is a good proxy of potential opportunity costs, it is also a reasonable proxy for other mechanisms, such as consumption opportunities.

Some authors have used commodity price shocks to proxy for short-term variation in wages from productive employment that represents the opportunity cost of conflict (Dube and Vargas 2013; Besley and Persson 2008). Miguel, Satyanath, and Sergenti (2004) use rainfall as an instrumental variable to predict civil war onset through economic growth. They argue that increases in rainfall can lead to enlarged crops, which automatically increases economic output and wages. The authors find rainfall to be an effective instrumental variable and show that growth and civil war onset are highly significantly negatively correlated, both substantively and statistically.

However, their second-stage model seems somewhat restricted in its time-frame. Regressing conflict on growth at both the current period and previous suggests that the time horizon of potential rebels is very short: they only consider very recent shocks and set a low value to expectations of long-term trends. This indicates that the turn to rebellion is not

necessarily a vocational decision but a plan to redress immediate needs, such as procuring enough to eat or drink. In contrast to the authors' conclusions, this short-term perspective, in fact, supports the theory presented here that consumption matters more than income. If potential rebels truly considered rebellion as a solution to their long-run prosperity, one would assume that short-term shocks in wages should not affect their ultimate decision to rebel. However, a short-term shock on the availability of food might just motivate someone to seek alternative sources and temporarily offer their labor in civil war. This alleviation of scarcity that extra rainfall brings has been overlooked by the authors.

Nevertheless, in summation of this discussion, it is clear that the theory of opportunity costs would expect that the likelihood of conflict falls as private investment and production rises, due to an increase in incomes. The theory of consumption opportunities, on the other hand, would expect the likelihood of conflict to fall much faster with rises in production than investment, as investment does not immediately lead to a rise in the availability of consumable goods and services.

Trade

Another expectation of the opportunity cost argument is that as exports and imports rise individually, incomes will rise; although, incomes will rise faster with exports than imports. This is because exported goods form a direct part of domestic production and thus, income, while imports, on the other hand, add to domestic production and income only indirectly as imported intermediate goods are converted to consumer goods. Opportunity cost theory accordingly expects that there should be a negative correlation between both exports and imports and civil war onset, but that exports should be more strongly negatively correlated with onset than imports. In contrast, consumption opportunity theory considers imports to represent an increase in available opportunities to consume, while exports represent a leakage of

consumption opportunities from the economy and therefore might expect a negative relationship between imports and civil war onset and a positive relationship between exports and onset.

David Ricardo might disagree, arguing that rises in both exports and imports should equally lead to pacific outcomes. In his 1821 book, *On the Principles of Political Economy and Taxation*, Ricardo outlined the advantages of open economies and international trade (Ricardo 2000 [1821]). It was his belief that under almost all circumstances states will benefit from trade through the concept of comparative advantage. The resulting total increase in consumption will make people happier.

On the other hand, Bussman and Schneider (2007) propose that trade and liberalization may not be eternally positive (Sachs et al. 1995; Ricardo 2000 [1821]), arguing that higher levels of economic interconnectedness may indeed be associated with civil peace for reasons outlined by Ricardo but that the transition to such a state is often painful for the country. 'Foreign economic liberalization decreases the opportunity cost of civil unrest for losers of foreign economic liberalization' (Bussmann and Schneider 2007, 83). Under this situation disaffected agents will agitate for policy change, possibly violently. In divergence from Bussmann and Schneider, consumption opportunity theory would expect that conflict occurs in transition due to an emphasis on increasing the size of the export sector in economies that are seeking to liberalize. This emphasis increases export production at the expense of the domestic sector, which diminishes the supply of goods and services available to local communities. Then, as the open economy grows and becomes more established in the international society of states, imports will increase to fill this gap, which results in the long-term pacific effect found by Bussmann and Schneider.

Government expenditure

Although some governments may choose to restrict public spending, all governments have a rational motivation to provide public goods. As Olson (2000) explains, public goods raise the productivity of a population; their provision, therefore, drives up the taxable base and, thus, tax revenues. Diamond (1997, 287) goes further to claim that ‘large societies can function economically only if they have a redistributive economy in addition to a reciprocal economy’.

Building on competition model literature (Grossman 1991, 1995; Hirshleifer 1988; Tullock 1967), Azam (2001, 432) presents a model of civil war as a lottery in which ‘the probability of getting the prize... depends on the relative resources invested in the game by the two parties [rebels and state]’. In his model the state can raise taxes, the control of which is also seen as the prize for winning any rebellion; it can spend on public goods that will pacify the population; spend on defense; or spend on repression. Azam’s model predicts that the probability of civil war onset increases with the size of the prize but decreases with government expenditure on defense and public goods. If Azam’s theory is correct, we should expect government expenditure to be the driver behind the relationship between GDP and civil conflict; and, not only should this be true but the relationship should be positive – as government expenditure rises, civil conflict onset should become more likely. Consumption opportunity theory would expect the opposite relation.

Another theory that would expect the strongest relationship to be between government spending and civil conflict onset is state capacity. Though the mechanism of state capacity as a cause of peace has a long history in the literature (Azam 2001; Benson and Kugler 1998; Collier and Hoeffler 1998; Collier 2000b), Fearon and Laitin (2003) brought the proposition to the fore. For these scholars, state capacity is understood as “state military and police strength”. Fearon and Laitin suggest that as a country develops economically, it will have more resources to invest in its security forces. Therefore, larger government expenditures should indicate a

greater ability of the state to maintain its monopoly of the use of violence. In contrast to this theory, this paper will argue that it is the provision of consumption opportunities and the alleviation of perceived scarcities that is the driving force behind the relationship between GDP and civil war onset, and not an increase in state capacity. This can be distinguished with reference to other components of GDP. To this end, the paper will now outline consumption opportunity theory.

Consumption Opportunities

Consuming makes us happy; whether it is a roof over our heads, food in our mouths, or a visit to the doctor when we are sick. In economics it is generally accepted that our wants are infinite. And so, development and growth of free-market economies are often seen as the best way in which to fulfil as many of these wants as possible.

In more economically developed countries (MEDCs) opportunities to consume are many and varied. Economic, political and physical infrastructures are all in place to maximize the ability to consume. Though public policies may vary from state to state, the primary aim is still to achieve the greatest total social happiness through consumption. However, in less economically developed countries (LEDCs) opportunities to consume are less abundant because of a lack of this same economic, political and physical infrastructure.

Indeed, in MEDCs most are able to find a job, save some funds if necessary or take out credit to purchase what they would like. And when this is not possible, systems are often in place to ensure abilities to consume, such as minimum welfare safety nets and charities that will help to fulfil the most important needs. Yet, further to this, are economic dreams. The most famous of which is the American dream, which is the belief that anyone who works hard can get rich on their own merit.

In LEDCs these are regularly just that – dreams. For the poorest in these societies with little schooling and no safety net, there are very few prospects for fulfilling their wants. Thus far, globalization has not helped to bring economic dreams to all parts of the world. Stuck in poverty with seemingly no hope for future prosperity, people may do things that many in MEDCs would see as desperate. Yet, if the system is not providing opportunities to fulfil wants and dreams, then the reordering of that system may not seem so abhorrent. Someone who has received nothing from the existing political and economic order has nothing to lose from its destruction. Individuals are, therefore, motivated to offer their labor in civil conflict when consumption opportunities, including economic dreams, are low because a change in the system may bring about new consumption opportunities.

Taking this to its logical extreme, we find the slave economy. In this economy slaves are forced to work without reward. They are often given only basic food, shelter and clothing, if at all. They also have only a very minute possibility of experiencing change in the future as a result of their hard work. In such a situation, it is quite understandable that desperate individuals can be easily enticed into violence by a political entrepreneur who is able to convince them that everything can change if they only overthrow the system. The political front and aims of such a movement may vary, yet it is the situation of absolute deprivation and work without reward that has set within many a contempt for the current political and economic system.

A much less extreme example, yet with similar economic undertones, is Nicaragua. Although, many have explained this conflict as being between the haves and the have-nots, when viewed through the lens of consumption opportunity theory, an underlying contempt for the political and economic system of the Somoza regime appears to have initially motivated many toward violence. During the 1970's the Nicaraguan economy grew significantly. This growth fueled 'conspicuous consumption' by the bourgeoisie and 'undoubtedly raised the

aspirations of most urban Nicaraguans' (Booth 1985, 85) – a key recruitment group for the Sandinista National Liberation Front. However, economic mismanagement by the Somoza dictatorship meant that 'Nicaragua's internal market remained small, and most manufactures were exported' (Booth 1985, 78). At the same time, the apparent 'food last' approach in which 'the demands of export agriculture for land, credit, and human resources had priority' (Ryan 1995, 56) meant that many ordinary Nicaraguans were going without basic necessities. Furthermore, with very little government investment in healthcare or education and expenditure predominantly 'confined to building infrastructure for the agro-export sector' (FitzGerald and Grigsby 2001, 122), alternative opportunities to consume were also restricted. Given the availability of jobs in the export sector, individuals would have expected increased opportunities to consume; however, these opportunities were restricted by poor economic policies of the Somoza regime. Continued absolute deprivation with no expectation of future change, will have given large portions of the Nicaraguan population a contempt for the political and economic system of Somoza. With a distaste for the current system, it is easy to understand how individuals could be easily manipulated by political entrepreneurs who taught them to blame it on the haves.

Whilst the collective benefit from group action is clear in these circumstances, the collective action problem must still be overcome for war to break out. Thus, insurgent groups may offer individuals with low consumption opportunities selective benefits from participation. This being said, selective benefits are not the cause of rebellion in LEDCs, they simply facilitate group endeavors. Potential rebels are not originally motivated to rebel by these incentives but by the economic situation of low consumption opportunities. If individuals were motivated purely by opportunity cost, then civil war labor supply would be as present in MEDCs as LEDCs – a case we know to be false.

Hence, the individual is not motivated by greed because they are not trying to get rich out of war. Yet they are also not motivated by grievance held against some other group. They are frustrated because they cannot fulfil their wants and see no chance for fulfilling them in the future. It is a political entrepreneur, who channels this discontent into grievance against the state. As such, consumption opportunity theory does not fall neatly into the greed or grievance dichotomy. It is a structural foundation for conflict. With the presence of this element, all it takes is a political entrepreneur to convince the potential recruit that the current regime is responsible for their state of affairs, and violent conflict will ensue.

It is now clear why states would be more peaceful if they maximized domestic consumption opportunities. However, consumption opportunity theory should not be seen as a deterministic argument. Rather, it presents the case of a structural foundation that facilitates rebel recruitment. It is a latent factor within a society that increases the likelihood of conflict through increased incentives to join a rebellion. The flash-factor that precipitates the onset of war could be traced to inequality, religion, ethnicity or any other grievance that is manipulated by the demand side of civil war labor.

If consumption opportunity theory is a good explanation of the development-peace relationship, we should expect the following:

H1: Higher levels of consumption opportunities imply a reduced likelihood of civil war onset.

Research design

Method

As previously discussed, it is impossible to distinguish between the mechanism of consumption opportunities and others previously presented using GDP as an indicator. In such a situation Humphreys (2005) recommends disaggregating the explanatory variable. 'If

multiple mechanisms are simultaneously in operation, and each has an independent effect on the outcome, then multiple measures may be able to capture the effects of these rival mechanisms' (Humphreys 2005, 519). Following Humphreys' reasoning, GDP can be disaggregated into its five key constituent elements: private consumption, private investment, government spending, exports and imports, which will allow for an analysis of their individual relationships with civil war onset. The unique variation in these relationships should allow for determination of the driving force behind the aggregate relationship and a consistency check with each theory highlighted above.

GDP is calculated by summing private consumption, investment, government expenditure and exports, then subtracting the value of imports. Private consumption can be defined as 'expenditure by individuals on domestic and foreign goods and services, produced and sold to their final users'. Investment is defined as 'expenditure on the production of goods not for present consumption but rather for future use'. Government expenditure can be defined as 'all government purchases of goods and services'. This will include the provision of public services such as the bureaucracy; though, it does not include transfer payments such as welfare payments as they do not add output to an economy, they only reflect the exchange of money from one source to another. Finally, exports can be defined as all goods and services that are produced in a country and sold to foreigners, and imports can be defined as all goods and services that are produced by foreigners but purchased by the domestic population (Lipsey and Chrystal 1999, 342–44).

The indicator of private consumption includes expenditure on both domestic and foreign goods and services. The distinct imports component specifies the value of these consumables that were brought in from abroad. Thus, for the purposes of calculating domestic production, imports are subtracted from the total figure. Otherwise, the foreign goods and services would be counted as part of domestic production – GDP – which, clearly, they are not.

Consumption opportunities are maximized in the components of private consumption and government expenditure. As exports are sold to foreigners, they cannot be consumed at home. Investment also does not increase current consumption as its focus is on expanding future production. While the imports component is also expected to correlate highly with consumption opportunities, the impact of these opportunities is already measured in private consumption as discussed above. This notwithstanding, the imports component will be analyzed along with the others in the econometric models to identify its individual relationship with civil war onset and confirm whether its loading into GDP is averaging away the pacific effect of this component.

We should, therefore, expect indicators of private consumption, government spending and imports to be most strongly negatively correlated with civil war onset as they each relate directly to consumption opportunities. Exports could be expected to be positively correlated with onset as these represent a reduction in consumption opportunities. However, increasing exports also allows for increasing imports through the process of international exchange. This factor may cause this component to be ambiguously related to onset; however, it should definitely not be as strongly negatively correlated with onset as private consumption, government expenditure or imports. Investment is likely to be weakly correlated with onset as it does aid in the expansion of opportunities to consume; although, it is not expected to be as strongly correlated with onset as private consumption, government expenditure and imports. This is because a large proportion of this expenditure is on items that increase productive capacity of consumable items and are not immediately consumable by general members of the public, for example, expenditure on new machinery that allows a factory to produce more goods.

In conclusion, private consumption, government expenditure and imports are expected to be the most strongly negatively correlated with civil war onset. Investment is expected to be

weakly negatively correlated with onset and exports are expected to be positively correlated or not correlated with onset at all. If found, these relationships should allow for a distinction from other arguments such as opportunity cost, which would predict that the investment, government spending and exports components will be equally correlated with onset – a rise in wages in one sector should be the same as that in another; imports should be very weakly negatively correlated with onset because this component only indirectly adds to income as imported intermediary goods are converted into final consumables; and, finally, private consumption will be less strongly negatively correlated with civil war onset than investment, government expenditure and exports because it is overinflated by the value of imports consumed.

Entering all the components into one model simultaneously could generate nonsensical results. This is because the absolute values of GDP components will be highly correlated with each other.² That is, as economies grow as a whole, the components tend to grow in the same direction. This does not mean, however, that there is no variation in the relative size of components.³ Therefore, each component will enter a separate model and its effects compared with that of GDP.

As previously outlined, it is expected that those components most associated with raising domestic consumption – private consumption, government expenditure and imports – will be the most effective indicators of a reduced propensity toward civil war onset. Therefore, an indexed measure of private consumption (containing expenditure on both domestic and foreign goods and services) and government spending, termed ‘Consumption Opportunities’, will also be evaluated against GDP to see whether the indicator of the development-peace relationship can be improved.

This paper will answer the research question using time-series cross-sectional data of 150 countries from 1957-2007, which is the largest sample possible given the data availability of the covariates. The unit of analysis is country-year with a population of countries at risk of

civil war. With a dichotomous dependent variable of civil war onset, this paper will use logistic regression.

This study will use a random effects model with estimators of both within and between unit relationships. Following Bell & Jones (2015) and Rabe-Hesketh and Skrondal (2008, 114–22), within-unit variation is measured by the difference between the yearly observation and the unit mean whilst between-unit variation is measured using the unit means. Estimates of the within effects are identical in this model to fixed effects (Bell and Jones 2015, 142–43); however, this method also allows for a consistent estimation of between effects, as the mean of each within-effect covariate is equal to zero.

Bell and Jones (2015) have shown that this model is superior to standard random effects and pooled models in the estimation of between effects. As the theory presented above is specifically interested in assessing the between effect across countries of the world, it is believed that this model allows for the most accurate estimation of the parameters.

The issue of endogeneity caused by reverse causality is severely reduced in this model as between effects are time-invariant and any reverse causality would need to be so severe as to suggest that LEDCs are only poor compared to MEDCs because they experience more conflict.

Independent and dependent variables

The key independent variables are private consumption, private investment, government expenditure, exports and imports measured at purchasing power parity in real per capita income at constant 2005 prices. These variables are generated using data taken from Penn World Table (PWT), which provides information on GDP share for each of the components per country-year, combined with the expanded GDP data of Gleditsch (2002).³ Where GDP is used in its own right as a covariate, this vector is that of Gleditsch (2002).

As pointed out by Jerven in his book *Poor Numbers*, much of the developing world's statistical data may be incomplete, based on models of growth rather than measurement or simply the reporting of an individual's best guess (Jerven 2013). Therefore, there is expected to be at least some measurement error in the data. This is most obviously seen in the 'residual' indicator provided by PWT, which measures deviation from the 100% maximum total GDP figure when the five components are linearly combined. This indicator varies from -74% to +80%, has a standard deviation of 10% but a mean close to zero. Whilst it is troubling that some countries can report detailed component information that does not add up to 100%, there is little that can be done at this stage, except to recognize the poor quality of some of this data and use it *faute de mieux*.

The indexed indicator of Consumption Opportunities will linearly add private consumption and government expenditure as these are expected to capture opportunities to consume most directly. It will be compared against GDP in its original form, and a new index, which will be called here the Gross Domestic Peace Product (GDPP). GDPP linearly adds private consumption, investment, government expenditure, and exports but does not subtract imports as with GDP. GDPP is produced because it is expected that the current indexation of GDP is averaging away the effects of its individual components on the likelihood of civil war onset and is, thus, a deficient indicator of peace.

The key dependent variable is civil war onset and is obtained from the UCDP Monadic Conflict Onset and Incidence Dataset (Gleditsch, Wallensteen, and Eriksson et al., 2002; Pettersson and Wallensteen 2015). Conflict is defined as 'a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths' (Themnér 2015, 1). The original prevalence variable is coded 1 for years in which conflict is observed and zero for all other years. A new conflict is coded if prevalence returns to zero for

at least two consecutive years. The onset variable used in this study drops observations for all years of ongoing conflict as countries cannot enter a new civil war in this data whilst one is continuing.

Control variables

The brevity of peace is included in the model to allow the most accurate estimation of the within effects given the time-dependence of many of these estimators (Beck, Katz, and Tucker 1998). The variable is measured in years since the last incidence of civil war and is taken from Hegre, Karlsen, and Nygård et al. (2013), being extended backward and forward to cover the entire length of the sample period described above and converted through a decay function to give it a half-life of four years (Raknerud and Hegre 1997, 393).

A dummy variable indicating a neighboring country in conflict will enter the model as such close proximity to another war is likely to have an effect on all components of GDP. Given evidence to suggest that bad neighborhoods increase the likelihood of civil war onset (K. S. Gleditsch 2007), this dummy will enter the model to minimize omitted variable bias. The variable is taken from Gleditsch (2007) and expanded with observations contained in Hegre et al. (2013).

Trade openness will enter the model to ensure that observed relationships between imports and exports with civil war onset are not merely a reflection of the expected relationship between trade openness and civil war onset through a liberal peace mechanism. The indicator represents exports plus imports over GDP; original data being obtained from Penn World Tables.

Democratic institutions may potentially confound the relationship between consumption opportunities and civil war as increasing political rights will increase demand for economic rights and thus growth. Given previous research and the established connections

between civil war onset, democracy and polyarchy (Hegre et al. 2001) it is, therefore, pertinent to enter the model as a both a linear and quadratic control. The measure of democracy used will be the Scalar Index of Politics (Gates et al. 2006), formed using data from the Polity IV project and Vanhanen and Lundell's 'Measures of Democracy 1800-2012' dataset.

Region dummies will enter the model to help control for omitted variable bias that correlates with different regions of the globe. The regions included are North America, South America, Europe, Asia, North Africa, South-East Asia and Australasia with Sub-Saharan Africa as the reference category.

Two final control variables are drawn from the V-Dem data set. Firstly, a measure of social group discrimination will enter the model as it is possible under certain circumstances that the benefits of any government spending, for example, will not be distributed equally amongst the population (Bueno de Mesquita et al. 2003). Given previous research into the link between horizontal inequalities and civil war onset (Stewart 2002), this variable is considered relevant to add as a control. Secondly, petroleum production per capita will enter the model to control for the influence of primary commodity dependence (Humphreys 2005; Le Billon 2001; Ross 2004; Collier 2000a; Weinstein 2005; Collier and Hoeffler 2005) that may also affect the levels of domestic production and government spending beyond the obvious trade implications.

Results

Table 1. GDP and the onset of civil war

Table 1 near here

Results of the logistic regressions can be viewed in Table 1, which shows between and within effects, calculated in the same model, side-by-side. Anticipated between relationships are found in the data and are robust to the inclusion of control variables (Levine and Renelt 1992). Model 1 contains only the indexed variable of GDP. Models 2 to 6 reveal the relationships between the individual components of GDP and civil war onset, controlling for the same factors, using the same sample. The results clearly support private domestic consumption (model 2) as the power behind the strong relationship between the indexed variable of GDP and civil war onset. They also show that imports have the opposite impact on civil war onset from that expected given the current method of indexation. A negative coefficient indicates that as the number of imports rises, the probability of civil war onset is reduced. Furthermore, this finding is robust to the inclusion of trade openness.

It is interesting to note that there are seemingly no within effects of GDP, or any of its components, on the likelihood of civil war onset. This is consistent with previous findings in cross-country analyses (Djankov and Reynal-Querol 2010; Jensen and Sørensen 2012). The measure of social group discrimination has a positive and statistically significant between effect in all models. However, it has a negative within effect, although this is not statistically significant at the 5% level in any model. Democracy is not found to have a significant between effect. Somewhat surprisingly, on the other hand, its within effect is positive and statistically significant at the 1% level, suggesting that the transition from autocracy to democracy is fraught with conflict. There is also evidence in these models for an inverted-U shaped relationship as previously theorized.⁵

Table 2. GDP comparison with GDPP and Consumption Opportunities

Table 2 near here

Table 2 presents the results of the same analysis conducted with two new indexed measures – GDPP and Consumption Opportunities. As can be seen GDPP and Consumption Opportunities are substantively and statistically more significant than GDP. Movement one standard deviation either side of the mean of GDP changes the probability of civil war onset in Model 1 from 1.9% to 5.9% (all other variables at their means). This change of 211% is not statistically significant. In contrast, movement one standard deviation either side of the mean of Consumption Opportunities in Model 8 changes the probability of civil war onset from 1.7% to 6.4% (all other variables at their means). The change of 288% is much larger than that of GDP and is statistically significant at the 5% level.

Figure 1 near here

Figure 1. Between Effects of Consumption Opportunities on Civil War Onset

The difference between the power of the two variables can be seen clearly in Figure 1. This shows the probability of civil war onset running from 0.6% to 11.1% across the range of Consumption Opportunities whilst only running from 0.7% to 9.6% across the range of GDP. One of the most telling examples of this difference is the case of Iraq. From 1973 to 1995 Iraq experienced the onset of five civil wars. By GDP and model 1, the probability of conflict onset was 14.7% on average across the 5 observations; by Consumption Opportunities and model 8, the probability of conflict across the 5 observations was 18.3%. This is an increase of 3.6 percentage points solely because Consumption Opportunities has been used to predict conflict instead of the blunt indicator of GDP.

Discussion

Base models

Results presented in Table 1 show that previous relationships found between GDP and civil war onset in cross-country analyses are the result of the influence of between effects – the within effects are all close to zero with none being statistically significant (Besley and Persson 2008; Dube and Vargas 2013; Miguel, Satyanath, and Sergenti 2004; Collier and Hoeffler 1998). It is also clear that the primary substantive significance of GDP as an indicator of civil war onset is driven by private domestic consumption. Being measured in a logged function of 2005 international dollars per capita, the coefficients of GDP, its components, GDPP and Consumption Opportunities are all directly comparable. Domestic production has a coefficient of -0.76, which is much stronger even than GDP itself, with a coefficient of -0.57. This suggests that the impact of domestic production and consumption is being averaged out in the indexed measure (Signorino and Xiang 2009). The next strongest components of GDP are imports and government spending with coefficients of -0.64 and -0.50 respectively. The coefficients of exports and private investment are much lower at -0.20 and -0.38 respectively.

The results presented in models 2 to 6 are most consistent with the theory of consumption opportunities and hypothesis H1. Domestic consumption, government spending and imports appear to be driving the relationship between GDP and onset, suggesting that the increased consumption opportunities brought about through growth in these areas would lead to a reduced propensity toward civil conflict. Investment is less strongly correlated with civil war onset. This is likely because investment does not relate to an immediate increase in consumable goods and may take some time before new production relieves perceived scarcities – a shift that will then be reflected in domestic consumption figures.

Imports are found to be negatively correlated with civil war onset as expected. This suggests that as increasing amounts of goods are brought into an economy, the relief of scarcity is reducing the propensity toward conflict. Interestingly, exports are not found to be significantly statistically correlated with civil war onset in model 5. This suggests that the reduction in consumption opportunities which results from the goods being sent abroad has a powerful impact on societies; one that is not easily overcome by latter increases in consumption through related rises in imports.

Table 3. Expected relationships between components of GDP and the probability of civil war onset

Table 3 near here

Table 3 above gives a summary of the alternative expected relationships between the components of GDP and civil war onset from competing theories outlined in the previous research section of this paper. The findings presented above are in clear contrast to the opportunity cost theory, which would suppose that investment, government expenditure, and exports are the most strongly negatively associated with civil war onset. Investment, government spending and exports will all equally raise the income of a country and thus increase opportunity cost equally, whilst imports will only reflect a minor increase in income through the conversion of intermediary goods. Because private consumption includes expenditure on imports, it should be less strongly associated with civil war onset than investment government spending or exports. Finding the strongest relationship between domestic consumption and civil war onset, combined with a strong negative relationship with imports and weaker associations between investment, government spending and exports shows

less support for the opportunity cost theory as the driving force behind the robust relationship between GDP and civil war onset. Indeed, examination of the correlations suggests that it is more likely to be increasing consumption opportunities and not wages that are driving relationships found in previous research (Besley and Persson 2008; Dube and Vargas 2013; Miguel, Satyanath, and Sergenti 2004; Collier and Hoeffler 1998). To add further weight to these findings, more fine-grained analyses that can distinguish between wage and consumption opportunity shifts and provide causal evidence of conflict onset should be undertaken. This will allow for scrutiny of previous research that assumes a link between increased income and civil war onset works through wages (Besley and Persson 2008; Dube and Vargas 2013; Miguel, Satyanath, and Sergenti 2004).

When government budgets rise, the amount available to spend on defense and potential ‘state capacity’ will also rise (Azam 2001; Fearon and Laitin 2003). If this theory were to explain the power behind the relationship between GDP and civil war onset, we should expect the indicator of government spending to be the most strongly negatively correlated with onset. While a statistically significant negative relationship appears to exist between government spending and onset, this relationship is weaker than private production and imports, suggesting that it is not the driving force behind the robust relationship between GDP and onset.

Control of the state or state funds is the goal of many rebel leaders, whether the cause is secession or a change of government. Following the logic of Azam (2001), it can be argued that the size of state funds also represents the size of the prize. Thus, we should expect the opposite relationship between government expenditure and civil war onset as set out in the previous paragraph. This is clearly not found to be the case in the current sample and so no support is detected for the use of GDP as an indicator of the size of the prize mechanism.

Finally, Hegre, Gissinger and Gleditsch (2003) argue that the effect of trade on civil war onset appears to work through its effect on growth and thus the opportunity cost of conflict.

However, in contrast to the opportunity cost argument, they expect that total trade will have this impact and not exports or imports individually. As a result, they would expect that growth in imports and exports together should reduce the likelihood of civil war onset. This is not seen in any of the models with the indicator of the between effect of total trade being statistically insignificant at the 5% level in all regressions, further suggesting that international trade is not the driving force behind the robust relationship between GDP and civil war onset. There is also no support for Busmann and Schneider's (2007) proposition that transition to an open economy and the increase in exports is potentially conflict causing with no within effect of the value of exports found. Further research is required to determine exactly why no between effect is found here between exports and civil war onset.

In summation of this review, it appears that the results presented in Table 1 are most consistent with the consumption opportunities mechanism as the driving force behind the robust relationship between GDP and civil war onset. Results are less consistent with opportunity cost, state capacity, size of the prize and the liberal peace.

Further to these findings is the confirmation that imports are positively related to civil war onset when they are indexed into GDP through the net exports function. Consequently, they are averaging out the effect of other components and dulling the overall impact of GDP as an indicator of civil war onset (Signorino and Xiang 2009). If this component is instead left out of an indexed variable, creating GDPP, the substantive effect of the variable increases from -0.57 to -0.61 in this sample as seen in Table 2.

The new indicator of Consumption Opportunities fares even better with a beta coefficient of -0.75, which is substantively and statistically more significant than either GDP or GDPP. Figure 1 shows the difference in substantive impact and the example of Iraq, which had a much higher probability of onset across five observations, highlights the point that the

indexed indicator of GDP may obscure the true likelihood of conflict in a country as the weight of its components is not taken into account.

In this light, perhaps the indicator of Consumption Opportunities should be incorporated into models of civil war onset rather than GDP. If nothing else, GDPP should be used as results presented here clearly show that the method of GDP indexation is inconsistent with the individual statistical relationships between components of GDP and civil war onset. That is, it is a deficient indicator of peace.

Alternative specifications and checks of robustness⁶

To check the robustness of the results additional controls of foreign aid and the previously mentioned reporting error indicator were also individually added to the base model. Interpretations presented above were found to be robust to the inclusion of these variables and to the exclusion of region dummies and influential cases.

When using an indicator of civil war onset that attributes a positive observation only when battle-related deaths reach 1,000 in one year, all of the relationships between GDP and its components lose statistical significance, except for imports. This is most likely because the total number of positive observations drops from 198 to 64, or from 4.0% of observations to only 1.2%. Unfortunately, data on the components of GDP is not available from known sources before 1950. It is hoped that this data will become available in the near future to allow for a full assessment of the components of GDP and their relationships with the onset of intense civil wars.

It could be argued that inequality is driving the relationship between low consumption opportunities in LEDCs and conflict. If there is little to go around but some have more than others, then this is what is driving grievances. However, this cannot be the case in the observed relationships above as inequality is increasing in consumption opportunities. That is, the states

with the lowest consumption opportunities and most conflict also have the lowest income inequality. It is, therefore, unlikely that this factor is driving the observed relationship.

Of course, the analysis between components of GDP and civil war onset could be taken further to consider the distinct impact of sub-components of consumer spending, investment, government expenditure, exports and imports and their weighting in these composite variables. Indeed, some have argued that certain government expenditures are more peace inducing than others, for example, education as opposed to military spending (Berthélemy, Azam, and Calipel 1996). Whilst this may undeniably be the case, such an extension is beyond the scope of this research and, furthermore, beyond the scope of the theories that this paper was intended to scrutinize.

Conclusion

The purpose of this study was to examine GDP as an indicator of the development-peace relationship. With multiple competing mechanisms theorized to explain the association, this paper disaggregated GDP into its constituent components to establish the driving force behind the robust statistical relationship. With this information at hand, consistency with previous theories could be established. This paper also presented a new theory – consumption opportunities – which pertains to one’s ability to fulfil consumption wants or needs, or to have a good expectation of being able to fulfil those wants or needs in the future. If this condition is not met, conflict onset is more likely.

Evidence presented here shows that the consumption opportunity maximizing elements of private production, government spending and imports appear to be the driving force behind the robust relationship between GDP and civil war onset. Findings are less consistent with opportunity cost, state capacity, size of the prize and liberal peace. Though additional research

is required to extend the scope of this evidence, it is found to be robust to model specification in the current sample. Future research might employ quantitative and qualitative methods to test the mechanism presented and provide causal evidence. Results also suggested that the measures of GDPP or Consumption Opportunities, rather than GDP, should enter future models of civil war onset to more accurately capture the relationship with economic development.

This analysis suggests that peace and development can be achieved at the same time if growth is geared toward the maximization of domestic consumption opportunities. Export-led growth, for example, is less likely to make societies more internally peaceful if it is aggressively pursued at the expense of domestic markets and growth in local consumption opportunities. Indeed, when individuals can see the economic system working for them and have expectations of a better future, we are much less likely to see disastrous civil conflicts rage around the globe.

Notes

1. See table A2 of the appendix for correlation matrix of the key independent variables.
2. See figures A1-3, which show how the proportion of each component can change year on year within one country. On the other hand, it is still likely that countries with low levels of income will have low levels of each component, whilst high income countries will have high levels of each.
3. Updated version 6.0 beta of this database is available at <http://privatewww.essex.ac.uk/~ksg/exptradegdp.html>.
4. See Vreeland (2008) for discussion of origins of this theory.
5. See appendix for tables reporting all results discussed in this section.

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Declaration of interest statement

I certify that I have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Appendix

This appendix contains figures and tables of additional observations within the data and from the models specified in the paper.

Example of variation in the components of GDP across time

The following figures illustrate that the components of GDP, being domestic production (C), domestic investment (I), government spending (G), exports (X) and imports (M) vary across both time and space. That is, they are not constant relative to each other and various economic and social forces can lead to restructuring of the economy.

Figure A1. Cross-Time Variation in the Share of C, I, G, X and M in the UK

Figure A1 near here

Figure A2. Cross-Time Variation in the Share of C, I, G, X and M in Venezuela

Figure A2 near here

Figure A3. Cross-Time Variation in the Share of C, I, G, X and M in Zambia

Figure A3 near here

Summary statistics

Table A1. Summary Statistics

Table A1 near here

Figure A4. Key Independent Variables Univariate Kernel Density – Between Indicators

Figure A4 near here

Figure A5. Key Independent Variables Univariate Kernel Density – Within Indicators

Figure A5 near here

Figure A6. Control Variables Univariate Kernel Density – Between Indicators

Figure A6 near here

Figure A7. Control Variables Univariate Kernel Density – Within Indicators

Figure A7 near here

Table A2. Correlation matrix between key independent variables

Table A2 near here

Alternative model specifications

The following tables present various model re-specifications as checks of robustness.

Table A3. Additional control: Net ODA

Table A3 near here

Table A4. Additional control: Reporting residual

Table A4 near here

Table A5. Key independent variables and inequality

Table A5 near here

Table A6. GDP and the onset of civil war (>1,000 battle-related deaths)

Table A6 near here

Table A7. The exclusion of region dummies

Table A7 near here

Leverage analysis

The identification of influential cases was completed through DFBETA leverage analyses, the results of which are shown in Figure A8.

Figure A8. DFBETA leverage analysis

Figure A8 near here

Table A8 shows the results of a repeated analysis of the data when omitting ‘influential cases’ (DFBETA above 0.015 or below 0.015 as per Figure A8). In Model A25 GDP becomes insignificant. Investment also becomes insignificant in model A27. However, the substantive significance of private consumption and imports increases in models A26 and A30 compared to models 2 and 6. As these are two of the main drivers of increased consumption opportunities, the results presented below further support the hypothesis, H1.

Table A8 near here

Table 1. GDP and the onset of civil war

	Between Effects						Within Effects					
	1 Civil war onset	2 Civil war onset	3 Civil war onset	4 Civil war onset	5 Civil war onset	6 Civil war onset	1 Civil war onset	2 Civil war onset	3 Civil war onset	4 Civil war onset	5 Civil war onset	6 Civil war onset
GDP per capita _(log)	-0.57** (0.26)						-0.04 (0.26)					
Total Private Production/pc _(log)		-0.76** (0.30)						0.05 (0.27)				
Total Private Investment/pc _(log)			-0.38** (0.18)						0.08 (0.14)			
Total Government Spending/pc _(log)				-0.50** (0.22)						0.02 (0.17)		
Total Exports/pc _(log)					-0.20 (0.17)						-0.17 (0.13)	
Total Imports/pc _(log)						-0.64*** (0.21)						-0.01 (0.15)
Discrimination	0.63*** (0.19)	0.65*** (0.18)	0.62*** (0.19)	0.60*** (0.19)	0.62*** (0.19)	0.63*** (0.18)	-0.30* (0.18)	-0.30* (0.18)	-0.30 (0.18)	-0.30* (0.18)	-0.31* (0.18)	-0.30* (0.18)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at War	0.24 (0.72)	0.10 (0.71)	0.43 (0.72)	0.39 (0.72)	0.31 (0.72)	0.15 (0.70)	0.14 (0.25)	0.14 (0.25)	0.13 (0.25)	0.14 (0.25)	0.17 (0.25)	0.14 (0.25)
Trade openness	-1.19* (0.68)	-1.16* (0.67)	-1.07 (0.70)	-1.11 (0.69)	-0.84 (0.84)	0.39 (0.84)	-0.79 (0.60)	-0.80 (0.59)	-0.86 (0.61)	-0.80 (0.60)	-0.32 (0.69)	-0.75 (0.69)
Democracy	1.88 (3.10)	1.61 (3.08)	1.61 (3.10)	2.61 (3.10)	2.34 (3.13)	2.09 (3.03)	3.42** (1.52)	3.44** (1.52)	3.47** (1.52)	3.43** (1.52)	3.40** (1.52)	3.44** (1.52)
Democracy ²	-0.09 (2.82)	0.45 (2.83)	0.04 (2.83)	-1.01 (2.76)	-1.00 (2.81)	0.01 (2.73)	-2.76* (1.58)	-2.80* (1.57)	-2.84* (1.58)	-2.79* (1.58)	-2.69* (1.57)	-2.77* (1.57)
Peace Decay							-0.62* (0.37)	-0.61 (0.37)	-0.60 (0.37)	-0.62* (0.37)	-0.70* (0.38)	-0.61 (0.37)
Constant	0.17 (2.04)	1.28 (2.20)	-2.14* (1.22)	-1.43 (1.39)	-3.15*** (1.09)	-1.23 (1.22)						
AIC	1,411	1,409	1,411	1,411	1,413	1,407						
No. of Observations	5,007	5,007	5,007	5,007	5,007	5,007						
No. of Countries	150	150	150	150	150	150						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

Table 2. GDP comparison with GDPP and Consumption Opportunities

	Between Effects			Within Effects		
	1 Civil war onset	7 Civil war onset	8 Civil war onset	1 Civil war onset	7 Civil war onset	8 Civil war onset
GDP per capita (log)	-0.57** (0.26)			-0.04 (0.26)		
GDPP per capita (log)		-0.61** (0.27)			-0.08 (0.25)	
Consumption Opportunities per capita (log)			-0.75*** (0.29)			0.01 (0.27)
Discrimination	0.63*** (0.19)	0.63*** (0.19)	0.63*** (0.18)	-0.30* (0.18)	-0.30 (0.18)	-0.30* (0.18)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at War	0.24 (0.72)	0.26 (0.71)	0.20 (0.71)	0.14 (0.25)	0.15 (0.25)	0.14 (0.25)
Trade Openness	-1.19* (0.68)	-0.92 (0.70)	-1.11* (0.67)	-0.79 (0.60)	-0.74 (0.61)	-0.79 (0.59)
Democracy	1.88 (3.10)	1.90 (3.09)	1.88 (3.07)	3.42** (1.52)	3.41** (1.52)	3.43** (1.52)
Democracy ²	-0.09 (2.82)	-0.06 (2.81)	0.11 (2.80)	-2.76* (1.58)	-2.74* (1.57)	-2.78* (1.57)
Peace Decay				-0.62* (0.37)	-0.63* (0.37)	-0.61* (0.37)
Constant	0.17 (2.04)	0.39 (2.07)	1.34 (2.19)			
AIC	1,411	1,411	1,409			
No. of Observations	5,007	5,007	5,007			
No. of Countries	150	150	150			

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

Table 3. Expected relationships between components of GDP and the probability of civil war onset

GDP Component	Theory				
	Consumption Opportunities	Opportunity Cost	Government Ability to Defend	Size of the Prize	Liberal Peace
Consumption	Strong (-)'ve	Moderate (-)'ve	-	-	-
Investment	Weak (-)'ve	Strong (-)'ve	-	-	-
Government	Strong (-)'ve	Strong (-)'ve	Strong (-)'ve	Strong (+)'ve	-
Exports	Ambiguous	Strong (-)'ve	-	-	Strong (-)'ve
Imports	Strong (-)'ve	Weak (-)'ve	-	-	Strong (-)'ve

Table A1. Summary statistics

Variable	Mean	Std. Dev.	Min	Max
<u>Between</u>				
Civil war onset	0.040	0.195	0.000	1.000
GDP per capita (log)	8.274	1.127	6.059	11.292
Total Private Production/pc (log)	7.789	1.030	5.824	9.875
Total Private Investment/pc (log)	6.502	1.487	3.114	9.602
Total Government Spending/pc (log)	6.532	1.135	3.661	9.667
Total Exports/pc (log)	6.195	1.746	0.346	10.918
Total Imports/pc (log)	6.410	1.600	2.628	10.261
Consumption Opportunities	8.075	1.020	6.121	10.483
Discrimination	-0.484	1.213	-2.995	2.471
Discrimination	-0.484	1.213	-2.995	2.471
Petroleum production per capita	398.855	2,037.694	0.000	21,680.390
Neighbor at war	0.688	0.278	0.000	1.000
Trade openness	0.414	0.290	0.028	2.023
SIP	0.590	0.275	0.020	0.994
SIP ²	0.464	0.322	0.001	0.987
<u>Within</u>				
GDP per capita (log)	0.000	0.375	-1.674	1.705
Total Private Production/pc (log)	0.000	0.359	-2.042	2.068
Total Private Investment/pc (log)	0.000	0.569	-3.286	1.997
Total Government Spending/pc (log)	0.000	0.501	-2.721	2.223
Total Exports/pc (log)	0.000	0.781	-7.237	3.397
Total Imports/pc (log)	0.000	0.727	-6.750	3.674
Discrimination	0.000	0.475	-3.104	2.023
Petroleum production per capita	0.000	1,821.858	-15,219.700	56,908.410
Neighbor at war	0.000	0.371	-0.978	0.974
Trade openness	0.000	0.178	-0.741	1.246
SIP	0.000	0.203	-0.824	0.613
SIP ²	0.000	0.208	-0.792	0.630
Peace decay	0.000	0.205	-0.478	0.762

Table A2. Correlation matrix between key independent variables

	GDP	Consumption	Investment	Government	Exports	Imports
GDP	1					
Consumption	0.9828	1				
Investment	0.9631	0.9365	1			
Government	0.9382	0.8905	0.8969	1		
Exports	0.9064	0.8845	0.8745	0.8606	1	
Imports	0.8873	0.8875	0.863	0.8448	0.9566	1

Table A3. Additional control: Net ODA

	Between Effects						Within Effects					
	A1 Civil war onset	A2 Civil war onset	A3 Civil war onset	A4 Civil war onset	A5 Civil war onset	A6 Civil war onset	A1 Civil war onset	A2 Civil war onset	A3 Civil war onset	A4 Civil war onset	A5 Civil war onset	A6 Civil war onset
GDP per capita _(log)	-0.61** (0.27)						-0.25 (0.28)					
Total Private Production/pc _(log)		-0.81*** (0.30)						-0.11 (0.30)				
Total Private Investment/pc _(log)			-0.42** (0.18)						-0.01 (0.15)			
Total Government Spending/pc _(log)				-0.56** (0.22)						-0.05 (0.18)		
Total Exports/pc _(log)					-0.23 (0.17)						-0.26* (0.13)	
Total Imports/pc _(log)						-0.63*** (0.21)						-0.04 (0.16)
Discrimination	0.58*** (0.18)	0.59*** (0.18)	0.56*** (0.18)	0.55*** (0.18)	0.56*** (0.18)	0.58*** (0.18)	-0.25 (0.20)	-0.26 (0.20)	-0.27 (0.20)	-0.26 (0.20)	-0.29 (0.20)	-0.27 (0.20)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at war	0.60 (0.72)	0.45 (0.71)	0.82 (0.73)	0.78 (0.73)	0.62 (0.72)	0.45 (0.70)	0.01 (0.28)	-0.00 (0.28)	-0.01 (0.28)	0.01 (0.28)	0.01 (0.28)	-0.00 (0.28)
Trade openness	-0.37 (0.72)	-0.35 (0.71)	-0.18 (0.74)	-0.35 (0.73)	0.15 (0.88)	1.06 (0.85)	-1.15* (0.64)	-1.17* (0.64)	-1.13* (0.65)	-1.15* (0.65)	-0.47 (0.72)	-1.05 (0.73)
Democracy	0.08 (3.13)	-0.10 (3.10)	-0.43 (3.12)	0.51 (3.17)	0.14 (3.17)	0.19 (3.08)	3.05* (1.56)	3.13** (1.57)	3.11** (1.57)	3.06* (1.56)	3.07** (1.56)	3.12** (1.56)
Democracy ²	1.46 (2.90)	1.92 (2.90)	1.87 (2.91)	0.81 (2.92)	1.00 (2.92)	1.55 (2.84)	-2.41 (1.65)	-2.52 (1.65)	-2.52 (1.65)	-2.47 (1.65)	-2.42 (1.64)	-2.52 (1.64)
Net ODA	-0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Peace decay							-0.99** (0.41)	-0.98** (0.41)	-0.97** (0.41)	-0.96** (0.41)	-1.10*** (0.42)	-0.96** (0.41)
Constant	0.44 (1.98)	1.57 (2.15)	-2.00* (1.15)	-1.14 (1.34)	-2.91*** (1.05)	-1.22 (1.17)						
No. of observations	3,515	3,515	3,515	3,515	3,515	3,515						
No. of countries	119	119	119	119	119	119						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

Table A4. Additional control: Reporting residual

	Between Effects						Within Effects					
	A7 Civil war onset	A8 Civil war onset	A9 Civil war onset	A10 Civil war onset	A11 Civil war onset	A12 Civil war onset	A7 Civil war onset	A8 Civil war onset	A9 Civil war onset	A10 Civil war onset	A11 Civil war onset	A12 Civil war onset
GDP per capita _(log)	-0.59** (0.26)						-0.08 (0.26)					
Total Private Production/pc _(log)		-0.81*** (0.30)						0.06 (0.27)				
Total Private Investment/pc _(log)			-0.42** (0.18)						0.08 (0.14)			
Total Government Spending/pc _(log)				-0.50** (0.22)						0.01 (0.17)		
Total Exports/pc _(log)					-0.23 (0.17)						-0.16 (0.13)	
Total Imports/pc _(log)						-0.61*** (0.21)						-0.05 (0.15)
Discrimination	0.68*** (0.19)	0.69*** (0.19)	0.67*** (0.19)	0.64*** (0.19)	0.67*** (0.19)	0.66*** (0.18)	-0.30* (0.18)	-0.30* (0.18)	-0.30 (0.18)	-0.30* (0.18)	-0.31* (0.18)	-0.31* (0.18)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at war	0.05 (0.72)	-0.12 (0.72)	0.21 (0.72)	0.20 (0.72)	0.11 (0.73)	0.05 (0.71)	0.16 (0.25)	0.15 (0.26)	0.15 (0.25)	0.15 (0.25)	0.17 (0.26)	0.16 (0.26)
Trade openness	-1.26* (0.68)	-1.22* (0.67)	-1.12 (0.69)	-1.18* (0.69)	-0.82 (0.83)	0.26 (0.86)	-0.66 (0.59)	-0.68 (0.59)	-0.73 (0.60)	-0.68 (0.60)	-0.22 (0.68)	-0.53 (0.70)
Democracy	1.44 (3.09)	1.09 (3.07)	1.05 (3.09)	2.20 (3.10)	1.90 (3.12)	1.84 (3.03)	3.40** (1.52)	3.43** (1.52)	3.46** (1.52)	3.42** (1.52)	3.37** (1.52)	3.45** (1.51)
Democracy ²	0.45 (2.82)	1.13 (2.83)	0.76 (2.84)	-0.52 (2.77)	-0.41 (2.81)	0.25 (2.73)	-2.75* (1.57)	-2.83* (1.57)	-2.85* (1.58)	-2.80* (1.58)	-2.69* (1.57)	-2.79* (1.57)
Reporting Residual	0.04 (0.03)	0.05* (0.03)	0.05* (0.03)	0.04 (0.03)	0.05 (0.03)	0.03 (0.03)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.01)	-0.02 (0.01)
Peace decay							-0.65* (0.38)	-0.63* (0.37)	-0.62* (0.38)	-0.64* (0.37)	-0.72* (0.38)	-0.66* (0.38)
Constant	0.37 (2.03)	1.70 (2.19)	-1.86 (1.22)	-1.33 (1.39)	-2.94*** (1.09)	-1.32 (1.22)						
No. of observations	5,007	5,007	5,007	5,007	5,007	5,007						
No. of countries	150	150	150	150	150	150						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

Table A5. Key independent variables and inequality

	A13	A14	A15	A16	A17	A18
	Inequality	Inequality	Inequality	Inequality	Inequality	Inequality
Consumption Opportunities	0.05*** (0.00)					
Total Private Production/pc _(log)		0.05*** (0.00)				
Total Private Investment/pc _(log)			0.03*** (0.00)			
Total Government Spending/pc _(log)				0.04*** (0.00)		
Total Exports/pc _(log)					0.02*** (0.00)	
Total Imports/pc _(log)						0.03*** (0.00)
Constant	0.56*** (0.03)	0.58*** (0.03)	0.75*** (0.02)	0.69*** (0.02)	0.81*** (0.01)	0.79*** (0.02)
Observations	4,938	4,938	4,938	4,938	4,938	4,938
Number of countries	148	148	148	148	148	148

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A6. GDP and the onset of civil war (>1,000 battle-related deaths)

	Between Effects						Within Effects					
	A19 Civil war onset	A20 Civil war onset	A21 Civil war onset	A22 Civil war onset	A23 Civil war onset	A24 Civil war onset	A19 Civil war onset	A20 Civil war onset	A21 Civil war onset	A22 Civil war onset	A23 Civil war onset	A24 Civil war onset
GDP per capita _(log)	-0.29 (0.38)						0.21 (0.43)					
Total Private Production/pc _(log)		-0.16 (0.44)						-0.05 (0.44)				
Total Private Investment/pc _(log)			-0.36 (0.23)						0.32 (0.24)			
Total Government Spending/pc _(log)				-0.42 (0.29)						0.25 (0.30)		
Total Exports/pc _(log)					0.01 (0.25)						0.03 (0.17)	
Total Imports/pc _(log)						-0.75** (0.31)						-0.05 (0.18)
Discrimination	0.85*** (0.24)	0.84*** (0.25)	0.84*** (0.24)	0.84*** (0.25)	0.84*** (0.24)	0.86*** (0.24)	-0.20 (0.27)	-0.22 (0.27)	-0.17 (0.27)	-0.16 (0.27)	-0.22 (0.27)	-0.20 (0.27)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Neighbor at War	1.80* (1.07)	1.80* (1.09)	1.94* (1.05)	1.83* (1.07)	1.89* (1.08)	1.37 (1.05)	1.56** (0.65)	1.58** (0.65)	1.53** (0.65)	1.57** (0.65)	1.57** (0.65)	1.61** (0.65)
Trade openness	-3.11*** (1.13)	-3.26*** (1.16)	-2.83** (1.12)	-2.90*** (1.11)	-3.46*** (1.56)	-0.53 (1.42)	-0.57 (1.19)	-0.48 (1.19)	-0.80 (1.23)	-0.62 (1.19)	-0.65 (1.41)	-0.20 (1.32)
Democracy	0.59 (3.80)	0.57 (3.83)	0.28 (3.67)	1.31 (3.86)	0.51 (3.83)	0.77 (3.87)	-5.15** (2.12)	-5.23** (2.12)	-5.20** (2.12)	-5.09** (2.12)	-5.25** (2.13)	-4.97** (2.11)
Democracy ²	1.72 (3.40)	1.57 (3.44)	2.38 (3.32)	1.13 (3.39)	1.35 (3.38)	2.55 (3.44)	4.21* (2.30)	4.32* (2.30)	4.34* (2.28)	4.24* (2.29)	4.31* (2.30)	4.08* (2.28)
Peace Decay							2.70*** (0.54)	2.71*** (0.54)	2.65*** (0.54)	2.65*** (0.54)	2.72*** (0.54)	2.66*** (0.54)
Constant	-4.52 (2.87)	-5.39* (3.11)	-4.98*** (1.58)	-4.53** (1.85)	-6.50*** (1.52)	-3.60** (1.68)						
AIC	612	613	609	610	613	607						
No. of Observations	5,404	5,404	5,404	5,404	5,404	5,404						
No. of Countries	145	145	145	145	145	145						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

Table A7. The exclusion of region dummies

	Between Effects						Within Effects					
	A19 Civil war onset	A20 Civil war onset	A21 Civil war onset	A22 Civil war onset	A23 Civil war onset	A24 Civil war onset	A19 Civil war onset	A20 Civil war onset	A21 Civil war onset	A22 Civil war onset	A23 Civil war onset	A24 Civil war onset
GDP per capita _(log)	-0.49** (0.23)						-0.03 (0.26)					
Total Private Production/pc _(log)		-0.64** (0.25)						0.05 (0.27)				
Total Private Investment/pc _(log)			-0.35** (0.16)						0.08 (0.15)			
Total Government Spending/pc _(log)				-0.42** (0.20)						0.02 (0.17)		
Total Exports/pc _(log)					-0.22 (0.16)						-0.17 (0.13)	
Total Imports/pc _(log)						-0.56*** (0.18)						-0.01 (0.15)
Discrimination	0.69*** (0.18)	0.70*** (0.18)	0.68*** (0.18)	0.65*** (0.18)	0.69*** (0.18)	0.68*** (0.17)	-0.30* (0.18)	-0.30* (0.18)	-0.30* (0.18)	-0.30* (0.18)	-0.31* (0.18)	-0.30* (0.18)
Oil Production	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at War	0.98 (0.66)	0.87 (0.65)	1.11* (0.66)	1.11* (0.67)	0.93 (0.66)	0.87 (0.64)	0.15 (0.25)	0.14 (0.25)	0.14 (0.25)	0.14 (0.25)	0.17 (0.25)	0.15 (0.25)
Trade openness	-1.25* (0.67)	-1.21* (0.67)	-1.11 (0.69)	-1.18* (0.69)	-0.75 (0.82)	0.23 (0.83)	-0.79 (0.60)	-0.80 (0.60)	-0.85 (0.61)	-0.80 (0.60)	-0.32 (0.68)	-0.75 (0.69)
Democracy	2.63 (3.11)	2.41 (3.09)	2.41 (3.10)	3.12 (3.12)	2.87 (3.13)	2.59 (3.03)	3.42** (1.52)	3.44** (1.52)	3.49** (1.52)	3.44** (1.52)	3.42** (1.52)	3.45** (1.51)
Democracy ²	-1.12 (2.86)	-0.62 (2.86)	-0.98 (2.86)	-1.86 (2.82)	-1.86 (2.84)	-0.82 (2.77)	-2.78* (1.58)	-2.83* (1.57)	-2.88* (1.58)	-2.82* (1.58)	-2.73* (1.57)	-2.80* (1.57)
Peace Decay							-0.62* (0.37)	-0.61 (0.37)	-0.59 (0.37)	-0.61* (0.37)	-0.70* (0.38)	-0.61 (0.37)
Constant	-0.97 (1.80)	-0.08 (1.92)	-2.80** (1.15)	-2.32* (1.30)	-3.55*** (1.07)	-2.08* (1.15)						
AIC	1,404	1,403	1,404	1,404	1,405	1,400						
No. of Observations	5,007	5,007	5,007	5,007	5,007	5,007						
No. of Countries	150	150	150	150	150	150						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A8. GDP and the onset of civil war excluding influential observations

	Between Effects						Within Effects					
	A25 Civil war onset	A26 Civil war onset	A27 Civil war onset	A28 Civil war onset	A29 Civil war onset	A30 Civil war onset	A25 Civil war onset	A26 Civil war onset	A27 Civil war onset	A28 Civil war onset	A29 Civil war onset	A30 Civil war onset
GDP per capita _(log)	-0.61 (0.40)						-0.09 (0.28)					
Total Private Production/pc _(log)		-1.02** (0.46)						0.00 (0.30)				
Total Private Investment/pc _(log)			-0.28 (0.26)						0.09 (0.16)			
Total Government Spending/pc _(log)				-0.56* (0.32)						0.02 (0.18)		
Total Exports/pc _(log)					-0.03 (0.25)						-0.22 (0.14)	
Total Imports/pc _(log)						-0.82*** (0.29)						-0.01 (0.17)
Discrimination	0.90*** (0.25)	0.92*** (0.25)	0.90*** (0.25)	0.86*** (0.25)	0.92*** (0.25)	0.89*** (0.24)	-0.25 (0.19)	-0.25 (0.19)	-0.25 (0.19)	-0.25 (0.19)	-0.27 (0.19)	-0.25 (0.19)
Oil Production	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Neighbor at War	-0.26 (0.95)	-0.48 (0.95)	-0.10 (0.95)	-0.11 (0.95)	-0.18 (0.95)	-0.45 (0.92)	0.08 (0.29)	0.07 (0.29)	0.06 (0.29)	0.07 (0.29)	0.10 (0.29)	0.07 (0.29)
Trade openness	-2.32** (0.99)	-2.13** (0.96)	-2.38** (1.04)	-2.25** (1.00)	-2.66** (1.35)	-0.13 (1.21)	-0.82 (0.70)	-0.84 (0.69)	-0.92 (0.71)	-0.84 (0.70)	-0.17 (0.81)	-0.78 (0.82)
Democracy	-0.30 (4.06)	-0.65 (4.03)	-0.52 (4.07)	0.49 (4.07)	-0.26 (4.11)	0.06 (3.97)	2.53 (1.60)	2.56 (1.60)	2.61 (1.61)	2.57 (1.61)	2.53 (1.60)	2.57 (1.60)
Democracy ²	2.33 (3.69)	3.28 (3.71)	2.19 (3.71)	1.40 (3.62)	1.47 (3.67)	2.58 (3.57)	-1.70 (1.69)	-1.75 (1.69)	-1.83 (1.69)	-1.77 (1.69)	-1.67 (1.68)	-1.75 (1.68)
Peace Decay							-0.43 (0.40)	-0.42 (0.40)	-0.40 (0.40)	-0.42 (0.40)	-0.51 (0.41)	-0.42 (0.40)
Constant	0.91 (2.95)	3.49 (3.22)	-2.00 (1.61)	-0.56 (1.89)	-3.08** (1.42)	-0.04 (1.63)						
AIC	1,115	1,155	1,158	1,157	1,157	1,152						
No. of Observations	4,819	4,819	4,819	4,819	4,819	4,819						
No. of Countries	145	145	145	145	145	145						

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Region fixed effects omitted from table.

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Figure 1. Between Effects of Consumption Opportunities on Civil War Onset

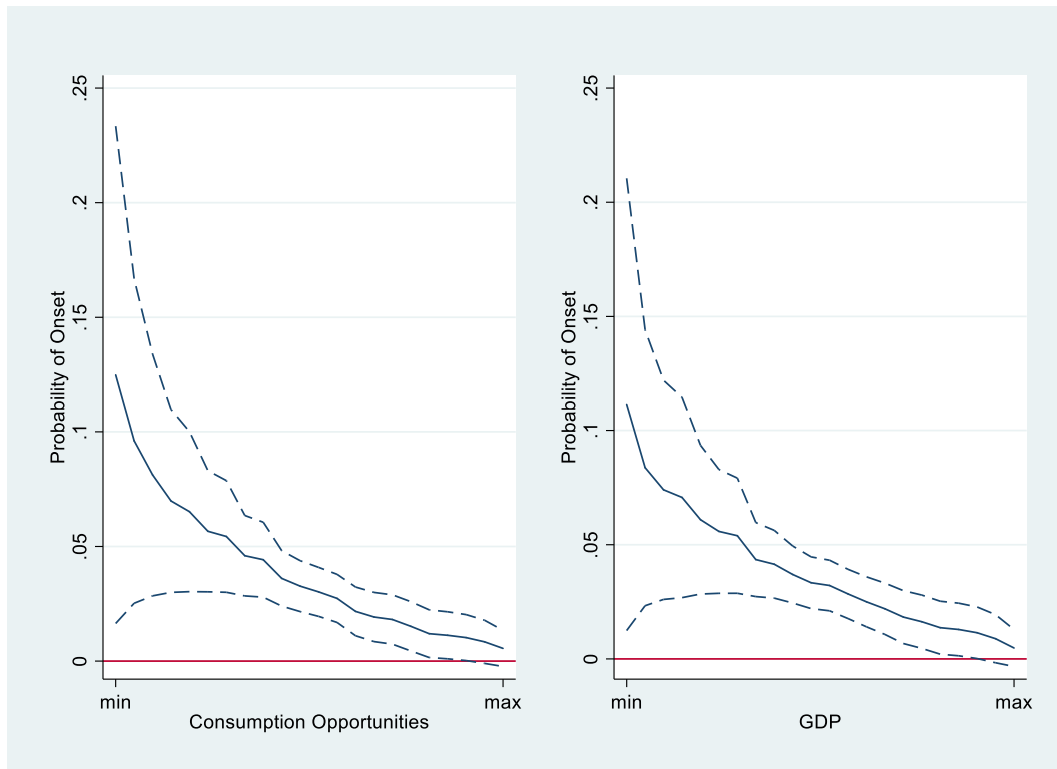


Figure A1. Cross-Time Variation in the Share of C, I, G, X and M in the UK

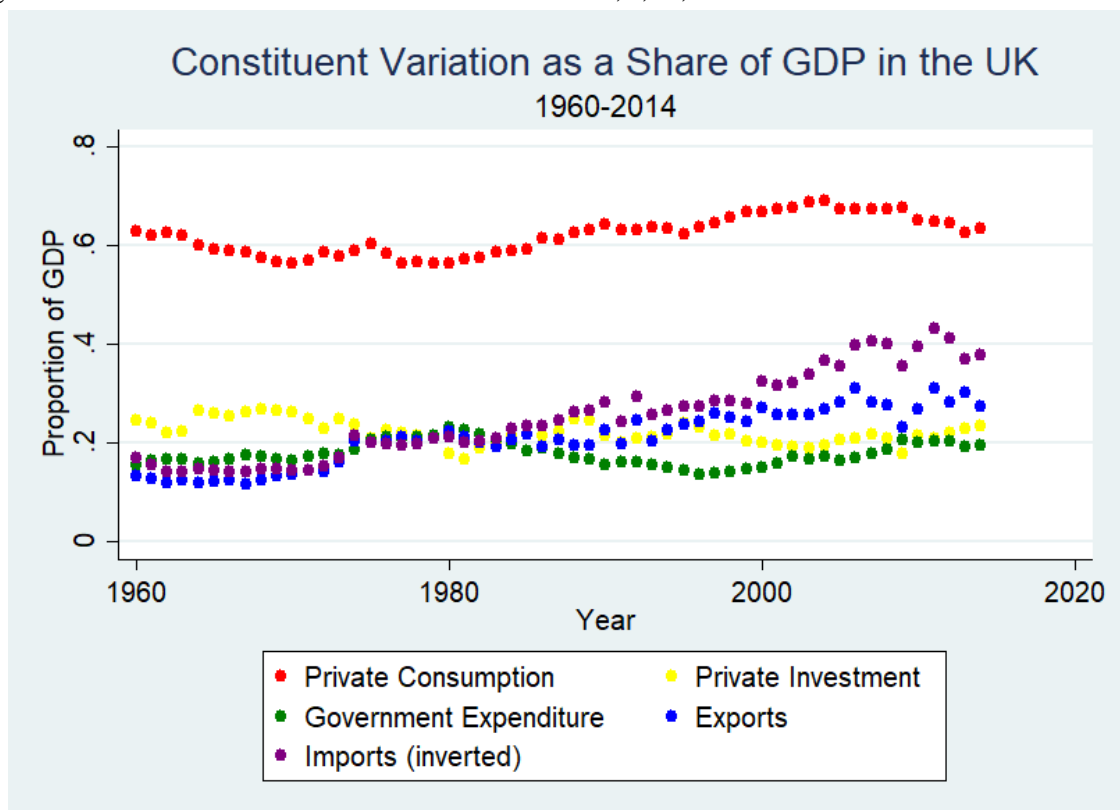


Figure A2. Cross-Time Variation in the Share of C, I, G, X and M in Venezuela

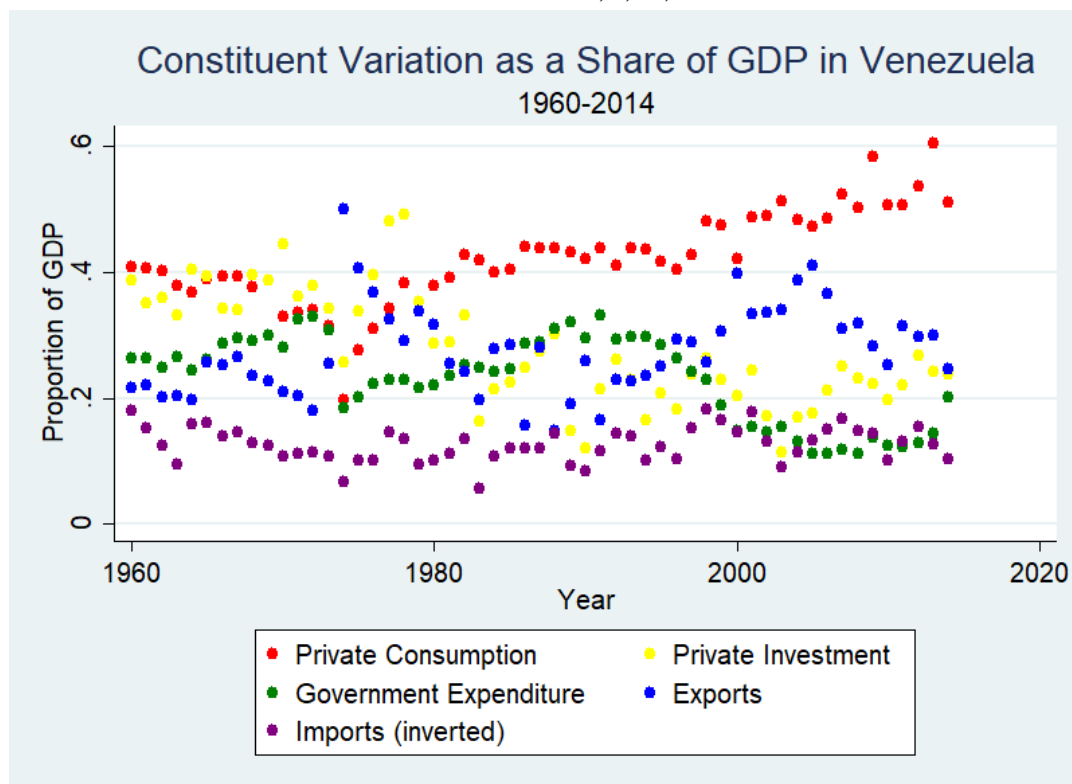


Figure A3. Cross-Time Variation in the Share of C, I, G, X and M in Zambia

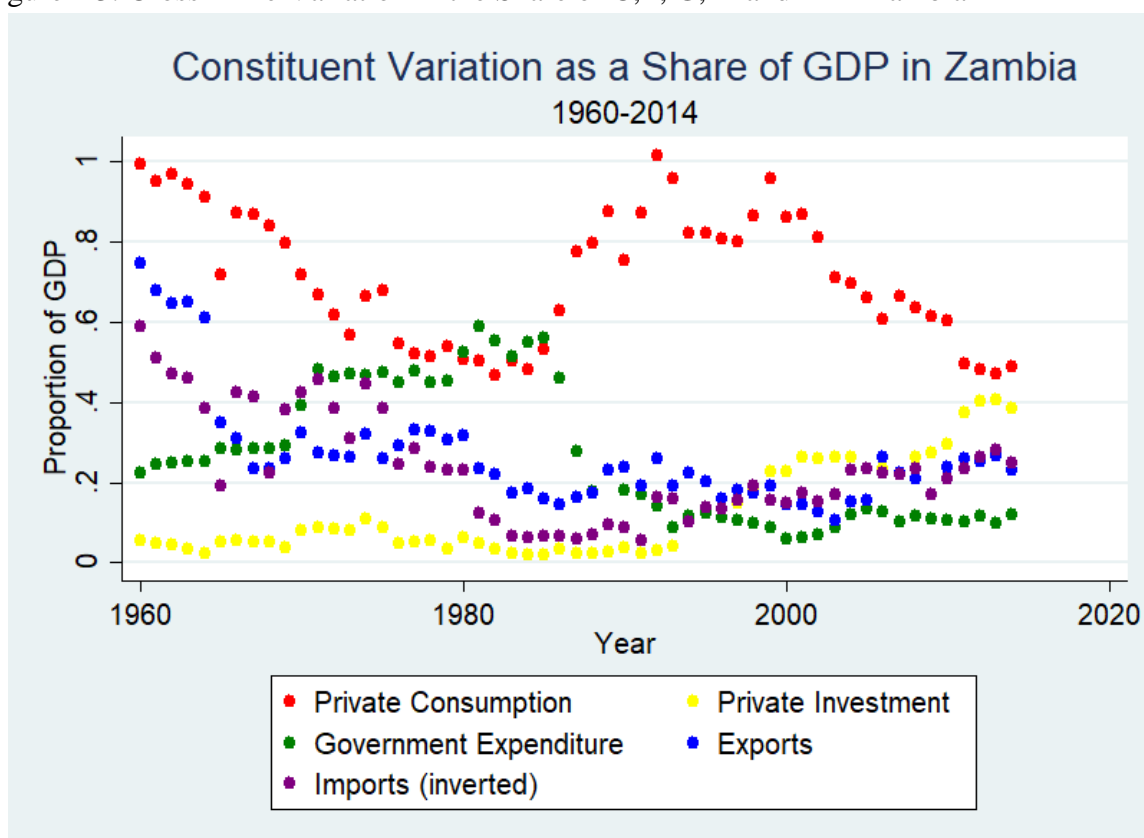


Figure A4. Key Independent Variables Univariate Kernel Density – Between Indicators

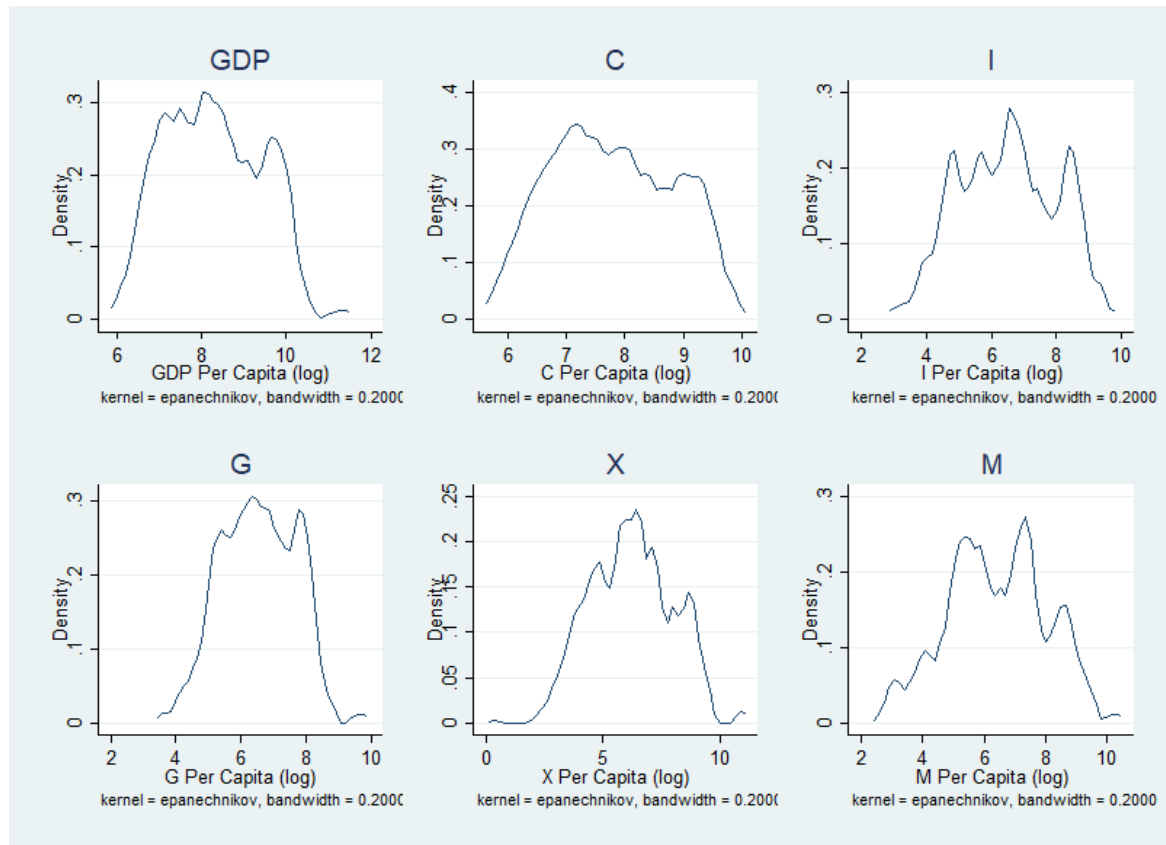


Figure A5. Key Independent Variables Univariate Kernel Density – Within Indicators

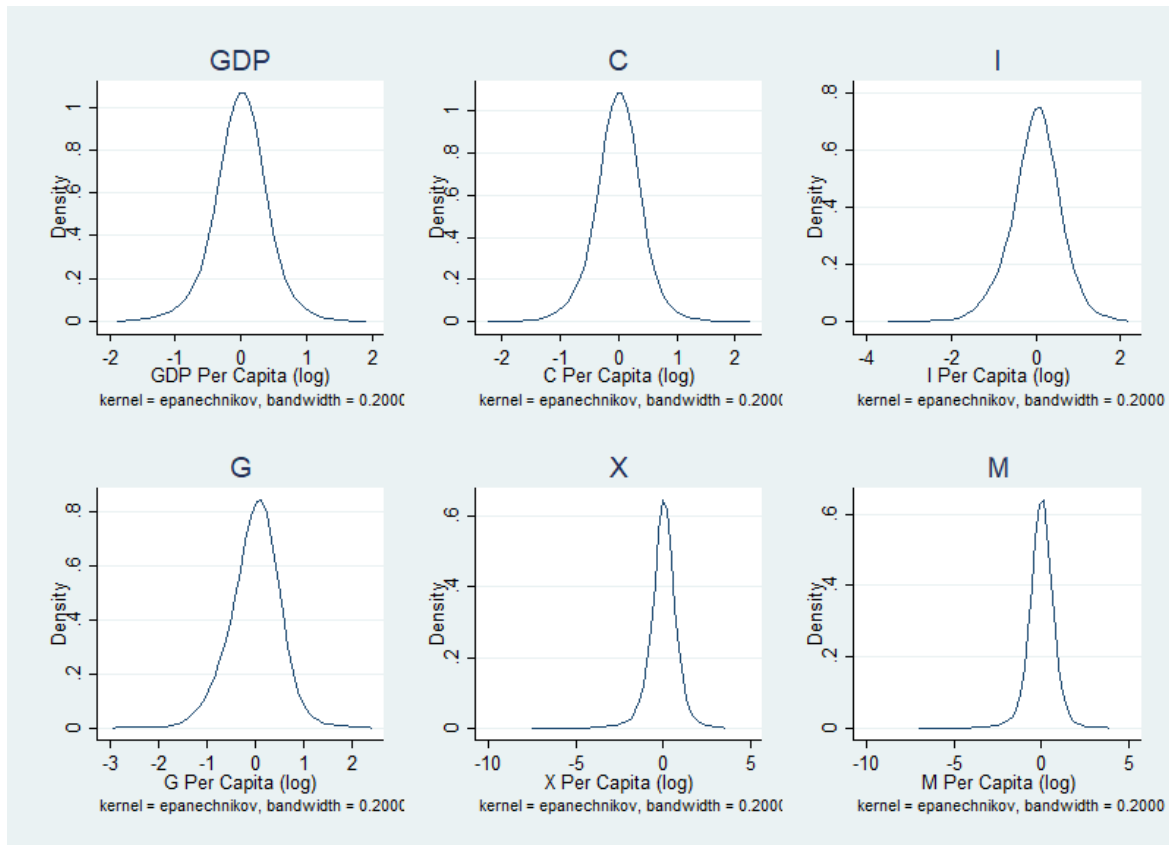


Figure A6. Control Variables Univariate Kernel Density – Between Indicators

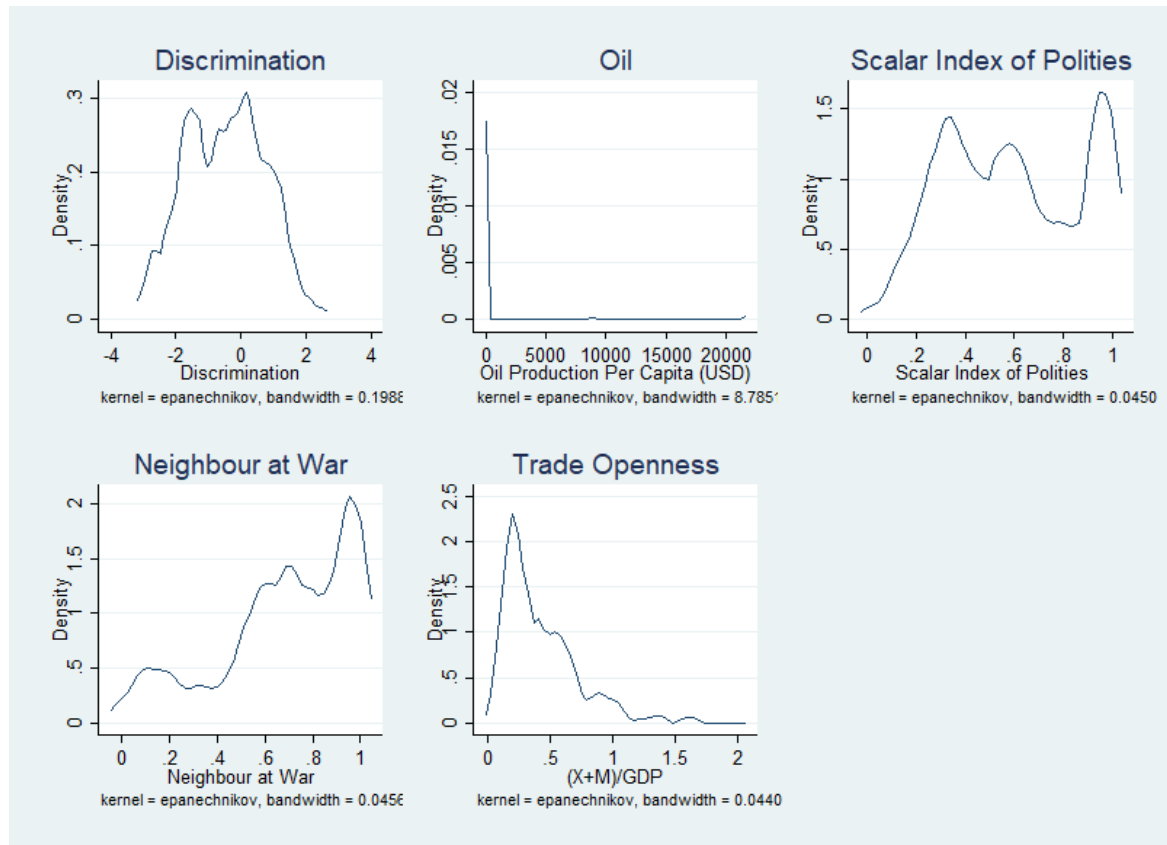


Figure A7. Control Variables Univariate Kernel Density – Within Indicators

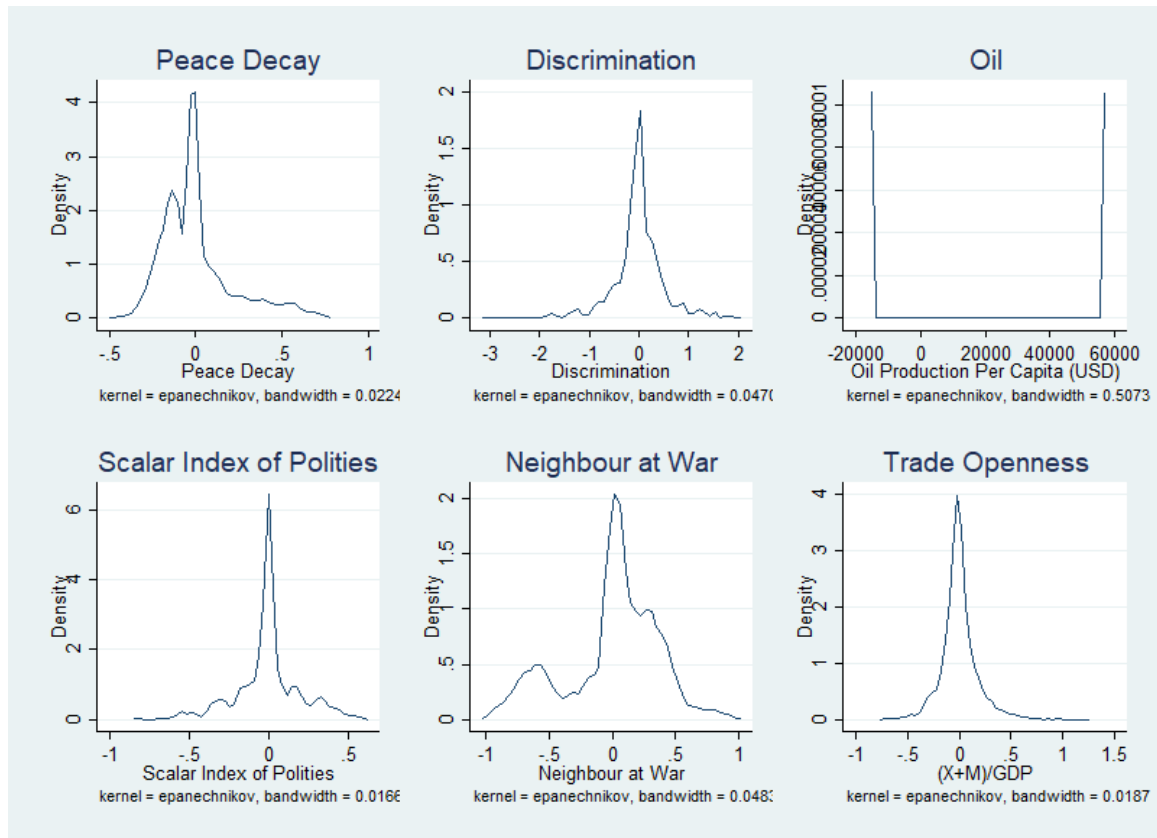


Figure A8. DFBETA leverage analysis

