

Argentine Chaotic Term Length Series in an American Historical Context

Part 1: Time Domain Analysis

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ABSTRACT

The political stability of a government depends on the norms that come from a state of rights. Several metrics have been proposed to measure political stability, but they must be applied carefully to individual countries or to compare countries. In the related literature the cultural factors are not directly considered and are limited to quantifying their practical effects. Concepts such as contempt for authority have not been directly quantified. This study proposes indicators that account for the cultural concept of contempt for authority and permit a rapid quantitative and visual analysis of the political stability of a country or province throughout its history. A specific historical analysis for the Republic of Argentina between the 16th and 21st centuries was realized. The results indicate 1) the permanence of socially toxic behavior patterns in Argentina and other Latin American countries, 2) that inherited cultural causes could explain the high political instability in Argentina over the last 500 years and 3) a succession of singles term length by ruler during decades could be used to stabilize a country.

1. Introduction

1.1. Part 1: Time Domain Analysis

The political instability of Latin America is well known (Blanco, 2009; Johnson, 1964). In particular, Argentina is subject of study due to their endemic crises (Campos, 2008), despite having all material and human resources to not have them (Waisman, 1990). Quantitative analysis of political instability are prevalent in the revisited bibliography, cultural causes are qualitatively described, time frames are not bigger than one century, and social pattern behaviors are only qualitatively described.

The present work is the first part of a study about deep causes of political instability in Argentina and Latin America. A study of the time series of time in office of american rulers is performed by using time domain visualization. Wide time frame from America discovered to

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the present day is used, and time series of time in office of rulers are quantitatively and qualitatively analyzed. This framework allows us to become independent from any ideology or form of government. In the second part we made an analysis of chaotic systems as tools to identify the persistence of toxic social behaviors and to deduce methods to improve *political stability*.

This paper begins with definitions of political stability and then introduces the time domain analysis method.

Various parameters, variables, and models can be used to analyze the grade of political stability of a government system. A possible definition of political instability is the propensity of a government to collapse, which is not observable and can be characterized using political and economic variables such as the change of Cabinet ministers, democratic status, economic growth rate, GDP per capita, or the regularity of transference of power (e.g. military governments) (Alesina, 1996). Another definition includes the weighted sum of the number of revolutions, coups d'état, number of strikes and manifestations against the government, guerrilla wars, murders, and purges (Blanco, 2009). We can also use a multi-indicator definition of political instability, which accounts for the number of political parties, number of coalitions in the government, number of seats occupied by each political party, and dates of the parliament and presidential elections (Bussiere, 2000). The most general example of available data that can be used to quantify political stability is available in the Database of Political institutions of the Development research group of the World Bank. It contains 72 quantified variables for 180 countries between the years of 1975 and 2015 (Cruz, 2016). The variables are quantified as binary or whole numbers and grouped into sets. One of the subsets is the Chief executive variables that includes, among other variables, the type of government, number of years that a governor is in charge, whether there is a limit on the time in the government, whether the governor can be re-elected, whether the minister of defense is from the military, percentage required to be elected, name of the political party, and their orientation on economic policies. This database is available for free on the internet and its objective is for the investigators to use its data for research on economic policies. One of the most used indicators of political stability is the one proposed by the World Bank. It is defined as *political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism*. This indicator is obtained using the statistics methodology of the unobserved components model and must be used carefully when comparing countries or their history (Kaufmann, 2010). Some individual variables used to build this indicator are the number of violent demonstrations, social tension, terrorist threats, intensity of internal conflicts, ethnic tensions, and the number of strikes and protests. Some publications that have used the stability indicator defined by the World Bank have applied it to countries and specific themes. For example, in Pakistan there is a causal relationship between human development and economic growth, which is moderated by political stability (Khan, 2020); or in the Arab countries, political stability encourage foreign investments (Abdul Rahman, 2020). A particular application of this indicator in the Middle East and North of Africa showed that there is a positive relation between political stability and inflation, that is, higher political stability contributes to higher inflation, which is contrary to the expectation (Samimi, 2012). The author of the study stated that the results obtained by them were owing to *the increase in government expenditures, especially non-productive government expenditures and insufficient tax revenues to finance them*, which proves that the indicator must be used carefully in each case, as suggested by the World Bank. The following diagram shows a general model of political stability that takes into account all the previous proposals.

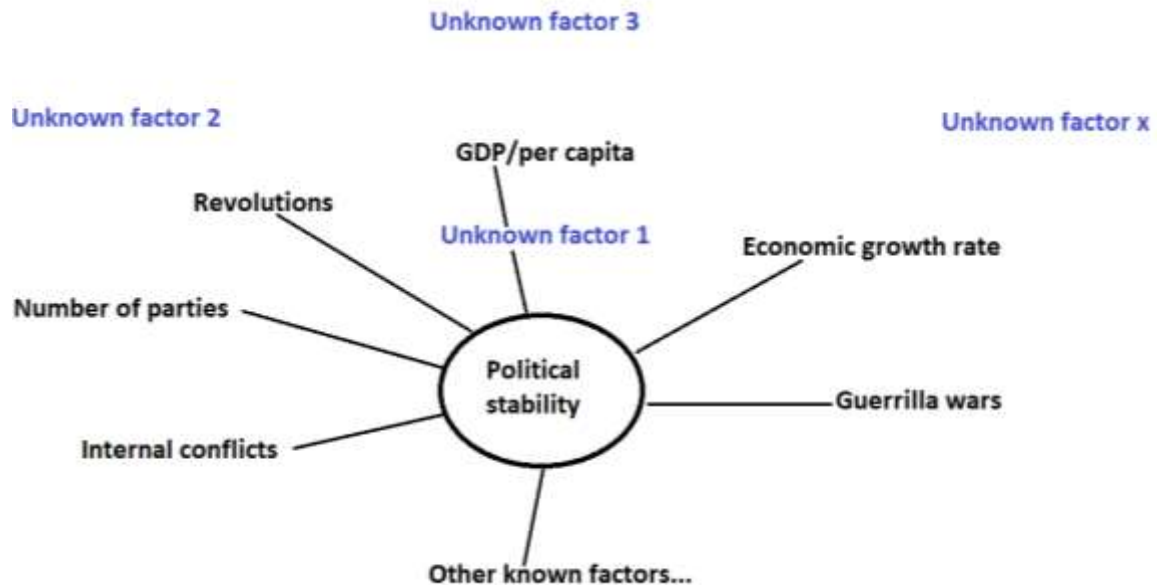


Diagram 1. General political stability model

In this model, political stability is considered as a construct, that is, a complex concept without a clear definition that allows us to recognize and quantify it. However, the unknown factors, although not taken into account in the model, could have a strong influence on political stability or be causally related to political stability rather than some apparently causal factor (e.g.: GDP/per capita).

The different indicators of political stability proposed by the World Bank, or the ones that can be extracted from the variables of the Database of Political Institutions, are difficult to interpret because they include subjective concepts, numerical parameters, and different variables. Therefore, they must be applied carefully when used for individual countries, or to compare countries.

The definitions we mentioned do not directly consider cultural aspects, like patterns of social behaviors or intergenerational transmission of values. Therefore, the proposed models only use measurable practical effects of the political stability (e.g.: number of strikes).

In this paper we start replacing *political* stability by *politicians* stability, focusing the problem on individuals and not on abstract concepts like *politics*. In our context, *politicians* stability is affected by the behavior of the surrounding people, and such behavior depends on the contempt level of them in their authority. If it is zero there are no problems, but if it is greater than zero, the bigger the contempt, the bigger the problems.

Our proposal is to quantify the *contempt for authority*, without using the word *politicians* to become independent from any ideology or time frame, i.e., an authority is a colonial governor, a viceroy or the president of any country in our world. Any level of *contempt for authority* is the cultural base that affects both political and politician stability anywhere in the world.

The contempt for authority is a subjective concept, depends on each individual and cannot be quantified in a direct way. But analogously, an electric field can be considered not directly measurable since it is also a subjective concept. In Physics, quantifying *the force exerted by an electric field* on a charge is used to solve the problem. In a similar way, we quantify *the time in office (TIO) of rulers* as the more important effect of the contempt for authority. TIO variable implicitly takes into account all factors that could affect politicians stability, because in our context, any kind of human action or lack thereof influences the value of TIO.

In this first part of our study, we present and use the indicator *stepped graph of terms in office* that allow for a rapid visual and quantitative analysis of the political stability of a country throughout its history. This indicator implicitly accounts for all the parameters, measured variables, and subjective concepts related to the political stability of a given culture, and it is based on the temporal series of time in office of rulers in specific locations.

As a case analysis, we collected and performed in-depth analysis of the indicator for the Republic of Argentina between the 16th and 21st centuries, with the historical context of the more important Spanish and British colonization of the American continent. From the analysis of the results, we propose the possible cultural causes that can explain the high political instability in Argentina over the past 500 years

2. Materials and Methods

2.1. Quantitative Indicators of Contempt for Authority

The *contempt for authority* is the devaluation of power that an individual manifest with respect to who governs or exercises command. In practice, it comprises removing the *de facto* authority from whom it was granted to, with or without prior formal agreement, or indirectly acting against the authority by failing to comply with the laws or regulations dictated by the authority. The degree of contempt for the authority of a society is directly related to the political instability of a country.

In our set of papers, contempt for authority is quantified with a set of three indicators based on the analysis of the time interval between mandates of the rulers of a given country, state, or province.

The analyzed time range includes the date of discovery or foundation of the country, state, or province until the year 2020. The territory governed by the rulers can vary over time while maintaining its historical denomination. For example, the Argentinian province of Tucumán first belonged to the Viceroyalty of Peru and included a territory of more than 700,000 km². It then became a part of the Viceroyalty of the Río de la Plata with a smaller territory and is now a 22,525 km² province of the Argentine Republic. When counting the office terms, the leaders are called Governors of Tucumán, as they are referred to in historical books and publications (Zinny, 1879; Olivieri, 2018; Astrada, 1987, Lascano, 1992). To avoid confusion, the person who rules will be called *ruler* in all cases, which includes the governor, president, interim president, interim governor, chairman of government boards, military governor, civil controller, military controller, commander-in-chief, and other similar titles used by countries to refer to their rulers at certain historical times.

The length of the term of a ruler depends on several factors. Particularly, when the time in office (TIO) is shorter than agreed, there may be many reasons to justify it. However, if this behavior is repetitive, it ceases to be an exception and becomes the norm, thereby making the government system unstable. History provides different reasons in different cultures to justify these exceptions, e.g., military reasons during the conquest of a territory, or internal political reasons in a defined and independent country.

To avoid the complexity of justifying the particular reasons in each case, a hypothesis is raised, which is that there exist a set of graphic and numerical indicators that reflect the cultural habit of contempt for authority at the country or province level, and they can be obtained from the TIO analysis of the rulers.

The proposed indicators are: 1) stepped graphs of TIO duration for a quick visual analysis; 2) social stability index (SSI) to quantify the stability degree of the predominant social behaviors and 3) phase plane to identify the type of predominant chaotic system. These indicators refer to social behaviors and their evolution over time, and also to human systems that can change over time both in behavior and number of people involved. In this first part we only present the stepped graphs of TIO duration.

2.2. Stepped Graphs of Time in Office (TIO)

A stepped graph of TIO shows the number of years, months, or days that the rulers of a country or province/state remained in office for a given period. The TIO is obtained as the difference between the date of appointment or formal assumption of the ruler and the date on which their appointment ceases. The consecutive TIOs of the same president are computed with a single value, which is the time difference between the date of assumption of the first term and the date of termination of the last term.

TIOs were adopted as the data source for the indicators because of the following reasons:

1. A TIO is sensitive to multiple causes and does not disturb the interaction between them or their quantity. The causes can have an involuntary origin such as illness, accident, or death, or can be voluntary owing to various authoritative problems. Some causes that can affect the TIO are coups, military intervention, civil intervention, self-coups, protests, strikes, social tension, corruption, and economic or ethnic problems. The list of variables can be extensive, such as those described by the World Bank for analyzing the political stability index (Cruz, 2016), but they can all affect the TIO. The comments column of the technical file attached with this study includes some examples of causes, such as natural death, flight from office, coups, and forced resignations.
2. The absence of authority or *interregnum* that occurs between the removal from office of one ruler and the assumption of the next also implies authority problems. Generally, the longer the interregnum, the bigger the problem. For example, on December 9, 2015, Argentina did not have a formal president in-charge for a few hours owing to bureaucratic problems, but the 27-year interregnum between 1827 and 1854 included decades of internal struggles without a formal president in-charge (Moran, 2000).

The date of assumption can be the date of formal appointment or the date of *de facto* assumption by occupation of a territory that may or may not have been inhabited by the same culture. The territory can change its limits over time because the geographical limits are defined until their current form. At times, the date of assumption occurred after the formal appointment of the ruler of a territory. For example, Francisco de Aguirre was appointed ruler of Tucumán by the Viceroy of Peru Don Lope García de Castro in 1563, but he formally assumed his position in April of 1565 (Maeder, 1972). This discrepancy may affect the variability of the TIO time series.

The cessation date may or may not coincide with the date of assumption or designation of the new ruler. The cessation may be formal with a delivery of command attributes to the next ruler or simply a bureaucratic act of taking office without the presence of the outgoing ruler, or informal through peaceful deposition, violent deposition, illness, abandonment of office, evasion of office, war, or murder (Zinny, 1879). When there exists a discrepancy between the dates of assumption and termination owing to lack of information or inconsistency between the sources, the time difference is assumed to be an interregnum (see glossary). In the special case of absence-of-ruler interregnums, a null duration is assumed, which indicates that nobody ruled during that time interval. In some cases, despite the fact that the day of assumption does not

coincide with the day of cessation, there is no interregnum because a ruler rules until midnight of his last day in office, and the next ruler begins ruling on the next day at zero hours.

Both the assumption and cessation dates are defined as exact when they are composed of days, months, and years. If the exact date is not known, an error of ± 15 days is assumed; if the month is not known, an error of ± 1.5 months is assumed; and if the exact year is not known, an error of ± 0.5 years is assumed. When only the year is known, the date of June 1 of that year is assumed. If there is more than one ruler in the same year and months are not known, the year is divided into the number of rulers, and the dates of assumption in the fraction of the corresponding year.

The duration of a TIO may depend on several factors in a determined moment of history. These factors may include environmental, political, human, social, economic, and war. For example, the indicator of political stability of the World Bank contains 72 variables, to which we can add the cultural and technological differences between the invading and invaded culture, owing to the extensive length of time analyzed in this study.

A historical example of a term interrupted for reasons of conquest is when a governor or military abandons their post to fight a battle far from the place where they exercise the post. In this case, a regent governor retains the post and keeps its power for as long as required. When a country or province is in a period of great stability and the duration of the term is clearly defined, it assumed the value of a constant or multiplier of itself.

In the stepped graphs the irregular behavior can be positive or negative based on the reference value. The positive is considered as changes that are not multiples of their reference value and negative as those of durations less than the reference value. Figure 1 shows a typical example of a stepped graph and its parts.

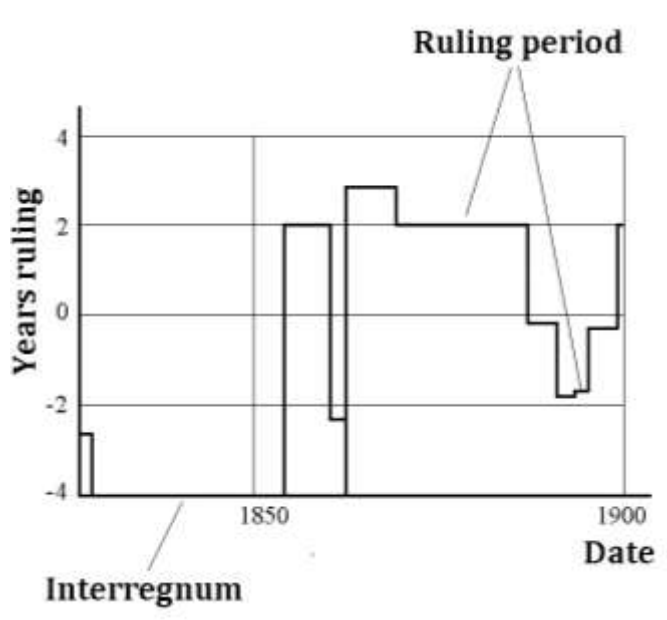


Figure 1. Example of stepped graph

Note. Example of a stepped graph of time in office.

The graph shown in Figure 1 must be understood based on a reference value of the analyzed country. The reference value for each country is the duration of its last known legal before the year 2020. For example, if the full terms were four years, any term less than four indicated that there was some problem. Moreover, the longer the duration of the interregnum, the bigger the problem, which mostly implies disorder, civil or succession wars, likewise voids of power

filled with the invasion of a foreign power, or the emergence of a new internal power. The interregnums also imply problems, such as a day without a defined government may imply a simple bureaucratic problem, but a time space of several years may imply worse problems.

Non-periodical variations with different durations indicate problems. For example, the movement of the graph away from a typical ruled sequence with periods of four and eight years indicates significant problems. The simple panoramic vision of the stepped graphs visually comprises all the information and can be easily interpreted. The stepped graph assumes that there is a continuous signal during each term, which is sampled periodically once per day. This means that between the two dates of assuming power, the variable takes the value corresponding to the duration of the term.

2.3. Temporal Series of TIO

The temporal series is generated by incorporating a pair of data [*date of assumption; term in office*] of all the rulers of a territory in the interval of time between the discovery or foundation of a country, province, or territory and the year 2021.

2.4. Analyzed Countries

In this study, we analyzed the time in office of rulers of the Republic of Argentina at the country and province levels. The analysis was performed considering the geographical context of the American continent, including countries that were conquered and colonized by the Spanish and British empires between the 16th and 21st centuries. The analyzed countries with a predominant Spanish influence were Mexico, Colombia, and Argentina, which include 40% of the Spanish-speaking population from the 33 countries in America. The analyzed countries with Anglo-Saxon influence are the USA and Chile, with Chile being a special case wherein there was simultaneous British and Spanish influence. Chile is the Latin American country with maximum British ascendancy who still influence the way of living in Chile (Zimmerman, 1977; Bernal-Meza, 2013).

The histories of other Latin American countries such as Peru, Venezuela, Paraguay, Bolivia, and Panama show a pattern of political stability similar to the previously mentioned countries. Therefore, they were not included in this study.

For the local analysis of Argentina, the province of Tucuman was considered because it has the oldest chronological records. The ephemeral city of “El Barco” was founded in Tucuman in 1550 (Medina, 1896), and it was the first city in the future territory of the Republic of Argentina. After the juridical act of foundation, it was certified by a notary with a royal license; thus, this new territory was incorporated into the crown of Castilla (Medina, 1896; Palacios, 2012). In the analysis, we also included the province of Buenos Aires because it contains the capital city of Argentina. Furthermore, it has the largest population and greatest political, cultural, and economic influence on Argentina. The behavior of other provinces such as Santa Fe, Córdoba, Mendoza, Entre Ríos, Salta, Misiones, and Chaco, which all had more than a million inhabitants each in 2020, show similar sequences up to the end of the 20th century. These provinces will be analyzed in a future work.

For a province-level comparison between the British and Spanish influences, we included the state of New York, which was first colonized by the Dutch, and then by the British; the state of Virginia because it is the oldest American colony and a model of pure British influence; the states of California and Florida because they were conquered and colonized by the Spanish, Mexican, and British.

The selected territories allow us to visualize the historical influence of the British and Spanish cultures on the political stability of an American country. The sources consulted for each date of the time in office series are listed in the complementary spreadsheet that contains the analyzed data.

The analyzed countries and provinces are listed in Table 1, including their independence dates, and the formal TIO duration of their governors and presidents in the year 2021. The formal duration is used as the reference value in our analysis.

Table 1.

Reference values

Place	Level	Independence	Reference (in 2021)	Time range	Years from independence
Argentina	Country	09/07/1816	4	1777–2019	203
Buenos Aires	Province	09/07/1816	4	1534–2019	203
California	Province	14/06/1846	4	1767–2019	173
Chile	Country	12/02/1818	4	1539–2018	200
Colombia	Country	20/07/1810	4	1538–2018	208
Florida	Province	04/07/1776	4	1565–2019	243
México	Country	16/09/1810	6	1521–2018	208
New York	Province	04/07/1776	4	1624–2021	245
Tucumán	Province	09/07/1816	4	1543–2019	203
United States	Country	04/07/1776	4	1607–2021	245
Virginia	Province	04/07/1776	4	1607–2020	244

Note: Reference values of countries and provinces

To interpret the results, it is important to know that the countries under Spanish rule had centralized governments prior to their independence; however, this was not the case in the USA under British rule. Argentina had two Spanish colonial governments, the first one under the rule of the Viceroy of Peru, and in a lesser way through the Captaincy General of Chile; and the second under the Viceroyalty of the Rio de la Plata when it was created. Chile, Colombia, and Mexico also had centralized governments; for example, Viceroys in Mexico and Colombia, and governors in Chile. In the USA, they did not have centralized governments for the colonies, and each colony negotiated directly with Great Britain.

3. Results

3.1. Stepped Graphs

The stepped graphs of the analyzed countries are shown below, with comments regarding their particularities. In all graphs, if the duration of the period exceeds the range used, the corresponding value is detailed in the figure label. We called the excessive values “overshoot.” The data are grouped by country level, including viceroyalties and republics, and by province level, including geographical regions that changed over time until they became provinces or states. In the descriptions of the graphs, a consecutive sequence of multiple periods x1 and x2 of the reference value is defined as positive stability, with the exception of x3 duration. All interregnums were assigned the negative value of TIO reference (i.e. -4 or -6).

3.1.1. Country Level

From Figure 2, it is evident that the Argentina territory contained cities belonging to the Captaincy General of Chile and the Viceroyalty of Peru prior to 1777, and operated under strict local Spanish control that was dependent on the King of Spain. The Captaincy General de Chile played an undefined part.

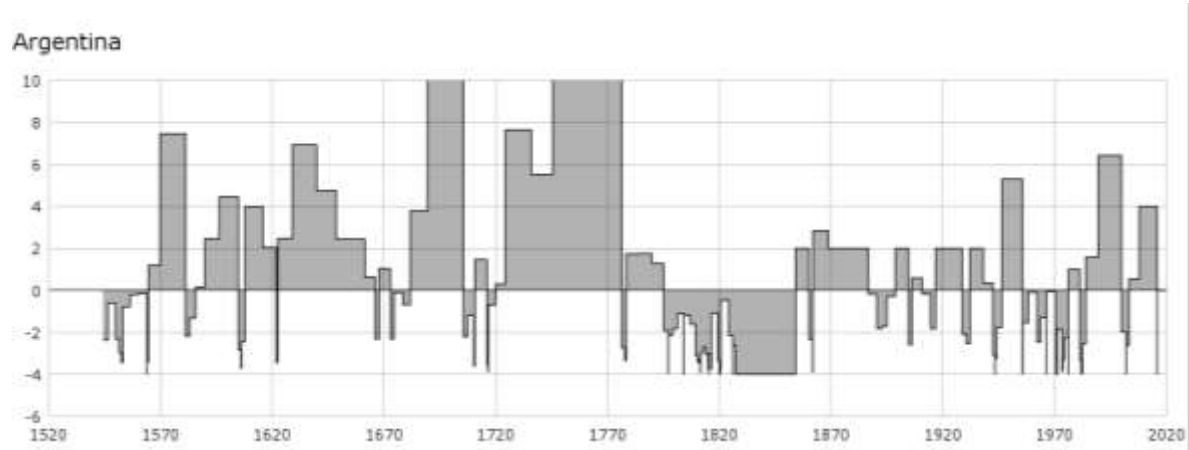


Figure 2. TIO of Argentina

Note: Time in office of ruler of the Republic of Argentina. We assigned -4 to the period between 1827 and 1854 because the post of President did not exist. Between 1534 and 1777, the data on the Viceroyalty of Río de la Plata are included, and then the data of the Argentine independence period are included. The overshoot is 12.1 years. The data of the Captaincy General of Chile are not included.

In 1777, the Viceroyalty del Río de la Plata was created and in 1816, Argentina declared its independence. The interregnum of 27 years, between 1827 and 1845, owing to the absence of a presidential figure is the longest out of all the provinces and countries that we analyzed, and also the data of India, Singapore, and Canada not presented in this study. In this period without a president in-charge, the decisions related to foreign affairs were taken *de facto* by the city of Buenos Aires (Aguero, 2018). The inversion of the sign in the TIO irregularities before and after 1810 is notable.

United States

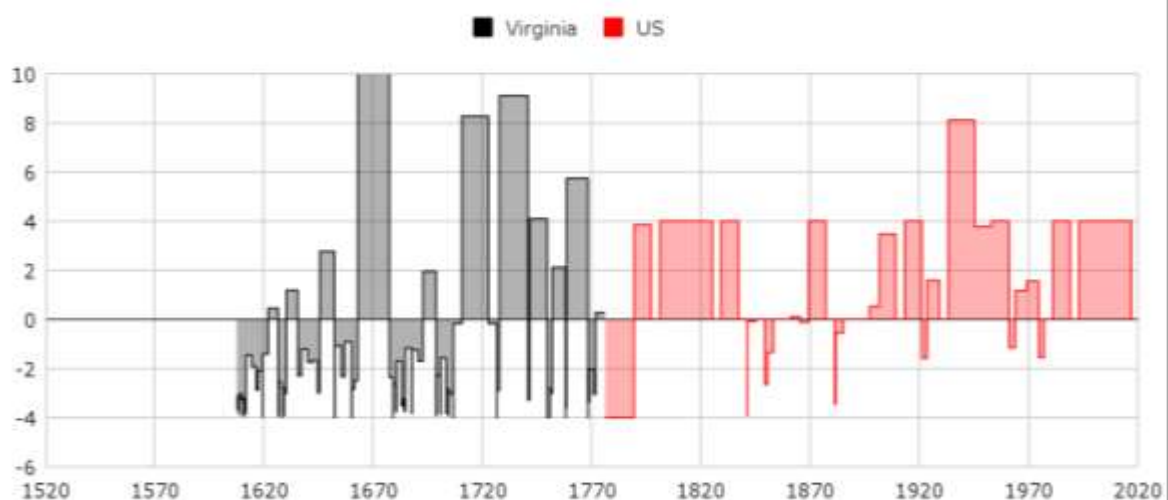


Figure 3. TIO of United States

Note: Time in office of the ruler in the state of Virginia and Presidents of the USA. Between 1607 and 1777, rulers of the colonial British period are included, and between 1777 and 2020, the Presidents of the USA are included. The colony of Virginia is included as an example of the situation prior to the creation of the USA. The “overshoot” in Virginia is 10.2 years.

In the USA, before the 4th of July 1776, there was no post equivalent to that of a President or Viceroy. The 13 British colonies during that time had significant autonomy and held local elections, and their political systems were constitutional and legally very similar. Each colony dealt directly with Great Britain.

From Figure 3, it is evident that the instability in the TIO of Virginia existed until 1777 because it is the analyzed period, but it continues until 1874 as shown in Figure 15, which is the year in which there was an uninterrupted succession of the TIO of four years that remains unchanged (Odintz, 2002).

The TIOs of the US presidents show a stable behavior on average, including during critical periods such as the stock market crisis of 1929 and the Second World War. From Figure 3, it is also evident that periods longer than four years were the most frequent.

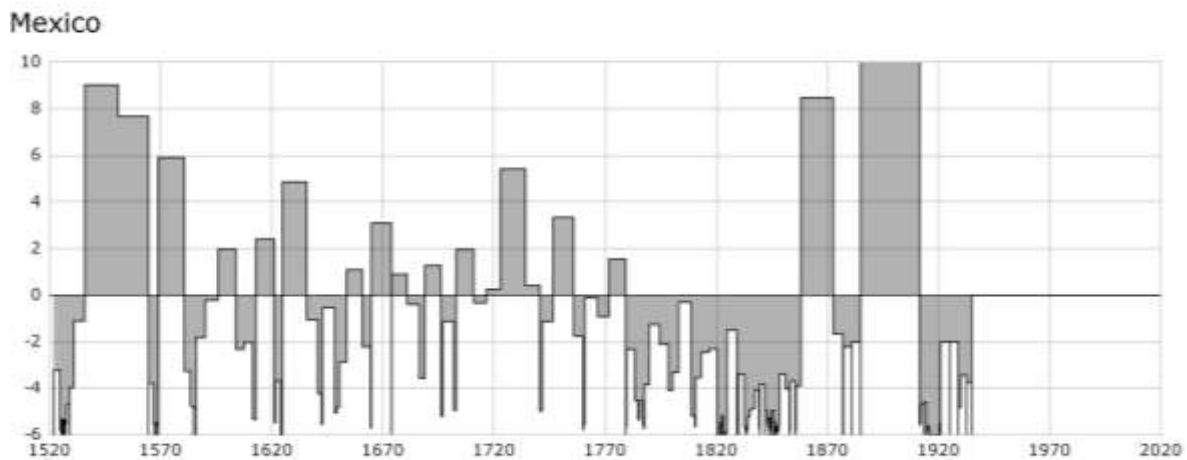


Figure 4. TIO of Mexico

Note: Time in office for the rulers of México. Since 1934, all TIOs have a duration of 6 years. The “overshoot” is 20.5 years.

Owing to data overlapping and to obtain a better visual presentation, the periods of the presidents known as *conservatives* (1858-1860), Junta superior de Gobierno (Superior Board of Governors) (1863), Regencia (Regency) (1863-1864), Emperador (Emperor) (1864-1867), and Venustiano Carranza (1914-1920) were not included in Figure 4. Between 1521 and 1779, only two governments had TIOs of more than six years, being the rest of TIO negatives and highly irregular. In the same period, we observe the longest period of government in the history of Mexico between 1884 and 1911, when Porfirio Diaz was in-charge. It is noteworthy that a little more than 20 years after Porfirio Diaz, the TIO of six years in Mexico is regular up to 2020.

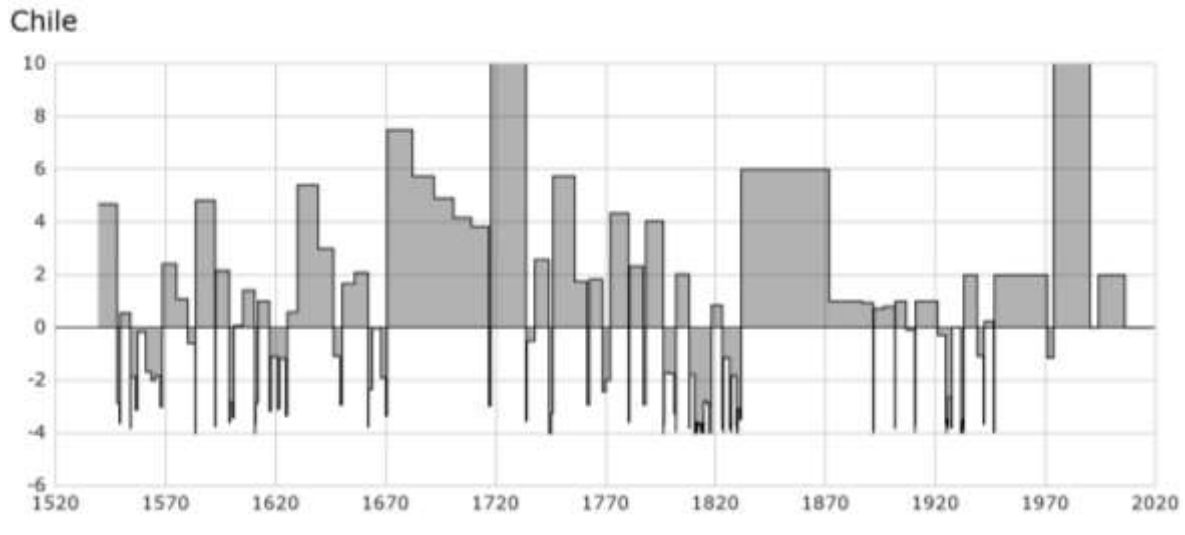


Figure 5. TIO of Chile

Note: Time in office of the rulers of Chile. The colonial and post-independence periods are included. The first “overshoot” is 11.9 years, and the second is 12.5 years.

In Figure 5, the predominance of the positive TIO between 1539 and 2020 is evident, with two governments of long durations in 1717 (15.9 years) and 1973 (16.5 years). In the periods of instability, we observe a high frequency of ruler changes in short time periods. For example, between 1829 and 1831, there were 7 different rulers. In the 481 years analyzed, the negative and positive values of TIO alternate, which appears to end in the middle of the 20th century. The mentioned characteristics are detailed in the spreadsheet that contains the analyzed data.

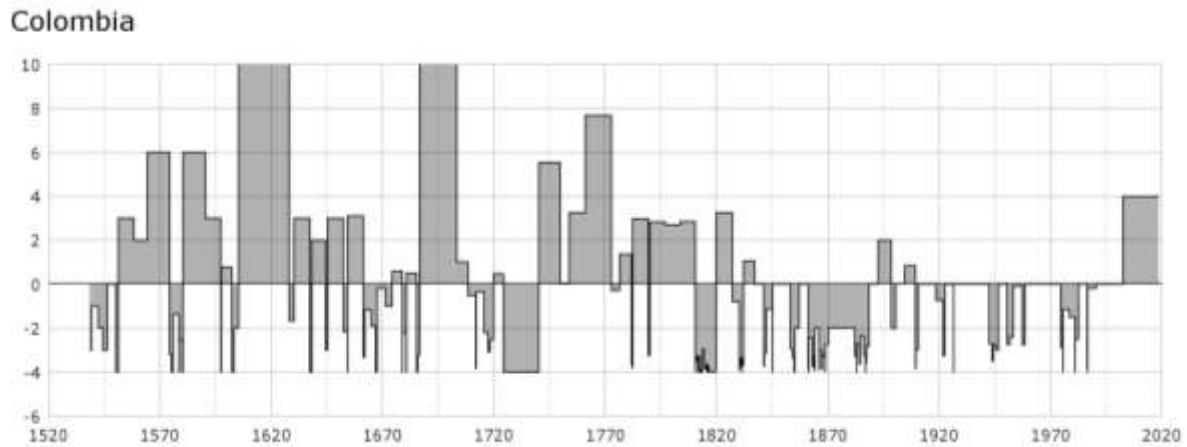


Figure 6. TIO of Colombia

Note: Time in office of the rulers of Colombia. Between 1538 and 1810, the Spanish colonial period rulers ruled. From 1810 to 2020, Colombia has been ruled as an independent country. To avoid data overlapping and aid in clarity, simultaneous governments in 1811, 1814, 1854, 1855, and 1861 were not included. The first “overshoot” is 18.7 years, the second is 12.8 years, and the third is 12 years.

In Figure 6, the instability in the positive and negative TIOs is evident, with a marked decrease in positive TIO until its annulment in 1837. The presence of considerably lengthy periods of government are noteworthy, 22 years in 1605, 17 years in 1686, and an interregnum of 16 years in 1724 when the Viceroyalty of New Granada unified with the Viceroyalty of Peru owing to economic problems. From 1837 to 2020, there were successive sequences of governments of four years, some of which were interrupted by periods of negative instability, and then in the

21st century, a TIO of two successive periods of four years with the same ruler appeared for the first time.

3.1.2. Province Level

Tucumán

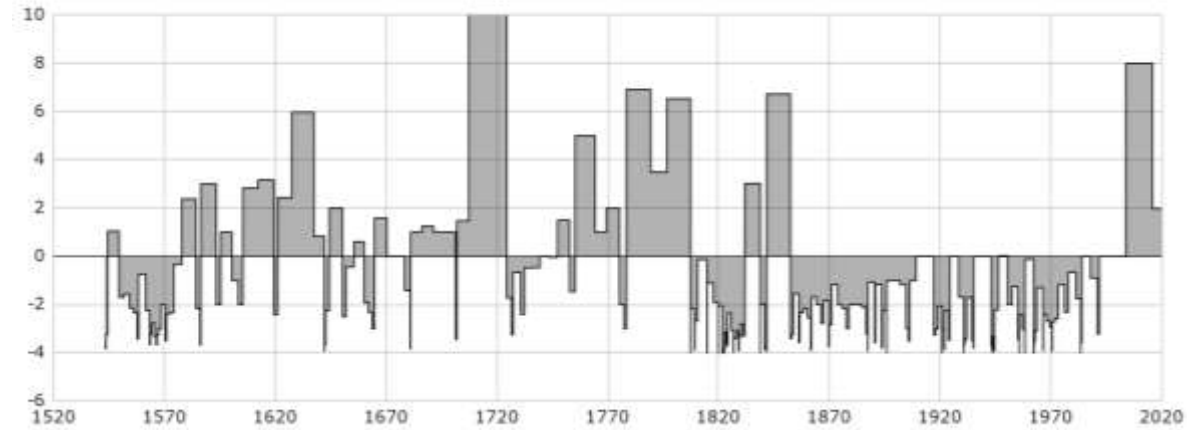


Figure 7. TIO of Tucuman

Note: Time in office of rulers of Tucuman. The “overshoot” is 12.93 years.

Among the rulers of Tucuman shown in Figure 7, there is significant instability with negative TIOs of very short durations before 1577. Between 1577 and 1814, it changes to a very positive TIO instability, which indicates rulers with TIOs of over four years but with a variable duration. Since the revolution of May, 1810, there is an increase in instability that remains until the beginning of the 21st century, with only four rulers surpassing the four year barrier of government period. Particularly, the period of maximum instability in the history of Tucuman was between 1814 and 1831, with highly variable and short TIOs. The analysis of the data shows that in almost 500 years since the discovery of Tucuman, more than 81% of the times the rulers remained in their posts for less than four years and more than 46% of them remained for less than one year.

Buenos Aires

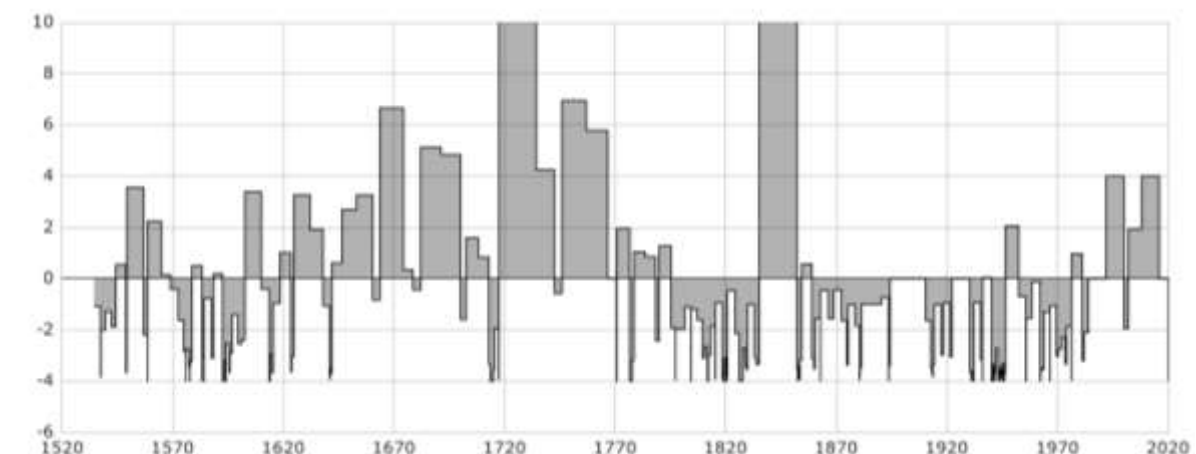


Figure 8. TIO of Buenos Aires

Note: Time in office of rulers of Buenos Aires. The first “overshoot” is 12.7 years and the second is 12.9 years.

In Figure 8, we can see two periods of government that are more than 10 years in the 18th and 19th centuries. 80% of the rulers remained for less than four years, with an average TIO of one year. In both cases, that is, periods that are more or less than the reference value, the duration in the post was quite variable, particularly for the negative TIO. The analysis of the data shows that in 500 years, it never reached a positive stability that lasted more than 25 years. The period between 1797 and 1837 was the most unstable in the history of Buenos Aires, with 34 rulers in less than 40 years.

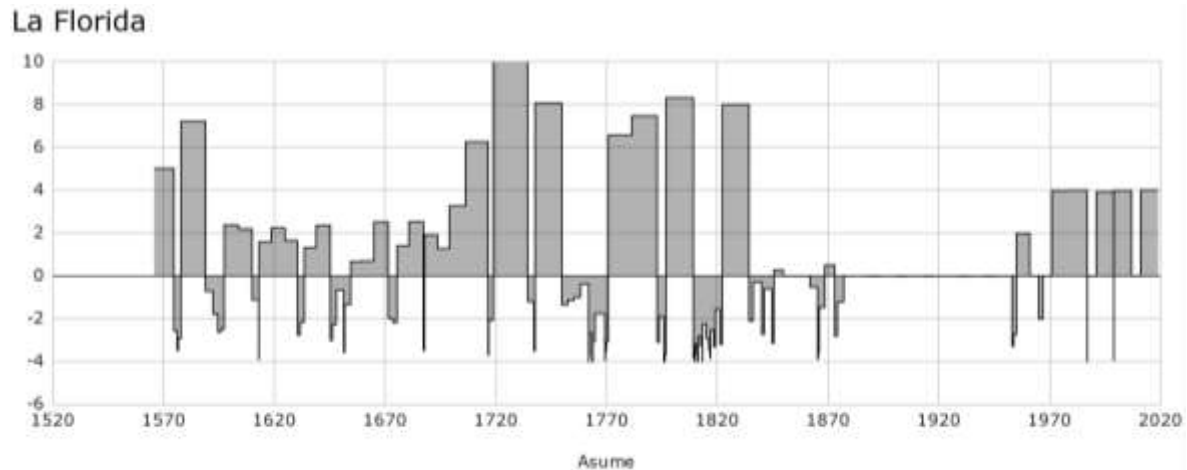


Figure 9. TIO of La Florida

Note: Time in office of the rulers of Florida. The “overshoot” is 11.6 years.

In the temporal sequence of Figure 9, the predominant empires alternated in time: Spain between 1574 and 1763, Great Britain between 1763 and 1781, and Spain again from 1784 until 1821. In 1821, Florida was transferred to the USA in exchange for Texas according to the treaty of Adams-Onís (Del Cantillo, 1843). From 1877, we see a period of strict alternation with four years in power until 1953 when, with a few exceptions, the rulers succeeded in periods of four or eight years.

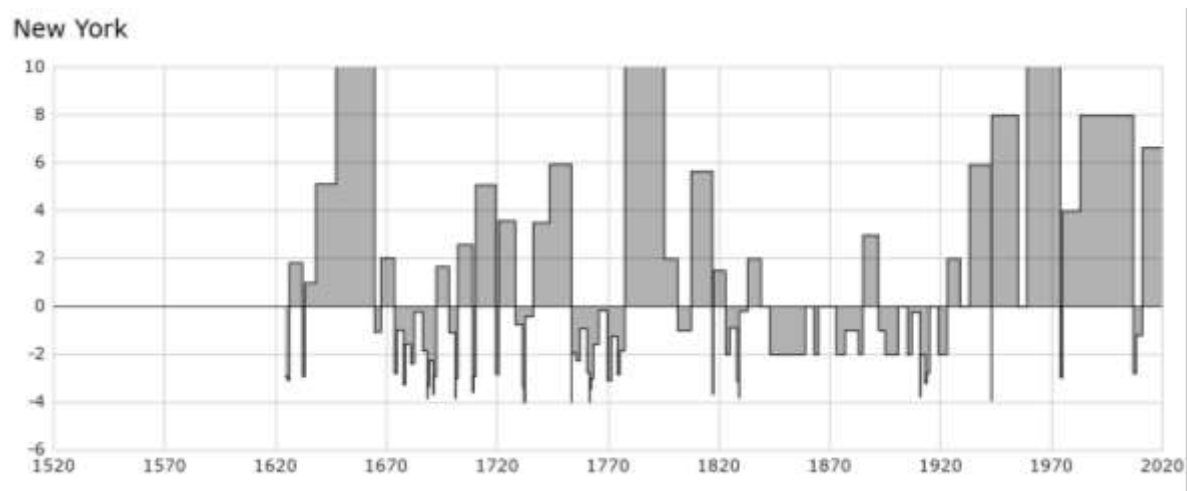


Figure 10. TIO of New York

Note: Time in office of rulers of the state of New York. For a better view, we did not include the overlapping of British and patriots between 1775 and 1783. From left to right, the “overshoot” are 13.3, 13, 9, and 10.9 years.

In Figure 10, the duration of the post changed several times between 1777 and 1938 in the sequence of 3, 2, 3, 2, and 4 years, and the last value is retained to the present day. Furthermore,

New York is one of the dozen states without term limits for statewide offices. Neither negative nor positive periods of stability can be observed.

California

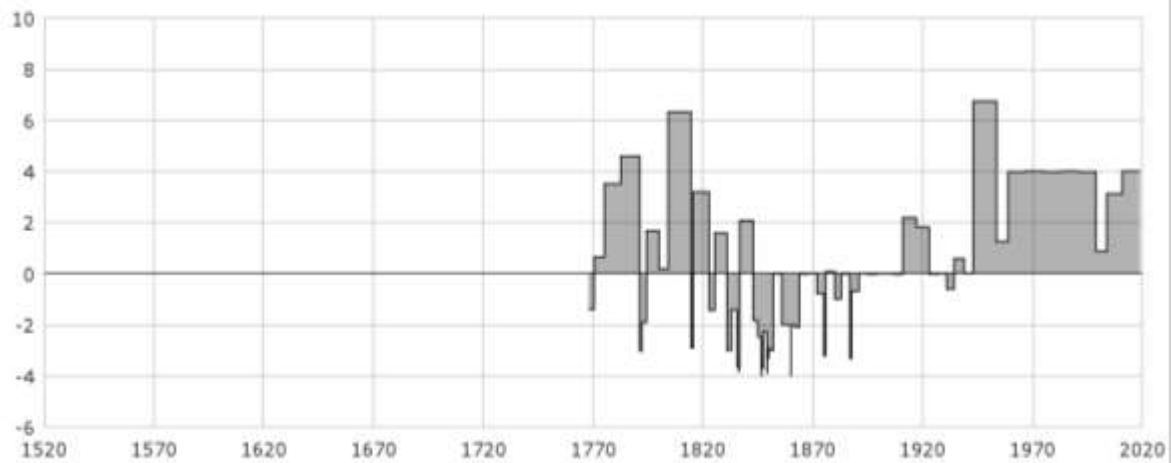


Figure 11. TIO of California

Note: Time in office of the rulers of California.

In California, an amendment ratified in 1862 increased the term from two to four years (Grodin, 2016), which is the same till date. In Figure 11, a gradual decrease in the positive and negative TIOs until 1891 can be observed. There are no negatives from 1891, except in 1931, when the governor in-charge James Rolph passed away. Since 1990, the governors can only occupy two periods of four years each.

Virginia

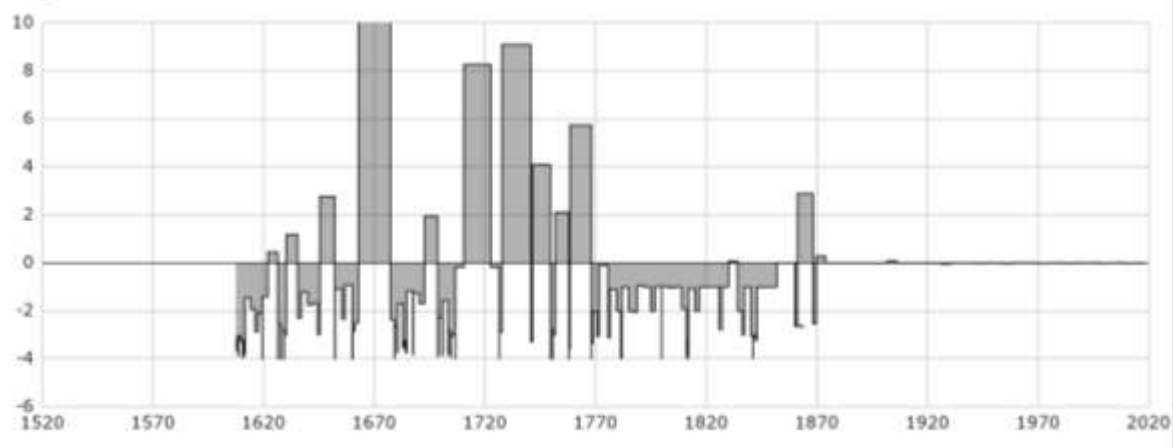


Figure 12. TIO of Virginia

Note: Time in office of the rulers of the state of Virginia. The “overshoot” is 10.5 years.

In Figure 12, the reference value of the TIOs between 1776 and 1830 is three years. After the second constitution of 1830, it was changed to four years, which remains unchanged. In the state of Virginia, governors are not allowed to serve consecutive terms of four years. The TIO of 6.88 years in 1816 was during the American civil war, and the stability of the post from the end of the war up to now is noteworthy. The “overshoot” in 1670 is 10.4 years.

4. Discussion

Many centuries of data can be easily analyzed in the stepped graphs. This feature allows us to understand temporal trends in social behaviors and their changes over time. In our graphs we can see and deduce things like long-term social behaviors in Latin America, the consequences of a dictatorship on social stability, very long-term TIOs or post-independence processes, and we can also distinguish patterns of social behavior from different cultures.

4.1. On Social Randomness and Chaos

The most general observation in our data is that there is no lasting social stability without periodicity, neither from a mathematical nor a social point of view. Periodicity implies TIO multiples of reference value.

In the first case, we are talking about a noticeable lack of periodicity in time series, such as the distribution of TIO values data during the colonial and post-independence time frames of Tucumán, as shown in Figure 13.

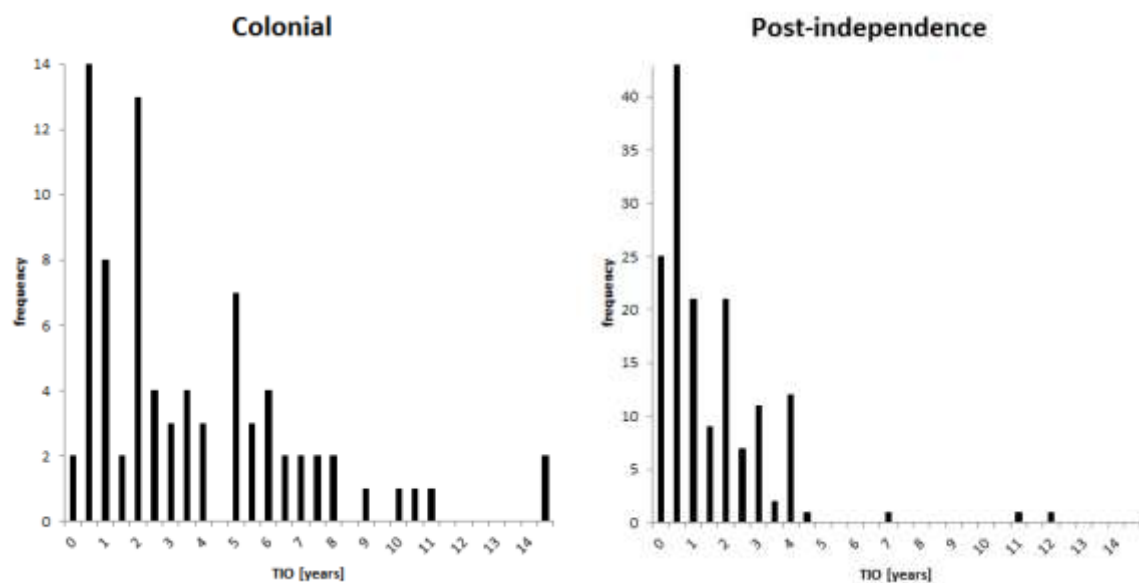


Figure 13. Histograms of Tucuman

Note: Histograms of Tucumán TIO values during colonial period (1543-1810) and post-independence (1810-2020).

From a social point of view, the instability is manifested in any of factors described previously in this paper, e.g.: strikes, murders, economic problems or revolutions. The randomness of TIO time series indicates that social systems are or become ungovernable, and government decisions and social behaviors are chaotic, as we demonstrated mathematically in the second part of this paper.

The positive irregularities, that is, TIO not multiples and greater than the reference value, were more common during the colonial period. There were no term limits for rulers, and their time in office depended on multiple, sometimes uncontrollable factors, such as wars or internal disagreements. Positions were assigned by royal appointment, bought, taken by force, or simply as a replacement for a ruler who had to leave office for various reasons.

The delays in communications between Spain and its colonies in America had a strong influence on time in office of rulers. Typical values of time delays were one year between

issuance of royal decree and its reception by final recipients in South American colonies (Archivo, 1911).

The delays were greater in the Viceroyalty of the Rio de la Plata, due to its remote location and the mandatory pass of any royal decree throughout Lima city, before traveling to its final destination in Buenos Aires or some northwestern cities by land.

New York is a special case from positive irregularities, since between 1777 and 1938 the reference value of TIO changed five times by constitutional means. From a mathematical point of view, changes in the time series increase the randomness of the political system, making it more unpredictable as shown in figure 14.

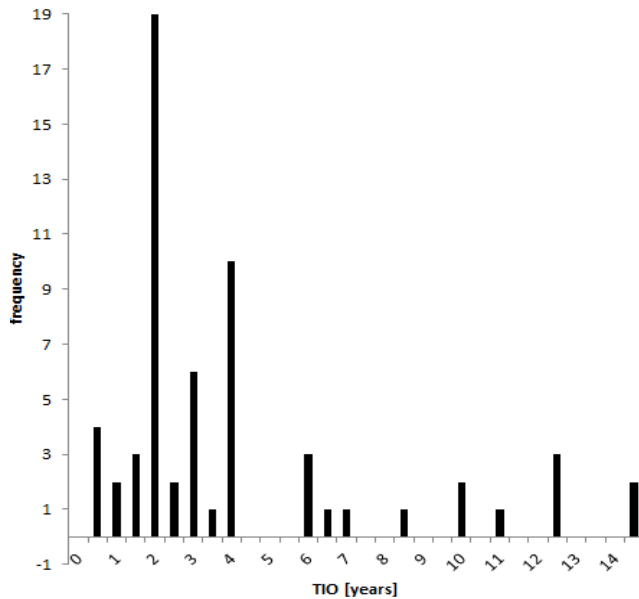


Figure 14. Histogram of New York
Note: Histogram of New York between 1777 and 1938.

4.2. Very Long-Term Effects of TIOs

Through the centuries it is quite common to observe in America, rulers who hold office for a long time, commonly more than two or three TIO reference values. As examples, Viceroys and Governors appointed by the Crown, dictators, de-facto presidents, caudillos (warlords) and directors appointed by companies remained in their charge for more than 14 years. *In all cases* a period of high instability was observed during the following decades.

4.3. Social Stability and Self-Regulation Process after Independence

Latin America countries have remarkable post-independence irregularities with TIOs less than 4 years. Chile is an exception with fewer short-term TIOs. In the provinces colonized by Spaniards, the behaviors of the TIO are similar to those observed at the country level, also showing great negative instability after independence.

Post-independence instability also exists in the states of Virginia and Florida, but with a special trait, the presence of *long sequences of a single TIO by ruler without re-election*. These periods of time can last many decades, the governors remain for a single term and are not re-elected, such as in Virginia between 1874 to date and in Florida from 1877 to 1953. Moreover, Mexico applied the same apparent mechanism of social self-regulation from 1934 to the date. Florida

abandoned this social method in 1953, since then the rulers have succeeded each other in terms of four or eight years showing great political stability.

Virginia and Mexico still remain in these *frozen* political systems, and both constitutions prevent rulers from succeeding themselves, a prohibition that exists to the present day. In Virginia a former governor can run for a second term in a future election, but only two governors since 1830 have been elected to additional terms.

4.4. Politicians Stability

Some useful information that can be extracted from the analyzed data is the probability that a ruler has completed more than one consecutive period. From the data extracted from the stepped graph, we observed that the calculated percentages of TIO times or an interregnum are negative for each country and province from their date of independence, except for California and Florida that were calculated from 1846 and 1821, respectively. These percentages are listed in Table 2, wherein a null duration is assumed when the difference of time between rulers is equal to or less than one day.

Table 2.

Countries classified by negative values of time in office duration

Country/ province or state	%
Tucumán	91%
México	87%
Buenos Aires	87%
Argentina	85%
Colombia	78%
Chile	63%
Virginia	51%
New York	37%
California	34%
Florida	31%
US	20%

Table 2 indicates that in Tucumán, the probability that a ruler remains in his post for more than one period is less than 9%. On the contrary, a ruler in the US has a permanence probability of more than 80%. Similar high percentages are observed for Buenos Aires and Argentina. Generally, in Tucuman, Buenos Aires, and Argentina, the probability that a ruler remains for more than one period of government is always less than 15%, whereas in the US a president has a probability of more than 80% of retaining his post.

5. Conclusions

The *contempt for authority* has its origin in the non-compliance of royal laws by the Spanish authorities in America (Terán, 1927; Luna, 1993) and it is an obstacle in the development of Latin-American (Araujo, 2009; Puit, 1995; Holland, 2017). The stepped graphs show that the social behavior of contempt for authority originated during the Spanish conquest and colonization, and was inherited by the countries after their independence. They are rooted in the culture and manifested in the persistent instability in the posts of governors in Latin America. In the cases of Argentina, Buenos Aires, and Tucuman, the contempt for authority is observed from the significant instability of the TIO value over the last 200 years. Thus, it can be deduced that the social conduct of *contempt for authority* was transmitted through generations, from the times of conquest and colonization up to the present day.

During the historical analysis of the governors, an enormous amount of evidence appeared in different publications when identifying the dates on which they assumed office and ceased their rule. Several Spanish historians and the *probanzas de méritos y servicios* (proofs of merits and services) indicate that there is a second-deep cause of political instability in Latin America: *the indigenous contempt for the white man's law*, which is considered as a *post-hoc* hypothesis.

5.1. Post-Hoc Hypothesis Foundation

We defined it as *the contempt of the pure Amerindian people and their descendants by the Spanish authorities and their descendants*. In *descendants of Amerindians*, we include all people with genetic admixtures of Amerindians with Europeans and Africans, and in *descendants of Spaniards* we include *criollos* or children of Spaniards born in America and those with genetic mixtures of Spaniards with Amerindians and Africans.

The complexity of the definition is understood when the causes and historical evolution of this *contempt for authority* is known, which we believe explains a large part of the Argentine social behavior.

This contempt originated owing to the extensive historical maltreatment of the Amerindian People over the centuries. They were enslaved, humiliated, tortured, denaturalized, and uprooted for hundreds of years (García Hamilton, 1984; Clendinnen, 1982; de las Casas, 1552; Montes, 1998; Farberman, 2006; de Albornoz, 1990).

The deep hate developed by the Amerindian people for the conqueror and their descendants was passed down the generations over centuries, and in Latin America it is reflected by the non-compliance of laws and regulations as a practical effect of the *indigenous contempt for the white man's law*, which is a factor for the permanent instability of Latin America proposed as the hypothesis *post-hoc* in this study. It will be further developed in a future study.

Thus, we can state that the political instability of Latin America originated from two fundamental causes: the *contempt for authority* inherited from the Spanish, and the *indigenous contempt for the white man's law* inherited from the Amerindian people. These factors form a negative synergy that hinders the development of countries.

Freezing the TIO could be a part of the solution, that is, *allowing for only one period of government per ruler*. This has been in effect in Virginia for 145 years, in Mexico for 92 years, very recently in Chile for 16 years, and in Florida it was stopped in 1950 after 73 years to allow for the stabilization of the system. Of course, more data is required to confirm this affirmation through an analysis that includes more countries, states, and provinces.

All the cases require a redefinition that includes a right to equal basis for all people regardless of their genetic mixture, and incorporating the Amerindian cultures as an integral part of each nation.

In any case, the results of this study can serve to change the future using knowledge of the past, because observing behaviors can help in changing them. This concept, which is known and applied in psychology, is called Heisenberg's uncertainty principle in physics (Stamm, 1985).

5.2. Policy Suggestions

The results of this work may provide an overview of the social behavior of a country, and allow us to step back from everyday affairs and plan actions that have a deeper effect. During the planning of concrete policies, scientists of different areas must participate, including Political Sciences, Sociology, History, and Statistics, to identify intentional cultural changes that can benefit citizens.

5.3. Research Limitations

- There could be a polarization of the authors in the points of temporal division or *stages* used for data analysis.
- Although the dates of the events can be controversial, in all the cases the mistakes in dates are low and do not significantly affect the general tendencies.

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