

Examining the Influence of .com Registrations on the Dynamics of Country Code Top-Level Domains (ccTLDs) renewals

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Executive Summary

This article explores the dynamic relationship between locally registered .com domain registrations¹ and the renewal levels² of country code top-level domains (ccTLDs). With .com domains maintaining their dominance in the global domain market, it is important to consider their potential impact on ccTLDs.

Using an Arellano-Bond dynamic panel-data estimation technique³, the study investigates the influence of .com registrations on ccTLD renewals, while also considering factors such as registrar market concentration (using HHI⁴ as a measure of concentration), population size, and economic conditions. The analysis draws on data from multiple countries over several time periods, providing a comprehensive examination of the interplay between global and local domain name trends.

The findings have significant implications for domain registrars, policymakers, and businesses. Understanding the factors that influence ccTLD renewal rates in the context of .com domain competition is critical for developing strategies to support the viability of ccTLDs. This could involve initiatives such as pricing adjustments, localisation efforts, or marketing campaigns that emphasise the unique value of ccTLDs for local users. Policymakers may also find the insights valuable in formulating regulatory frameworks that promote fair competition in the domain name market while supporting the growth of local digital infrastructures.

The study contributes to the broader understanding of how global and local domain registration trends interact, offering a comprehensive analysis of the factors that shape renewal behaviours in the domain ecosystem. The research provides both theoretical and practical perspectives, informing efforts to maintain diversity and competitiveness within the domain name industry.

¹ Locally registered .com registrations aggregates (supplied by Zooknic to CENTR) are estimates of the number of gTLD registrations in a country. The method geo-locates gTLD domains based on Whois sampling.

² Renew - When a registered domain name has its registration period extended (either explicitly or implicitly)

³ The Arellano-Bond dynamic panel-data estimation technique is a method used to estimate dynamic panel models, particularly when the dataset involves a large number of cross-sectional units observed over a shorter time period. It addresses issues of endogeneity and autocorrelation in the lagged dependent variable by using instrumental variables, typically the lagged values of the endogenous variables, in a Generalized Method of Moments (GMM) framework. This technique is particularly useful in econometrics when dealing with potential biases arising from unobserved heterogeneity and the inclusion of lagged dependent variables as regressors. In this context it was important to account for the shorter time frames and large

⁴ The Herfindahl-Hirschman Index (HHI) is a common measure of market concentration and is used to determine market competitiveness. In the context of CENTR data, the index measures the size of registrars by their domain holding relative to the overall total domains in the zone.

Key Findings

- **Impact of .com Registrations:** Contrary to expectations, locally registered .com registrations do not have a statistically significant impact on ccTLD renewal rates. This finding suggests that while .com domains are pervasive, they do not directly undermine the renewal of ccTLDs⁵. Note this relationship differs for new registrations as examined in additional research commissioned by CENTR⁶.
- **Market Concentration:** The study finds a negative and significant relationship between market concentration⁷ and ccTLD renewal rates. In markets where fewer players dominate, renewal rates for ccTLDs tend to be lower, indicating that reduced competition may discourage the continued use of cccTLDs⁸.
- **Population Size:** Larger populations are positively correlated with higher ccTLD renewal rates. This highlights the importance of market size in sustaining the viability of ccTLDs, as regions with larger populations tend to have more robust digital markets⁹.
- **Other Influential Factors:** While trademark registrations and broader economic indicators such as the consumer price index were considered, they did not show significant effects on ccTLD renewals¹⁰. This emphasizes that the dynamics within the domain name market are more critical in determining ccTLD sustainability.

The findings of this study suggest that the dominance of .com domains does not inherently threaten the existence or renewal of ccTLDs. Instead, local market conditions, particularly competition and demographic factors, play more significant roles. Policymakers and domain registries should focus on fostering competitive registrar markets and supporting ccTLDs in regions with smaller populations or higher market concentration to ensure their long-term sustainability.

This research contributes to the understanding of the relationship between .com registrations and ccTLDs, providing insights for stakeholders in the domain name industry. Future studies should continue to explore these dynamics, particularly in the context of emerging technologies and evolving market trends.

⁵ The scarcity of data limits the generalisability of this claim.

⁶ Forthcoming data and analysis will better enumerate this relationship.

⁷ The Herfindahl-Hirschman Index (HHI) is a commonly used measure of market concentration, which indicates the degree of competition within an industry. It is calculated by summing the squares of the market shares of all firms within the market. The HHI can range from close to zero, indicating a highly competitive market with many small firms, to 10,000, indicating a monopoly. The HHI employed in this study is the HHI for domain registrars.

⁸ Market concentration may also serve as a proxy for innovation, given that greater incentives for innovation may exist when competition is greater.

⁹ This finding is largely consistent with other telecommunications literatures

¹⁰ This finding is different when considering new domain registrations.

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Abstract

The proliferation of .com domain registrations has raised questions about their impact on the growth and sustainability of country code top-level domains (ccTLDs). This study employs an Arellano-Bond dynamic panel-data estimation to explore the relationship between .com registrations and ccTLD renewal rates, accounting for market concentration, population size, and other relevant factors. The results indicate that while .com registrations do not have a statistically significant direct impact on ccTLD renewals, market concentration and population size play crucial roles in shaping domain renewal dynamics¹¹. The findings contribute to understanding how global domain name trends influence local domain ecosystems and offer insights for policymakers and stakeholders in the domain name industry.

¹¹ It is pertinent to acknowledge that these findings are based on panel data analysis and jurisdictional effects may differ.

Introduction

The domain name industry has experienced rapid growth, with .com domains emerging as the most popular choice in terms of aggregate numbers at a global level. This dominance has raised concerns about the potential crowding out of ccTLDs, which serve as critical digital assets for countries and regions. CcTLDs allow for entities to designate specific domains for specific regional activities. Research, such as that by Rajasekera (2009), has highlighted the importance of domain name diversity for maintaining a balanced internet infrastructure. Moreover, studies such as those by Webster (2019) and Mueller and Badiei (2015) have explored the competitive dynamics between generic top-level domains (gTLDs) and ccTLDs, emphasising the need to understand how .com registrations impact local domain ecosystems.

This study seeks to examine whether the growth in local .com registrations has a measurable impact on the renewal rates of ccTLDs. By employing a dynamic panel-data estimation method, we address potential endogeneity concerns and explore the broader factors influencing ccTLD renewal rates, including market concentration, population size, and economic conditions. This analysis builds on previous work, such as the empirical investigations by Noruzi (2006) and Sommesse et al. (2023), which have provided foundational insights into the domain name market structure.

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This study aims to address these gaps by incorporating a multi-faceted approach that accounts for economic, competitive, and demographic variables, thereby providing a more comprehensive understanding of the interplay between global and local domain name ecosystems. This perspective is essential for informing strategies that ensure the sustainability of ccTLDs amid the growing dominance of .com domains. While the study offers a unique set of insights based on data not previously explored, the modest data availability requires that we consider the findings robust but limited by data availability.

Methodology

To investigate the relationship between .com registrations and ccTLD renewals, we employ the Arellano-Bond dynamic panel-data estimation technique, a robust econometric method specifically designed for analysing panel data with dynamic characteristics. This approach, pioneered by Arellano and Bond (1991) and further refined by Blundell and Bond (1998), is particularly well-suited for contexts where the dependent variable is influenced by its past values, and endogeneity may bias standard regression results.

This method incorporates lagged values of the dependent variable, in this case, ccTLD renewal rates, as explanatory variables. By doing so, it captures the persistence or momentum inherent in renewal behaviours over time. For example, countries with historically high renewal rates may continue to exhibit similar patterns due to factors like local brand loyalty or a well-established internet ecosystem. The inclusion of these lagged variables ensures that the model adequately reflects these dynamics.

Endogeneity arises when explanatory variables are correlated with the error term, potentially biasing estimates. The Arellano-Bond technique mitigates this issue by using lagged values of endogenous variables as instruments. For instance, local .com registrations could be influenced by unobserved factors that also affect ccTLD renewals, such as marketing strategies, national digital policies, or shifts in consumer preferences. By leveraging past data as instruments, the technique accounts for these latent relationships, providing more reliable and unbiased estimates.

The Arellano-Bond technique explicitly addresses potential autocorrelation in residuals. This is critical for ensuring that the dynamic relationships between variables are not distorted by systematic biases in the data. Robust standard errors are employed to improve the reliability of the results, even in the presence of heteroscedasticity or serial correlation.

We apply the Arellano-Bond dynamic panel-data estimation technique to analyse the relationship between .com registrations and ccTLD renewals using a panel dataset comprising multiple groups (countries) over several time periods. The dependent variable is the ccTLD renewal rate (“renew”), while the independent variables include local .com registrations (“com”), trademark registrations (“trademark_res”), total population (“popn_total”), market concentration (“hhi”), and economic indicators such as the consumer price index (“cpi_price”). These variables were selected following the recommendations of Umana et al. (2010), who emphasise the importance of controlling for economic and demographic factors in domain name studies.

The dataset captures country-level data across several years, enabling the analysis of temporal patterns and country-specific effects. The dynamic nature of ccTLD renewals is modelled by including lagged values of “renew” as explanatory variables, accounting for the influence of historical renewal behaviour on current rates. For example, a higher renewal rate in the previous period may indicate strong consumer loyalty or effective management of the ccTLD registry.

Instrumentation and Endogeneity Control

The potential endogeneity of variables such as “com” is addressed by using their lagged values as instruments. This approach ensures that the estimates are not biased by contemporaneous correlations between the independent variables and the error term. The system GMM (generalised method of moments) framework,

introduced by Blundell and Bond (1998), is particularly useful here, as it combines moment conditions for both levels and first differences, enhancing the efficiency of the estimates.

Results

The estimation results provide several critical insights, particularly in areas that differ from the findings related to new registrations. The variable abbreviations are indicated in parentheses for reference. These insights are outlined as follows:

i. **Impact of .com Registrations:** Contrary to initial expectations, the analysis reveals that .com registrations do not have a statistically significant impact on ccTLD renewal rates. This finding is intriguing because it suggests that while .com domains dominate the global market, their prevalence does not directly undermine or discourage the renewal of ccTLDs. This indicates that the factors influencing renewal rates for ccTLDs are likely more complex and not merely a reflection of .com domain popularity. It is important to appreciate that the estimates pertain to renewals rather than new registrations, and that the results may be impacted by aggregation effects and limited by the available data. Further research into this dimension remains pertinent, particularly with region specific estimates, once data availability enables such analyses.

ii. **Role of Market Concentration:** The Herfindahl-Hirschman Index (hhi), which measures market concentration, exhibits a negative and statistically significant association with ccTLD renewal rates. This result aligns with the findings of Mueller and Badieli (2015), who argue that higher levels of market concentration; where fewer dominant players control the domain registration market; can stifle competition and innovation. A less competitive market environment may limit the options available to registrants, potentially discouraging renewals.

iii. **Population Size:** The variable representing total population size (popn_total) is positively and significantly associated with ccTLD renewal rates. This relationship underscores the role of market size in sustaining ccTLD renewals. Larger populations typically indicate broader potential user bases and increased demand for locally specific domains, which may incentivise higher renewal rates. This observation supports conclusions drawn in studies such as Webster (2019), which emphasise the importance of population-driven market dynamics.

iv. **Other Factors:** Some variables, including trademark registrations and economic conditions (measured by cpi_price), do not exhibit statistically significant effects on ccTLD renewal rates. This finding suggests that the primary drivers of renewal rates are likely domain market-specific factors rather than broader economic or regulatory conditions. The limited influence of economic indicators highlights the specialised nature of the domain name market, where domain-specific dynamics and preferences play a more substantial role than general economic trends.

These insights provide a deeper understanding of the factors influencing ccTLD renewal rates, offering valuable context for policymakers and stakeholders in the domain name industry. They suggest that while some broad trends are evident, market-specific dynamics, such as registrar competition and population-driven demand, are pivotal in shaping renewal behaviours. This study contributes to the growing literature on the economics of the internet and domain names, as outlined by Sommese et al. (2023), but also evidences the need for further analysis with more expansive datasets, and also region specific analyses, as the data permits in the future.

Conclusions

The findings suggest that .com domains do not inherently threaten the viability of ccTLDs, echoing the nuanced views of Yu (2003). Instead, market structure and local factors, such as population size and market concentration, play greater roles in determining ccTLD renewal dynamics. Policymakers and domain registries should focus on fostering competitive markets and supporting ccTLDs in regions with smaller populations or higher market concentration to ensure their sustainability. This perspective is supported by the work of Mueller and Badiei (2015), who argue for the importance of maintaining competition in digital markets.

This study provides a broad understanding of how .com registrations interact with ccTLD renewal rates. While .com domains continue to grow, their impact on ccTLDs is more complex and influenced by market conditions and demographic factors. Future research should explore the long-term effects of these dynamics and consider the role of emerging technologies and market trends in shaping the future of the domain name industry.

Notes

The data employed in this study, in addition to being sourced from CENTR, have been sourced from authoritative and well-established data providers and credible sources, the World Bank, IMF and EuroStat. These sources are comprehensive, reliable and well established data providers, which are extensively utilised in both academic research and policy analysis.

Limitations - *While the studies employ suitable methods of estimation, the modest amounts to data available to facilitate analysis, necessitate that the studies are seen as robust foundational explorations of the noted issues. The dearth of renewal price data necessitated the use of domain price data (initial) as a proxy, and while both parameters evidence strong association this limitation should be acknowledged. The estimations serve as robust exploratory estimates of critical domain relationships that will inform future studies, and potentially support the development of viable forecasting methodologies and models.*

Renewal rate methodology

Renewal rates have been calculated by CENTR for each ccTLD based on the following calculation: Total renewals divided by the sum of renewals and deletes* in the same month

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Estimation Results

Variables	Model 1	Model 2
	Coefficient (Std. Error)	Coefficient (Std. Error)
Lagged Renewal (L1.renew)	-0.0809 (0.1192)	-0.1896 (0.1986)
.com Registrations (com)	-747.0204 (68060.18)	-799863.6 (828836.8)
Trademark Registrations (trademark_res)	0.4936 (0.3549)	0.4619 (0.6602)
Total Population (popn_total)	0.0331 (0.0107)***	0.0769 (0.0419)*
Market Concentration (hhi)	-550.4921 (190.2737)***	-1637.57 (800.4662)**
Domain price (wp_buy_tax_ex)	51.8009 (1468.509)	-83086.78 (136988.5)
Consumer Price Index (cpi_price)	—	-4085.601 (5698.4)
Observations	78	40
Number of Groups	6	3
Wald chi	3385.34	2677.25
Number of Instruments	79	41

Note: Significance levels: $p < 0.1$ (*), $p < 0.05$ (**), $p < 0.01$ (***). Standard errors are in parentheses.

About the author

Dr. Michael D’Rosario is a Senior Research Fellow at Central Queensland University’s CREATE institute and a Lecturer at the University of Adelaide, specializing in applied economics, data science, and policy evaluation. He facilitates Executive Education for the University of Oxford’s AI in Business program, focusing on the strategic applications of artificial intelligence in industry.

Formerly Chief Economist and Head of Data Science at Per Capita, Dr. D’Rosario led initiatives like the Australian Inequality Index and consulted for organizations such as Transparency International and CENTR. With a PhD in Econometrics and Policy, he has over 15 years of experience in research, teaching, and advising on economic and data-driven solutions spanning the University of Melbourne, Deakin University and Loyola University, where he was a Prime Minister’s Fellow.

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