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Rereading a theory: Does the income level of countries affect the consumer behavior?

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ABSTRACT

This study examines how income levels influence consumer behavior, particularly through the lens of Duesenberry's relative income and ratchet effect hypotheses. Duesenberry's "ratchet effect" refers to the tendency for individuals to maintain their consumption levels at a higher level once they have reached a certain standard of living, even when their income falls, meaning they are less likely to cut back on spending significantly during economic downturns, similar to how a ratchet only allows movement in one direction; once consumption increases, it is difficult to reverse it downwards easily. The ratchet effect suggests that consumers are resistant to reducing their consumption levels despite decreases in income, as past consumption serves as a psychological baseline. We analyze these hypotheses across two distinct groups: middle-income countries (Brazil, Senegal, Kenya, Jordan) and high-income countries (Japan, Germany, Sweden, Belgium). Using time series data from 1970 to 2020, we employ an Autoregressive Distributed Lag (ARDL) model along with panel data regression to analyze 20 middle-income and 20 high-income countries from 1980 to 2018. Our findings confirm the ratchet effect in middle-income countries, where consumption patterns are strongly influenced by prior income levels, suggesting a persistent upward consumption bias even during economic downturns. However, in high-income countries, the ratchet effect exhibits inconsistent applicability, potentially due to higher income stability, stronger safety nets, and differing consumer priorities. These discrepancies highlight the varied behavioral responses to economic fluctuations based on income levels and societal norms.

Contribution/Originality: This research uniquely tests the consumption ratchet effect empirically across cross-sections of economies at two distinct GDP levels.

1. INTRODUCTION

Most economies widely recognize consumption as the driving force behind GDP. Data shows that approximately 70 percent of GDP in high-income societies is attributed to consumption. The critical role of consumption in national and global economies has led to the development of several consumption theories, emphasizing the strong association between consumption and GDP.

Consumption is both a major source of economic activity and the ultimate goal of the economy (Bonsu & Muzindutsi, 2017). Household consumption expenditures make up the largest share of Gross Domestic Product (GDP) in many developed and developing economies. According to Keynes (1936) consumption is the primary

purpose and goal of all economic activity. Influenced by various economic and social factors, consumption drives market activity and shapes policy issues (Varlamova & Larionova, 2015). Globally, it accounts for 58% of total GDP, underscoring its significance as an economic variable. Keynes categorized the factors influencing consumption propensity into objective and subjective components. Objective factors include prices, taxes, wealth, interest rates, income distribution, and shifts in the relationship between current income and future income expectations.

Contrary to the earlier belief that supply would naturally generate and satisfy its own demand, John Maynard Keynes introduced a groundbreaking idea that challenged classical conservative theory. The Great Depression of the 1930s shattered the classical myth by highlighting the significance of demand-side factors, such as consumption, in determining income, interest rates, and employment levels within an economy.

Regarding Keynes (1936) the propensity to consume tends to decrease as income increases, and saving becomes a more significant contributor to income growth. In other words, when income increases, average consumption spending also increases, but not at the same rate as income, resulting in a decline in the average propensity. This, in turn, can make investment decisions more challenging.

Keynes's consumption theory prompted him to assert that if the marginal propensity to consume declines as the economy expands, the government would need to elevate the expenditure-to-income ratio to sustain growth. Examining an extensive time series dataset for the US economy, Kuznets (1942) found that while the Keynesian consumption function holds true in the short term, it does not hold in the long run. Simply put, Kuznets demonstrated that, over time, the average propensity to consume (APC) remains nearly constant rather than falling as income rises. The failure to predict post-war consumer spending using its regression on disposable income has piqued the curiosity of many economists in consumer behavior theory. Thus, Kuznets identified a paradox that a simple linear consumption could not be explain. The Kuznets paradox is that in the long run, the percentage of disposable income consumed remains astonishingly constant, implying a proportional consumption function. Kuznets eventually concluded that as income increased, the share of it consumed decreased (Palley, 2008).

Several consumption functions were proposed during and just after World War II. These recommendations limited themselves to the use of alternative deflators and the addition of one or two extra explanatory variables. Duesenberry (1948) and Duesenberry (1949) established the relative income hypothesis, which challenged Keynes' theory of aggregate spending by integrating psychological elements related to habit formation and social interdependencies based on relative income concerns. Duesenberry assert that a household's consumption is not solely based on its current disposable income, but also on how it compares to its previous maximum income and the income of the other households. In the 1950s, this concept was extremely popular.

The relative income hypothesis suggests that consumer choices are shaped by societal prices, incomes, and consumption norms. The hypothesis posits that consumption behaviors, shaped by the surrounding social context, determine an individual's social position. Unlike conventional theories, Duesenberry's approach views individual preferences as interdependent within a community. He highlighted the role of relative income in understanding the relationship between savings and income, showing that while the savings rate rises with income across U.S. households, it remains nearly constant over time. This discrepancy, he argued, reflects interdependent preferences and the non-reversibility of consumption patterns. Davis (1953) and by Duesenberry, Eckstein, and Fromm (1960) later modified Duesenberry's hypothesis (RIH).

In the 1950s, however, Duesenberry's consumption theory was replaced by Modigliani and Brumberg (1954) and Friedman (1957) theory of permanent income. Duesenberry's theory of consumer behavior clearly works better than the alternative theories that replaced it in the 1950s. His disappearance from modern economics textbooks is a fascinating case study in knowledge sociology. It does, however, have substantial practical ramifications. We can't forecast how people will react to policy changes like tax cuts or Social Security privatization until we understand what drives consumption, which accounts for two-thirds of overall economic activity. It seems that most economists have never wanted to believe the relative income hypothesis - perhaps because it suggests the possibility of cost-

effective competition (Frank, 2005). Recent theories have removed the theory of consumption from social interdependence and revived an atomistic approach that emphasized maximizing utility without regard to social concerns. There has been a resurgence of interest in Duesenberry and Veblen's theories on relative consumption throughout the last decades, for instance, studies by Easterlin (1995) and Alpizar, Carlsson, and Johansson-Stenman (2005). Duesenberry rejected two assumptions of the aggregate demand theory.

1) That every individual's consumption behavior is independent of that of every other individual and 2) That consumption relations are reversible in time (Duesenberry, 1949).

Duesenberry's ratchet effect describes the tendency for consumers to adjust their consumption patterns based on their past levels of consumption rather than their current income. This phenomenon has significant implications for both monetary and fiscal policy.

In terms of monetary policy, the ratchet effect suggests that changes in interest rates may have limited impact on consumer spending behavior. Consumers accustomed to a certain standard of living may be reluctant to increase their consumption, even if central banks lower interest rates to stimulate borrowing and spending. This is because they may view reductions in interest rates as temporary or uncertain and therefore opt to save the extra income rather than increase their spending. As a result, monetary policy tools such as interest rate adjustments may be less effective in boosting aggregate demand and stimulating economic growth when the ratchet effect is prevalent.

On the fiscal policy front, the ratchet effect also poses challenges for policymakers seeking to use tax cuts or spending increases to stimulate economic activity. Even if households receive a tax cut or additional government spending, they may choose to save or pay down debt rather than increase their consumption, particularly if they perceive the increase in income as temporary. Past levels of consumption influence their desire to maintain their current standard of living. Consequently, fiscal stimulus measures may not have the intended impact on aggregate demand and economic growth when the ratchet effect constrains consumer spending.

Furthermore, the ratchet effect can exacerbate income inequality and amplify the impact of economic downturns. Compared to lower-income households, higher-income households, with greater discretionary income and propensity for conspicuous consumption, may experience less impact from the ratchet effect. This can widen the gap in consumption patterns between different income groups, leading to greater income inequality. Additionally, during economic downturns, the ratchet effect may lead to a sharp contraction in consumer spending as households prioritize maintaining their previous consumption levels, exacerbating the downturn and prolonging the recovery process.

Thus, Duesenberry's ratchet effect has important implications for both monetary and fiscal policy, as it can constrain the effectiveness of policy measures aimed at stimulating consumer spending and economic growth. Policymakers need to be mindful of this phenomenon when designing and implementing policy interventions and may need to explore alternative approaches to address the challenges posed by the ratchet effect in consumption theory.

This study aims to estimate both the long-term and short-term marginal propensity to consume in high- and medium-income countries. Understanding consumption propensities over different time horizons provides valuable insights into consumer behavior, benefiting both researchers and policymakers. The findings on the social aspects of consumption behavior will serve as a basis for designing effective commercial, labor, and taxation policies.

The paper is organized as follows: Section 2 reviews relevant literature, Section 3 outlines the data and theoretical framework, Section 4 discusses the methodology, Section 5 presents the empirical findings, and the final section offers a summary and conclusions.

2. REVIEW OF LITERATURE

To develop effective policy measures around consumption behavior, it is essential to identify its key determinants. While many factors influence consumption, standard theory primarily focuses on the relationship between income and consumption. Duesenberry proposed that the peak income level of an individual and the consumption habits of

those around them significantly influence their consumption. Unlike Keynes's absolute income theory, Duesenberry's relative income theory suggests that people are more concerned with how their consumption compares to that of their peers.

He contended, in support of his relative income hypothesis, that recognizing the social nature of consumption patterns is crucial for a complete understanding of consumer behavior. This challenges one of the artificial norms of individual consumption behavior in neoclassical economics (Goodwin et al., 2018).

Despite the significant implications of Duesenberry's theory, there is a notable lack of research on it in the economic literature. While scholars have extensively explored various consumption theories, highlighting the fact that consumption accounts for roughly seventy percent of GDP in most economies, the ratchet effect has received minimal attention. This gap in research overlooks an important aspect of consumer behavior that can influence the effectiveness of fiscal policies.

The Absolute Income Hypothesis (AIH), Permanent Income Hypothesis (PIH), Relative Income Hypothesis (RIH), and Life-cycle Hypothesis (LCH) are the four basic hypotheses based on the consumption-income relationship. At the time, each of these hypotheses garnered significant attention. However, Duesenberry's relative income hypothesis was swiftly marginalized and overshadowed by other consumption theories. The increasing mathematiztion of economics and the widespread acceptance of mainstream economists' consumption theories, which easily lend themselves to mathematical formulations, led to its gradual disappearance from modern economic textbooks (McCormick, 2018). He developed the RIH using the concepts of the ratchet effects, i.e., the tendency for the consumption level to be dependent on its own highest previous value. For example, consumers may be forming habits, and consumption from any given income may be higher, the higher the previous peak consumption level. Alternatively stated, the ratchet effect is evident when households resist reducing their consumption in response to changes in their income. In this scenario, consumers aim to maintain their previous high standards of living, resulting in a sticky consumption pattern. On the other hand, the demonstration effect occurs when a consumer seeks to emulate their neighbors in making consumption decisions.

Sticky consumption patterns refer to the tendency of consumers to maintain relatively consistent levels of spending on certain goods and services, even when faced with changes in their disposable income. This behavior can have significant implications for the effectiveness of fiscal policy measures, such as tax cuts.

When consumers have sticky consumption patterns, they are less likely to alter their spending habits in response to changes in their income. This means that even if they receive a tax cut and have more money available to spend, they may not necessarily increase their overall consumption significantly. Instead, they may choose to save the extra income or use it to pay down debt rather than increasing their spending on goods and services.

Additionally, sticky consumption patterns can also lead to a phenomenon known as "income buffering." This occurs when consumers adjust their savings or borrowing behavior in response to changes in income in order to maintain a relatively stable standard of living. For example, if consumers receive a tax cut, they may choose to save or invest the extra income as a precaution against future economic uncertainty, rather than immediately increasing their consumption.

Furthermore, certain goods and services may exhibit stronger sticky consumption patterns than others. For example, essential goods like food, housing, and healthcare tend to have less elastic demand, meaning that consumers are less likely to reduce their consumption of these items even when faced with changes in income. As a result, tax cuts may have limited impact on stimulating demand for these goods and services.

In light of these factors, fiscal policy measures such as tax cuts may be less effective in stimulating economic growth and consumption when consumers exhibit sticky consumption patterns. Policymakers should consider these dynamics when designing and implementing fiscal policies and may need to explore alternative measures, such as targeted spending initiatives or investment incentives, to achieve their economic objectives effectively.

While it is undeniable that social interactions influence many consumption choices, this hypothesis has come under heavy criticism.

The main argument revolves around the challenge of selecting an appropriate reference group since it's practically impossible to assign a specific reference group for each commodity. Since it is reasonable to assume that individuals often emulate others within their own economic class, we have employed income level as a general reference group to address this problem (Hadden, 1965). However, starting in the 1970s, several empirical studies have revitalized Duesenberry's relative income hypothesis. These efforts have sought to incorporate the evolution of interconnected habits and preferences into models of consumer behavior (Frank, 1985; Gaertner, 1974; Pollak, 1976). Moreover, Easterlin (1974) and Easterlin (1995) unearthed that relative income plays a crucial role in determining happiness, underscoring the significance of this concept.

Despite the theoretical dominance of permanent income hypothesis, the empirical evidence in its favor is weak at best. Many early experimental works provide strong evidence against the relevance of savings rates. The experimental work over the past decades has confirmed the finding that the relationship between income and savings in terms of permanent income and life cycle theory is hardly plausible (Altonji & Villanueva, 2007; Brady & Friedman, 1947; Browning & Lusardi, 1996; Mayer, 1966). Although common in economic research, the premise that preferences are independent across households is not particularly appealing. Indeed, social scientists have long emphasized the importance of status seeking as a key feature of human behavior.

The notion that the overall degree of satisfaction gained from a given level of consumption is dependent not only on the level of consumption itself but also on how it compares to the consumption of other members of society is not new, but prior to the writings of Duesenberry (1949) and Pollak (1976) no one had expressed it empirically (Alvarez-Cuadrado & Van Long, 2011).

A select group of researchers worldwide has delved into the connection between income and consumption within the framework of the RIH hypothesis. Several studies have demonstrated that an individual's relative income significantly influences their consumption patterns and overall sense of well-being.

Singh and Kumar (1971) state that RIH provides an excellent representation of consumer behavior for all the nations studied, including Canada, Finland, Guatemala, Honduras, India, Japan, the Philippines, Sweden, the United Kingdom, and the United States. According to their findings, consumption is a stronger predictor of living standard than income, and habit formation is a continual process, contrary to Duesenberry's original specification.

Kosicki (1987) found that, when the absolute quantity of income remained constant, an individual's regional income rank significantly influenced their savings (consumption) behavior. According to him, the relative income model has a greater ability to predict savings changes for different incomes than the permanent income models and life cycle models.

Corrales and Mejía (2009) in their study, clearly showed that the RIH is valid in Brazil, Mexico, Argentina, and Colombia. Clark and Oswald (1996) discovered a negative relationship between worker's wage satisfaction and that of their colleagues. Similarly, Alimi (2015) discovered the existence of a long-run link between consumption and income for Nigeria and South Africa from 1980 to 2013 using Cagan's adaptive expectation model. Their study showed that Nigerian consumers are forward-looking, while South African consumers are retrospective and demonstrate habit formation and ratchet effect.

Bowles and Park (2005) establish a strong positive link between average working hours and the proportion of consumption by the wealthiest members of society, using data from eleven economies in The Organization for Economic Cooperation and Development (OECD). The researchers interpreted this result as emulation-motivated consumption. In a similar vein, Khan, Khan, Chaudhary, and Fedorova (2015) tested the Duesenberry hypothesis for Pakistan and concluded that their findings confirmed the existence of income ratchet effect in Pakistan.

Using quarterly data from 1999/2000 Q1 to 2018/19 Q4, Bisset and Tenaw (2020) examined Duesenberry's demonstration and ratchet effects in Ethiopia. Their analysis revealed that an increase in relative income leads to a

notable decrease in the APC among lower-income groups, indicating the presence of the ratchet effect in these households. Hatamerad, Asgharpur, Adrangi, and Shahryari (2024) investigate Duesenberry's ratchet effect in the Iranian economy using annual data from 1976 to 2020. The study employs multiple methodologies, including the Autoregressive Distributed Lag (ARDL) model, BMA_ADL, and the Long Short-Term Memory (LSTM) deep learning method. The findings indicate that Duesenberry's hypothesis is not consistent with the Iranian context.

Empirical evidence reveals that, contrary to Duesenberry's theory, the slope of the short-run consumption function is higher than that of the long-run function. Consequently, the multiplier effect of demand management policies is more pronounced in the short run than in the long run. This pattern of consumption behavior, termed "precautionary behavior," appears to stem from the unique economic conditions in Iran. The findings provide insights into household consumption dynamics and highlight the importance of considering local economic contexts when applying theoretical frameworks. The importance of the relationship between consumption and consumer income has been well established by researchers. However, our literature review reveals that existing studies often fail to adequately address the ratchet effect and its implications for fiscal policy effectiveness. The ratchet effect refers to habit formation in consumption, meaning that once consumers adjust to a certain level of consumption, they are less responsive to changes in income, such as those resulting from tax increases or cuts. This effect can render fiscal policy measures less effective in stimulating or contracting the economy.

Even high-income countries can exhibit the ratchet effect. For example, the Bush tax cuts in the U.S. around 2000 did not significantly stimulate economic growth as intended but instead led to a substantial increase in the federal deficit. This suggests that consumers had already adjusted their consumption habits to a level where additional income from tax cuts did not translate into increased spending, thereby diminishing the efficacy of such fiscal policies.

In this study, we explore consumer behavior in various countries categorized as either high or middle income within the framework of Duesenberry's relative income theory.

3. THEORETICAL FRAMEWORK

One of the central hypotheses in the theory of relative income is the notion that consumer behavior exhibits persistence over time. This suggests that learning and habit formation, rather than rational planning guide consumption decision. Consumer behavior and mindset are shaped by the consumption patterns developed during periods of rising income. In essence, the relative income hypothesis elucidates the cyclical fluctuations in the APC. As individuals experience an increase in income and attain a higher standard of living, they tend to acclimate themselves to this elevated lifestyle and endeavor to sustain their level of consumption, even in the face of income fluctuations. Consequently, when their income declines, they often prioritize reducing savings to maintain a consistent level of consumption, as it is considerably more challenging to curtail their consumption habits. This is the reason that Duesenberry opts for current income relative to the previous peak income as an approximation to explain consumption expenditures. Duesenberry states the following:

"The fundamental psychological postulate underlying our argument is that it is harder for a family to reduce its expenditure from a higher level than for a family to refrain from making high expenditures in the first place (Duesenberry, 1948)*."*

This sentence may be clarified as follows: When a family's income decreases, they tend to prioritize maintaining their consumption levels and reducing savings, which results in an increase in the ratio of consumption to income (C/Y). Conversely, when their income rises, this ratio decreases. In essence, when their income reaches or surpasses their previous peak level, they promptly or eventually adjust their consumption behavior based on long-term patterns. Therefore, the highest previous level of income experienced affects the levels of savings and consumption.

Duesenberry argued that past consumption patterns, in addition to relative and absolute income, influence consumption, establishing a connection between current and past consumption behavior. Furthermore, the ratio of total savings to current income is shaped by the highest income previously attained. Equation 1 represents this relationship.

$$\frac{S_t}{Y_t} = \alpha_0 + \alpha_1 \frac{Y_t}{Y^h} \quad (1)$$

Here S_t shows total savings of period t, Y_t indicates current total incomes in period t and Y^h represents highest level of previously experienced income. When Y_t is less than Y^h, the savings-to-income ratio becomes smaller, it indicates that consumers reduce their savings to compensate for the decrease in income and keep the level of consumption approximately constant. The total average consumption function can written as Equation 2.

$$\frac{C_t}{Y_t} = (1 - \alpha_0) - \alpha_1 \frac{Y_t}{Y^h} \quad (2)$$

When the relative income (Y_t) is lower than the highest previous level of income (Y^h), it causes the total average consumption ($\frac{C_t}{Y_t}$) to increase, which means that C_t does not decrease as much as Y_t. According to Equation 2, the short-run consumption and the marginal propensity to consume can be shown by Equations 3 and 4.

$$C_t = (1 - \alpha_0)Y_t - \alpha_1 \frac{Y_t^2}{Y^h} \quad (3)$$

$$\frac{dC_t}{dY_t} = (1 - \alpha_0) - 2\alpha_1 \frac{Y_t}{Y^h} \quad (4)$$

According to these equations, Duesenberry's short run consumption function is nonlinear and has a decreasing slope. The term Y_t/Y_h represents the ratchet effect. But in the long run, consumption function Y_t is equal Y^h, so the long-run consumption function is given by Equation 5.

$$C_t = (1 - \alpha_0 - \alpha_1)Y_t \quad (5)$$

The distinction in slope between Equations 3 and 5 when Y_t is not equal to Y^h, illustrates a key aspect of Duesenberry's ratchet effect theory. Figure 1 visually depicts this variation in slope, with "a," "b," and "c" denoting breakpoints. These breakpoints correspond to periods characterized by short-term consumption, where income falls below the previous peak level. According to Duesenberry's theory, during these intervals, households do not significantly reduce their consumption in proportion to the income decrease. As a result, the short-term consumption function exhibits a shallower slope compared to its long-term counterpart.

However, when incomes rise once more, especially if they reach or surpass the previous peak income, households revert to their long-term consumption patterns and follow a more gradual trajectory.

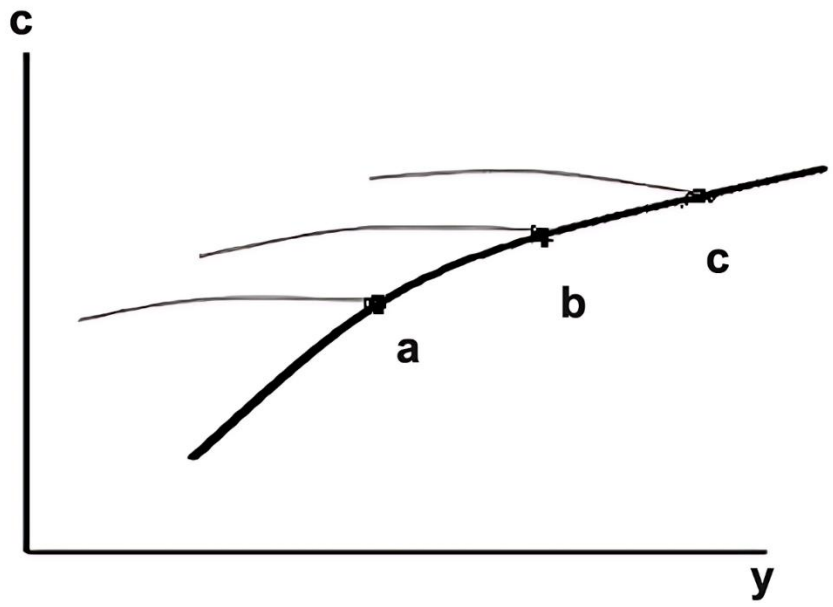

Figure 1. Large curves indicate long run consumption and small curves indicate short run consumption.

[1] - we will show lnYt2lnYh with lnzt.

4. METHODOLOGY AND DATA

The autoregressive distributed lag (ARDL) method is good for modeling both long-run and short-run relationships between nonstationary and cointegrated time series variables (Hill & Griffien, 2018; Pesaran & Pesaran, 1997). In contrast, traditional cointegration tests, such as those by Engle and Granger (1987); Phillips and Ouliaris (1990); Park (1992); Johansen (1991) and Johansen (1995) require all variables in the Vector Autoregressive (VAR) model to be integrated of order one (I(1)), which involves extensive unit root testing and increases the risk of misclassification errors. Conversely, equations involving variables that may not necessarily possess the same degree of co-integration can apply ARDL.

The initial step in estimating the ARDL model is to test for cointegration among the non-stationary variables. This test identifies whether a long-run equilibrium relationship exists between the dependent and explanatory variables.

To find out if there is long-term equilibrium relationship between the dependent and independent variables, the first step in ARDL estimation is to test for cointegration among non-stationary variables (see (Hill & Griffien, 2018; Pesaran & Pesaran, 1997; Pesaran, Shin, & Smith, 2001)).

Pesaran et al. (2001) introduced a robust approach to cointegration testing that combines the first two steps and does not rely on variables being strictly I (0) or I (1). The bounds test for cointegration checks how important the parameters are in the ARDL model's cointegrating relationship. It does this by using a standard F or Wald test to test the idea that the long-run relationship coefficients are not statistically significant.

The test's interpretation depends on the test statistic's value relative to the critical values. If the test statistic is less than the lower critical value, it indicates no cointegration. Conversely, exceeding the upper critical value confirms cointegration. A test statistic between the lower and upper critical values yields inconclusive results, requiring further analysis of the cointegrating rank. The test statistic is compared against two sets of asymptotic critical values, considering two scenarios: all variables are purely I(0) or all variables are purely I(1).

The ARDL error correction specification of the model for Equation 3 is given by Equation 6.

$$\Delta lnC_t = \gamma + (\Phi_1 \ln C_{t-1} + \Phi_2 \ln Y_{t-1} + \Phi_3 lnz_{t-1}) + \sum_{i=1}^{p} \lambda_i \Delta lnC_{t-i} + \sum_{i=1}^{p} \eta_i \Delta ln Y_{t-i} + \sum_{i=1}^{p} \theta_i \Delta lnz_{t-i} + \epsilon_t \quad (6)$$

Equation 6 consists of two components. The first in parentheses represents long-run cointegrating relationship, and the second part shows short-run effects indicated by the terms in Σ, where Δ is the first difference operator, Φ_i are the long-run cointegrating coefficients, γ is the drift, and ϵ_t are white noise errors. The variable Z_t represents the ratchet effect.

The first step in the ARDL bounds test approach is to test the existence of a long-run cointegrating relationship among the model variables by performing an F test as follows.

H0: $\phi_1 = \phi_2 = \phi_3 = 0$ against the alternative Ha: $\phi_1 \neq 0$, $\phi_2 \neq 0$, $\phi_3 \neq 0$. The two boundaries of an asymptotic critical value, when the variables are I(d) where $0 \leq d \leq 1$, provide a test for cointegration among the model variables. The lower value indicates that the regressors are I (0), while the higher value indicates that the variable are I (1). For the F test, there are three modes.

- When F is greater than the upper critical value of F, the null hypothesis, which indicates no long-run relationship, is rejected.
- F falls between lower and upper bounds of F; the result is inconclusive.
- Finally, if F is lower than the lower bound of F critical, the null hypothesis cannot be rejected.

The second step commences when the null hypothesis is rejected. Equation 7 represents the long-run ARDL (p, q) formulation.

$$\Delta lnC_t = \gamma + \sum_{i=1}^{p} \delta_1 \Delta lnC_{t-i} + \sum_{i=1}^{q} \delta_2 \Delta lnY_{t-i} + \sum_{i=1}^{q} \delta_3 \Delta lnz_{t-i} + \epsilon_t \quad (7)$$

Finally, in the third step, short-run dynamic coefficients in conjunction with the error correction term are jointly estimated in Equation 8.

$$\Delta lnC_t = \gamma + \sum_{i=1}^{p} \lambda_i \, \Delta lnC_{t-i} + \sum_{i=1}^{p} \eta_i \, \Delta ln \, Y_{t-i} + \sum_{i=1}^{p} \theta_i \, \Delta lnz_{t-i} + \omega \, ECM_{t-i} + \epsilon_t \quad (8)$$

Where $\lambda_i, \eta_i \; and \; \theta_i$ are the short-run dynamic coefficients of the model's convergence to equilibrium, and ω is the speed of adjustment.

In this study, we aim to elucidate the distinction between short-term and long-term consumption patterns through the lens of Duesenberry's theory. We have gathered data on consumption (final consumption expenditure) and GDP from the World Bank Open Data website for two country groups, as outlined in Table 1. The selection of specific countries is contingent upon data accessibility. Panel A in Table 1 identifies the economies included in each sample for the period spanning 1980 through 2018. The availability of data from the World Bank Open Data (WBOD) primarily determines the time period of the study. Panel B of this table summarizes and offers the descriptive statistics for the natural logarithms of the GDP and consumption expenditures in each group of the countries as well as the final panel data.

Table 1. Countries and data.

Panel A: Sample countries in high- and middle-income categories					
High income countries: Japan, USA, Australia, Belgium, Denmark, France, Germany, Ireland, South Korea, Netherlands, Norway, Sweden, Spain, UK, Italy, Portugal, Austria, Uruguay, Luxembourg, Chile. Middle income countries: Jordan, Bulgaria, Bolivia, Bangladesh, Kenya, Panama, Tunisia, Senegal, Sudan, Philippine, Colombia, Morocco, Cuba, Indonesia, Iran, Algeria, South Africa, Mexico, Argentina, Malaysia.					
World bank open data https://data.worldbank.org/					
1980-2018					
Panel B: Descriptive statistics					
High income countries					
Countries	Variables	Mean	Median	Std. dev	Jarque-Bera (Prob)
Belgium	Ln C	26.24	26.26	0.26	0.23
	Ln Y	26.47	26.48	0.31	0.18
Sweden	Ln C	26.25	26.21	0.25	0.29
	Ln Y	26.50	26.40	0.31	0.16
Japan	Ln C	28.48	28.63	0.35	0.04
	Ln Y	28.80	28.96	0.34	0.02
Germany	Ln C	28.23	28.30	0.25	0.14
	Ln Y	28.51	28.57	0.27	0.14
Middle income countries					
Countries	Variables	Mean	Median	Std. dev	Jarque-Bera (Prob)
Brazil	Ln C	27.65	27.69	0.44	0.27
	Ln Y	27.42	27.51	0.47	0.28
Senegal	Ln C	22.79	22.69	0.49	0.24
	Ln Y	22.95	22.86	0.46	0.24
Kenya	Ln C	24.02	24.09	0.60	0.36
	Ln Y	24.21	24.21	0.55	0.51
Jordan	Ln C	23.53	23.42	0.59	0.45
	Ln Y	23.63	23.55	0.55	0.39
Panel of developed & developing countries					
Countries	Variables	Mean	Median	Std. dev	Jarque-Bera (Prob)
Developed	Ln C	26.57	26.49	1.44	0.00
	Ln Y	26.95	26.79	1.59	0.14
Countries	Ln c	25.08	24.95	1.26	0.00
	Ln Y	24.49	24.79	1.22	0.00

Note: The sample data are taken from the world bank open data (https://data.worldbank.org/). All observations are in natural logarithms.

5. EMPIRICAL RESULTS

In this section, we present the empirical findings. Initially, we examine the variables to determine their order of integration before proceeding with the ARDL bounds test. The estimated F-statistics for the bound test provided by Pesaran and Shin (1996) and Pesaran et al. (2001) are invalid in the presence of I (2) variables since it is predicated on the assumption that the variables are I (0) or I (1) (Ouattara, 2004). The results of the Augmented Dickey–Fuller

(ADF) test of unit root are presented in Table 2. Based on these results, the ARDL model can be deployed. (see Table 1 in the Appendix for more information).

Table 2. Unit root tests.

Countries	C	Y	Z
Brazil	I(0)*	I(0)*	I(0)*
Senegal	I(1)*	I(1)*	I(1)*
Kenya	I(0)*	I(1)*	I(0)*
Jordan	I(1)*	I(1)*	I(1)*
Japan	I(0)*	I(0)*	I(0)*
Germany	I(1)*	I(1)*	I(0)*
Sweden	I(1)*	I(1)*	I(0)*
Belgium	I(0)*	I(1)*	I(0)*

Note: * indicate significance at 1percent level.

5.1. Middle-Income Countries

Table 3 reports the F-statistic values for the ARDL bound test for the middle-income group of countries. The calculated F-statistics value for these countries is greater than the upper bounds value at 10%, 5%, 2.5%, and 1% levels of significance. This outcome strongly suggests the presence of cointegration among the study variables.

Table 3. ARDL bounds test.

Countries				
	Brazil	**Senegal**	**Kenya**	**Jordan**
F	14.95*	5.90*	4.35*	9.55*
Significance		Lower bound		Upper bound
10%		2.17		3.19
5%		2.72		3.83
2.5%		3.22		4.5
1%		3.88		5.3

Note: * indicate significance at 1percent level.

Table 4 presents the estimated long-run coefficients of the error correction version of the ARDL model, while Table 5 provides the results of various diagnostic statistics. Akaike and Schwarz, as well as Hannan-Quinn information criteria, were deployed to determine the ARDL lag structure in all estimations. The complete estimation results of the ARDL model are not presented here for the purpose of brevity but are available from the authors. To ensure the reliability of our model, we conducted diagnostic tests. The Breusch-Godfrey LM test was employed to assess serial correlation. The ARCH test was used to examine potential heteroscedasticity issues. The Ramsey RESET test was applied to evaluate the specification of the functional form. Additionally, the CUSUM test was conducted to identify any structural breaks in the model.

Table 4. Estimated long-run coefficients.

Countries				
	Brazil	**Senegal**	**Kenya**	**Jordan**
Y	1.06* (0.03)	1.06* (0.02)	1.05* (0.03)	1.08* (0.40)
Z	-0.78*** (0.46)	-0.82* (0.27)	-0.73*** (0.03)	-1.08* (0.35)
ECM	-0.38* (0.08)	-0.42* (0.03)	-0.26 (0.03)	-0.57* (0.07)

Note: Standard errors are in parentheses. * and **** indicate significance at 1 and 10 percent levels. ECM stands for the error correction model

Table 5. Diagnostic statistics.

Countries				
F-statistic	**Brazil**	**Senegal**	**Kenya**	**Jordan**
Serial correlation (LM test)	0.99	0.20	0.08	0.81
Functional form (RESET)	0.36	0.76	0.33	0.22
Heteroscedasticity	0.21	0.61	0.09	0.34
CUSUM test	Stable	Stable	Stable	Stable

Note: CUSUM test results are presented in the Appendix.

Table 4 affirms the Duesenberry hypothesis for four middle-income countries. The theoretical expectation, in accordance with Equation 3 in Duesenberry's hypothesis, is that the variables 'y' and 'z' should exhibit positive and negative relationships, respectively. The estimation results, as previously highlighted, align with this theoretical expectation, providing empirical support for the theory. This suggests that the presence of ratchet effects cannot be discounted in these countries. To elaborate further, the theory posits that as income increases, consumption also increases in proportion to that rise.

Conversely, in the event of income decline, consumption exhibits a relatively smaller decrease. This phenomenon is particularly noticeable in the short term, regardless of the underlying causes of the income reduction.

This resistance to reducing consumption stems from households' tendency to maintain their consumption levels, resulting in a certain degree of inflexibility or "stickiness" in consumption. Consequently, this inflexibility contributes to a reduction in the slope of the short-term consumption function.

Table 4 substantiated the decrease in slope for four middle-income countries under examination. Furthermore, diagnostic tests, as indicated in Table 5, suggest that the consistency in the outcomes across all four countries may contribute to the robustness of the results.

To validate these findings, we extended our analysis by employing panel data to estimate the same consumption function for a broader set of 20 middle-income countries, encompassing various income subcategories (middle income, upper middle, lower middle). This analysis spanned from 1980 to 2018.

Table 6. Panel data diagnostic tests.

Statistics	F-Limer	Hausman test	Breusch and Pagan test
F	149.55	_	_
(P-value)	(0.00)		
χ^2	_	2.18	8858.07
(P-value)		(0.33)	(0.00)

Prior to estimating the model in Equation 3 using the panel data, we test for fixed and random effects in the data. The diagnostic results for panel data, presented in Table 6, reveal the significance of both the F-statistic and the Chi-squared statistic from the Breusch-Pagan test, as indicated by their respective p-values. The F-Limer and Breusch-Pagan tests assume the absence of random effects, but zero p-values decisively reject these null hypotheses. Conversely, the Hausman test, based on the null hypothesis of the presence of random effects, does not lead to the rejection of this null hypothesis. Consequently, all three tests provide consistent evidence supporting the existence of random effects in the panel data. These findings affirm that the most suitable approach for estimating Equation 3 is under the assumption of random effects.

Table 7 provides the estimation results for the panel data, employing the random effects assumption.

Table 7. Panel data estimation of Equation 3 based on random effect.

Variables	Coefficient	Std. err.	P>|z|
Y	0.99	0.007	0.00
Z	-1.45	0.75	0.05

The negative value of the coefficient of 'Z' signifies a declining slope, which aligns with and confirms the Duesenberry (RIH), particularly the presence of the ratchet effect. These findings closely mirror those presented in Table 5. Therefore, it can be inferred that in the context of middle-income countries, the effectiveness of monetary and financial policies tends to be more pronounced in the long term compared to the short term. The presence of the ratchet effect indicates that fiscal policy may be more effective in these types of the economies. For instance, the efficacy of a tax cut to stimulate the economy during economic downturns may be boosted further from the ratchet effect in consumption.

5.2. High-Income Countries

Table 8 displays the outcomes of the ARDL bounds test for high-income economies. These results provide confirmation of a long-term relationship between the dependent and independent variables. It is worth noting that, except for Sweden, where the test shows significance at the 5 percent level, the F-test for the remaining countries exhibits significance at the 1 percent level and beyond.

After obtaining these results, we proceed to estimate the long-term coefficients and construct the error correction model, as detailed in Table 9.

Table 8. ARDL bounds test.

Countries				
	Japan	**Germany**	**Sweden**	**Belgium**
F	14.95*	5.90*	4.35**	9.55*
Significance		Lower bound		Upper bound
10%		2.17		3.19
5%		2.72		3.83
2.5%		3.22		4.50
1%		3.88		5.30

Note: * and ** indicate significance at 1 and 5 percent levels.

Table 9. Estimated long-run coefficients.

Countries				
	Japan	**Germany**	**Sweden**	**Belgium**
Y	0.86* (0.05)	0.84* (0.02)	0.76* (0.02)	0.79* (0.02)
Z	1.84* (0.73)	2.07* (0.42)	2.98* (0.28)	2.57* (0.27)
ECM	-0.17* (0.02)	-0.23* (0.05)	-0.21* (0.05)	-0.31* (0.05)

Note: Standard errors are in parentheses. * Indicates significance at 1 percent level.

In the case of high-income countries, the assessment of the Duesenberry hypothesis reveals a divergence from the findings observed in middle-income nations. Specifically, this hypothesis does not hold consistently in high-income settings, primarily due to the presence of a positive coefficient 'Z'. The positive sign of 'Z' signifies that when household income declines over time for any reason, consumption falls by a greater proportion than the income decrease. Conversely, when income increases, consumption also increases proportionately. Therefore, the ratchet effect is not present. This implies that the short-term consumption slope is steeper than the long-term slope. The uniformity of results across all four countries is particularly noteworthy, confirming the robustness of the estimation outcomes. Table 10 presents a summary of the diagnostic test results conducted to validate the validity of our estimations.

Table 10. Diagnostic statistics.

Countries				
F-statistic	**Japan**	**Germany**	**Sweden**	**Belgium**
Serial correlation	0.37	0.48	0.97	0.69
Functional form	0.18	0.96	0.87	0.16
Heteroscedasticity	0.19	0.24	0.10	0.16
CUSUM test	No problem	No problem	No problem	No problem

To generalize and extend the estimation results beyond the initial four countries, we employed panel data encompassing 20 countries spanning from 1980 to 2018. Table 11 presents the outcomes of three tests aimed at assessing the suitability of the random effect model for this panel dataset.

Prior to estimating the model, we test for the presence of the fixed and random effects in the panel data. The null hypothesis for the F-Limer and Breusch-Pagan tests is that there is no random effect. Both tests decisively reject the null hypotheses, as indicated by zero p-values. Conversely, the Hausman test does not reject the null hypothesis of random effect. Consequently, all three tests provide consistent evidence supporting the existence of random effects in the panel data. Table 11 provides a detailed summary of these results.

Table 11. Panel data diagnostic tests.

Statistics	F-Limer	Hausman test	Breusch-Pagan test
F	1411.22	_	_
(Prob)	(0.00)		
χ^2	_	0.26	13916.79
(Prob)		-0.87	0

Table 12 presents the estimation results for the panel dataset of twenty countries under the assumption of random effects.

Table 12. Estimated random effect.

Variables	Coefficient	Std. err.	P>|z|
Y	0.89	0.005	0.00
Z	2.83	1.16	0.01

In Table 12, the variable 'Z' is positive. This implies that, in the short run, the consumption slope is steeper than in the long run. In essence, Duesenberry's consumption theory does not hold consistently in high-income nations.

The presence of a greater short-term consumption slope compared to the long-term slope suggests that when income decreases, consumption experiences a more pronounced decline, i.e., there is no ratchet effect. Therefore, when households experience a decline in income, they might perceive this downturn as potentially lasting. Consequently, they tend to increase their savings and reduce consumption, aiming to create a financial cushion to maintain their consumption levels during challenging times.

Moreover, this consumption behavior likely finds its roots in the socio-cultural and economic fabric of societies, which can account for the disparities observed between middle-income and high-income countries in terms of their consumption patterns.

One of the unique aspects of this study, often overlooked in prior research, is the distinction in household consumption behavior between two distinct groups: middle-income countries, all classified as developing, and high-income countries, which are typically developed. This study addresses the fundamental question of whether changes in per capita income genuinely influence household consumption patterns. The results strongly suggest that this indeed holds true.

In conclusion, it becomes evident that middle-income countries tend to exhibit consumption stickiness and a commitment to maintaining their living standards when facing declining income. Thus, the consumption ratchet effect is present in this group. Conversely, in high-income countries, a clear inclination toward precautionary behavior is observed, and the consumption ratchet effect is not supported. Figure 2 graphically presents this phenomenon.

Figure 2 illustrates three consumption functions in natural logarithms. Curve "a" represents the long-run consumption pattern. Curve "b" depicts the short-run consumption behavior observed in middle-income countries, while curve "c" portrays the short-run consumption tendencies of high-income countries. The slope of curve b is clearly smaller than that of curve c when deviations from the long-run consumptions occur.

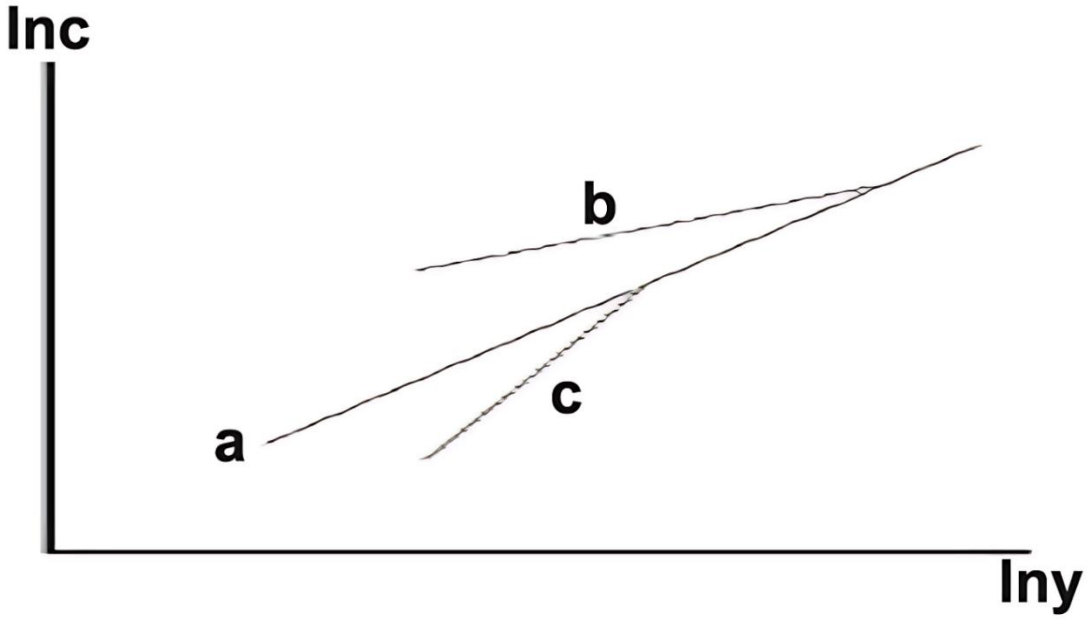

Figure 2. Curve c indicates precautionary behavior (Related to short run consumption of high-income countries) and curve b indicates sticky behavior (Middle-income countries) towards short run consumption.

The random-effects panel data estimation results reveal that the consumption function has a lower slope in middle-income countries in the short run compared to the long run. This suggests the existence of Duesenberry's ratchet effect in these economies, which implies that consumption fluctuates less than income over time.

Conversely, in high-income countries, the short-run consumption function's slope is greater than that of the long run, implying that the ratchet effect is not significant in these economies. This suggests that precautionary behavior is more prevalent in high-income countries, leading to different consumption dynamics compared to middle-income countries.

These findings have significant implications for policymakers. In high-income economies, fiscal policy measures such as tax cuts may effectively stimulate consumption, while tax increases could reduce it. However, in middle-income countries, the effectiveness of managing aggregate demand through tax cuts may be limited, as consumption tends to be sticky and does not respond quickly to fiscal measures.

Our paper uniquely compares the presence of the ratchet effect and its implications for high- and middle-income economies. The scarcity of scholarly work on this topic may be due to the limited traction of Duesenberry's ratchet effect theory, often relegated to footnotes in graduate macroeconomics textbooks. As a result, confirming or contradicting previous research is challenging. However, it is crucial for central banks and policymakers to consider the ratchet effect when planning stimulus packages. Otherwise, applying standard fiscal policy tools to middle-income, and potentially lower-income, economies may yield negative results. Anecdotal evidence of hyperinflation in Argentina, Turkey, and various emerging economies in Asia and Africa may illustrate the consumption ratchet effect. Further scholarly work on this subject is imperative.

6. SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

The level of domestic consumption, which typically represent the largest component of aggregate expenditures in most economies, significantly influence the size of the multiplier and the dynamic impacts of economic shocks.

Understanding consumption behavior is essential in policymaking because shifts in consumption patterns relative to changes in income over time can have a substantial impact on the effectiveness of aggregate demand stabilization policies, including monetary and fiscal policies.

A review of consumption theories reveals that each post-Keynesian theory of consumption aimed to provide a model that could resolve the Kuznets paradox. For instance, the Duesenberry theory of consumption proposed two hypotheses relating to demonstration and ratchet effects.

The primary objective of this paper is to investigate the presence of the ratchet effect within the context of Duesenberry's relative income hypothesis. To achieve this goal, two sets of countries were selected for analysis: middle-income countries (Brazil, Senegal, Kenya, and Jordan) and high-income countries (Japan, Germany, Sweden, and Belgium), using annual data spanning from 1970 to 2020.

The ratchet effect in consumption was examined in four specific economies in each group by deploying the ARDL model. Subsequently, to validate and generalize the findings for each category, panel data encompassing 20 middle-income and 20 high-income countries were compiled. The results of the random-effects panel data estimation reveal that, in the short run, the consumption function exhibits a lower slope in middle-income countries compared to the long run. This suggests the possibility of Duesenberry's ratchet effect in these economies, where consumption fluctuates less than income. Households in middle-income countries seem to resist reducing their consumption, demonstrating a sticky consumption pattern or habit formation.

In contrast, for high-income countries, the slope of the short-run consumption function is greater than that of the long run. This suggests that high-income countries do not support the ratchet effect in consumption. Here, precautionary behavior seems to prevail, leading to different consumption dynamics compared to middle-income countries.

These findings carry substantial implications for policymakers. In high-income economies, fiscal policy measures such as tax cuts may prove effective in stimulating consumption, whereas tax increases could potentially result in reduced consumption. However, middle-income countries may limit the effectiveness of managing aggregate demand through tax cuts due to the tendency of consumption to exhibit stickiness and slow response to such fiscal measures.

Duesenberry's ratchet effect in consumption presents a significant challenge to the effectiveness of fiscal policy in stimulating economic activity. Our study shows that in middle-income group of economies in the study, consumers tend to base their current consumption decisions on their past levels of consumption rather than their current income. As a result, even if fiscal policy measures such as tax cuts or increased government spending provide households with additional income, they may choose to save or pay down debt rather than increase their spending. Past consumption levels influence their desire to maintain their previous standard of living, driving this behavior. Consequently, fiscal stimulus measures may not generate the intended boost in aggregate demand, limiting their effectiveness in stimulating economic growth. Conversely, tax increases may not curb consumption or the aggregate demand because of the ratchet effect in consumption. Thus, tax increases may prove inflationary as both the higher government expenditures and sticky private consumption fuel higher levels of aggregate demand. Given that the middle-income economies also face supply-side constraints, inflationary pressures may emerge. The anecdotal evidence of hyperinflation in Argentina, Turkey, and many other emerging economies of Asia and Africa may be evidence of the consumption ratchet effect.

Additionally, the ratchet effect can exacerbate income inequality by widening the gap in consumption patterns between different income groups, further undermining the impact of fiscal policy interventions in middle-income countries. Therefore, policymakers of these economies must carefully consider the implications of the ratchet effect

when designing and implementing fiscal policy measures to ensure their effectiveness in promoting economic recovery, growth, and remedying income inequality.

Our paper underscores the need for further research into Dusenbery's consumption ratchet effect. The scant attention it has received highlights the need for further research given its potential significance, particularly for emerging economies. Moreover, there is a clear necessity for additional scholarly work on its implications for low-income countries.

Current research demonstrates that "one size does not fit all" when it comes to economic policies, especially fiscal policy. Policies that may seem effective and well-tested in high-income, mature economies may not address the unique challenges of economies with different structures and levels of development. Blindly applying these economic strategies can lead to suboptimal outcomes for countries lacking the same economic infrastructure as mature economies.

Therefore, it is essential to recognize and investigate the nuances of the ratchet effect to better tailor economic policies to the specific needs and conditions of various economies, ensuring more effective and sustainable growth strategies.

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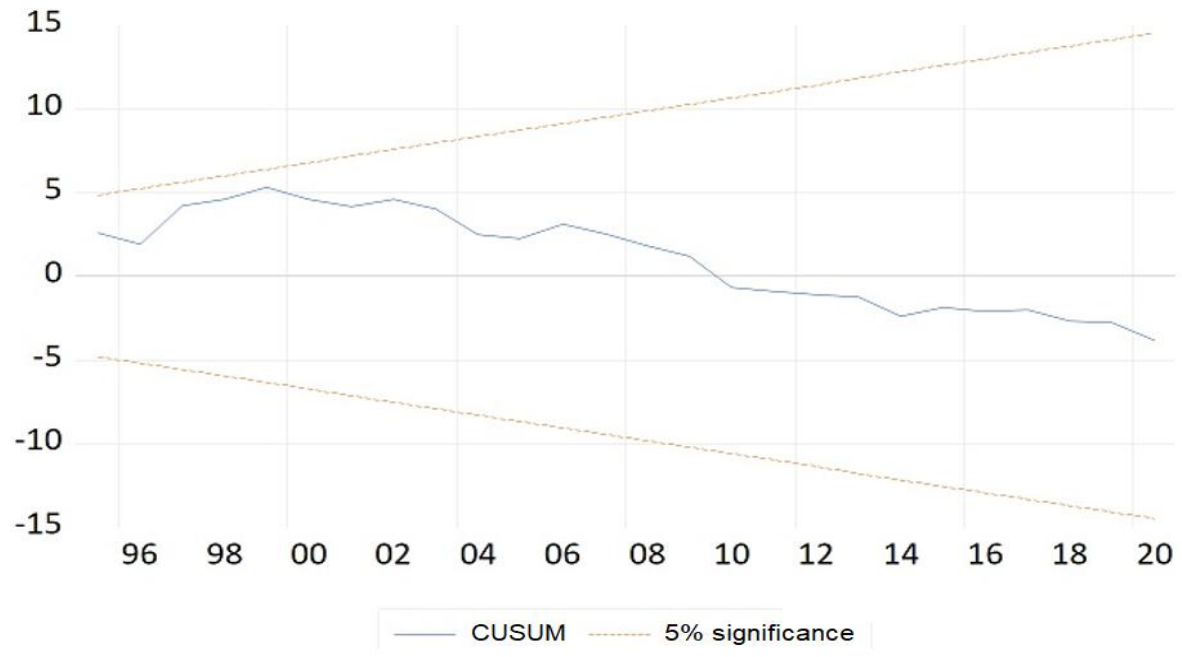
APPENDIX

Table 1. Unit root test.

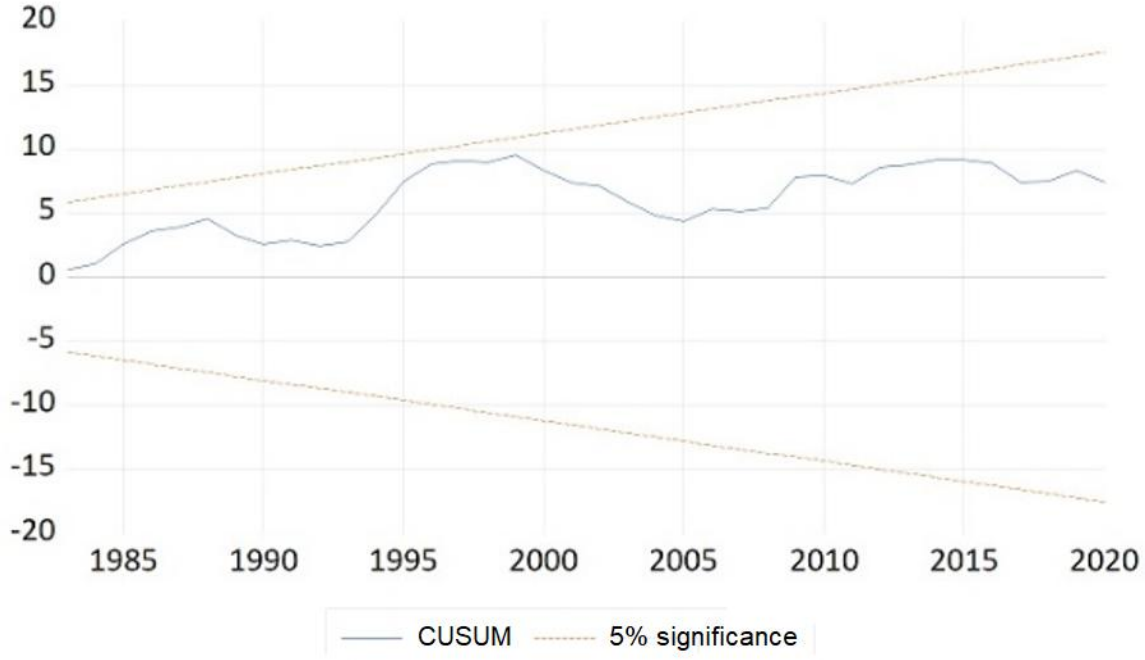
Variables countries	Level			First difference		
	C	Y	Z	C	Y	Z
Brazil	-4.90 *	-4.89*	-3.78*			
Senegal				-6.43*	-6.60*	8.33*
Kenya	-6.73*		-4.33*		-5.56*	
Jordan				-5.56*	-3.57*	-7.00*
Japan	-4.96*	-5.65*	-3.38*			
Germany			-4.90*	-3.18*	-5.53*	
Sweden			-5.30*	-3.67*	-5.11*	
Belgium	-5.07*		-7.13*		-6.29*	

Note: * indicates significant at 1 and 10 percent levels.

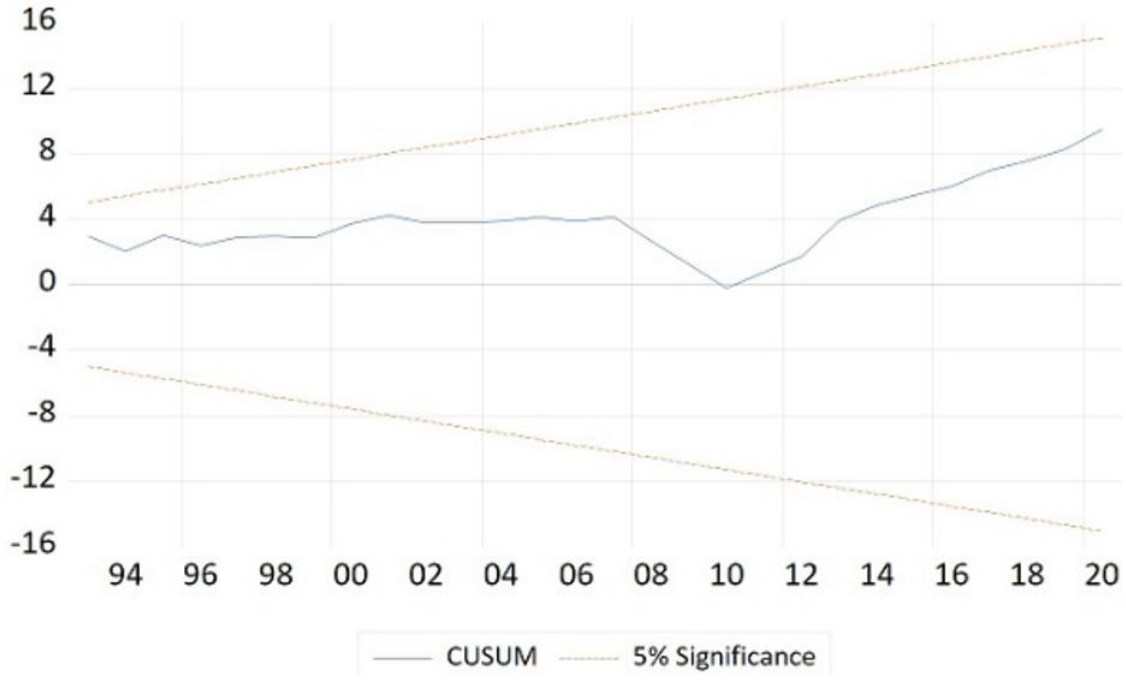
CUSUM test results



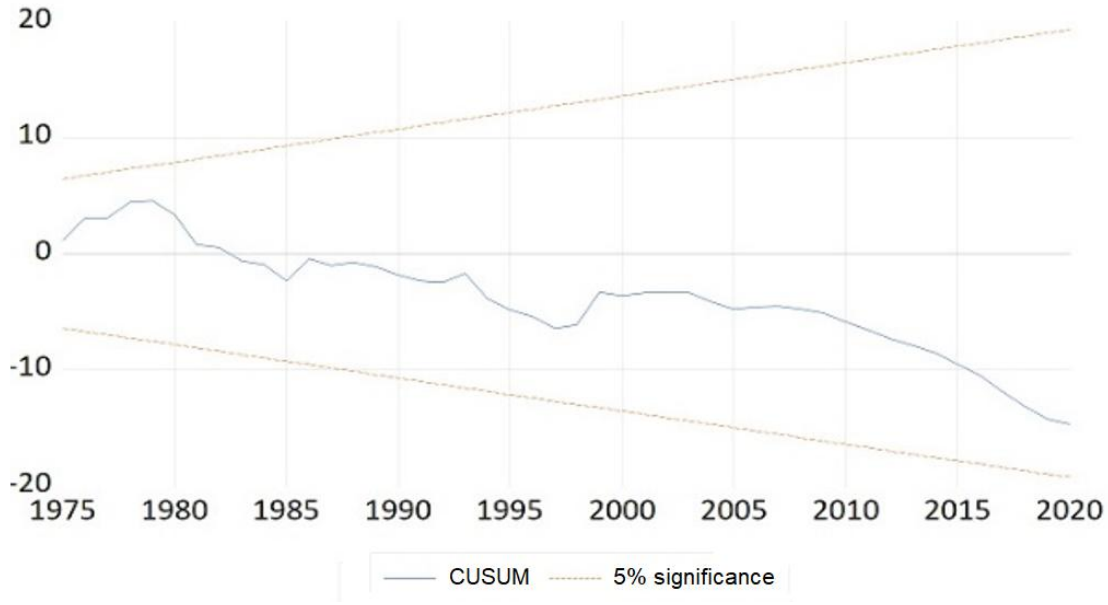
Brazil



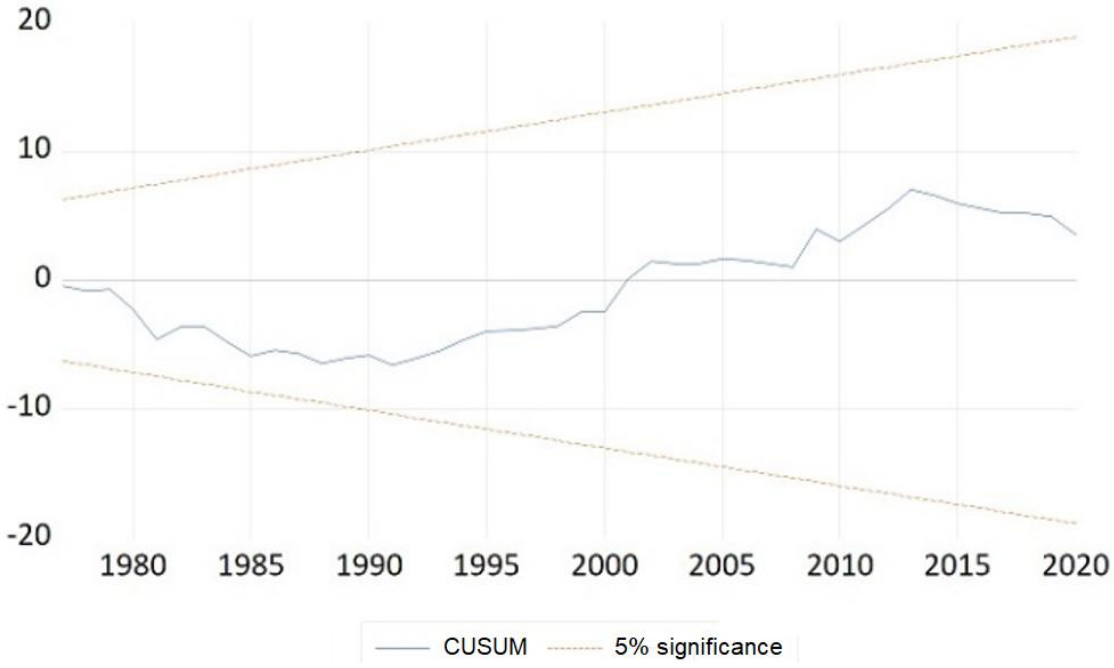
Kenya



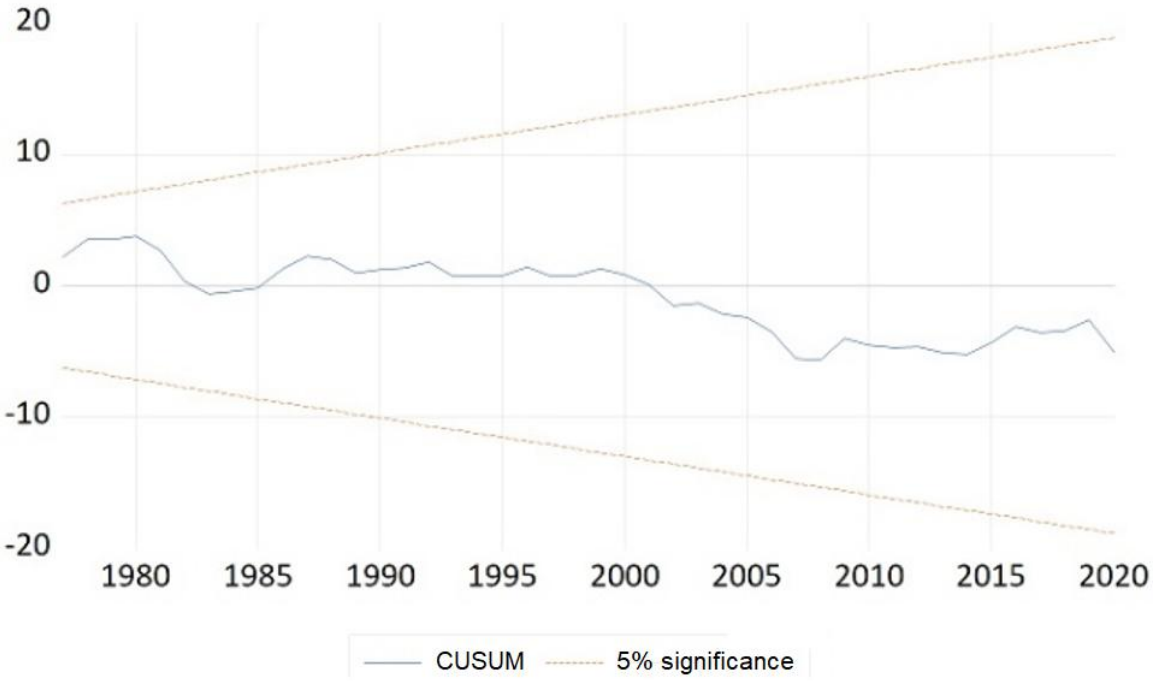
Senegal



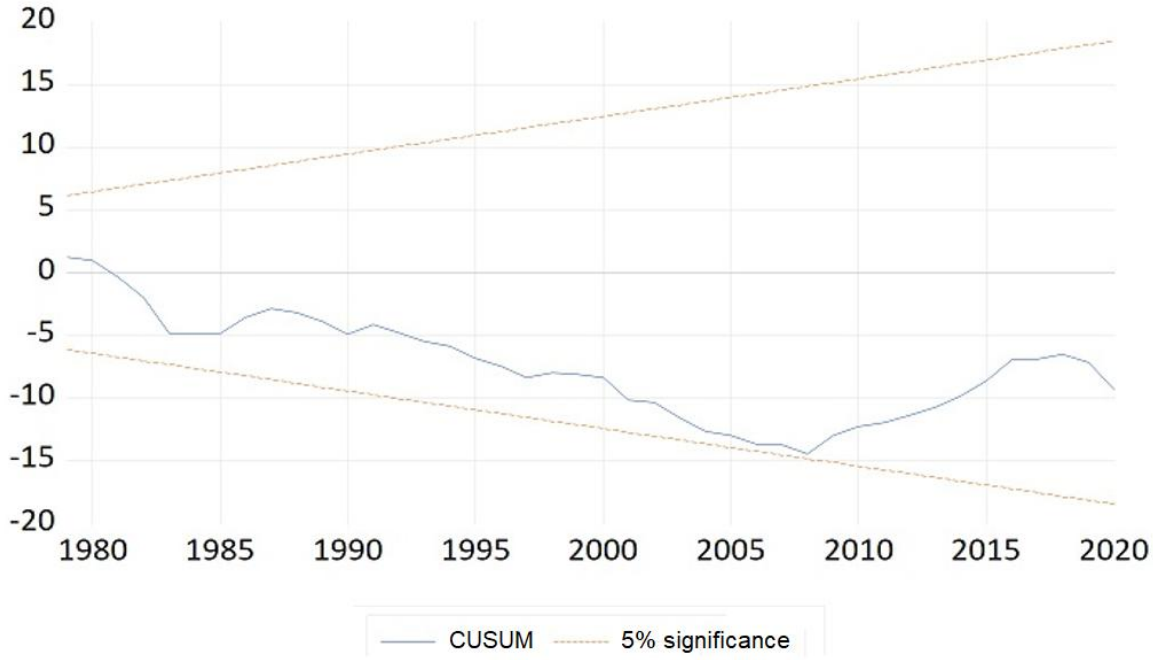
Jordan



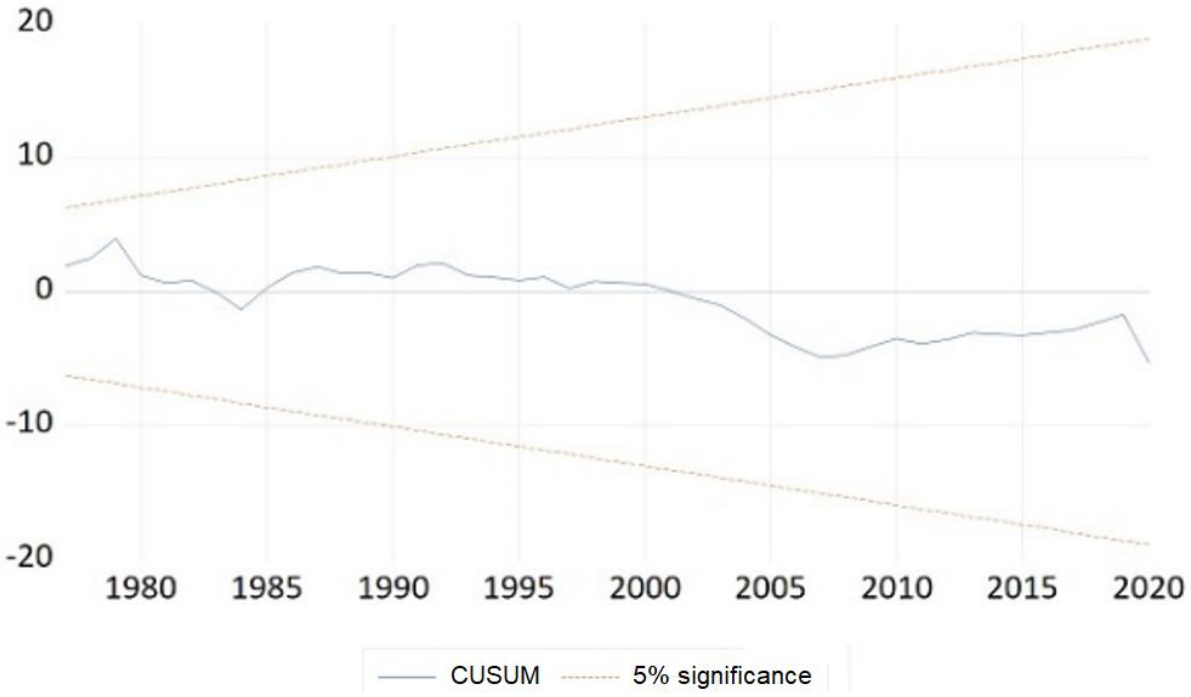
Japan



Germany



Sweden



Belgium