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The Four Force Currency Theory: An Innovative Dynamic of Pull–Push Effects in Exchange Rate Determination

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ABSTRACT

Most industrialized economies now operate hybrid, managed-floating exchange rate regimes that are neither perfectly flexible nor rigidly fixed, as illustrated by episodes such as the 1992 UK currency crisis, the 1997–98 Asian currency crisis, and the 2001 Latin American currency crisis, where exchange rates proved highly speculative and volatile. The core causes of these crises often lie in government mismanagement, large external and short-term debts, and weak liquidity management, all of which intensify macroeconomic fragility and heighten the risk of currency turmoil. This raises several fundamental questions: To what extent do currency crises propagate into regional or global economic disruptions? What forces drive such crises, and how should the international monetary system and currency value be re-conceptualized? Are hedge-fund-driven speculative flows primarily responsible for destabilizing the currency system, or do deeper structural forces dominate? This paper addresses these questions by proposing an innovative Four Force Currency Theory that combines a pull–push mechanism with a F-curve based interpretation of currency dynamics. Our model focuses on four strategic agents G7 economies, central banks, hedge funds, and domestic citizens and analyzes how their interactions jointly determine exchange rates and currency trajectories over time. F-curve not merely as a trade-balance analytic tool but as a dynamic currency adjustment mechanism consistent with the Marshall–Lerner condition, this research paper provides a structured framework for understanding exchange-rate determination, crisis propagation, and policy design.

Keywords: Four-Force Currency Theory, Four-Force Strategic Model, Push–Pull Dynamics, Exchange Rate Determination Mechanism

Research Design and Methods

The Four Force Currency framework develops an advanced pull–push model to evaluate each country's monetary position and potential future currency value. This approach systematically incorporates macro-financial indicators, institutional behavior, and expectations-driven forces into a unified structure that can serve both as a descriptive model and as a forward-looking indicator for exchange-rate movements and policy risk. Within this framework, four core forces, G7 economies, central banks, hedge funds, and domestic citizens, are treated as strategic players whose decisions exert upward (push) or downward (pull) pressure on the exchange rate in successive stages of a dynamic cycle. The empirical and theoretical design emphasizes: (1) currency strength and external balance, (2) exchange-rate and monetary policy regimes, (3) capital flow and speculative positioning, and (4) domestic confidence and expectations. By jointly assessing these dimensions, our model enables a more precise diagnosis of the current currency "state" and a structured forecast of its likely path, thereby informing macroeconomic management, crisis prevention, and policy formulation.

Literature Review

The recent literature [1]-[5] emphasizes how monetary policy decisions in systemically important economies, particularly the G7, propagate through global financial conditions and generate

pronounced exchange-rate spillovers. Unconventional monetary policies and shifts in expected policy rates transmit via interest-rate differentials, risk premia, and cross-border portfolio flows, influencing bilateral exchange rates and amplifying global risk-on/risk-off cycles. A parallel strand of research shows that foreign exchange turnover is increasingly driven by hedging and speculative strategies, with hedge funds and leveraged investors playing a significant role in episodes of abrupt currency adjustment and crisis. Another body of work stresses the importance of regime credibility and expectations, demonstrating that credible pegs [1]-[7] or tightly managed regimes can lower inflation, reduce nominal volatility, and alter term structures of interest rates via a "credibility channel." Micro-level evidence from surveys and behavioral studies confirms that expectations about inflation, growth, and policy stability shape currency demand, precautionary savings, and balance-sheet choices, thereby reinforcing or undermining the nominal anchor [5]-[9]. Taken together, these strands motivate the Four Force perspective developed in this research paper, which synthesizes G7 policy, central bank behavior, hedge-fund positioning, and citizen expectations into a coherent currency-determination framework.

Introduction: The Four Forces

This paper proposes that the value of a local currency is primarily shaped by the strategic interaction of four dominant forces: (1) G7 economies, (2) the domestic central bank, (3) hedge funds and other leveraged speculators, and (4) domestic citizens. Within the Four Force Strategy, exchange-rate determination is conceptualized as the outcome of a multi-period game in which each force exerts pull or push effects on the currency through buying and selling decisions, policy choices, and shifts in expectations. Currency valuation in this framework requires detailed analysis of: (1) G7 trade and financial strategies and their impact on international balances, (2) central bank interest-rate and intervention policies, (3) hedge-fund portfolio allocation and speculative behavior, and (4) domestic citizen expectations regarding inflation, constitutional risk, and regime credibility. By formalizing these interactions, this innovative model seeks to explain both tranquil periods and crisis episodes in a unified, dynamic manner.

Core Framework: Roles of the Four Forces

Within the Four Force Strategy, each agent has a distinct decision domain and transmission channel:

Four Force Currency Framework

Figure 1: Rectangular Based Style representation of the Four Force Currency Framework and net dynamic stages valuation

- **G7 economies**: G7 governments and monetary authorities influence exchange rates through coordinated interventions, macroeconomic policy alignment, and trade strategies. A classic example is the 1985–86 Plaza/Louvre episode, in which coordinated G7 actions led to significant appreciation of the Japanese yen and depreciation of the US dollar to address perceived trade imbalances. In this force, key variables include international trade balances, surplus/deficit positions, and explicit or implicit currency-realignment decisions.

- **Central bank**: The domestic central bank intervenes in the currency market based on inflation targets, output and employment objectives, external balance, and financial-stability concerns. Its main instruments are interest-rate decisions, foreign-exchange interventions, reserve management, and macroprudential tools. Through these levers, the central bank can either resist or reinforce external pressures, acting as a stabilizing or amplifying force in the pull–push process.

- **Hedge fund / speculators**: Hedge funds and leveraged investors respond to perceived misalignments between a country's fundamentals and its market-determined exchange rate, forming positions based on rational expectations, risk assessments, and cross-market arbitrage opportunities. They often amplify market dynamics by building large directional positions, which can accelerate depreciation or appreciation when combined with thin liquidity and weak policy credibility.

- **Domestic citizens**: Households and firms respond to local risk, government credibility, inflation expectations, and perceived solvency of the public sector. When citizens lose confidence, for example, due to crisis episode, unsustainable debt, or civil instability, they tend to sell local currency and shift into safe-haven assets such as the US dollar, thereby exerting additional downward pressure on the domestic currency and potentially fueling inflation during crises.

  These four forces form a strategic system in which each actor's decisions can either align or conflict, producing complex exchange-rate dynamics that the Four Force Currency Theory aims to formalize.

The above figure depicts a four-stage rotation of net order flow among four strategic currency forces, G7 governments, central banks, hedge funds, and domestic citizens, where in each stage exactly one force is the dominant net buyer while the remaining forces are net sellers. At Stage 1, G7 authorities undertake coordinated net purchases, providing official support for the currency while central banks, hedge funds, and citizens collectively reduce exposure. At Stage 2, the central bank assumes the role of marginal buyer of last resort, accumulating the currency on its balance sheet as G7 authorities, hedge funds, and citizens continue to sell. At Stage 3, hedge funds become the primary speculative long, aggressively buying into the currency as official sectors step back and households persist in net liquidation. By Stage 4, the dominant net-buying position migrates to citizens, signaling broad-based domestic accumulation and late-cycle retail participation, while G7, central banks, and hedge funds shift to net selling, thereby completing the rotation of pressure across the each state forces.
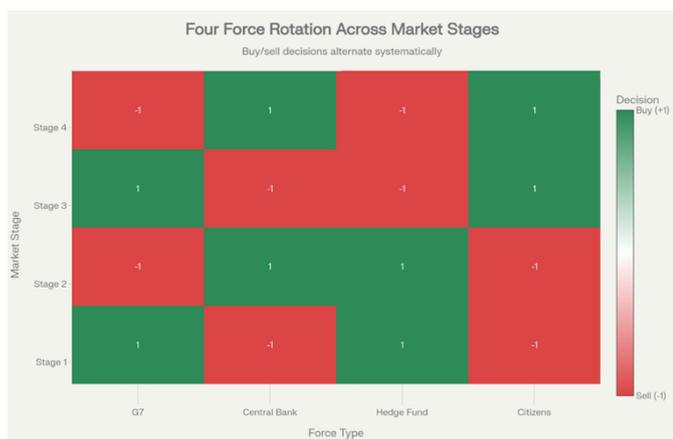
Dynamic Pull–Push Cycles and Stages

Figure 2: Rectangular Based Style representation of the Four Force Rotation Across Market and net dynamic effect across stages

Left panel (table/heatmap): A 4x4 grid exactly as described, with Stages 1-4 (rows) represent, four forces (columns: G7, Central Bank, Hedge Fund, Citizens). Each cell shows the rotating decision: +1 = Buy/Push (appreciation force, green) or -1 = Sell/Pull (depreciation force, red). Right panel (net graph): Line/bar chart of Combined Rotational Force (Net Force per stage), summing the four individual decisions in each stage to show the overall push/pull effect.

The Four Force Framework conceptualizes exchange-rate evolution as a sequence of dynamic cycles, each consisting of four stages corresponding to the decisions of G7 economies, the domestic central bank, hedge funds, and domestic citizens. In each cycle, every force decides whether to buy or sell the currency, generating either upward (push) or downward (pull) pressure. The combination of these decisions at each stage yields a "mixed rotated decision," where the net effect reflects the vector sum of four underlying forces.

In a stylized example, consider Country A with a large trade deficit. G7 authorities may decide that an adjustment is required and thus buy Country A's currency while selling US dollars or euros, generating appreciation pressure. The domestic central bank, by contrast, may judge the currency as too strong for export competitiveness and may decide to sell domestic currency and accumulate foreign reserves, pushing toward depreciation. Citizens, worried by rising deficits and debt, may also sell domestic currency in favor of foreign assets, while hedge funds, detecting overvaluation and locational risk, build short positions in the domestic currency. In this configuration, three forces (central bank, citizens, hedge funds) push toward depreciation, while one force (G7) pulls toward appreciation. The net outcome depends on the relative weight and correlation of these forces, which the model captures in a structured way.

Each dynamic cycle thus contains four stages (Stage 1 to Stage 4), and over time these stages can repeat toward "infinity," generating a trajectory of currency values. At every stage, four rotating individual forces interact, and the combined rotational force determines the quantitative value for that stage. Different configurations of alignment and conflict across stages yield different dynamic effects, including gradual trends, sudden reversals, and crisis-like jumps.

Formal Four Force Framework and Correlations

Formally, the model introduces four agents: A = G7, B = local central bank, C = hedge fund, and D = domestic citizens. Each agent carries a weight W_a, W_b, W_c, W_d representing its relative strength or market impact, and pairwise correlations such as Corr (AB), Corr (AC), etc., capture the degree to which their decisions co-move. The overall decision correlation and value correlation across the four forces can be normalized (for illustration), reflecting that the weight of force which carry may determines the exchange rate in the baseline state.

Within this structure, the currency "state" in each period is a function of: (1) weighted decisions (buy/sell) of the four forces, (2) their correlation structure, and (3) exogenous shocks such as sudden policy announcements or geo-location events. The resulting model, while based on standard approximations and assumptions, provides a tractable way to analyze the joint pull–push effects of the four forces on currency dynamics. It also enables the derivation of predictive indicators, such as the probability of a large depreciation given a particular configuration of **weights** and **correlations**, or the likelihood that an intervention-driven appreciation can be sustained in the presence of speculative opposition.

Integration with J-Curve and Marshall–Lerner

The Four Force Currency Theory is consistent with the J-curve phenomenon and the Marshall–Lerner condition, thereby embedding established trade-elasticity insights into a broader strategic framework. The J-curve describes how, following a depreciation of the nominal exchange rate, a country's trade balance tends initially to deteriorate due to short-run inelasticities in import and export demand, before gradually improving as quantities adjust and elasticities rise. The Marshall–Lerner condition states that a depreciation improves the trade balance only if the sum of the (absolute) price elasticities of demand for exports and imports exceeds one.

In the Four Force model, these trade responses are seen as the macroeconomic backdrop against which the four strategic forces act. For instance, if a country devalues its currency to address a trade deficit, the central bank force actively pushes the currency down, while the eventual J-curve improvement in the trade balance can strengthen citizen confidence and reduce speculative pressure over time. Conversely, if depreciation fails to satisfy the Marshall–Lerner condition, because trade elasticities remain low, citizens and hedge funds may interpret the policy as a sign of weakness, intensifying downward pressure and prolonging the crisis. The model thus explains the currency path is decided by the dominant force and is mediated by expectations and strategic behavior across the four forces.

Case Illustrations: Japan and Indonesia

The explanatory and predictive capabilities of the Four Force Currency Theory can be illustrated by two classic episodes. First, the 1980s Japanese yen appreciations, particularly around the 1985 Plaza Accord and subsequent G7 agreements, reflect a configuration in which the G7 force was dominant. Coordinated G7 decisions to sell US dollars and buy yen were designed to correct trade imbalances and reduce the US current-account deficit, leading to a sustained yen appreciation despite domestic concerns about export competitiveness. In this case, the G7 force's weight outweighed opposing domestic or speculative forces, and the yen's path broadly followed the external policy consensus [7-9], this event support our innovative model assumption.

Second, the 1997–98 Indonesian crisis illustrates a configuration where hedge funds and domestic citizens became the dominant forces. Large short-term external debts, an overvalued nominal exchange rate, and fragile financial institutions triggered speculative attacks; hedge funds and other investors sold Indonesian assets and

currency, while domestic citizens shifted into US dollars amid collapsing confidence. The central bank's limited reserves and policy credibility made it difficult to counter these pressures, and G7 intervention was insufficiently focused to stabilize the rupiah. The Four Force model captures this pattern as a crisis state in which hedge-fund and citizen forces are highly correlated and dominant, with central bank and G7 forces relatively weak [7-9], this event support our innovative model assumption.

Extended Exchange-Rate Policy Analysis

Viewed through the Four Force lens, exchange-rate policy is not just a technical exercise of buying or selling foreign currency but a strategic interaction across multiple decision-makers. Central banks essentially consider interest-rate differentials, balance-of-payments positions, fiscal trajectories, and global financial conditions when deciding whether to accumulate reserves, defend a peg, or allow depreciation. These choices feed into the expectations of hedge funds and citizens, who update their portfolios and currency holdings based on perceived policy credibility and future inflation risk. G7 policy decisions and communication, in turn, shape the external environment by influencing global liquidity, risk appetite, and bilateral exchange-rate targets. In flexible or managed-float regimes, this interplay is often complemented by macroprudential policies, capital-flow management measures, and structural reforms aimed at preserving financial stability without resorting to rigid pegs. The Four Force currency model provides a structured way to analyze how different policy mixes are likely to interact with speculative behavior and domestic expectations, thereby helping policymakers assess whether an intervention will be stabilizing or destabilizing over the medium term.

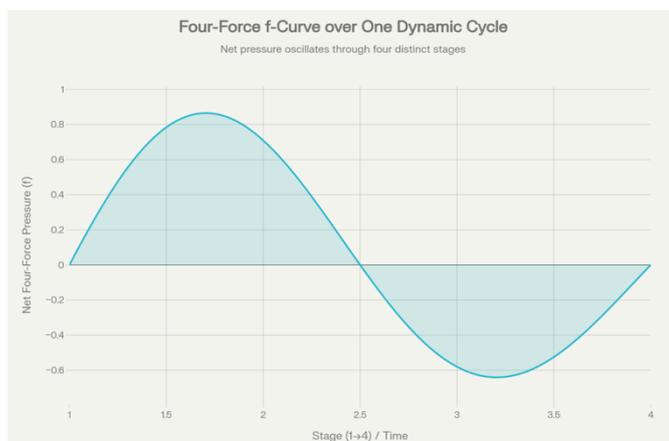**New f-Curve Concept and Predictive Power**

Figure 3: Illustrative f-curve showing net four-force push/pull pressure across one dynamic currency cycle (Appendix 1).

Building on the J-curve insight, the paper introduces an "f-curve" as a four-force analogue that traces the combined impact of G7, central bank, hedge-fund, and citizen decisions on the exchange rate over time. While the J-curve focuses on trade-balance dynamics, the f-curve focuses on currency value, showing how episodes of depreciation or appreciation emerge from shifting coalitions among the four forces. In this view, crises occur when a dominant coalition such as hedge funds plus citizens, or G7 plus central bank pushes strongly in one direction, overwhelming countervailing forces and generating abrupt adjustments. The larger the effective "distance" or power of the dominant force, the more likely it is that depreciation or revaluation will be used to restore balance-of-payments equilibrium, and the more pronounced the currency movement is likely to be.

Since the Four Force model explicitly accounts for the **weights** and **correlations** among the four agents, it can be used to construct predictive scenarios. For example, if G7, the domestic central bank, and hedge funds all align in supporting appreciation while citizens remain skeptical, the model would predict a high probability of near-term appreciation but a risk of reversal if citizen confidence fails to improve. Similarly, in a situation where G7 and domestic policy are mis-aligned but hedge funds and citizens are strongly correlated in their expectations of depreciation, the model would signal heightened crisis risk and probable downward pressure on the exchange rate.

Conclusion

The Four Force Currency Theory offers a systematic, integrative framework for analyzing exchange-rate determination by explicitly modeling the interaction of G7 economies, domestic central banks, hedge funds, and domestic citizens. By combining a pull–push structure this model links trade elasticities and policy choices to expectations, speculative behavior, and confidence dynamics. Its stage-based, rotational representation of decision cycles helps explain both gradual currency trends and sudden crisis episodes, while the correlation-based formalization provides a basis for predictive analysis across different country cases, including the United States and other major economies. As such, the Four Force framework aims to contribute to both theoretical understanding and practical policy design in modern currency theory, with potential applications in crisis prevention, regime assessment, and strategic exchange-rate management.

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(Appendix 1)
The vertical axis, is Net-Four-Force Pressure on Currency (f), summarizing the combined effect of G7, Central Bank, Hedge Fund, and Citizens as a single net "power force" at each point in the cycle. The horizontal is the zero pt of stage (one to four) with respect to time.