

A hand in a grey sleeve is shown from the top, dropping a single gold coin into a stack of gold coins. The stack consists of four columns of coins of increasing height from left to right, all resting on a bed of dark brown soil. The background is a clear blue sky. The entire image is framed with rounded corners.

Journal of Economics and International Finance

Volume 8 Number 9 November 2016

ISSN 2006-9812



*Academic
Journals*

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Journal of Economics and International Finance (JEIF) is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as econometrics, trade balance, Mercantilism, Perfect competition etc. The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in JEIF are peer-reviewed.

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Full Length Research Paper

Entrepreneurial distance: A novel evaluation tool of entrepreneurial intention

Alba Zurriaga Carda* and Kazuro Kageyama

Department of Technology Management for Innovation, The University of Tokyo, Japan.

Received 2 August, 2016; Accepted 18 October, 2016

Entrepreneurship and new business creation drive economic growth and employment generation. In this study we have developed a new way to evaluate entrepreneurial intention by looking at the respondents' opinion towards entrepreneurs and their own self-reported abilities. We have coined this methodology as the entrepreneurial distance. This study is based in an international sample of 264 respondents gathered through an online questionnaire. The results show that the different entrepreneurial distances (positive, negative, and zero) follow the distributions we have hypothesized. Additionally, across the countries studied, entrepreneurs are perceived to be dynamic, innovative, willing to take risks, having a good entrepreneurial vision and being able to create jobs. These findings have important implications for educators and policy makers to help in the promotion of entrepreneurship.

Key words: Entrepreneurship, entrepreneurial intention, entrepreneurial distance, stakeholder, spectator.

INTRODUCTION

Entrepreneurship is an important driver for economic growth (Zahra, 1999), through bringing innovation to the market and creating jobs (Shane and Venkataraman, 2000). Countries thus want to increase the rate of entrepreneurship to promote economic and social development (Peng et al., 2012). Therefore, understanding which are the most important attributes and skills of entrepreneurs can enhance the level of entrepreneurship by promoting these skills. Entrepreneurial intention is considered to be the best predictor of future entrepreneurial behaviour (Krueger et al., 2000), and thus, accurate evaluation tools of entrepreneurial intention are important.

Image of entrepreneurs

The purpose of our study is to understand if entrepreneurs around the world have mutual characteristics that define them, or if contrarily, entrepreneurs differ by country. We were interested to see how the image of entrepreneurs varied across the countries studied: Japan, Spain, United States (US) and the multi-national sample (composed by grouping 28 other countries' responses).

According to the Global Entrepreneurship Monitor (GEM consortium, 2014), conducive entrepreneurial cultures tend to have weak uncertainty avoidance, low power distance, tend to be masculine, individualistic,

*Corresponding author. E-mail: alba.zurriaga@giso.t.u-tokyo.ac.jp.

achievement-oriented, and universalistic (Hofstede, 2001). The three primary countries we are considering in our study: United States, Japan and Spain, show different levels in the key indicators considered conducive to entrepreneurship (GEM consortium, 2014). According to GEM (GEM consortium, 2014), United States shows the most conducive indicators whilst Japan appears to have the least conducive characteristics and Spain shows an intermediate position.

Hypothesis 1 (H1): Countries with more conducive entre-preneurial culture will have a more positive perception of entrepreneurs.

Entrepreneurial distance

Additionally, we were interested in evaluating the respondents own perception of the qualities they possess in first person, as a “stakeholder”, As well as the qualities they thought were important traits of entrepreneurs, in third person, as a “spectator”. We then analyze if their responses have statistically significant differences on the respondent’s entrepreneurial intention. To measure the difference between the “spectator” and “stakeholder” roles, for each of the respondents we calculated what we coined the Entrepreneurial Distance.

$$\text{Entrepreneurial Distance} = \sum_{i=1}^4 E_i - S_i$$

The items used can be found on Table 1. All answers were measured in a 5-point Likert Scale. We used the robust items found to describe entrepreneur’s characteristics (Table 5) and modified them to refer to the first person (Table 1). It is then possible to calculate the difference between both corresponding responses, for each respondent.

The Entrepreneurial Distance is the sum of the differences between each of the four pairs of items. Following the example above, this distance could be positive, negative or zero, with different implications.

Zero distance

In case of a zero “entrepreneurial distance”, we can argue there is a “match” between the characteristics that the respondents believe are necessary or not to become an entrepreneur with the respondent’s own self-reported abilities. In a sense, if a respondent strongly agrees with the item: “entrepreneurs are dynamic people” (value: 5), and strongly agrees with the item: “I am a dynamic person” (value: 5), the difference between the two items will be 0 (5 - 5 = 0). Respondents with a “matching” entrepreneurial distance will possess the same characteristics as they believe are important for entrepreneurs

and thus, will have a higher tendency to become entrepreneurs. We will consider a “match” case to occur, when the distance (sum of four differences) is between -1 and 1.

Hypothesis 2 (H₂): There will be a positive correlation between a match in entrepreneurial distance and entrepreneurial intention.

Positive distance

In case of a positive or negative entrepreneurial distance, we can argue that there is a mismatch between the traits that the respondents believe are necessary or not to become an entrepreneur with their own self-reported abilities, with different implication in each case.

If the “entrepreneurial distance” is positive, the respondent will believe a characteristic is important to become an entrepreneur, but he does not possess it. As an example, if a respondent strongly agrees with the item: “Entrepreneurs are dynamic people” (value: 5), and strongly disagrees with the item: “I am a dynamic person” (value: 1), the difference between the two items will be 4 (5 - 1 = 4). The respondent then lacks, in his opinion, a characteristic necessary to become an entrepreneur. A “positive distance” case will occur, when the sum of the four differences is 2 or above.

Hypothesis 3 (H₃): There will be a negative correlation between a positive entrepreneurial distance and entrepreneurial intention.

Negative distance

In the opposite case, if the entrepreneurial distance is negative, the respondent will believe a characteristic is not important to become an entrepreneur, but he does possess it. As an example, if a respondent strongly disagrees with the item: “Entrepreneurs are dynamic people” (value: 1), and strongly agrees with the item: “I am a dynamic person” (value: 5), the difference between the two items will be -4 (1 - 5 = -4). All items used have a positive connotation, being all desirable qualities to have. Therefore, we can argue that respondents with a negative distance, will have high self-esteem and self-confidence and might therefore be more likely to become an entrepreneur. A “negative distance” case will occur, when the sum of the four distances is -2 or below.

Hypothesis 4 (H₄): There will be a positive correlation between a negative entrepreneurial distance and entrepreneurial intention.

METHODS

Our survey instrument was designed to discover which are the most important qualities that entrepreneurs possess. Additionally, we

Table 1. Corresponding items used to calculate the “entrepreneurial distance”.

Entrepreneur's characteristics	Self characteristics
“Entrepreneurs are dynamic people” = E1	“I am a dynamic person” = S1
“Entrepreneurs are very innovative” = E2	“I am very innovative” = S2
“Entrepreneurs are able and willing to take risks” = E3	“I am able and willing to take risks” = S3
“Entrepreneurs have a good entrepreneurial vision” = E4	“I have a good entrepreneurial vision” = S4

Table 2. Effect size according to Cramer's V (Cohen, 1988).

df*	Small	Medium	Large
1	0.10	0.30	0.50
2	0.07	0.21	0.35
3	0.06	0.17	0.29

would like to know if this profile is the same across countries, or if differences exist around the world. To explore this, we used a five-point Likert Scale and Veciana's items of attributes related to the image of entrepreneurs (Veciana et al., 2005) (Table 3). The questionnaire was developed in English and later translated into Japanese and Spanish from the original version. Our survey instrument measured the degree of agreement of respondents to statements related to the image of entrepreneurs using a five point Likert scale (1: strongly disagree, 2: disagree, 3: neither agree nor disagree, 4: agree, and 5: strongly agree).

For each of the statements, we then compared the distribution of responses across countries, through cross-tabulation analysis using SPSS. We grouped responses agree with strongly agree and disagree with strongly disagree and compared the distribution of the two groups. Our sample included 264 responses, obtaining a response rate of 32.6%. The distribution by gender was of 56% of male and 44% of female respondents and 92% of respondents were aged between 18 and 30. The respondents came from 31 countries including Japan (20%), Spain (20%), United States (14%) and the other countries group (46%). The remaining 28 countries respondents were grouped together as there were not enough responses per country to get statistically significant results per country.

For the data analysis we used the Statistical Software SPSS. Through cross-tabulation analysis we compared differences across groups and performed chi-square tests to see if the differences were statistically significant. For all cases the null hypothesis (H_0) was that there is no statistically significant difference across groups, whilst the alternative hypothesis (H_A) was that there is statistically a significant difference across groups. If the chi-square test value was lower than 0.05, we rejected the H_0 and accept with a 95% confidence interval the H_A . Additionally, we evaluated the size of the significant effects as being small, medium or large, depending on the degrees of freedom and the size of the Cramer's V (Cohen, 1988) (Table 2).

RESULT

Image of entrepreneurs

We asked respondents if they personally knew someone

that had started their own business in the past five years, and 85% responded affirmatively. This shows that entrepreneurs are present in all of the populations of our study.

There were five items that showed no significant differences after the cross-tabulation between the entrepreneur's characteristics and the different countries, meaning they showed similar levels of support across the countries studied (Table 5). These items are important across all countries, and show a high level of agreement, making them robust and reliable characteristics of entrepreneurs in our sample (Table 5). These items are: “Entrepreneurs are able and willing to take risks” (92%, 4.38), “Entrepreneurs are dynamic people” (83%, 4.15), “Entrepreneurs help the economic development of the country” (81%, 4.11), “Entrepreneurs create jobs” (80%, 4.05), “Entrepreneurs have a good entrepreneurial vision” (70%, 3.84) and “Entrepreneurs are very innovative” (70%, 3.71) (Table 3).

Whilst the item that the respondents disagreed or completely disagreed with was: “Entrepreneurs can accomplish every task successfully” (60%), (Table 3). This is significant, as it seems that the image of the entrepreneur is not being idealized. Entrepreneurs are not being considered capable of doing every task well, but appear to have more realistic characteristics.

The results of the cross-tabulation analysis can be found in Table 4. Our results show that the image of the entrepreneurs in Spain was the most positive with the highest agreement with the items: “Entrepreneurs have good organizational skills”, “Entrepreneurs have good financial and management skills”, “Entrepreneurs are professionally well prepared” and “Entrepreneurs can manage a company successfully”. However they showed the least agreement, from the countries studied with the item: “Entrepreneurs earn a high income”. We found there to be less support to the entrepreneur characteristic

Table 3. Characterization of entrepreneurs across all countries studied.

Item	Agree (%)	Disagree (%)	Mean (%)	SD
“Entrepreneurs are able and willing to take risks”	92	3	4.38	0.75
“Entrepreneurs are dynamic people”	83	2	4.15	0.75
“Entrepreneurs help the economic development of the country”	81	5	4.11	0.84
“Entrepreneurs create jobs”	80	5	4.05	0.89
“Entrepreneurs have a good entrepreneurial vision”	70	5	3.84	0.82
“Entrepreneurs are very innovative”	70	7	3.71	0.75
“Entrepreneurs have good organizational skills”	50	12	3.43	0.79
“Entrepreneurs have good financial and management skills”	36	21	3.22	0.83
“Entrepreneurs can manage a company successfully”	35	20	3.21	0.82
“Entrepreneurs are professionally well prepared”	32	23	3.08	0.78
“Entrepreneurs earn a high income”	20	33	2.85	0.89
“Entrepreneurs can accomplish every task successfully”	10	60	2.31	0.90

Table 4. Statistically Significant Differences between countries in terms of Entrepreneur’s Characteristics.

Statement	Chi-square alpha	Cramer’s V (effect)	Countries (% agree)			
			Japan	Spain	US	Other
“Entrepreneurs have good organizational skills”	0.002	0.305 (3df) = large	63	94	71	84
“Entrepreneurs have good financial and management skills”	0.029	0.244 (3df) = medium	43	74	60	70
“Entrepreneurs are professionally well prepared”	0.029	0.251 (3df) = medium	59	83	33	55
“Entrepreneurs can manage a company successfully”	0.015	0.270 (3df) = medium	41	75	67	64
“Entrepreneurs earn a high income”	0.010	0.283 (3df) = medium	50	14	27	44
“Entrepreneurs help the economic development of the country”	0.006	0.234 (3df) = medium	83	98	100	94

Table 5. Non-statistically significant differences amongst countries in terms of entrepreneur’s characteristics.

Statement	Chi-square alpha	Agree (%)
“Entrepreneurs are dynamic people”	0.956	83
“Entrepreneurs are very innovative”	0.805	70
“Entrepreneurs are able and willing to take risks”	0.072	92
“Entrepreneurs have a good entrepreneurial vision”	0.652	70
“Entrepreneurs create jobs”	0.088	80

Table 6. Cross tabulation of Distance vs. Entrepreneurial Intention.

Variables		"I plan to establish my own business or be self-employed in the foreseeable future"		
		Disagree (%)	Neither (%)	Agree (%)
Distance	Negative	14.8	29.6	55.6
	Match	21.8	24.8	53.5
	Positive	35.9	28.1	35.9
Total		28.1	27.0	44.9

Results: Chi-square = 0.028 (4df), 0% cases have expected count < 5. Cramer's V = 0.146.

items in Japan, and US respondents had intermediate values. Interestingly 50% of Japanese respondents believed "entrepreneurs earn a high income", whilst only 14% of Spanish respondents believed so, despite the positive image previously shown in Spain. It appears that the perspectives of income are very different across the countries studied. Lastly, we found significant differences in the agreement of "Entrepreneurs help the economic development of the country". Although, the majority of respondents supported this statement, the proportion that did so in Japan (84%) was lower than in the rest of countries, (above 94%).

There were a number of items that showed no significant differences after the cross-tabulation between the entrepreneur's characteristics and the different countries, meaning they showed similar levels of support across the countries studied (Table 5). These items are important across all countries, and show a high level of agreement, making them robust and reliable characteristics of entrepreneurs.

Entrepreneurial distance

We cross-tabulated the three different categories with the respondent's intention to become an entrepreneur. We found significant differences between the three distance categories (negative, match and positive) and the entrepreneurial intention of the respondents, with the chi-square test being $0.028 < 0.05$, therefore we can say with a 95% confidence interval that the H_0 (no significant differences between groups) can be rejected, and we accept the alternative hypothesis H_A (there are significant differences between groups).

DISCUSSION

Our first hypothesis was partly supported, as the Japanese culture being considered the least conducive towards entrepreneurship (GEM consortium, 2014) and the less agreement with the items relating to the image of entrepreneurs. However, we expected the US respondents to have the most positive view of entrepreneurial characteristics, as the US culture is the most conducive

towards entrepreneurship of those studied, but in our study, Spanish respondents appeared to have a more positive image of entrepreneurs than any other.

For each of the respondents we plotted the relationship between the distance and intention and saw the three different distance groups (negative, match and positive) have different intention distributions (Table 6).

For the "negative" and "match" distances, as our hypothesis predicted, there are a higher number of respondents that intend to "establish my own business or be self-employed in the foreseeable future", 55.6 and 53.5% respectively, and a lower number of respondents that disagree with this statement, 14.8 and 21.8%, respectively. This supports our hypothesis 2 and 4 that stated that there would be a "positive correlation between a match (H_1) negative (H_3) entrepreneurial distance and entrepreneurial intention" and a "positive correlation between a negative entrepreneurial distance and entrepreneurial intention". H_4 shows the importance of self-confidence in a respondent's own abilities whilst H_2 highlights the importance of possessing the traits that they believe are important to succeed as an entrepreneur.

With regards to the "positive" distance, the respondents showed a lower level of entrepreneurial intention (35.9%) and a higher level of disagreement with this statement (35.9%), supporting hypothesis 3 that stated that there would be a "negative correlation between a positive entrepreneurial distance and entrepreneurial intention". Therefore a mismatch between the characteristics that the respondents consider to be important to become an entrepreneur and their own abilities, is detrimental for entrepreneurial intention.

Conclusion

There is a very positive general image of entrepreneurs across all countries studied, as them being dynamic, innovative, willing to take risks, having a good entrepreneurial vision and being able to create jobs. However some differences exist between countries, and these seem to be related to how conducive the culture of the country is, with those being less conducive supporting the least positive image of entrepreneurs. Additionally, we

have found a new way to assess entrepreneurial intention, by understanding how close to the entrepreneurial profile the respondents feel they are. This “spectator” and “stakeholder” comparative model could be applicable to other fields by comparing the qualities that are considered important for the profession being considered and the respondent’s own abilities and intention to take on that career. In the future we hope to apply this methodology to other fields in which the stakeholder-spectator relationship can be interesting.

Conflict of interests

The authors have not declared any conflict of interest.

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Full Length Research Paper

Factors affecting U.S. current account deficit: An empirical evidence

Ghassem A. Homaifar^{1*} and Abul Hasnat Muhammed Salimullah²

¹Jones College of Business at Middle Tennessee State University, USA.

²University of Chittagong, Bangladesh.

Received 1 April, 2016; Accepted 18 October, 2016

The purpose of this study is to determine the effects of the major macroeconomic indicators on U.S. current account deficit. Using the quarterly data from January 1973 to April 2013, this study attempts to examine whether those factors are truly the cause of massive current account deficit in the United States. We have considered a range of variables such as inflation rate, interest rate, exchange rate, and the gross domestic product (GDP) growth rate. We find in the presence of autocorrelation, the ordinary least square (OLS) coefficients having the right signs, and are statistically significant. However, we conducted the ARMA model to remedy the problem associated with ordinary least square and performed the CUSUM test, QLR test, and the test for serial correlation. The study estimation results suggest that an increase in GDP growth rate, inflation rate, and a decrease in the interest rate causes the country's imports to exceed exports. The trade-weighted U.S. dollar index as a measure of exchange rate did not generate any significant impact on the current account deficit in the study estimation results.

Key words: Current account deficit, inflation rate, GDP growth rate, interest rate.

INTRODUCTION

The current account balance as a percent of gross domestic product (GDP) implies the relative strength of a country in the field of international competition predicated on domestic growth. Usually, countries facing a substantial current account surplus represent a comprehensive dependence on exports revenues, with a high level of national savings. On the other hand, countries experiencing a current account deficit might have a strong dependence on imports, therefore indicating a low level of savings rate and a high personal

consumption rate as a percentage of disposable incomes.

Therefore, current account deficit represents a measure of a country's foreign trade imbalance in which the total value of imported goods and services exceeds the value of the exported goods and services. Researchers have investigated the causes of the global imbalances. For example, Chinn (2004) examined various factors indicating that they are intricately intertwined. Therefore, creating "up-hill" flows of excess savings from developing

Corresponding author. E-mail: hwnteme@yahoo.com.

JEL category: F14, G30, G31.

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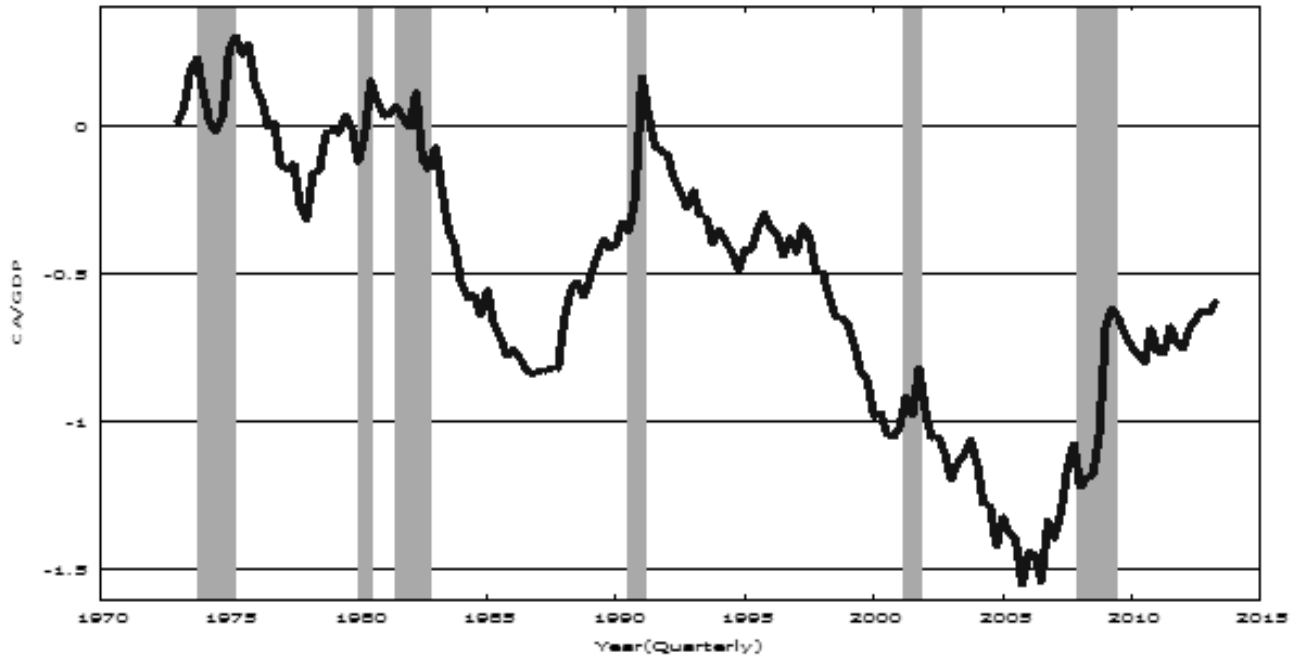


Figure 1. The time series plot of U.S. current account as a percentage of GDP.

countries with high rates of return to rich countries with low levels of growth, but with more developed financial markets (the "Lucas Paradox").

During the years of 1998 to 2008, economists focused their attention on the various causes and consequences of the expanding current account deficit and surplus. The dynamics of current account balance was revealing from an economic standpoint, as it did not appear to conform to what would be predicted by standard economic theories.

They were troubling from a policy perspective in that they were unprecedentedly large by postwar standards. Holman (2001) analysis reveals that the U.S. current account deficit has grown steadily since 1991, hitting 3.6% of GDP in 1999 and 4.4% in 2000. Much of the rise in the current account deficit over the past decade is related to two factors:

Accelerating the U.S. productivity and a surge in household wealth that is driven by the stock market.

In an earlier forecasting survey over the past decade conducted by the Wall Street Journal where a group of economists agreed that the current account deficit might be a major threat facing the U.S. economy as elaborated by Ford (2000).

Some policymakers have also suggested that the significant and substantial part of the U.S. current account deficit may be unsustainable and is likely to create problems for the economy. The sharp decrease in

current account deficit from the year 2002 to 2007 onward was at 1.5% of GDP. After that, it shows some improvement in that area. However, in the present decade, the growing deficit shows an upward trend over the years. In the recent past years (2012 to 2014), the growing deficits have increasingly raised concerns. Many economists unequivocally agree that the current account deficit is unsustainable and articulated as a major threat facing the U.S. economy. Figure 1 provides a non-stationary graph that exhibits an overall picture of the U.S. current account movement for the period 1970-2013. In this analysis, an unsustainable deficit may trigger a sharp increase in interest rates, as well as a rapid depreciation of the dollar, or some other domestic or global economic disruption.

This study examines the impact of factors—such as inflation rate, the rate of interest, exchange rate, and growth rate of GDP on the large current account deficits facing the United States and also tries to explain the significance of possible consequences.

LITERATURE REVIEW

This study is undertaken to identify and provide remedies on the causes and the consequences of the massive current account deficit facing the United States. Holman (2001) elaborated that the rise in the current account deficit may require a range of other variables. These variables constitute part of the U.S. economy's external

sector. They are trade account, foreign financial flows, as well as the currency exchange rate. Changes in the current account deficit are due primarily to the movement in the trade deficit (Figure 1).

The current account deficits are mostly financed by net capital inflows from abroad when the foreign government takes any expansionary fiscal policy. This will depreciate the exchange rate that is related to the current account because international transactions (including trade in goods, services, and financial assets) require exchanging dollars for foreign currencies. Brook et al. (2004) argue that the U.S. current-account deficit was around 5.2 percent of GDP and peaked at its highest level ever recorded in 2005 at 6.4% of GDP. Although it has fallen slightly, it remains significant by historical standards (Figure 1). For a large economy like the United States, a deficit of this amount absorbs a large proportion of total world savings and implies an increasing share of the U.S. assets in foreign investors' portfolios. While the United States remains an attractive investment destination, it remains uncertain for how long foreigners will continue to accumulate debt and equity claims against U.S. residents at the current pace. When the deficit does narrow, however, it will have implications both within and outside of the United States, with specific effects depending on the channels of adjustment.

Edwards (2006) reveals that in 1991, and after eight years of running a deficit, the U.S. posted a current account surplus of 0.7% of GDP. He also mentioned that the current account balance was positive for the last time over the whole decade. Some analysts have become increasingly alarmed by these enormous external imbalances. Some authors have argued that by relying on foreign central banks' purchases of government securities, the U.S. has become vulnerable to changes in expectations and economic sentiments (Feldstein, 2006). Many analysts argued that the U.S. current account deficit of more than 6 percent is clearly unsustainable. And they expected that it would have to be cut approximately in half percentage points over the next few years. And that in the next few years it will have to be cut approximately in half. However, from a global perspective, a reduction in the U.S. deficit implies a decline in the rest of the world's current account surpluses.

Clower and Ito (2011) argued that after the global financial crisis in 2008 and the European debt crisis that followed, sustainability of the U.S. massive debt has been an important consideration for policymakers, especially those in the developed economies. Concerns about the sustainability of deficits and the likelihood of downgrades or speculative attacks on government bonds have made many economies such as the United States and some European countries vulnerable. Causing severe constraints on fiscal policy despite the urgent need for significant stimulus expenditures. Unable to meet those limitations, some economies have already sought out international bail-outs to ensure solvency or short-term

liquidity. These countries continue to struggle to meet their debt obligations; others are amassing savings to send abroad. The underlying causes of the global debt crisis of advanced economies are related to the "global imbalances" financed by excess savings of emerging market economies, most notably China, and oil exporting countries. The imbalance capital flows have ensured that some economies run massive current account deficits, and others keep running excess current account surpluses.

Gruber and Kamin (2007) provided reasonable explanations for the global current account imbalances that have been seen in recent years. The large U.S. current account imbalance is associated with the massive surpluses of the Asian developing economies. By using the panel regression approach, they found that the Asian economies surplus might have explained this deficit which was something similar to the one that was adopted by Chinn and Prasad (2003). Their model incorporates per capita income, output growth, fiscal balances, net foreign assets, economic openness, and demographic variables. But their estimated parameters have failed to explain the massive U.S. current account deficit of recent years and the large developing Asian surpluses. However, their model, even augmented by measures of institutional quality, also failed to explain the large U.S. current account deficit. Another study conducted by Ferguson (2005) used the Federal Reserve staff's open economy macroeconomic simulation model to measure the effect of different shocks to the U.S. trade deficit. The rise in U.S. productivity growth, a fall in the risk premium on dollar assets, and the weakening of foreign domestic demand may be contributing factors. Nevertheless, the simulation model is unlikely to capture the relationships determining the external balance, and identifying the shocks affecting the trade deficit are both challenging and subjective.

According to Coughlin et al. (2006), it was worth noting that the current account imbalance has accumulated over relatively long time. The net foreign investment of the United States that is the difference between U.S.-owned assets abroad and foreign-owned assets in the United States has also grown ever larger. Firms build operations in other countries based on plans extending many years into the future. Demographic developments unfold over decades. What may appear to be an imbalance in the short-run is likely to make sense on a long-term basis. The adjustment of the current account is likely to change the foreign exchange value of the U.S. dollar. It is possible that these changes will take place in orderly markets over time. There is no apparent reason that these changes would lead to a financial crisis; as the United States with a stable, very diversified, and growing economy, is not likely to suffer from a lack of confidence by investors so long as it maintains sound economic policies. Obstfeld and Rogoff (2007) took into account terms of trade as well as shifts in the relative price of

traded and non-traded goods in a general equilibrium framework analyzed trade imbalance and exchange rate, pointing to a substantially steeper dollar decline. They maintain that the current account deficit running at 4.4 percent of GDP is unsustainable trajectory over the medium term. The inevitable reversal would precipitate a change in the real exchange rate of 12 to 14 percent if the rebalancing were gradual. Therefore, the idea that global imbalances might spark a sharp decline in the dollar value has created considerable skepticism at the time.

The dynamics of U.S. net international indebtedness has been somewhat different from that of the accumulated measure of current accounts, due primarily to the rate-of-return effect highlighted by Gourinchas and Rey (2005). The current account deficits historically predict high future dollar returns on U.S. foreign assets compared to U.S. foreign liabilities.

According to Adalet and Eichengreen (2007) current account strengthens when output was high and weakens when it was low. Its fluctuation was indicative of a country's ability to smooth its consumption. An ongoing current account deficit in a rapidly growing country may also be an indication that investment and growth are not overly constrained by domestic savings capacity, facilitating the country's convergence to a steady-state level of output and capital intensity. In practice, however, these advantages may be neutralized by large or persistent current account deficits that increase the likelihood of disruptive adjustments that produce large output losses. They found a negative correlation between government budget deficit and the incidence of reversal (devaluation of the dollar) in the larger actual sample.

Jarrett (2005) mentioned that the massive deficit in the current account financed with debt may not be sustainable in the long run. Luckily, the U.S. enjoys the benefit of being able to borrow in its currency—the US dollar as the world's primary reserve currency. However, how long this peculiarity would allow the U.S. to continue dodging a disruptive adjustment was difficult to figure out. Although the U.S. is the world's largest debtor, it is still far from being the most significant as a percentage of GDP. In short, trade-related factors are not the only cause of the current account deficit. At present the U.S. economy and the rest of the world are growing at the same rate, the U.S. trade deficit tends to widen. The result of this long-standing trend is that as imports exceed exports by 60%, the dollar value of the imbalance will continue to rise. Backus et al. (2009) revealed that current account deficits did not follow any notable depreciations in U.S. dollar. There has been no connection between the ratio of net exports to GDP and subsequent movements in the real effective exchange over periods of 4 to 16 quarters. In other words, the trade imbalance has not been useful for forecasting future changes in the actual exchange rate.

There is a short-run relationship between the real

exchange rate and the trade balance. Fluctuations in real exchange rates (the ratio of international prices to domestic prices) are typically negatively correlated with future trade balances and positively associated with past trade balances.

Warnock and Warnock (2009) used a simple empirical model demonstrating that international flows have a statistically and economically significant impact on the U.S. long-term rates. Using their benchmark-consistent flows, for a monthly sample spanning January 1984 to May 2005 they found that international inflows into U.S. bonds reduce the 10-year Treasury yield by an economically and statistically significant amount. Their model highlighted that the contributing factor to the decline in nominal long-term interest rates from nine percent in 1987 to roughly 5 percent by the end of the 1990s was reductions in inflation expectations and the volatility of long-term rates. International capital flows have a significant impact on the long-term rates. The foreign inflows have a tendency to reduce long-term U.S. rates, as well as to spur the U.S. economic activity. In a global economy substantial amount of capital inflows into U.S. bonds, making the Fed policy that is less restrictive than otherwise. At a sectoral level, one would expect the most interest rate sensitive sector, such as the housing market, to bear the bulk of this effect. Indeed, they show that the U.S. mortgage rates are also depressed by the foreign inflows. A related but less obvious implication is that their results are consistent with the notion that international flows are behind some of the flattening of the yield curve.

Bernanke (2005) has pointed out that the massive U.S. current account deficit would be attributed to an increase in the availability of saving from overseas. He argues that most of the increased flow of international savings has come from developing countries. A development that may be attributed to a significant part to the financial crises we have witnessed in the 80s through 90s. Emerging market financial crises are likely to generate current account surpluses (or lower deficits) through several channels. These channels are: The economy is likely to lose access to foreign credit, obstruction of financial intermediation within the economy, and causing a credit crunch. Balance sheet problems of firms and consumers may restrain domestic spending. The reasons for the widening of the U.S. current account deficit and corresponding tightening of trading partners' imbalances are fairly obvious. These factors are: The rise in the dollar between 1995 and early 2002 (which has given up only part of its gains since then). The pickup in the U.S. real GDP growth rate relative to that of its trading partners. And the higher elasticity of U.S. imports with respect to income than that of the U.S. exports with foreign income (the Houthakkere-Magee effect). Along with the slide in public saving rates, the decline in U.S. private saving since the mid- 1990s could help explain the widening of the United States' current account deficit. However, it is not clear

Table 1. OLS estimation: 1973:1-2013:2 (Dependent variable: CA/GDP).

Variable	Coefficient	Std. Error	t-ratio	p-value	-
Constant	-0.805755	0.335414	-2.4023	0.01746	**
Rate of inflation	12.3303	5.00171	2.4652	0.01477	**
Ten year treasury rate	0.0842509	0.019153	4.3988	0.00002	***
Trade weighted US \$ index	-0.00599197	0.00377912	-1.5855	0.11485	-
Growth rate of GDP	8.13883	3.31401	2.4559	0.01514	**

Note: Asterisks denote the statistical significance as like: ***significant at 1% level, **significant at 5% level, *significant at 10% level.

whether the decline in saving has been autonomous, perhaps reflecting Wall Street innovations that have made it easier for Americans to borrow or the endogenous response to other developments.

METHODOLOGY

This empirical work uses quarterly data set from the Federal Reserve Bank of St. Louis that covers the period of the first quarter of 1973 to the second quarter of 2013. However, it is useful at the outset to review details of the variables and the sample construction. We use the following parameters to investigate the causes of U.S. trade imbalance as elaborated by prior studies. These are inflation rate, interest rate, exchange rate, and the GDP growth rate. The inflation rate tends to make exports less competitive and imports more attractive.

We took Consumer's Price Index (CPI) for all urban consumers as a measure of the inflation rate. The ten-year Treasury constant maturity rate is chosen as a measure of interest rate. The exchange rate also plays a vital role in the unbalancing current account as the overvaluation of the currency makes import relatively cheaper. On the other hand, the export will become more uncompetitive and is likely to fall.

The trade-weighted index of the U.S. dollar is used as a measure of the exchange rate. We took the balance of the current account in billions of dollars and divided them by nominal GDP to calculate the actual imbalance as a percentage of GDP. In our research, we postulate to survey some of these factors that have been put forward to explain the deficit. As we do so, we will be referring to several macroeconomic simulation models, using Ordinary Least Squares (OLS) model and later the Autoregressive moving average (ARMA) model that are designed to measure the effects of these factors on the U.S. external imbalance.

The time series data and the non-stationary trend of these data set will create biases in the standard errors of the estimates for positive autocorrelation. The estimated standard errors will be smaller than the true standard errors. The result is that one can no longer trust the t-statistics from OLS. The usual OLS equation will therefore be:

$$y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon_t$$

Where X_{1t} is inflation rate in period t, X_{2t} is the Ten-year Treasury rate in period t, X_{3t} is the trade-weighted U.S. dollar index, and X_{4t} represents the growth rate of GDP, and ε_t is expected to capture all the effects of the unobserved factors that can affect current account deficit. The proposed causes of the deficit are by no means mutually exclusive, of course. Table 1 presents the results for the OLS estimates.

Econometric strategies

The following tests reveal that there is a serious flaw in the conventional OLS model and a structural break on the parameters creating a bias in the standard errors of the estimates.

Serial correlation test

The null hypothesis for the absence of autocorrelation test is rejected. However, the residuals might follow an AR (p) autoregressive scheme of up to order 4¹:

$$\varepsilon_t = \rho_1 \varepsilon_{t-1} + \rho_2 \varepsilon_{t-2} + \rho_3 \varepsilon_{t-3} + \rho_4 \varepsilon_{t-4} + \mu_t$$

CUSUM test

The CUSUM test is a sequential analysis technique used to find structural break on the data. Our findings reveal that there is a structural break on the data as encountered by prior studies as well.²

ARMA analysis

To resolve these problems related to the study estimated OLS model we then run the following Auto Regressive Moving Average ARMA (1, 1) model. We conduct the test for non-stationary nature of our variables as follows. The functional form and the forecasting expansion of the model is follows:

$$(1 - \varphi_1 L)y_t = \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 x_{4t} + (1 + \theta_1 L)\varepsilon_t$$

$$y_t = \varphi_1 y_{t-1} + \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 x_{4t} + \theta_1 \varepsilon_{t-1} + \varepsilon_t$$

Where $\varepsilon_t \sim N(0, 1)$ is a white noise error term and $\theta(L)$ is a polynomial in the lag operator L of order q. The estimation result for the ARMA model is illustrated in Table 2.

¹ The Lagrange Multiplier test works with the null hypothesis H_0 : No autocorrelation against the alternative H_a : there is autocorrelation and the test statistic is found: LMF = 208.776 with p-value = P(F(4,153) > 208.776) = 6.97948e-061.

² CUSUM test for parameter stability $-H_0$: No change in parameters, H_a : change in parameters. The Test statistic is Harvey-Collier t(156) = -6.089 with p-value = P(t(156) > -6.089) = 8.49243e-009. The lower p-value confirms rejecting the null as there is a structural break in the model.

Table 2. ARMAX Estimation: 1973:2-2013:2 (N = 161)(Dependent variable: $\Delta CA/GDP$).

Variable	Coefficient	Std. Error	z	p-value	-
ϕ_1	-0.517008	0.405402	-1.2753	0.2022	-
θ_1	0.589403	0.380449	1.5492	0.1213	-
Rate of inflation	1.81404	0.896005	2.0246	0.0429	**
Δ Ten year treasury rate	-0.0366829	0.012124	-3.0256	0.0025	***
Δ Trade Weighted U.S. \$ index	-0.00185786	0.00206134	-0.9013	0.3674	-
Growth rate of GDP	-1.62145	0.661931	-2.4496	0.0143	**

Note: Asterisks denote the statistical significance as like: ***significant at 1% level, **significant at 5% level, *significant at 10% level.

RESULTS AND DISCUSSION

A large part of the reason that investors disagree what will be needed to bring current account alignment is that they disagree about what has led the deficit to become so large in the first place. Assuming the increase in the current account deficit has been caused by deficit spending. It is possible to identify reversal of those policies to bring about current account adjustment. Furthermore, if the current account imbalance primarily reflects developments in the private sector, it is more likely that the marketplace will be the source of subsequent correction. Surprisingly, researchers have made relatively few attempts to assess and compare the full range of explanations that have been proposed for the emergence of the large U.S. external deficit. It has been argued that the United States has become a "net debtor" country, increasing the likelihood of currency depreciation and subsequent financial crisis.

Table 1 reveals that the inflation rate has a positive impact on the massive current account deficit. The rate of interest and the GDP growth rate also have positive coefficients. The above findings reveal that the current account deficit will worsen more if there is an increase in the T-bond or T-bills interest rate as well as higher the growth rate. That is an increase in national income, people will tend to have more disposable income to consume goods. In case domestic producers cannot meet the demand, consumers will have to import goods from abroad. In the U.S. we have a high marginal propensity to imports because we do not have a comparative advantage in the production of manufactured goods. Therefore, if there is a faster economic growth imports are expected to increase significantly.

The coefficient of the exchange rate is negative implying dollar devaluation tends to make imports relatively cheap, and tightening current account deficit is likely to improve export. However, this coefficient is not significant at any conventional level of significance.

Table 2 provides some different scenarios in this case. The coefficient of the inflation rate is positive in the ARMA model as well. However, the signs of ten-year Treasury or T-bills rate and the GDP growth rate are

negative as compared to the OLS estimates. After making the series stationary (first difference) in nature, the coefficient produced opposite sign. Both of these variables are significant in this case. The Trade-weighted dollar index is negative but insignificant.

CONCLUSION

The U.S. current account imbalance is in danger of falling into a "vicious cycle," as the borrowing required to finance this deficit is likely to crowd out private sector borrowing, and the interest payments required to service our foreign debt will negatively impact the growth rate of GDP. On the other hand, the combination of liberalized financial markets, high real interest rates at home, and economic volatility abroad has attracted massive inflows of foreign capital into the U.S. which in turn have caused a revaluation of the U.S. dollar and making our products less price competitive than our trading partners. Theoretically, deficit financing is likely to raise interest rates making debt more attractive for investors than equity. However, the real sector of the economy is likely to suffer as a result of high-interest rate and subsequent lower economic growth. Indeed, with a current account deficit hovering around 6 percent of GDP and a negative net international investment, some have drawn comparisons with Argentina, Brazil, Mexico and other countries that at times have experienced severe balance-of-payments crises.

Conflict of interests

The authors have not declared any conflict of interests.

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The background of the slide features a hand in a grey sleeve dropping a gold coin into a slot. Below the slot, several stacks of gold coins are visible, increasing in height from left to right. The scene is set against a blue background with a light gradient.

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