CONTEMPORARY RESEARCH IN ECONOMICS

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Prof. Sinan SÖNMEZ
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Chapter 1

A New Index and Rating Approach to The Triplet Deficits Hypothesis

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1. Introduction

Although there are various approaches and evaluations of economic schools in terms of the stability of the country's economy, the current account balance is a central concept in terms of macroeconomic balance (Dineri, 2016: 25-31).Looking at the datas of the last few decades, some of the countries have a current account surplus, but the majority of them are faced with a current account deficit (Worldbank, 2022). While many factors have been evaluated in terms of the causes of current account deficits, different theoretical approaches are in agreement that internal imbalances cause external imbalances (Xie & Chen, 2014: 95). The twin and triple deficits hypothesis is also based on this basic assumption. In summary, the extraction between monetary assets (leaks) that come out of the country's economy for any reason and monetary assets (injections) that enter the country's economy for any reason are the main cause of macroeconomic imbalance (Karahan, 2021: 538).

The twin deficit hypothesis was first put forward after the budget deficit of US economy emerged in the 1980s. (Marinheiro, 2008: 1041). The following studies revealed that in addition to budget deficits, savings deficits were the cause of current account deficits and revealed the concept of triple deficits (Yıldırım vd., 2010: 428). As expressed in equation (1), in the actual case, the leaks are equal to the injections. This situation also leads to the result that the internal balance and the external balance, which are formulated in simple equation (2), are equal.

$$\underbrace{S + T + M}_{leaks} = \underbrace{I + G + X + TR}_{injections} \tag{1}$$

S: Private Savings   *I*: Private Investment
T: Direct Tax Revenues   *G*: Public Expenditures
M: Import   *X*: Export
    TR: Transfers

$$\underbrace{\underbrace{(S - I)}_{\substack{Private\ Saving\\Balance\\(\tau^{\pm})}} + \underbrace{(T - G)}_{\substack{Budget\\Balance}}(\lambda^{\pm})}_{internal\ balance} = \underbrace{(X - M + TR)}_{\substack{Current\ Account\\Balance\\external\ balance\ (\mu^{\pm})}} \tag{2}$$

$$(\tau^{\pm}) + (\lambda^{\pm}) = \mu^{\pm} \tag{3}$$

In the light of the above equations, it can be said that every factor that causes internal imbalance has an effect indirectly on external balance. The budget

deficit, which arises when public expenditures are higher than public revenues, will be financed by foreign resources in the form of foreign loans or financial portfolio investments, if the savings in which private savings are higher than investments cannot be financed with excess. Because budget deficits are effective on many macroeconomic variables, especially like interest and exchange rates (Ball & Mankiw, 1995: 95-119). With the financing of the foreign exchange deficit, the external debt burden and interest payments increase, eventually causing the current account balance to deteriorate towards the deficit (Tang, 2014: 4). Similarly, even if the budget is balanced, the demand for investment in a country with a savings deficit will be financed from abroad and increase the current account deficit. However, if the budget balance or the savings balance is sufficient to fulfill the deficit of one of the other, the economy will not have a current account deficit.

Today, current account deficits and budget deficits, including developed countries, are a very common and normal situation (IMF, 2022). Classical economists accepted that a balanced budget was of vital importance until the Great Depression in 1929 and a strict budget balance was targeted. Due to this logic, the economic crisis deepened further and the idea of running a budget deficit to stimulate aggregate demand was never welcomed. After the Keynesian approach, budget deficits were introduced as a fiscal policy method and current account deficits accompanied the budget deficits (Arıcan, 2005: 77-79). Twin deficits have become chronic in many countries, especially with the stagflation crisis that emerged in the 1970s.

Unlike the current account deficit and budget deficit, it is more appropriate to point out the socio-economic structures and structural problems of the countries regarding the savings deficit (Aydoğuş & Keskin, 2005). Although it is known that current account deficits are financed in any case, a sustainable current account depends on the savings balance (Eğilmez, 2012). While high savings rates in countries such as Germany, Japan and China cause current account surpluses, current account deficits have become a chronic problem due to insufficient savings rates in some developing countries such as Turkey.

2.   Triple Deficit Index and Current Account Imbalance Degrees

In the light of the information and assumptions explained in the introduction, it is obvious that even if countries experience the same current account imbalance, this imbalance will not contain the same or similar elements, so it will not pose a level of risk. More important than the current account deficit is how the deficit is financed. Because it is also important how permanent or temporary these deficits are and their sustainability (Eğilmez, 2019).

Representing the relationship between current account deficit, budget deficit and savings deficit with the help of a mathematical index will create an important awareness in terms of comparison of countries with each other as a macroeconomic performance criterion. For this purpose, the triple deficit index (TDI), detailed below, was created.

- On the vertical axis, the ratio of the current account balance to GDP is $\mu^{\pm}$, on the left of the horizontal axis the ratio of the savings balance in GDP is $\tau^{\pm}$, on the right of the horizontal axis the ratio of the budget balance in GDP is $\lambda^{\pm}$. Because of this relationship, the vertical axis represents the external balance and the horizontal axis represents the internal balance.

- If the country has a budget deficit, the value of $\lambda^{\pm}$ will be shown as $\boldsymbol{\lambda^{-}}$ on the right side of the horizontal axis, while if the country has a budget surplus, the value of $\lambda^{\pm}$ will be shown as $\boldsymbol{\lambda^{+}}$ on the left side of the horizontal axis.

- Likewise, if the country has a savings deficit, $\tau^{\pm}$ value will be shown as $\boldsymbol{\tau^{-}}$ on the left side of the horizontal axis, while $\tau^{\pm}$ value will be shown as $\boldsymbol{\tau^{+}}$ on the right side of the horizontal axis if the country has a budget surplus.

- If the country has a current account deficit, the $\mu^{\pm}$ value will be shown as $\boldsymbol{\mu^{-}}$ at the bottom of the vertical axis, while the $\mu^{\pm}$ value will be shown as $\boldsymbol{\mu^{+}}$ at the top of the vertical axis if the country has a current account surplus.

Table 1: Symbol Descriptions

$\frac{Balance\ of\ Current\ Accout}{GDP}$ $: \mu^{\pm}$	$\frac{Current\ Account\ Surplus}{GDP}$ $: \mu^{+}$	$\frac{Current\ Account\ Deficit}{GDP}$ $: \mu^{-}$
$\frac{Balance\ of\ Saving}{GDP}$ $: \tau^{\pm}$	$\frac{Saving\ Surplus}{GDP}$ $: \tau^{+}$	$\frac{Saving\ Deficit}{GDP}$ $: \tau^{-}$
$\frac{Balance\ of\ Budget}{GDP}$ $: \lambda^{\pm}$	$\frac{Budget\ Surplus}{GDP}$ $: \lambda^{+}$	$\frac{Budget\ Deficit}{GDP}$ $: \lambda^{-}$

In Figure 1, triplet deficit of Turkey in 2020 are shown on the axis, and the situation subject to the index is illustrated as an example. The area of the triangle formed by combining the points given in the figure is the subject of the index value that forms the basis of the study. A new diagram is discussed by establishing a logic similarly to the magic square (magic diamond) diagram used by OECD (1987) (Al & Baday, 2019: 306).
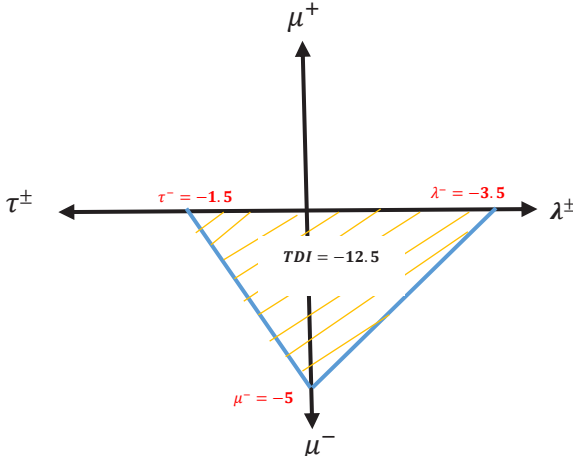
Figure 1. The Example of Turkey with Triple Deficits in 2020

Triple Deficits Index-TDI:

$$\text{TDI} = \frac{1}{2} \cdot |(\tau^{\pm}) + (\lambda^{\pm})| \cdot \mu^{\pm} = \frac{(\mu^{\pm})^2}{2} \qquad (4)$$

In equation (4), the $(\tau^{\pm}) + (\lambda^{\pm})$ value represents the internal balance, and the $\mu^{\pm}$ value represents the external balance. According to the triple deficit hypothesis, $(\tau^{\pm}) + (\lambda^{\pm}) = \mu^{\pm}$, the index equals $\frac{(\mu^{\pm})^2}{2}$ in absolute value.

$$TDI = \begin{cases} \left(-\frac{1}{2} \cdot |(\tau^{\pm}) + (\lambda^{\pm})| \cdot \mu^{\pm}\right) = -\frac{(\mu^{\pm})^2}{2}, & \mu^{\pm} < 0 \\ 0, & \mu^{\pm} = 0 \qquad (5) \\ \left(\frac{1}{2} \cdot |(\tau^{\pm}) + (\lambda^{\pm})| \cdot \mu^{\pm}\right) = +\frac{(\mu^{\pm})^2}{2}, & \mu^{\pm} > 0 \end{cases}$$

The index calculation with the selected datas of Turkey for 2020 is and is as follows. The share of current account balance in GDP is -5% ($\mu^- = -5$), the share of budget balance in GDP is -3.5% ($\lambda^- = -3,5$) and the share of savings balance in GDP is -1.5% ($\tau^- = -1,5$) was realized. In this case, the index value is calculated as -12.5.

$$\text{TDI}_{\text{2020 Turkey}} = \left(-\frac{1}{2} \cdot |(-1.5) + (-3.5)| \cdot 5\right) = \text{-12.5}$$

Similarly applied methods, current account deficit model of China in figure 2, England in figure 3, Luxembourg in figure 4 and Mauritania in figure 5 and index values are shown.

The main reason for explaining these country examples is that they show current account balance models with different characteristics. For example, China has a current account surplus because it has a saving surplus despite its budget deficit, while Luxembourg has a current account surplus because it has both a savings surplus and a budget surplus. Differently, United Kingdom has a current account deficit due to its high budget deficit despite its savings surplus, while Mauritania has a current account deficit due to its high savings deficit despite its budget surplus.
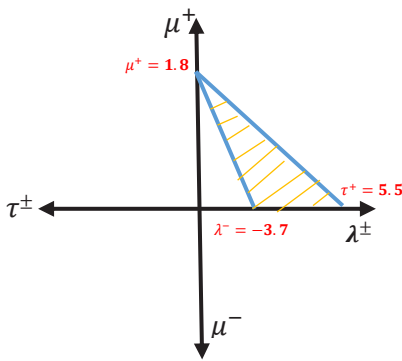
Figure 2. The Case of China with Budget Deficit, Savings Surplus and Current Account Surplus in 2021 (TDI=+1.62)
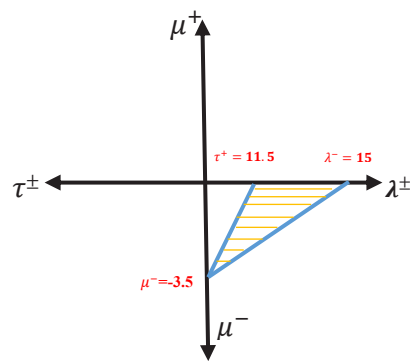
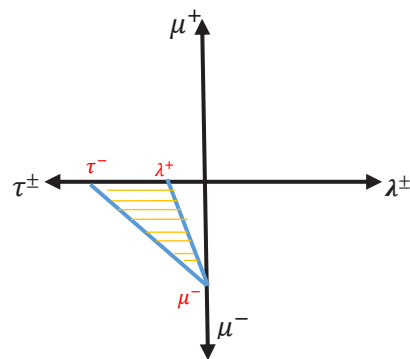**Figure 3.** The Case of the UK with Budget Deficit, Savings Surplus and Current Account Deficit in 2021 (TDI=-6.13)
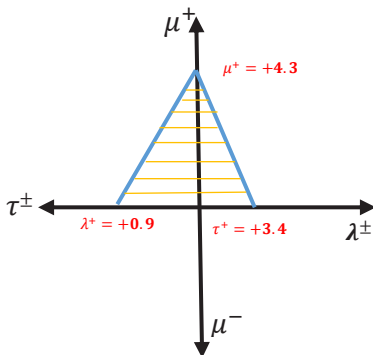
Figure 4. The Case of Luxembourg with Budget Surplus, Savings Surplus and Current Account Surplus in 2020 (TDI=+9.25)


Figure 5. The Case of Mauritania with Budget Surplus, Savings Deficit and Current Account Deficit in 2020 (TDI=-24.5)

The index values of 75 countries whose data can be accessed for the years 2020 or 2021 were calculated and a ranking was made in Chart 1 from the lowest to the highest. It is seen that Turkey is in the 47th rank.

Chart 1: Ordinary Index Values of 75 Selected Countries
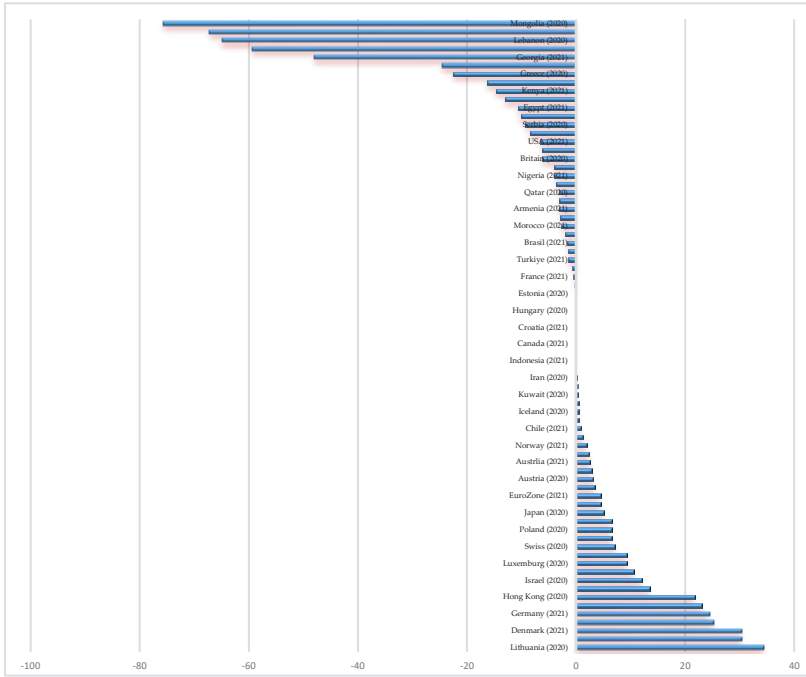
Source: Datas obtained from Trading Economics (2022), calculated and arranged by the author.

There are six different possibilities in total, three situations in case of a country running a current account deficit and three situations in case of a current account surplus. These six situations may contain different degrees of problems and solutions in terms of current account imbalances. In this respect, a rating was set up from the most problematic to the best.

Case 1: In the 3rd degree current account deficit (μ_3^-), the country has a current account deficit because it has both a savings deficit and a budget deficit.

Case 2: In the 2nd degree current account deficit (μ_2^-), the country runs a current account deficit due to its higher budget deficit despite having a savings surplus.

Case 3: In the 1st degree current account deficit (μ_1^-), the country runs a current account deficit due to the savings deficit due to the inadequacy of domestic savings, although it has a budget surplus.

Case 4: In the 3rd degree current account surplus (μ_3^+), the country runs a current account surplus due to its higher volume of domestic savings surplus despite running a budget deficit.

Case 5: If the second degree current account surplus is (μ_2^+), the country runs a current account surplus due to the budget surplus, although it has a savings deficit.

Case 6: In the first degree current account surplus (μ_1^+), the country runs a current account surplus because it has both a savings surplus and a budget surplus.

$$TDI_{degree}^{\pm} = \begin{cases} \boldsymbol{\mu_3^-}, & \mu^{\pm} < 0, \quad \tau^{\pm} < 0, \quad \lambda^{\pm} < 0 \\ \boldsymbol{\mu_2^-}, & \mu^{\pm} < 0, \quad \tau^{\pm} < 0, \quad \lambda^{\pm} > 0 \\ \boldsymbol{\mu_1^-}, & \mu^{\pm} < 0, \quad \tau^{\pm} > 0, \quad \lambda^{\pm} < 0 \\ \\ \boldsymbol{\mu_3^+}, & \mu^{\pm} > 0, \quad \tau^{\pm} < 0, \quad \lambda^{\pm} > 0 \\ \boldsymbol{\mu_2^+}, & \mu^{\pm} > 0, \quad \tau^{\pm} > 0, \quad \lambda^{\pm} < 0 \\ \boldsymbol{\mu_1^+}, & \mu^{\pm} > 0, \quad \tau^{\pm} > 0, \quad \lambda^{\pm} > 0 \end{cases} \tag{6}$$

Any country's current account deficit or surplus includes special forms of appearance in terms of its internal dynamics.

Whether the savings balance and the budget balance are in the same direction or which one is higher in absolute value determines the direction of the current account balance. Explanations on current account deficit in Table 2, current account surplus in Table 3 and sample countries for the aforementioned models are summarized.

Table 2: Three Degrees Current Account Deficit

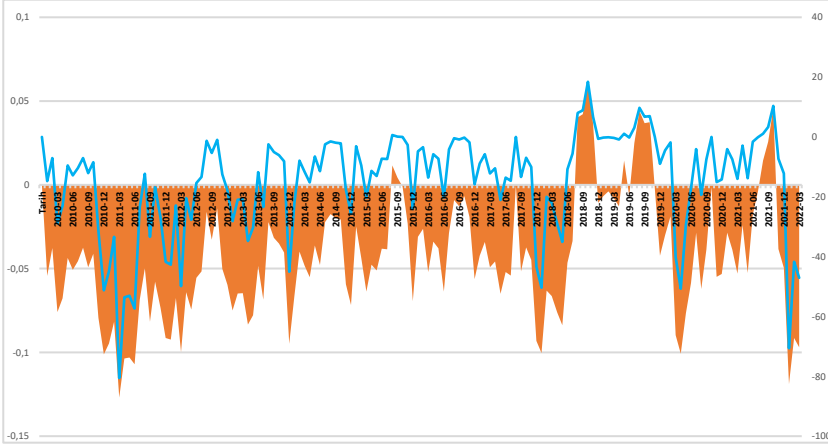| Type	Model	Content	Sample Countries
$\overline{\mu_3}$		**Savings Deficit Budget Deficit Current Account Deficit**	Turkey (2021) Chad (2021) Georgia (2021) Moldova (2021) Mongolia (2020) Mozambique (2020) New Zealand (2021) Qatar (2020)
$\overline{\mu_2}$		**Savings Deficit Budget Surplus Current Account Deficit**	Mauritania (2020)
$\overline{\mu_1}$		**Savings Surplus Budget Deficit Current Account Deficit**	USA (2021) England (2020) Belarus (2020) Brazil (2021) Bulgaria (2020) Colombia (2021) Egypt (2021) Nigeria (2021) Saudi Arabia (2020)

Table 3: Three Degrees Current Account Surplus

Type	Model	Content	Sample Countries
μ_3^+		**Saving Deficit Budget Surplus Current Account Surplus**	Norway (2021)
μ_2^+		**Saving Surplus Budget Deficit Current Account Surplus**	China (2020), Euro Zone (2021), Australia (2021), Austria (2020), Azerbaijan (2021), Canada (2021), Chile (2021), Cuba (2021), Czechia (2020), Germany (2021), Finland(2020), Hong Kong(2020), Iceland(2020), Indonesia(2021), Israel(2020), Italy(2020), Japan(2020), Kuwait (2021), Lithuania(2020), Malaysia(2020)), Mexico(2020), Netherlands(2021), Paraguay(2020), Ukraine(2020), Spain(2020), Switzerland(2020), Slovenia(2020)
μ_1^+		**Saving Surplus Budget Surplus Current Account Surplus**	Denmark (2021) Russia (2021) Sweden (2020)

3. Analysis of Triple Deficit Index in Turkey

Developing countries such as Turkey are faced with an important problem such as insufficient savings while investing in the desire for growth. The country's economy, which cannot finance current investments with private savings at the national level, needs foreign capital, and this demand affects the current account balance negatively with the expansion in credit volume. In addition, it is possible to talk about the effects of many conditions such as the socioeconomic status of the society, the financial depth of the capital markets, the banking system and financial policies on the savings balance (Ergün, 1989: 1-14).

Chart 3 shows the share of Turkey's current account balance in GDP and index values for the 2010 January-2022 March period.

**Chart 3.** Current Account Balance and Triple Deficit Index Values of Turkey

As can be seen from the graph, it can be stated that current account deficits are a chronic condition in Turkey, except for some exceptional periods. The energy deficit, which emerged in parallel with the growth target, directly increases imports and deteriorates the current account balance through the foreign trade deficit channel. Since the demand for imports of economic units has been brought forward in recent periods when the inflationary environment has risen, the current account balance is also adversely affected by this situation.

In addition, the budget deficits caused by the inadequacy of public revenues to satisfy public expenditures have a direct impact on the current account deficit. It is known that budget deficits are excluded by affecting the credibility of the private sector, cause decreases on social welfare with its negative effect on growth, and ultimately have effects on inflation. (Yıldırım et.al., 2010: 427). It is seen that Turkey, which mostly has a budget deficit, did not have a budget deficit in a very short period of time in the first years of the history of Turkey Republic (Göktaş, 2008: 46). After the stagflation that emerged after 1970, budget deficits increased in Turkey as well as all over the world, and budget deficits, which were used as a policy tool, became chronic. Chart 4 shows the share of Turkey's savings balance and budget balance in GDP.

Chart 4. Savings Balance and the Share of Budget Balance in GDP of Turkey
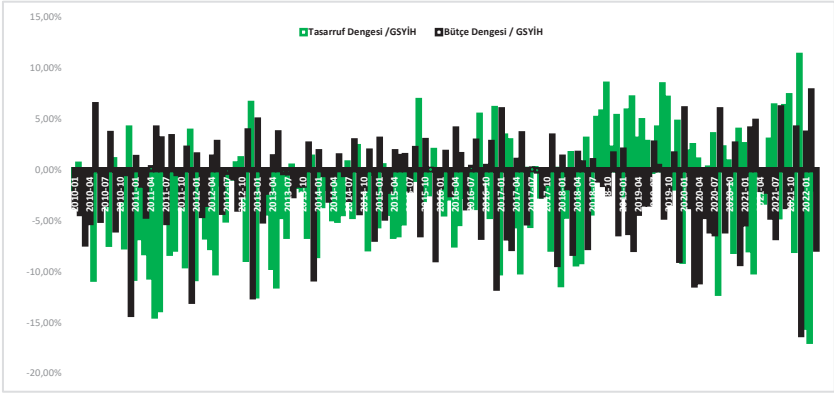
Source: The data obtained from the TCMB (2022) were calculated and arranged by the author.

The triple deficit index values for the years 2000-2021 and the degree of imbalance in Turkey are shown in chart 5. It is observed that Turkey has a chronic current account deficit, except for 2001 and 2019, and is mostly in the category of a country with a 3rd degree deficit. In summary, Turkey has a current account deficit as it regularly runs both a budget deficit and a savings deficit.

Chart 5. Index Value and Current Account Balance Ratings of Turkey After 2000's
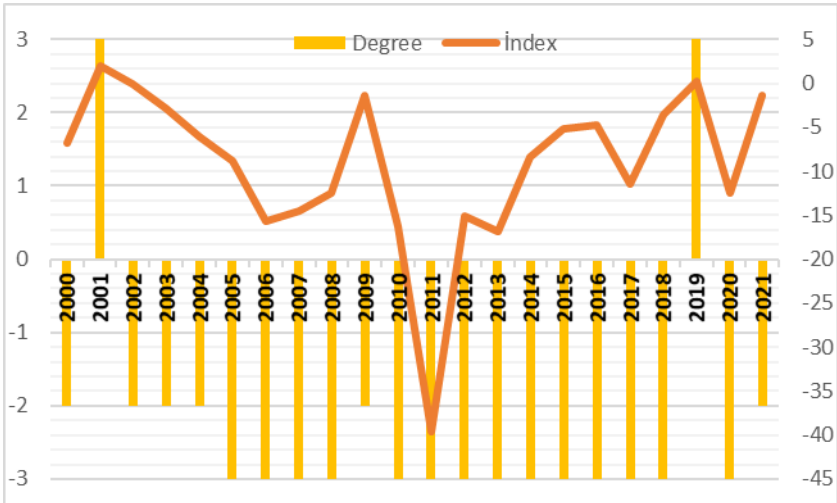

Source: Data from Trading Economics (2022) has been calculated and arranged by the author.

Turkey (2021, -1.44) is in the category of countries with 3rd degree current account deficit classified in the study because it has been running all three deficits simultaneously for a long time. In the same category, there are Chad (2021, -

59.4), Georgia (2021, -48.2), Moldova (2021, -67.2), Mongolia (2020, -75.6), Mozambique (2020, -474.3), New Zealand (2021, -3.65) and Qatar (2020, -3.1).

Figure 6 illustrates the rating of countries in terms of current account balance. When the current account balance degrees of the countries are considered, it is observed that the developed countries with current account deficit are mostly in the 1st degree, while the developing countries are mostly in the 3rd degree. There are very few examples of countries with 2nd degree current account deficits. In other words, it is not very common for countries to have a current account deficit despite their budget surpluses. In terms of countries with current account surplus, the majority of developed countries have a 2nd degree current account surplus, and there are few examples of 3rd degree current account surpluses. When an order is made from the most positive to the most negative in Figure 6, the situation is evaluated negatively for Turkey.
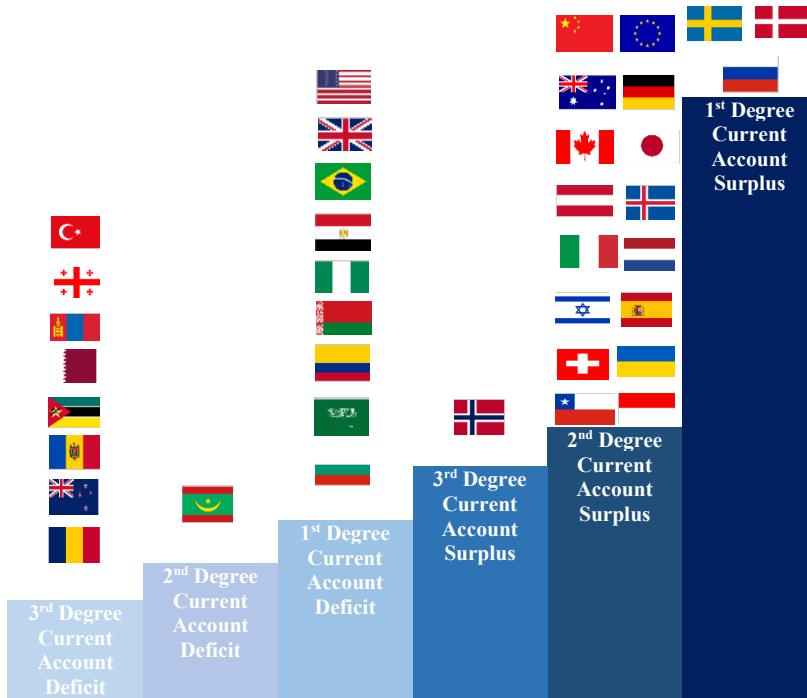
Figure 6: Countries by Current Account Balance Degree

4. Conclusion

After the 1970s, budget deficits and current account deficits became commonplace in many countries, including developed countries, and savings deficits came to the fore with the triple deficit hypothesis after the twin deficit hypothesis. The close relations of these three macroeconomic balances with each

other have been discussed in many academic studies. In this study, an index value was created on the diagram by establishing a model in case of excess or deficit in all three equilibria. In the model where the current balance represents the external balance vertically, the budget balance represents the internal balance, and the savings balance is on the coordinate system, the area of the triangle formed by connecting the dots forms the triple deficit index value. Thanks to the index, which has a negative value in the current account deficit and a positive value in the current account surplus, six different triangular regions containing the current account balance models of the countries are formed. Due to these regions, it is possible to talk about six different degrees of current account models, including three degrees current account deficit and three degrees current account surplus.

While the most of developed countries with current account deficit are in the first degree, the examples of countries with secondary deficits are very few. The riskiest group, including Turkey, is the countries with a third degree current account deficit. While the majority of developed countries with current account surplus are in the second degree, the examples of countries with a third degree deficit are very few. The most positive group in terms of current surplus is few and first degree. Considering the macroeconomic conditions and current account balance models of the countries, the 3rd degree current account deficit group, which gives a net triple deficit, is the most risky group, including Turkey.

Budget deficits and current account deficits are quite common even in today's developed economies. The savings surplus of developed countries covers a significant part of these deficits and makes the current account deficits sustainable. However, the situation is not very bright due to the need for external financing in terms of countries such as Turkey that have chronic shortage of savings. Because all kinds of negativities that may be experienced in borrowing opportunities pose a danger in terms of the sustainability of this imbalance. For example, the CDS risk premium, which was at the limit of 900 in the second quarter of 2022, makes borrowing opportunities difficult and costly for Turkey. This situation increases the risk of default and is seen as a danger in terms of sustainability.

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