

Arastırma Makalesi

Economic Crisis and Learning Economy: An Empirical Analysis on Turkey

Ekonomik Krizler ve Öğrenen Ekonomi: Türkiye'ye İlişkin Ampirik Bir Analiz

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Abstract

While economic crises have a negative effect on economies in general, they also provide new opportunities for the economies by requiring new regulations and reforms. Thus, crises could allow the economies to learn from the problems during the post-crisis periods through new policies and implementations. In this respect, the learning economy emphasizes the organizations required in post-crisis periods by the economies. Thus, the present study focused on the things learned by the Turkish economy after the November 2000 and February 2001 crises, For this purpose, Box-Jenkins Analysis was used to analyze the post-2001 quarterly GDP, inflation, industrial production index, real exchange rate, interest rate and current account balance figures. The study findings determined that the structural adjustments and reforms implemented in Turkish economy after the November 2000 and February 2001 crises significantly improved the economic performance. Based on these findings, Turkish economy became a learning economy after these twin crises.

Keywords: Economic Crisis, Learning Economy, The Crisis of November 2000, The Crisis of February 2001, Box-Jenkins Analysis, Turkey.

Öz

Ekonomik krizler bir yandan ekonomileri olumsuz etkilerken bir yandan da gerekli olan düzenleme ve reformların yapılmasını gerekli kılarak ekonomilere yeni fırsatlar sunmaktadır. Bu sayede krizler ekonomilerin kriz sonrası ortaya çıkan olumsuzluklardan ders çıkararak yeni politika ve uygulamalarla öğrenmelerine vesile olabilmektedirler. Bu açıdan öğrenen ekonomi krizler sonrasında ekonomilerde gerekli düzenlemelerin yapılmasına vurgu yapmaktadır. Bu bağlamda bu çalışmada Türkiye ekonomisinin Kasım 2000 ve Şubat 2001 krizlerinden öğrendikleri ele alınmaktadır. Bunun için çeyrek yıllık GSYİH, enflasyon, sanayi üretim endeksi, reel kur, faiz oranı ve cari denge serilerinin 2001 yılı sonrası durumu Box-Jenkins Analizi kullanılarak analiz edilmiştir. Elde edilen bulgulara göre Kasım 2000 ve Şubat 2001 krizleri sonrasında Türkiye ekonomisinde uygulamaya konan yapısal düzenleme ve reformlar ekonomik performansı önemli derecede iyileştirmiştir. Bu sonuca göre Türkiye ekonomisi söz konusu bu ikiz kriz sonrasında öğrenen ekonomi haline gelmiştir.

Anahtar Kelimeler: Ekonomik Kriz, Öğrenen Ekonomi, Kasım 2000 Krizi, Şubat 2001 Krizi, Box-Jenkins Analizi, Türkiye.

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1. Introduction

Turkish economy experienced significant structural changes after the January 24, 1980 decisions. In this context, the most significant change was the implementation of foreign policies to integrate the national economy to the international market (Karaçor, 2012, p. 383). However, the January 24, 1980 decisions could not fulfill the real expected transformational objectives in the institutional structure of the economy and previous problem of economic instability prevailed during the 1990s (Yüksel and Murat, 2002, p.3). On the contrary, these decisions resulted in higher levels of fragility in Turkish economy, leading to the two most significant crises in Turkish history on November 2000 and February 2001 (BRSA, 2010, p.6). To resolve the negative effects of these twin crises, the Transition to Strong Economy Program (hereinafter TSEP) was introduced. After the implementation of this program Turkish economy registered a significant progress in becoming an economy that learns from economic crises. Thus, TSEP became an important turning point in Turkey to become a learning economy.

The present study aimed to investigate the impact of the regulations and reforms implemented with the TSEP enacted after the November 2000 and February 2001 crises on the economy and whether the Turkish economy learned from these twin crises, in other words, whether the Turkish economy became a learning economy. For this purpose, initially, the correlation between the economic crisis and learning economy, and then, the pre- and post-November 2000 and February 2001 crisis periods, and the causes and consequences of these crises are discussed. Then, the TSEP, which was implemented to eliminate the negative effects of these twin crises, is addressed in detail. In the fourth section of the study, the dataset that would be utilized in econometric analysis and its properties, and the Box-Jenkins time series analysis are discussed. In the fifth section, where the econometric analysis findings are presented, the conclusions are included in the final section in the study.

2. Economic Crisis and Learning Economy

Economic crises can be defined as a set of short- or long-term unexpected fluctuations that adversely affect the economic and macroeconomic indicators (Aktan and Şen, 2002, p. 2). Although the economic actors (primarily corporations and the state) are adversely affected by the economic crises, the causes and dynamics are diverse in each crisis. Thus it is necessary to investigate the types of economic crises that are observed in markets based on the generation approach.

The types of economic crises that are observed in markets can be examined in two main categories: real and financial industry crises (Kibritçioğlu, 2001). Real industry crises are mostly associated with excess supply and demand in goods and services. In economies, when an excess demand arises in goods and services due to various reasons, an inflationary crisis is observed, while the excess supply in markets leads to recession. Thus, since possible recession crises could exacerbate unemployment, the labor market could be indirectly affected by a recession. Financial markets crises are analyzed under the categories of stock exchange, banking and exchange rate crises (Kale and Eken, 2017, p. 12; Eryılmaz and Eryılmaz, 2011, p. 39). Stock market crises are generally observed due to internal or external factors arising from the depreciation of stock prices due to corporate balance sheet problems. Initially, the lack of equity, the lack of structural regulations, and the asset-liability imbalance in banking industry could lead to banking crises. Furthermore, the increase and diversification in financial innovations, exchange rate regime changes, the central bank's financial market management skills, and the rate of change in short-term capital movements due to the financial globalization could lead to fluctuations in exchange rates (Ardıç, 2004). Thus, the development of financial crises is generally similar in developing countries that lack structural regulations. First, the flow of short-term capital to the country is halted due to the negative economic expectations the speculators. Then, the value of the domestic currency is depreciated, which Calvo christened as "sudden stop" (Calvo, 1998, p. 38). The decrease in purchasing power lowers domestic demand, while national banks are in search of liquidity. The presence of excess supply in real industry leads to lower production and an increase in unemployment. With the increase in exchange rates, especially in foreign-dependent nations,

the increase in input prices leads to cost-push inflation (Rodrik, 2009, p. 3). Thus, economic crises may be experienced due to internal or external factors, and the negative impact of the crisis could spread to other industries.

It was observed that the reasons and characteristics financial crises at different times experienced in different periods in nations were classified in the literature based on the generation approach. These classifications included first, second and third generation crisis approaches. The first-generation crisis approach was based on the Latin American crisis in the post-1970 period and studies conducted by Salant-Henderson (1978), Krugman (1979) and Flood-Garber (1984) (Çakmak, 2007, p. 82). Based on this approach, the contradictions created by economic policies implemented in economies without structural regulations and stability led to the crises. For instance, when fixed exchange rate system is adopted by a nation, the implementation of expansionary monetary policies by the central bank for various reasons (election economy, monetizing the budget deficit or supporting the weak banking system) paves the way for a crisis. The expansion in hard currency in an economy leads to inflation on the one hand, on the other, the central bank reserves tend to decrease to maintain a constant exchange rate. Thus, due to the deterioration of national macroeconomic indicators, short-term capital movements decelerate. The second-generation crisis approach was based on the studies conducted by Obstfeld (1986 and 1994) on the fact that certain crises (such as the 1992 UK crisis and the 1994 Mexico crisis) did not suit the first-generation crisis approach (Ardıç, 2004). In this approach, although there is no deterioration in basic national macroeconomic indicators, differences in economic actor expectations lead to crises due to internal and external factors. In particular, the decrease in the confidence in the sustainability of national policies and resulting economic uncertainties lead to speculative attacks. Thus, despite the implementation of structural policies, the causality of the policies should be well transferred to the market since the expectations are important. Third generation crisis approaches can be explained based on the studies conducted by Krugman (1999 and 2001), Radalet and Sachs (1998), and Chang and Valesco (1998) (Çakmak, 2007; Ardıç, 2004). Thus, the failure of nations to adopt specific structural regulations after financial liberalization or associated problems were analyzed based on monetary and banking crises. According to this approach, as a result of the rapid capital inflows into the country, weak regulations, especially for the banking industry, allow the banks to take higher risks. The increase in the granted loan volume and the discrepancy between the interest rates and the maturity of the loans leads to balloon prices in the real sector. Due to the dependency of loan collaterals on asset prices and the negative shocks experienced in the country, the asset prices decrease, leading to a fragile banking and financial industries. Furthermore, due the impact of globalization and financial innovations, vulnerabilities in these industries escalate the likelihood of the export of the crises to other nations.

Although economic crises have negative consequences for national economies, they actually create new opportunities to change the operations of the economic order. Especially an analysis of the historical development of economic schools would demonstrate that the Keynesian revolution emerged after the economic crisis in 1929 and the Monetarist school became popular after the stagflation crisis in 1973 (Tutar and Eren, 2011, p. 308). Thus, the fact that the crises lead to a structural economic transformation is due to the fact that the crises are “good teachers” and this topic is addressed within the scope of “learning economy or power of knowledge.” The learning economy can be described as the prevention of repeating the same mistakes by learning from previous economic crises in globalization. Thus, learning economy emphasizes the national requirements to take structural decisions and implement necessary modifications based on the lessons learned during previous crises. For example, due to the inefficiency of import substitution policies, high inflation, and rapid developments in Turkish financial markets, several successive crises in Turkey in late 1970s. As a result of the learning based on these crises, the structural adjustment program, which mostly included financial reforms, was introduced on January 24, 1980 (Karaçor, 2006, p. 382). The lack of free market regulations in January 24 program led to the banker crisis in 1982. Institutional regulations were implemented to resolve the crisis, and the Savings Deposit Insurance Fund (SDIF) and the Capital Markets Board (CMB) were established

in 1983. Thus, the negative economic developments led to the foundation of unique national institutions and introduction of structural reforms. Also, as a requirement of the January 24 reforms, the Turkish lira was established as a convertible currency with the act no: 32 in 1989. However, at that time, the financing of public sector deficits in the money market in Turkey, the problem of dollarization due to high inflation, the presence of speculative attacks and the coalition government laid the foundations for the 1994 crisis (Karaçor, 2006, p. 384). The April 5 decisions taken immediately after the 1994 crisis focused on the solutions of short-term problems and failed to achieve long-term structural reforms and an institutional transformation. Thus, the formation of external instabilities in addition to internal instability and the incomprehensive structural reforms included in April 5 decisions led to the 1998 crisis and the twin crises experienced in November 2000 and February 2001. Thus, it can be suggested that the presence of weak national market systems, political and economic instabilities and institutional failures prevented structural decisions by delaying the learning of the economy. Therefore, an environment of political and economic stability is required to achieve structural and institutional transformations after the crises. The presence of a social consensus on economic policies along with political and economic stability would support the process of learning economy. As a result, the most economically adequate decisions would be made quickly and at the right time and institutional changes would be achieved (Karaçor, 2006, p. 390). Furthermore, the structural reforms developed by a country as a response to previous crises would provide examples for other countries due to the advances in global communication instruments. Thus, the risk of contagion of financial crises as emphasized by the third-generation crisis approach would be reduced.

3. The Twin November 2000 – February 2001 Crises in Turkey

3.1. Pre-2000 Economic Developments

Before the analysis of November 2000 and February 2001 twin crises in Turkey, it would be adequate to review the economic developments in the pre-crisis period. The state has played a significant role in foreign trade, goods and services markets and finance industry before 1980. Factors such as the import restrictions, the control on interest rates, foreign exchange regime policies, and the high share of public banks in the financial system demonstrated that the government played a supervisory and determinative role in the markets (Mangır, 2006, p. 462). Furthermore, a significant substitution policy was adopted in this period, and the method of industrialization by the state was preferred. However, the subsequent oil crises in the 1970s, high inflation, and inadequate import-substitution industrialization policies led to the depletion of the public resources and deterioration of the balance of payments. Consequently, the governments attempted to resolve the series of crises experienced in late 1970s through devaluations. However, since the devaluations aimed to resolve short-term problems and due to the inadequacy of the industrialization strategy, a requirement for structural reforms arose. Thus, on January 24, 1980, the economic stability program was announced. January 24 decisions included short- and long-term structural transformations aimed to improve the operation of the free market mechanisms. Thus, the decisions aimed to reduce the inflation and the imbalance in balance of payments in the short term. A new industrialization strategy was introduced to resolve long-term foreign exchange and energy crises through exports-oriented industrialization. The dominance of the state on the markets was reduced by abolishing foreign trade restrictions and price controls in the goods and services markets. Furthermore, interest rate controls were abolished through financial liberalization and the exchange rate was increasingly determined by market conditions.

As a result of the change in financial strategy with the decisions of January 24, capital movements were liberated in 1989 with the act no: 32. In addition to the problems in monetary and fiscal policies, the deterioration of the macroeconomic indicators led to an instability in short-term capital flows (BRSA, 2010, p. 3). Prior to the 1994 crisis, primary budget deficit has increased steadily, and this debt has been financed by the central bank (Celasun, 2002, p. 7). Furthermore, after the 1991 Gulf crisis, regional trade volume decreased, leading to a shift in global capital towards safer countries. In addition to these problems, factors such as the increase in real wages and the appreciation of domestic currency due to high inflation rate resulted in higher than expected increase in current deficit. In 1993, the unwillingness of the Treasury to borrow at high

interest rates and the reduction of interest rates led to a flow in inactive funds towards the foreign exchange market (Ural, 2003, p. 17). The 1994 crisis erupted as a result of the political uncertainty that increased with the coalition government, failures in liquidity management by the central bank, and the reduction in Turkish credit rating by Moody's credit rating agency in January 1994. April 5 decisions were taken to solve the problems that led to the 1994 crisis. Thus, the focus was on reducing the inflation and budget deficit, increasing exports and providing an environment of confidence in politics and economy in the short term. Although the April 5 decisions provided a temporary stability in macroeconomic indicators in the short term, these decisions did not provide the structural reforms necessary to solve the crisis in the long term. Especially in the banking industry, state guarantee on deposits and supervision problems led to a chain of ethical problems in the financial sector (Kale and Eken, 2017). Furthermore, the high inflation and interest rates, the increases in the public sector borrowing requirement, instability in the current account deficit, as well as the 1997 Asian and 1998 Russian crises increased doubts about the sustainability of the current debt. This led to significant capital outflow in 1998, resulting in an economic recession in Turkey (Özbilen, 2002, p. 174). Thus, the structural economic problems in Turkey during the 1990s could be grouped in several categories. These included economic and political uncertainties, increases in the public borrowing requirement, high and unstable inflation rate, unresolved crises experienced with other countries, uncontrolled increase in the number of banks after financial liberalization and auditing problems, and superficial financial markets (BRSA, 2010, p. 7- 18).

3.2. The Causes and Consequences of the Twin Crises

The Anti-Inflationary Program (AIP) was announced on December 9, 1999, to overcome the economic problems of the 1990s and provide market confidence. AIP was a medium-term program (covering the period between 2000 and 2002) and the main target of the program was to reduce the high inflation rate with a fixed exchange rate policy. Furthermore, the program included structural reforms such as the acceleration of privatization, new social security system regulations, and institutional and administrative support for financial markets (Taşar, 2010). The fact that the fixed exchange rate system was valid due to the trilateral dilemma necessitated the presence of a monetary board with full capital mobility. Thus, the impact of the central bank on monetary policies was passive and the currency board could increase the money supply due to an increase in foreign exchange reserves. After the implementation of the program, inflation and real interest rates have decreased. The decrease in interest rates led to an increase in consumer loans, which prevented the inflation from falling even further. Furthermore, the increase in imports due to real appreciation of the exchange rate led to an increase in the foreign trade deficit (Kale and Eken, 2017; Karaçor, 2006). Although AIP aimed to achieve both short- and long-term structural transformations, it was observed that the program depended on sensitive balances. Since the liquidity increase depends on the foreign exchange reserves under a fixed exchange rate system, a possible market liquidity crisis would pose a great danger. Moreover, in a country that is sensitive to short-term capital mobility, the possibility of a significant decrease in foreign currency reserves due to external or internal shocks would affect the financial markets, especially the banking industry, negatively. While full capital mobility is valid in a country under the Mundell-Fleming model, it is known that fiscal policy has an effect on economic activity under a fixed exchange rate regime. Therefore, the implementation of expansionary fiscal policies requires paying attention to budget deficit levels while improving the economic growth. In nations with a fixed exchange rate regime, increases in budget deficit will increase financial vulnerability due to the correlations between reserves and liquidity.

The stabilization of the exchange rate before the November 2000 crisis with the AIP significantly reduced the risk of foreign currency borrowing and portfolio investments. Commercial banks benefited from this opportunity and used the foreign funds to fund the treasury at higher interest rates. This, on the one hand, increased the foreign currency short positions of the banks, and on the other hand, led to an asset and liability imbalance in bank balance sheets. Furthermore, external problems such as the public bank operational losses, the lack of privatization as specified in the AIP, the burden created by the two major earthquake disasters in 1999 and IMF programs

and the Latin American crises reduced the foreign currency inflow to Turkey (BRSA, 2010, p. 20). The increasing foreign currency demand by the banks that aimed to cover their short positions led to a liquidity shortage in the markets. Due to the liquidity shortage and short positions, the demand for foreign currency was not met, exacerbating the interest rates and lowering the treasury bond prices significantly. This resulted in the liquidation of Demirbank, which had significant debt securities among its assets. The crisis erupted on November 22, 2000 with the expectation that the crisis would affect other banks as well, and the overnight interest rate rose to 210% (Güloğlu, 2001). As a result of the central bank interventions to ensure stability in exchange rates, reserves decreased by approximately 6 billion dollars and the stock market prices lost about 50% (Albeni, 2003). Additional reserve opportunities were provided by the IMF to remedy the negative effects of the November 2000 crisis on the markets. Thus, the central bank reserves increased by around \$ 4 billion, partially stabilizing the financial markets. To meet the liquidity requirements of the banking industry, local currency funds were obtained through open market transactions. Privatization of public banks (Ziraat Bank, Emlak Bank and Halk Bank) with operational losses was accelerated and the loans extended to banks by the third parties were secured by the state (BRSA, 2010, p. 24-25).

Measures taken after the November 2000 banking crisis temporarily stabilized the markets. However, the macroeconomic problems that led to the November 2000 crisis and the incurring debt problem of the banking industry were not fully resolved. This revealed the shortcomings of the AIP and reduced the confidence in the present stabilization program. Furthermore, the ratio of the short-term external debt stock to reserves and the increase in the balance of payment deficit were an indication that it was not possible to achieve economic stability before the February 2001 crisis (Independent Social Scientists, 2001). On 19 February 2001, political tensions between the President and the Prime Minister just before a significant state debt tender demonstrated a lack of political stability in addition to economic stability. As a result, the foreign currency demands by domestic and foreign residents have intensified. To meet the foreign currency demand, to defend the fixed exchange rate regime, and to prevent a decrease in reserves, the central bank limited the domestic currency liquidity. As a result, the interbank interest rate increased to around 1000%, and as a result of the inadequacy of this policy, central bank reserves decreased by 6 billion dollars (BRSA, 2010, p. 25; Güloğlu, 2001). Due to unsustainable liquidity, exchange rate and interest management, the floating exchange rate regime was introduced on February 22, 2001. With the transition to the floating exchange rate regime, the domestic currency lost about 250% of its value. In addition to the banking industry balance sheet problems, the high exchange and interest rates exacerbated the cost of resources. Thus, February currency crisis deepened the banking industry crisis. As a result of the twin crises experienced in November 2000 and February 2001, the economy shrank by about 8%. Domestic debt stock increased 4 times when compared to the pre-crisis figures, inflation rate reached 70% and 19 banks were abolished (Karaçor, 2006, p. 388).

3.3. The Significance of the Transition to A Strong Economy Program

The twin crises revealed both the legacy economic problems of the 1990s and the lack of financial auditing and risk management. The eruption of these crises as a result of economic problems provided an opportunity to change the economic policies. Thus, politicians should learn from these crises and implement adequate structural reforms. The success of the structural regulations made after the crises depends on taking applicable and inclusive steps towards the solution of serious economic problems. Furthermore, it is necessary to take advantage of legislative regulations to prevent arbitrariness in the implementation of structural reforms. Thanks to the structural reforms armed with the rule of law, future economic crises could be prevented. Thus, after the 2001 crisis, TSEP was introduced on May 15, 2001 with the support of the IMF and the World Bank to achieve macroeconomic stability and structural transformation in the economy. The main objective of the program was to provide an infrastructure that would allow harmonious operation of the financial and real markets, as well as a permanent public sector balance (Albeni, 2003, p. 48). In addition, the other objectives of the program included ensuring price stability under the floating exchange rate regime, restructuring the public banks that had a high share in the banking industry, and implementing adequate revenues policy that would allocate equal

responsibilities to all groups in the society. It was stated that, to achieve these goals, it was important to differentiate political and economic players and to ensure social consensus and a transparent and efficient public sector. Based on the TSEP, solutions were produced for the present and accumulated economic problems, and approximately 15 legal acts were used to maintain long-term economic stability. In Table 1 below, the objectives, legal regulations and results of the TSEP program are presented.

Table 1. Structural Characteristics of the Transition to A Strong Economy Program

Program Targets	Instruments and Legislation	Outcomes
Macroeconomic Stability	Tight Fiscal Policy, High Primary Surplus, Monetary Targeting, Inflation Targeting, Current Account Deficit Control, Floating Exchange Rate Regime	Fiscal Discipline, Lower Inflation, Economic Growth and High Productivity
Permanent Reforms in the Financial System	Amendments in Banking Law, Central Bank Act No. 4651	Instrumental Independence of the Central Bank, Appropriation of A Budget for Operational Losses, Price Stability, Deeper Financial Markets
Competition and Free Market Operation in the Economy	Sugar Act, Tobacco Act, Natural Gas Act, Privatization of Turkish Telecom, Civil Aviation Act	Increased efficiency in free market conditions through independent Administrative Authorities and Supreme Boards
Public Financing and Transparency	Borrowing Act, Expropriation Act and Public Procurement Act	Prevention of Operational Losses, Financing the Budgetary and Extra-Budgetary Funds
Social Solidarity	Job Security Act, Economic and Social Council Act	Preservation of the interests of the society and confidence building for the program

Resource: Designed based on Undersecretary of Treasury (2001) and Taşar (2010) by the authors.

The program primarily aimed to ensure macroeconomic stability in the short-term. Unlike the AIP, it was mentioned in the program that adhesion to the floating exchange rate regime will be decisive. The reasons for the insistence in the floating exchange rate regime included the mutual balance between the foreign trade and exchange rate fluctuations, the degree of dollarization and openness in foreign trade factors (Taşar, 2010). To ensure the stability in exchange rates, it was emphasized that the central bank should intervene in exchange rates using tenders in case of excessive fluctuation. In TSEP, controlling the inflation in the short term was crucial for the viability of the long-term reforms. Thus, the program initially aimed to reduce inflation through short-term monetary targets. Monetary strategies included the introduction of net domestic asset ceiling and monetary baseline and minimum net external asset values (Güloğlu, 2001). It was mentioned that inflation targeting would be initiated in the medium term due to incompatibility of expected and actual inflation levels and inadequate preconditions. With the possible success in inflation targeting in the medium term, the implementation of structural reforms aimed to decrease

nominal and real interest levels in the long term. Controlling foreign trade and current account deficit was another target of the program. Thus, the program aimed to increase exports via EXIMBANK loans, higher tax rebates in exports and elimination of red tape. A decrease of 3% in national income was expected during the first year of the program, which would in turn reduce the imports due to the decrease in domestic demand, leading to a positive development in the current account deficit.

A strong fiscal discipline and high primary surplus were required to meticulously follow the monetary targets set for price stability. Thus, it was planned to achieve a high primary surplus through the implementation of a tight fiscal policy to ensure the financial discipline. Therefore, the program aimed to increase the primary surplus to national income ratio to approximately 6% to end the domestic debt dynamics that were not sustained in the 90's (Yendi et al., 2012). Based on this target, it was stated that public spending would be reduced through the reduction of the role of the public sector in economy. Furthermore, it was observed that various newly enacted laws attempted to finance the budgetary or extra-budgetary deficits (Yendi et. al., 2012). Along with these policies, the program aimed to reduce the public sector net debt stock to national income ratio to 64.9% in 2003 and the net domestic debt to national income ratio to 41.5% (Independent Social Scientists, 2001, p. 10-11).

It could be observed that permanent structural banking industry and financial system reforms are adopted in the program. Efforts were spent to improve public bank balance sheets, which accounted for about 30% of the banking system, to liquidate operational losses, and to finance the short positions of private and public banks. Thus, the balance sheets of the banks that were transferred to the Saving Deposits Insurance Fund were improved by issuing special domestic debt securities. In particular, private commercial banks were allowed to benefit from foreign currency debt securities to solve the short position problem. Thus, supplemental resources that amounted to 8 billion dollars and 4.3 quadrillion Turkish lira were created for the banking industry (Independent Social Scientists, 2001). In addition to the financial regulations implemented for the banking and financial industries, legal regulations were also introduced to avoid the same problems in the future. The new legal regulations included the duties and allowances for public banks in the budget. Thus, while preventing public bank operational losses, the decisions led to an improvement in administrative transparency (Celasun, 2002, p. 17-18). Furthermore, legal regulations were enacted (Act no. 4651 / April 25, 2001) to preserve the political independence of the Central Bank. The primary target of this legislation was to ensure price stability and it was emphasized that the central bank would utilize policy instruments independent from the government (instrumental independence) to achieve this goal.

It is known that competition, economic efficiency and quality would improve with the proper operation of the free market. Thus, various legal regulations were introduced with the TSEP and privatization efforts were accelerated. This aimed to provide additional resources for the public sector, as well as the separation of political and economic fields. It was emphasized that the free market economy should be implemented by introducing the sugar act, tobacco act, natural gas act and civil aviation act, and that the government should play a supervisory role in these fields. Furthermore, job security act and economic and social council laws were enacted to support the implementation of the market mechanisms by the government. With the introduction of the TSEP that included comprehensive economic reforms, significant improvements were observed in macroeconomic indicators. Thus, while the growth rate was around 3% between 1992 and 2001, the same rate reached about 7% between 2002 and 2007. 17% decrease in the inflation rate was observed with the implementation of the program between 2002 and 2007. In 2007, the budget deficit to national income ratio reached 3.5% and the net debt burden of the public sector reached 32% (Yendi et al., 2012, p. 52).

4. Dataset and Econometric Methodology

The present study investigated whether institutional and structural reforms included in the TSEP introduced after the November 2000 and February 2001 crises had an impact on economic performance based on the learning economy approach. For this purpose, quarterly GDP, inflation,

current balance, industrial production index and interest rate data for the 1987-2012 periods were analyzed with the Box-Jenkins method, an autoregressive time series analysis. Eviews 9 and Gauss 10 software were used in the analysis.

As is known, to model any series with Box-Jenkins model, initially the series should be de-trended and de-seasonalized. In other words, the series should be stationary. If a time series demonstrates a constant growth pattern, or a general trend, or if it returns back or jumps to a level from another, series of this structure could not be modeled before they are transformed into a stationary series. Thus, in the present study, whether the series contained seasonal effects was analyzed by creating seasonal dummy variables and then estimation using the regression model. The series observed to have seasonal effects were cleared of these effects using Census X-12 method. Then, whether the series were stationary or not, in other words, whether they contained unit root was tested by both Augmented Dickey-Fuller (ADF), ADF-GLS, Philips-Perron (PP), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Ng-Perron unit root tests that ignore structural breaks (Nazlıoğlu, 2011, p. 2938; Nazlıoğlu et al., 2015, p. 281; Tayyar, 2019, p. 1942) and two-break Lee-Strazicich (2003) unit root test that takes structural breaks into account. As is known, presence of unit root in the series should be investigated before conducting Box-Jenkins modeling on the series. If there is unit root in the series, the unit roots should be removed and then ARMA/ARIMA/SARMA/SARIMA model or Box-Jenkins modeling should be conducted. *Thus firstly unit root tests and then Box-Jenkins modeling will be addressed.*

General expression of the utilized *Autoregressive Moving Average Model (ARMA)/Autoregressive Integrated Moving Average Model (ARIMA)/Seasonal Autoregressive Moving Average Model (SARMA)/ Seasonal Autoregressive Integrated Moving Average (SARIMA) Model* or *Box-Jenkins Model* could be formulated as below:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_n Y_{t-n} + Dummy + \varepsilon_t \quad (1)$$

In Equation (1), Y_t series represents each series that belong to Turkish economy. Also, the *Dummy* variable in the equation depicts the dummy variable that reflects the impact of the institutional and structural reforms implemented with the TSEP on the economy after the November 2000 and February 2001 crises of and was assigned a value of "1" for 2002 and thereon, and assigned a value of "0" otherwise. Since it was considered that the effects of TSEP, which was introduced in May 2001, on the economy would be observed in 2002 the earliest, dummy variable was assigned a value of "1" in 2002 and thereon. Thus, in the post-2002 period, the effects of the TSEP on the economic performance of the institutional and legal reforms were addressed, and attempt was made to determine whether Turkey became a learning economy based on the lessons learned during the twin crises.

Detailed information on data utilized in the study is given below:

GDP: Quarterly GDP series data expressed in current prices for 1987 Q1 – 2012 Q4 were obtained from Republic of Turkey Central Bank Electronic Data Distribution System. The series were transformed into real data using 2003-based GDP deflator and its logarithm was taken and then analyzed. The series was determined to contain seasonal effect and the series was cleared of these effects with Census X-12 method. Time series graph for the variable is presented in Figure 1.

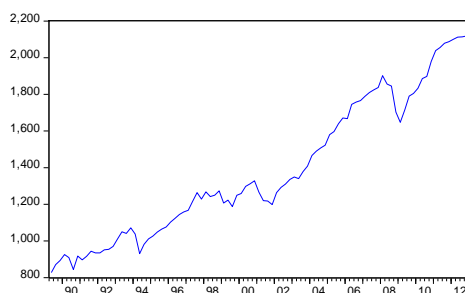


Figure 1. GDP Time Series Graph.

Inflation: Quarterly inflation series data for 1987 Q1 – 2012 Q4 were obtained from Republic of Turkey Central Bank Electronic Data Distribution System. Consumer price index (CPI) series were revised based on 2003-base year and their logarithms were taken. The series was determined to contain seasonal effect and the series was cleared of these effects using Census X-12 method. Time series graph for the inflation series is presented in Figure 2.

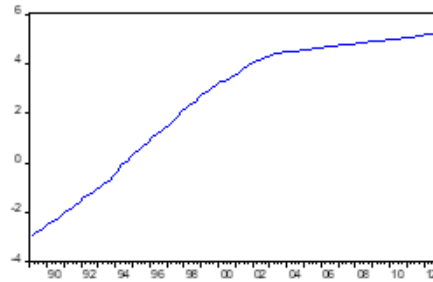


Figure 2. Inflation Time Series Graph

Industrialproduction: Seasonally corrected series data for 1987 Q1 – 2012 Q4 representing 2010-based industrial production index were obtained from Federal Reserve Bank of St. Louis Economic Data (FRED). It was determined that the series did not contain seasonal effect and was modeled after its logarithm was taken. Time series graph for the series is displayed in Figure 3.

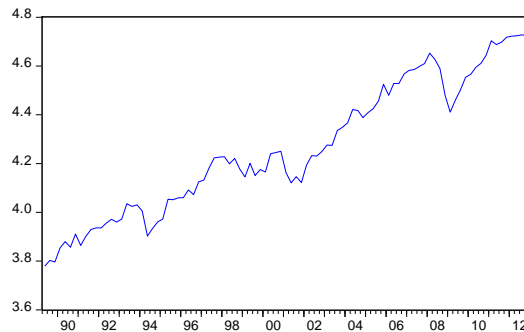


Figure 3. Industrialproduction Time Series Graph

Currentaccount: Seasonally corrected series data for 1987 Q1 – 2012 Q4 representing current balance/GDP rate were obtained from FRED. It was determined that the series did not contain seasonal effect. Time series graph for the series is presented in Figure 4.

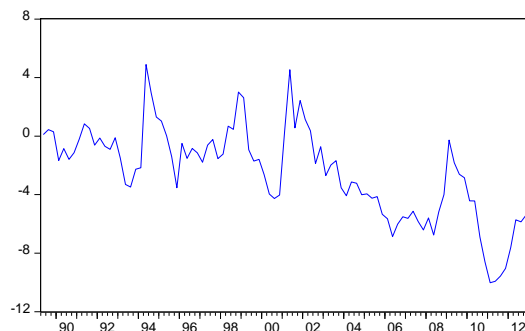


Figure 4. Current Account Time Series Graph

Interbank Rate: Quarterly interbank overnight interest rate data for 1987 Q1 – 2012 Q4 were obtained from FRED. It was determined that the series did not contain seasonal effect and only its logarithm was taken. Time series graph for the series is displayed in Figure 5.

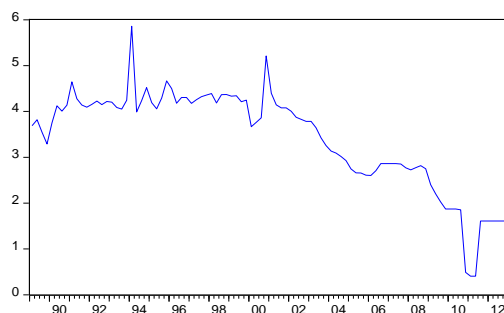


Figure 5. Interbank Rate Time Series Graph.

5. Findings

After the determination of the existence of seasonal effects in the series and before the Box-Jenkins modeling phase, it should be determined whether the series were stationary or not, in other words, whether they contain unit root. For that purpose, initially *ADF*, *ADF-GLS*, *Phillips-Perron* and *Ng-Perron* unit root tests that ignore structural breaks were conducted. Unit root test results for the series are presented in Table 2.

Table 2. Unit Root Tests Results

The Level Values of Series								
Unit Root Tests	ADF Test	ADF-GLS Test	KPSS Test	Phillips-Perron Test	Ng-Perron Test			
					MZa	MZt	MSB	MPT
GDP	-1,96 (3.45)	-1,78 (-3.04)	0.21 (0.14)	-2.16 (-3.45)	-6.69 (-17.3)	-1.74 (2.91)	0.26 (0.16)	13.6 (5.48)
Inflation	-1.92 (3.45)	-1.24 (-3.04)	0.28 (0.14)	-2.20 (-3.45)	-25.88 (-17.3)	-3.54 (2.91)	0.13 (0.16)	3.84 (5.48)

Industrialproduction	-2.27 (3.45)	-2.24 (-3.04)	0.18 (0.14)	-2.57 (-3.45)	-9.31 (-17.3)	-2.10 (2.91)	0.22 (0.16)	10.01 (5.48)
Interbankrate	-2.60 (2.89)	-2.49 (-1.94)	1.06 (0.46)	-6.35 (-2.89)	-10.6 (-8.10)	-2.26 (1.98)	0.21 (0.23)	2.46 (3.17)
Currentaccount	-2.70 (2.89)	-1.76 (-1.94)	1.01 (0.46)	-2.75 (-2.89)	-9.41 (-8.10)	-2.08 (1.98)	0.22 (0.23)	2.95 (3.17)

Notes: Hypotheses for ADF, ADF-GLS, Phillips-Perron, Ng-Perron MZA and MZt unit root tests:

H_0 : unit root exists in the series and H_1 : unit root does not exist in the series. Hypotheses for KPSS, Ng-Perron MSB and MPT unit root tests: H_0 : unit root does not exist in the series and H_1 : unit root exists in the series. Values within parentheses represent critical values for 5% level of significance. Furthermore, while it was determined that the model with constant was suitable for currentaccount and interbank rate variables, it was identified that model with constant and trend was suitable for other variables. While conducting unit root tests, latency count was determined by taking into account the Akaike Information Criterion (AIC) maximum latency count of 12. While default in Spectral Estimation Method (Bartlett Kernel) was considered in Philips-Perron and KPSS tests, in Bandwidth, Newey-West Bandwidth was considered. In Ng-Perron test, default in Spectral estimation method (AR-GLS de-trended) was considered.

Findings depicted in Table 2 demonstrated that GDP, Industrialproduction series contained unit root based on all unit root test results. That is, these series were not stationary. On the other hand, there was unit root in inflation series based on all unit root tests except theNg-Perron test result. Also, while Interbankrate series was not stationary according to ADF and KPSS test results, it was stationary based on other tests. Finally, the Currentaccount series was stationary based on Ng-Perron test results, but not stationary according to the results of other test. Unit tests that ignore structural breaks could identify unit root inaccurately when there are structural breaks in the series (Nazlıoğlu, et al. 2014, p. 319). To overcome this deficiency, in the present study, Lee-Strazicich (2003) two-break unit root test that takes structural breaks into account was also used. Lee-Strazicich (2003) unit root test calculates two test statistics that take breaks in the constant (Model A) and in the constant and the trend (Model C) into consideration (Yıldırım,et. al., 2013, p. 83- 84). Lee and Strazicich (2003) unit root test results that take both breaks into consideration are presented in Table 3.

Table 3. Lee and Strazicich (2003) Unit Root Test Results

Series	Model	Lag	Break Times	λ	t-statistics	Critical Values
GDP	Model A	3	1998Q3,2008Q4	0,4;0,8	-2,92	-3,84
	Model C	3	1994Q2, 2004Q3	0,2; 0,6	-5,63	-5,74
Inflation	Model A	3	1990Q2, 1993Q3	0,4; 0,9	-2,98	-3,84
	Model C	2	1988Q2, 1993Q2	0,2; 0,8	-5,41	-5,71
IndustrialProduction	Model A	0	2000Q4, 2003Q2	0,5; 0,6	-3,47	-3,84
	Model C	0	1999Q1, 2004Q1	0,4; 0,6	-4,99	-5,67
Interbank Rate	Model A	0	1989Q4, 1990Q4	0,1; 0,2	-3,52	-3,84
	Model C	0	1998Q2, 2010Q2	0,4; 0,8	-6,38	-5,65
CurrentAccount	Model A	0	2002Q4, 2003Q3	0,6; 0,6	-4,20	-3,84
	Model C	0	2003Q3, 2010Q1	0,6; 0,8	-6,52	-5,73

Note: Lee-Strazicich (2003) test was conducted using models with constant (Model A) and with constant and trend (Model C). These models allow for two structural breaks. Lee-Strazicich (2003) test critical values for the models were taken from Lee-Strazicich (2003) at 5% significance level.

Unit root test results displayed in Table 3 demonstrated that GDP, inflation, industrial production series had unit roots based on both Model A and Model C test results. While interbank rate series had unit root based on the Model A result, it was stationary based on the Model C test result. Since there was a break in interbank series both in the constant and trend, it was determined that Model C result was valid for this series. Thus interbank series was considered as stationary. On the other hand, current account series did not contain unit root based on both Model A and Model C results. Thus, based on the data provided in Table 3 GDP, inflation, industrial production were not stationary, while interbank and current account series were. A comparison of unit root test results that do not consider structural break in Table 2 and unit root test results that consider structural break in Table 3 demonstrated that tests with and without structural break could occasionally give different results. *As a result of the joint analysis of unit root test results that consider and do not consider structural breaks, it was observed that GDP, industrial production and inflation series were not stationary, while interbank rate and current account series were stationary.* Since it was determined that when the first degree differences of non-stationary GDP, industrial production and inflation series were taken and both unit root tests that take and do not take structural breaks into consideration were applied, it was observed that the series became stationary, so GDP, industrial production and inflation series were modeled after their first degree differences were taken.

Following the completion of the unit root analyses, dummy variable, which would be included in the modeling phase, was created to determine the effect of institutional and legislative regulations introduced with TSEP in 2001 on the performance of Turkish economy. Since it was considered that the policies introduced with TSEP would demonstrate their effects in 2002 the earliest, a value of “0” was assigned to the dummy variable for 1987 Q1 – 2001 Q4 period and a “1” value was assigned for 2002 Q1 – 2012 Q4 period. After conducting unit root tests, the most appropriate autoregressive model was identified for each variable. *Automatic ARIMA Selection* feature of Eviews 9 software was used for this identification and the model with the lowest AIC value was preferred. The most suitable autoregressive model for each variable is presented in Table 4.

Table 4. Autoregressive Model Prediction Results

	GDP	Inflation	Industrial production	Interbank rate	Current account
Most Suitable Model	ARIMA (0,1,10)	SARIMA (2,1,2) (0,0,4)	ARIMA (0,1,10)	SARMA (0,0,1) (1,0,0)	SARMA (0,0,2) (0,0,4)
Coefficient	1138.373 (0.000)	7824.377 (0.9661)	59.43 (0.000)	-87.51 (0.000)	-0.73 (0.19)
Dummy	555.10 (0.000)	2.10 (0.2784)	30.98 (0.000)	-72.4 (0.000)	-3.68 (0.000)
MA(10)	0.44 (0.0003)		0.46 (0.001)		

AR(2)		0.99 (0.000)			
MA(2)		0.38 (0.003)			0.60 (0.000)
SMA(4)		0.33 (0.01)			0.31 (0.003)
MA(1)				-1.10 (0.000)	
SAR(1)				0.93 (0.000)	
Adjusted R^2	0.72	0.99	0.72	0.52	0.61
F_p Value	0.000	0.000	0.000	0.000	0.000
AIC	13.45	5.10	7.64	9.75	4.23

Note: In the table, AR depicts the Autoregressive Model, MA depicts the Moving Average Model, ARMA depicts the Autoregressive Moving Average Model, ARIMA depicts the Autoregressive Integrated Moving Average Model, SAR depicts the Seasonal Autoregressive Model, SMA depicts the Seasonal Moving Average Model, SARMA depicts the Seasonal Autoregressive Moving Average Model and SARIMA depicts the Seasonal Autoregressive Integrated Moving Average Model.

Based on the findings presented in Table 4, ARIMA (0,1,10) was the most suitable model for the GDP, SARIMA (2,1,2) (0,0,4) was the most suitable model for the inflation, ARIMA (0,1,10) was the most suitable model for the industrial production, SARIMA (0,0,1) (1,0,0) was the most suitable model for the interbankrate, and SARIMA (0,0,2) (0,0,4) was the most suitable model for the current account. Then, with the inclusion of the Dummy variable into the above-mentioned models, Box-Jenkins model estimation phase was initiated and the signs and coefficients of the Dummy variable obtained with the estimation were examined for each series. The review of the coefficient and sign of the Dummy variable in the model estimates demonstrated that the policies implemented with TSEP had a statistically positive effect on GDP, industrial production index and had statistically significant and negative effects on the interbankrate and current account variables. On the other hand, the sign of Dummy variable in the inflation series was positive but the impact was statistically insignificant.¹ Thus, interpretation of the data presented in Table 4

¹There could be a few reasons why this decreasing effect was not observed for inflation. It could be explained by the fact that post-2002 period was defined by an economic revival. As is known, in periods of economic revival, an increase in inflation is observed. Also, the second probable reason for the lack of a decrease in inflation rate during this period could be the fact that target inflation rates and planned inflation rates are not determined realistically in Turkey, as noted by Şimşek (2007). This is due to the lack of certain prerequisites in Turkey necessary to target inflation accurately. Thus, there are important ambiguities about inflation in Turkey and these ambiguities limit the effects of implemented policies to reduce inflation. A third possible reason is the fact that, in Turkey, the degree of reflection of exchange rate increases on

demonstrated that after 2002, as the institutional and structural reforms were implemented after the TSEP, it was observed that GDP, industrial production index increased, while current account and interest rate series decreased. This could suggest that the TSEP improved the economic performance and affected other variables except inflation in accordance with the expectations. *Consequently, a general review of the findings presented in Table 4 demonstrated that under the TSEP regulations were effective in improving the macroeconomic performance in Turkey. This could suggest that Turkey has learned the necessary lessons after the economic crises of November 2000 and February 2001 and emerged as a learning economy after the above-mentioned adverse and difficult process. In other words, the effects of the learning economy were started to be observed with the new policies implemented after the twin crises.*

5. Conclusion

While economic crises lead to negative consequences for national economies, they also create significant opportunities for economic improvements due to new policies and regulations implemented during the post-crisis periods. Thus, crises often provide learning opportunities for the national economies; thus, allowing the economy to become a learning economy. National economies that became a learning economy due to economic crises implement significant structural and institutional reforms and policies in several fields. In this context, the present study aimed to investigate the impact of the structural regulations and reforms that were implemented with the TSEP after the November 2000 and February 2001 crises and whether Turkish economy learned with the lessons learned during these crises and became a learning economy.

For this, quarterly GDP, inflation, industrial production index, interest rate and current balance series were analyzed with the Box-Jenkins analysis for the post-2001 period. Based on the study findings, it was determined that the implementation of the TSEP had a statistically positive and significant impact on GDP and industrial production index, and a statistically significant and negative effect on interest rate and current balance variables. No significant effect was determined on the inflation variable. Thus, the measures implemented after the November 2000 and February 2001 crises with the TSEP led to significant improvements in the macroeconomic performance of the Turkish economy. As reported by Karaçor (2006), the November 2000 and February 2001 crises forced the Turkish economy to decide and became a milestone on the path to becoming a learning economy.

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inflation is approximately 60 – 65%. This value is quite close to the critical value of 1. Which means that, the increases in exchange rates create an effect that causes an increase in inflation As the findings of the present study demonstrated, an increase in real exchange rates were observed during the post-2002 period, which probably have caused an increase in inflation.

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Research Article

Economic Crisis and Learning Economy: An Empirical Analysis on Turkey

Ekonomik Krizler ve Öğrenen Ekonomi: Türkiye'ye İlişkin Ampirik Bir Analiz

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Genişletilmiş Özet

1. Giriş

Ekonomik krizler, beklenmedik bir zamanda ortaya çıkarak piyasalarla birlikte temel makro ekonomik göstergeleri olumsuz etkileyen kısa ve uzun vadeli dalgalanmalardır (Aktan ve Şen, 2002, s.2). Ülke ekonomileri açısından ekonomik krizlerin olumsuz sonuçları olsa da ekonomik düzenin işleyişinin değiştirilmesi açısından yeni fırsatlar sağlamaktadır. Krizlerin ekonomik anlamda yapısal dönüşümü sağlaması ve “iyi bir öğretici” olması “öğrenen ekonomi veya bilgi gücü” kapsamında incelenmektedir. Öğrenen ekonomi küreselleşen dünyada ülkelerde yaşanan ekonomik krizlerin yol gösterici olmasından yararlanılarak aynı hataların tekrarlanmaması şeklinde açıklanabilir (Karaçor, 2006). Bu açıdan öğrenen ekonomi krizlerden dersler çıkararak ülkelerin yapısal kararları alması ve düzeltmesi zorunluluklarını vurgulamaktadır. Örneğin Türkiye’de ithal ikameci politikaların etkisizliği, yüksek oranlı enflasyon ve finansal piyasalarda yaşanan hızlı gelişmeler sonucunda 1970’li yılların sonuna doğru peş peşe krizler ortaya çıkmıştır. Yaşanan krizlerin öğreticiliğinden yola çıkılarak daha çok finansal sektörle ilgili reformları içeren yapısal uyum programı 24 Ocak 1980 yılında uygulamaya konulmuştur (Karaçor, 2006, s. 382). 24 Ocak kararlarının serbest piyasa koşulları açısından düzenlemelerinin eksikliği sonucunda 1982 yılında bankerler krizi yaşanmıştır. Krizin çözümü için kurumsal anlamda düzenlemeler yapılmış olup 1983 yılında Tasarruf Mevduatı Sigorta Fonu(TMSF) ve Sermaye Piyasası Kurulu (SPK) kurulmuştur. Dolayısıyla ekonomi alanında yaşanan olumsuzluklar yapısal reformlara ek olarak ülkenin kendine özgü kurumlarının ortaya çıkmasını sağlamıştır. Yine 24 Ocak kararlarının bir gereksinimi olarak 1989 yılında alınan 32 sayılı karar kapsamında Türk lirasının konvertibilitesi sağlanmıştır. Ancak o dönemde Türkiye’de kamu kesimi açıklarının para piyasaları yoluyla finanse edilmesi, enflasyonun yüksek olmasından dolayı yaşanan dolarizasyon sorunları, spekülatif ataklar ve koalisyon iktidarlarının varlığı 1994 krizinin oluşumuna zemin hazırlamıştır (Karaçor, 2006, s. 384). 1994 krizinin hemen ardından alınan 5 Nisan kararları kısa vadeli sorunların çözümüne odaklanmakta olup uzun vadeli yapısal reformu ve kurumsal dönüşümü sağlayamamıştır. Dolayısıyla iç istikrarsızlığa ilave olarak dış istikrarsızlıkların oluşması, 5 Nisan kararlarının kapsayıcılıktan uzak yapısal eksikliklerinin bulunması sorunları birikerek sırasıyla 1998 krizi ve Kasım 2000 –Şubat 2001 ikiz krizlerinin yaşanmasına neden olmuştur. Bu krizler 1990’lı yılların birikimli ekonomik sorunlarının bir sonucu olup ülkede finansal alanda denetim ve risk yönetiminin olmadığını göstermiştir. Dolayısıyla politikacılar ülkede krizlerin ortaya çıkış nedenlerini iyi bir şekilde inceleyerek dersler olarak yapısal reformları düzenlemeleri gerekmektedir. Bu bağlamda 2001 krizinden sonra

makro ekonomik istikrarı sağlamak ve yapısal dönüşümü gerçekleştirebilmek için 15 Mayıs 2001 tarihinde “Güçlü Ekonomiye Geçiş Programı” uygulanmaya başlanmıştır. Programın temel amacı kamu kesimi dengelerinin kalıcı olarak sağlanmasının yanı sıra finansal ve reel piyasalarının uyumlu bir şekilde çalışmasını sağlayacak altyapıların oluşturulmasıdır (Albeni, 2003, s. 48). Ayrıca dalgalı kur rejimi altında fiyat istikrarının sağlanması, bankacılık sektörü içerisinde yüksek paya sahip olan kamu bankalarının yapılandırılması ve toplumun tüm kesiminin eşit sorumluluklar üstlenerek buna uygun gelirler politikasının yapılması programın diğer amaçları olarak sıralanabilir. Bu amaçların gerçekleştirilebilmesi için siyasi ve ekonomik kesimlerin birbirinden ayrıştırılmasının, toplumsal uzlaşının, kamu kesiminde şeffaflığın ve etkinliğin sağlanmasının önemli olduğu belirtilmiştir. GEGP açısından var olan ve birikerek gelen ekonomik problemlere çözümler üretilmiş olup uzun vadeli ekonomik istikrarın sürdürülebilmesi için yasal düzenlemelerden faydalanılmıştır.

2. Yöntem

Kasım 2000-Şubat 2001 yıllarında yaşanan ikiz krizlerin ardından yapılan “Güçlü Ekonomiye Geçiş Programı”nın öğrenen ekonomi kapsamında ekonominin performansı üzerinde etkisinin olup olmadığının incelenmesi makalenin temel amacını oluşturmaktadır. Bu paralelde çalışmada 1987-2012 dönemine ilişkin çeyrek yıllık GSYİH, enflasyon, cari denge, reel döviz kuru, sanayi üretim endeksi ve faiz oranı değişkenleri kullanılmıştır. Değişkenlerin analizi açısından Eviews 9 ve Gauss 10 programlarından yararlanılmıştır. Ayrıca ekonometrik metodoloji bakımından otoregresif zaman serileri analizi olan Box-Jenkins yönteminin aşamaları takip edilmiştir. Değişkenlerin Box-Jenkins yöntemi kullanılarak modellenenebilmesi için serilerin durağan olması gerekmektedir. Eğer serilerde trend veya mevsimsel etkiler bulunuyorsa bu yapıdaki seriler durağan olmadığı için modellenmesi mümkün değildir. Dolayısıyla çalışmada ilk olarak her bir seriye ilişkin mevsimsel kukla değişkenler oluşturularak mevsimselliğin olup olmadığı regresyon modeli aracılığıyla incelenmiştir. Mevsimsellik içeren seriler Census X-12 yöntemi kullanılarak mevsimsel etkiden arındırılmıştır. Ardından serilerin birim kök taşıyıp taşımadıkları ADF, ADF-GLS, Phillips-Perron ve Ng-Perron testlerinden faydalanılarak araştırılmıştır. Ancak sözü edilen durağanlık testleri yapısal kırılmaları dikkate almadığı için yapısal kırılmaları dikkate alan çift kırılmalı Lee-Strazicich(2003) testi yardımıyla her bir seri sınanmıştır. Yapılan testler sonucunda birim kök içeren serilere fark alma yöntemiyle seriler durağan hale getirilerek modellenmiştir. Çalışmada kullanılan otoregresif modelin gösterimi aşağıdaki gibi ifade edilebilir;

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_n Y_{t-n} + Dummy + \varepsilon_t \quad (1)$$

Yukarıda yer alan (1) numaralı denklemde Y_t serisi çalışmada kullanılan değişkenleri temsil etmektedir. *Dummy* değişkeni ise ikiz krizler sonrasında uygulanan kurumsal ve yapısal düzenlemelerin ekonomiye olan etkisini incelemek için kullanılmıştır. Buna göre kukla değişkene 2002 yılı ve sonrası dönem için “1” ve diğer hallerde ise “0” değeri verilmiştir. Güçlü Ekonomiye Geçiş Programı 2001 yılının Mayıs ayında uygulamaya konulduğu için ekonomi üzerindeki etkilerinin en erken 2002 yılı itibarıyla ortaya çıkacağı düşünülmüştür. Bu sayede ikiz krizler sonrasında yapılan kurumsal ve yasal düzenlemelerin ekonomik performans üzerindeki etkisi görülerek Türkiye ekonomisinin ikiz krizlerden ders alıp almadığı ampirik açıdan öğrenilmeye çalışılacaktır.

3. Uygulama

Census X-12 yöntemine göre enflasyon serisi dışında diğer değişkenlerde mevsimselliğin olmadığı tespit edilmiştir. Enflasyon serisi mevsimsellikten arındırılarak diğer değişkenlerle birlikte durağanlık analizine tabi tutulmuştur. Hem yapısal kırılmayı dikkate alan hem de yapısal kırılmayı dikkate almayan birim kök testleri sonuçlarına göre GSYİH, sanayi üretim endeksi, reel döviz kuru ve enflasyon serilerinin durağan olmadığı görülmüştür. Faiz oranı ile cari denge serisinin ise durağan olduğu tespit edilmiştir. Durağan olmayan serilerin farkı alınıp yeniden aynı testlerle sınıdığında serilerin durağan hale geldiği görülmüştür. Değişkenlerin durağanlık süreçlerinden sonra Box-Jenkins analizi yardımıyla her bir değişken için en uygun otoregresif

model belirlenmiştir. Bu aşamada Eviews 9 programına ait “Automatic ARIMA Selection” kısmından faydalanarak en düşük AIC değerine sahip model seçilmiştir. Buna göre *GSYİH* değişkeni için *ARIMA (0,1,10)*, enflasyon değişkeni için *SARIMA (2,1,2)(0,0,4)*, sanayi üretim endeksi için *ARIMA (0,1,10)*, reel döviz kuru için *SARIMA (0,1,3)(0,0,1)* faiz oranı için *SARIMA(0,0,1)(1,0,0)* ve cari denge değişkeni için ise *SARIMA (0,0,2)(0,0,4)*’ün en uygun modeller olduğuna karar verilmiştir. Elde edilen modellere Dummy değişkeninin katılmasıyla modellerin tahmin aşamasına geçilmiştir. Tahmin sonucunda elde edilen Dummy değişkeninin her bir seri için işaret ve katsayılarına bakılmıştır. Buna göre Güçlü Ekonomiye Geçiş Programı ile uygulamaya konan politikaların GSYİH, sanayi üretim endeksi ve reel döviz kuru verileri üzerinde istatistiksel olarak pozitif anlamlı bir etki yarattığı, faiz oranı ve cari denge değişkenleri üzerinde ise istatistiksel olarak anlamlı ve negatif bir etkide bulunduğu görülmektedir. Ayrıca enflasyon serisine ait Dummy değişkenine ait işaretin pozitif fakat istatistiksel olarak anlamsız olduğu görülmektedir.

4. Sonuç

Değişkenler açısından elde edilen sonuçlara göre ikiz krizler sonrasında uygulanan Güçlü Ekonomiye Geçiş Programının yapısal ve kurumsal düzenlemeleri GSYİH, sanayi üretim endeksi ve reel döviz kurunda artış yaratmıştır. Buna ilave olarak elde edilen sonuca göre söz konusu program cari denge ve faiz oranı değişkenlerinin azalmasını sağlamıştır. Enflasyon değişkeninde ise anlamlı bir sonuç ortaya çıkmamıştır. Dolayısıyla genel olarak 2001 Güçlü Ekonomiye Geçiş Programı ile yapılan düzenlemeler ekonominin performansını artırıcı etkide bulunmuş ve enflasyon harici diğer değişkenleri beklenildiği yönde etkilemiştir. Bu kapsamda Türkiye ekonomisi Kasım 2000 ve Şubat 2001 krizlerinden gerekli dersleri çıkarmış ve söz konusu olumsuz ve zorlu süreçten öğrenen ekonomi olarak çıkabilmiştir. Bir diğer deyişle söz konusu ikiz kriz sonrasında uygulamaya konan yeni politikalarda öğrenen ekonomi etkileri görülmektedir. Karaçor (2006)’nın da belirttiği gibi Kasım 2000 ve Şubat 2001 krizleri Türkiye ekonomisini karar vermeye zorlayarak öğrenen ekonomi olma yolunda bir dönüm noktası olmuşlardır.

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