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CONTENT

Title and Author/s	Page
1. Determination of micro and macro factors affecting cash dividend payout policies by panel data analysis: A research on BIST 100 index <i>Nakit kar payı dağıtım politikalarını etkileyen mikro ve makro değişkenlerin panel veri analizi ile tespit edilmesi: BIST 100 endeksi üzerine bir araştırma</i> <i>Emre Esat Topaloglu, Turhan Korkmaz.....</i>	<i>1-18</i>
DOI: 10.17261/Pressacademia.2019.1024 JEFA- V.6-ISS.1-2019(1)-p.1-18	
2. Interest rate risk of banking sector: The effect of maturity gap on net interest income in Indonesia <i>Andewi Rokhmawati.....</i>	<i>19-31</i>
DOI: 10.17261/Pressacademia.2019.1025 JEFA- V.6-ISS.1-2019(2)-p.19-31	
3. Determinants of Jordan-Turkish bilateral trade balance <i>Mutasem Jaloudi, Omar Harb.....</i>	<i>32-40</i>
DOI: 10.17261/Pressacademia.2019.1026 JEFA- V.6-ISS.1-2019(3)-p.32-40	
4. Economic sanctions and globalization: Assessing the impact of the globalization level of target state on sanctions efficacy <i>Murad Duzcu.....</i>	<i>41-54</i>
DOI: 10.17261/Pressacademia.2019.1027 JEFA- V.6-ISS.1-2019(4)-p.41-54	
5. A research on interaction between bitcoin and foreign exchange rates <i>Mustafa Ozyesil.....</i>	<i>55-62</i>
DOI: 10.17261/Pressacademia.2019.1028 JEFA- V.6-ISS.1-2019(5)-p.55-62	



DETERMINATION OF MICRO AND MACRO FACTORS AFFECTING CASH DIVIDEND PAYOUT POLICIES BY PANEL DATA ANALYSIS: A RESEARCH ON BIST 100 INDEX

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ABSTRACT

Purpose - It was aimed to determine the micro and macro factors affecting the dividend policies of firms. Firms in Borsa İstanbul 100 Index, whose shares are traded on a regular basis and which are not active in the financial sector have been analyzed.

Methodology - Relationship between the dividend policies of firms and micro and macro factors have been analyzed using the panel data method. And We used the White's cross section coefficient covariance method in order to account for heteroscedasticity effects.

Findings - A statistically significant and positive relationship was observed between payout ratio and return on assets, financial leverage and market value. Significant and negative relationship was observed between payout ratio and assets structure, growth opportunity, firm size and inflation rate. There was no significant relationship between payout ratio and liquidity ratio, gold price and interest rate.

Conclusion - These findings support bird in the hand, tax effect, signal and agency theories.

Keywords: Dividend, micro factor, macro factor, panel data analysis, BIST 100.

JEL Codes: C33, C82, E44

NAKİT KAR PAYI DAĞITIM POLİTİKALARINI ETKİLEYEN MİKRO VE MAKRO DEĞİŞKENLERİN PANEL VERİ ANALİZİ İLE TESPİT EDİLMESİ: BIST 100 ENDEKSİ ÜZERİNE BİR ARAŞTIRMA

ÖZET

Amaç - Firmaların nakit kar payı dağıtım politikalarına etki eden mikro ve makro faktörlerin belirlenmesi amaçlanmıştır. Borsa İstanbul 100 Endeksi'nde payları devamlı olarak işlem gören ve mali sektörde faaliyet göstermeyen otuz üç firmanın 2010-2016 dönemindeki verileri incelenmiştir.

Metodoloji - Nakit kar payı dağıtım politikaları ile mikro ve makro faktörler arasındaki ilişki panel veri yöntemi kullanılarak analiz edilmiştir. Yatay kesitler arasındaki farklı hata varyanslarının yanı sıra korelasyon sorununa da çözüm üreten White'in standart hataların düzeltilmesi yöntemi kullanılmıştır.

Bulgular - Analiz sonucunda, nakit kar payı dağıtım oranı ile aktif karlılık oranı, finansal kaldıraç ve piyasa değeri arasında anlamlı ve pozitif ilişki tespit edilirken; varlık yapısı, büyüme fırsatı, firma büyüklüğü ve enflasyon oranı arasında anlamlı ve negatif ilişki tespit edilmiştir. Likidite oranı, altın fiyatı ve faiz oranı ile nakit kar payı dağıtım oranı arasında ise anlamlı herhangi bir ilişki bulunmamıştır.

Sonuç- Çalışmadan elde edilen bulguların, eldeki kuş, vergi etkisi, sinyal ve temsil maliyeti teorilerini desteklediği belirlenmiştir.

Anahtar Kelimeler: Karpayı, mikro faktör, makro faktör, panel veri analizi, BIST 100.

JEL Kodları: C33, C82, E44.

1. GİRİŞ

Firmaların gerek ulusal gerekse uluslararası piyasalarda varlıklarını sürdürebilmeleri ve rekabet avantajı elde edebilmeleri için yürütmüş oldukları finansman, yatırım ve kar payı dağıtım politikaları önem arz etmektedir. Finansal küreselleşme ile birlikte gelişim ve büyüme süreçlerinin son derece hızlı geliştiği firmalarda, piyasa değerini maksimize edebilmek için elde edilen karın ne kadarının yatırımlarda kullanılacağı ya da hangi oranda hissedarlara kar payı olarak dağıtılacağı ve bu dağıtımın sabit tutarda veya oranda yapılıp yapılmayacağı da kar payı dağıtım politikasının belirlenmesi açısından önemli bir konudur. Firmalar uygulamış oldukları kar payı dağıtım politikaları ile sermaye piyasalarından fon ihtiyaçlarını karşılayabilmekte, yatırımcıları kendilerine çekebilme ve piyasa değerlerini artırabilmektedir. Finans literatüründe, kar payı dağıtım politikaları ile firma değeri arasındaki ilişkiyi açıklayan yaklaşım ve teorilerin geliştirildiği temel nitelikte çalışmalar söz konusudur.

Firmaların kar payı dağıtım politikalarına etki eden faktörleri belirleyebilmek için Lintner (1956) tarafından yapılan çalışma, konuya ilişkin gerçekleştirilen öncü çalışmalardan biri konumundadır. Bu çalışma sonrasında, kar payı dağıtım politikasını etkileyen faktörler ile piyasa değerleri arasındaki ilişkiyi açıklamaya yönelik birçok yaklaşım ve teori geliştirilmiştir.

Kar payı dağıtım politikalarına ilişkin ilintisizlik teorisi ve eldeki kuş teorisi gibi temel iki görüşün olmasının yanı sıra vergi etkisi teorisi, müşteri etkisi teorisi, sinyal etkisi teorisi ve temsil maliyeti teorisi gibi görüşler de söz konusudur (Ceylan ve Korkmaz, 2017: 298).

İlintisizlik teorisinde, kar payı dağıtım politikası ile firma değeri ve finansman kararları arasında herhangi bir ilişkinin olmadığını öngörmüştür. Diğer bir deyişle teoride, firmanın yatırım kararının ve sermaye yapısının kar payı dağıtım politikasından bağımsız olduğu savunulmaktadır. Teoriye göre firma değeri, varlıkların kazanma gücüne, firmanın risklilik düzeyine ve yatırım politikalarına bağlı olarak değişmektedir. İlintisizlik teorisinde yatırımcılar, cari dönemde dağıtılacak kar payı ile gelecek dönemde elde edilecek sermaye kazancı arasında kayıtsız kalmaktadır. Piyasaların etkin olduğu varsayımı altında yatırımcılar, sermaye kazancını sahip oldukları pay senetlerini satarak elde edebilecekleri gibi, firmada kalan karın kar payı olarak dağıtılması durumunda ise likidite ihtiyacı içerisinde olmayan yatırımcılar firmanın pay senetlerini satın alabilmektedir. Dolayısıyla yatırımcılar sermaye kazancı ya da kar payı dağıtım kararı arasında yaptıkları tercihler doğrultusunda firmanın kar payı dağıtım politikasını belirleyebilmektedir (Modigliani ve Miller, 1961).

Lintner (1962) ve Gordon (1963) tarafından gerçekleştirilen çalışmalarda geliştirilen eldeki kuş teorisinde, Modigliani ve Miller ilintisizlik teorisinin aksine, kar payı dağıtım politikalarının firma değerini etkilediği öngörülmektedir. Teoriye göre kar payı kazancı eldeki kuşu ifade ederken, sermaye kazancı ise daldaki kuşu temsil etmektedir. Yatırımcıların riskten kaçındıkları dikkate alındığında risk düzeyi daha düşük olan kar payı ödemelerine, riskin daha yüksek olduğu sermaye kazancına göre daha düşük iskonto uyguladıkları söylenebilir (Gürsoy, 2014: 611). Diğer bir deyişle, sermaye kazancı üzerindeki belirsizlik, kar payı kazancı için geçerli olmadığından kar payı kazancı, sermaye kazancına göre daha üstündür.

Vergi etkisi teorisine göre, farklı zamanlarda ortaya çıkan ve farklı vergi oranlarına tabi olan sermaye ve kar payı kazançlarının firma değerini etkilediği görüşü söz konusudur. Firmaların ihtiyaç duydukları fonları otofinansman yoluyla sağlayabilmeleri için birçok ülke kar payı kazancına daha yüksek vergi uygulamaktadır. Böylelikle sermaye birikimi teşvik edilerek otofinansman özendirilmektedir. Dolayısıyla Lintner ve Gordon'un tersine vergi teorisinde, sermaye maliyetini düşürebilmek için kar payı dağıtım oranının azaltılması benimsenmektedir. Diğer taraftan, piyasaların etkin olduğu varsayımı altında vergi uygulamalarının sermaye ya da kar payı kazançları açısından farklılık yaratmadığını belirtmişlerdir. Ancak rasyonel piyasa koşulları dikkate alındığında firma paydaşları açısından vergi etkisinin kar payı politikalarına ve firma değerine herhangi bir etkisinin olmadığı varsayımı gerçeği yansıtmamaktadır (Modigliani ve Miller, 1961).

Kar payı dağıtım politikaları ile firma değeri arasındaki ilişkiye yönelik bir diğer yaklaşım da müşteri etkisi teorisidir. Teoriye göre, kar payı kazancını tercih eden, sermaye kazancını tercih eden ve her iki kazanç arasında kayıtsız kalan yatırımcılar söz konusudur. Yatırımcılar farklı vergilendirme uygulamaları doğrultusunda yatırım yapacakları firmaları belirlemektedir. Sermaye kazancına ilişkin vergi avantajlarından faydalanmak isteyen yatırımcılar, nakit temettü ödemesi yapan firmalara yatırım yapmamakta ya da mevcut pay senetlerini satmaktadırlar. Böylelikle yatırımcılar, vergi uygulamaları doğrultusunda firmalara yatırım yapmakta ve firmaların piyasa değerlerini etkilemektedir (Diacogiannis, 1993).

Sinyal etkisi teorisine göre, kar payı dağıtım politikalarındaki değişimler, firmaların mevcut ve gelecekteki karlılık durumları hakkında başta yatırımcılar olmak üzere piyasalara da bilgi sunmaktadır. Firmalar, yatırım politikası, sermaye yapısı ve kar payı dağıtım kararlarına ilişkin gerçekleştirdikleri uygulamalar neticesinde, bilgi düzeylerindeki farklılıklardan dolayı ortaya çıkan asimetric bilgi sorununu ortadan kaldırarak, piyasada ve yatırımcılarda olumlu bir algı oluşturabilmektedir. Bu durum da firmanın piyasa değerini etkilemektedir. Kar payı dağıtım oranının düşük olduğu firmalarda, yatırımları finanse edebilmek için

otofinansman kararı alınabilmektedir. Dönem boyunca yürütülen faaliyetler sonucu elde edilen kazancın pay sahiplerine dağıtılmayıp, net bugünkü değeri pozitif olarak belirlenen yatırımlara yönlendirilmesi, yatırımcılarda firmanın mali durumunun yetersiz ve iyi olmadığı gibi yanlış algılara yol açabilmektedir. Buna karşın daha yüksek kar payı dağıtımını piyasalara aktaran firmalar için yatırımcılar, karlılık düzeylerinin yükseldiğini, mali durumun iyi olduğunu ve bu nedenle daha yüksek oranda kar payı dağıtımının yapıldığını varsaymaktadır. Dolayısıyla yatırımcılar, firmaların piyasaya ilettikleri sinyaller doğrultusunda pay senetlerine yatırım kararı almaktadırlar (Harris ve Raviv, 1991; Van Horne ve Wachowicz, 1997).

Temsil maliyeti teorisi, firma yöneticileri, pay sahipleri ve firmaya borç verenler arasındaki çıkar çatışmaları sonucu ortaya çıkan maliyetleri içermektedir. Pay sahipleri ve yöneticiler firmadaki konum ve güçlerini kullanarak firma değerini maksimize etmek yerine, kişisel çıkarlarını maksimize etme çabasına girmektedir. Diğer bir ifadeyle, firma içerisindeki bu gruplar firma kazancının kendilerine aktarılmasını talep etmektedirler. Pay sahipleri, firmanın karlılığı yüksek ve net bugünkü değerleri pozitif olan yatırımlara yönelerek daha yüksek oranda kar payı dağıtımını gerçekleştirmelerini istemektedirler. Kar payı dağıtım oranının yüksek olduğu firmalarda likidite düşük olmakta ve yöneticiler devamlı olarak yeni yatırım fırsatı arayışına girmektedir. Kaynakların devamlı olarak yeni yatırımlara aktarıldığı firmalarda yöneticiler, bu fonları kendi çıkarları doğrultusunda kullanamamaktadır. Bu durum da firma içerisindeki temsil maliyetleri azalmaktadır. Dolayısıyla kar payı dağıtım oranının yüksek olduğu firmalarda yöneticiler, kaynakları verimli ve net bugünkü değeri pozitif olan yatırımlara yönlendirerek, diğer koşullar sabit varsayıldığında, firma değerini yükseltebilmektedir. Kar payı dağıtım oranının yüksek olması, pay sahiplerinin çıkarlarına daha fazla hizmet etmektedir. Dolayısıyla firmaya borç verenler açısından kar payı dağıtım oranının düşük olması tercih edilmektedir. Bu bağlamda borç verenler, firmaya kaynak aktarımı yaparken, firmanın kar payı dağıtım politikalarına kısıtlama getirerek, kendi menfaatlerini koruyabilmektedir (Jensen ve Meckling, 1976).

Kar payı dağıtım politikası ile firma değeri arasındaki ilişkiye yönelik olarak geliştirilen teoriler doğrultusunda, firmalar açısından kar payı dağıtım politikalarının en az yatırım ve finansman politikaları kadar önemli olduğunu söylemek mümkündür. Dolayısıyla firmaların kar payı dağıtım politikalarına etki eden mikro ve makro faktörlerin belirlenmesi gerekmektedir. Bu amaçla çalışmada, Borsa İstanbul 100 Endeksinde 2010-2016 döneminde pay senetleri devamlı olarak işlem gören firmaların nakit kar payı dağıtım politikaları ile mikro ve makro faktörler arasındaki ilişki panel veri analizi yardımıyla incelenmiştir. Çalışmada ilk olarak konuya ilişkin ulusal ve uluslararası yazında yapılmış önceki çalışmaların yer aldığı literatür taramasına yer verilmiştir. Ardından çalışmanın metodolojik bilgilerine ve gerçekleştirilen analiz neticesinde elde edilen bulgulara değinilmiştir. Sonrasında ise sonuç ve değerlendirmeler açıklanarak, daha sonraki çalışmalara yönelik öneriler sunulmuştur. Bu çalışmada, payları Borsa İstanbul'da işlem gören ve BİST 100 endeksinde dâhil olan firmaların nakit kar payı dağıtım politikalarına etki eden mikro ve makro faktörler tespit edilmeye çalışılmıştır. Çalışmada nakit kar payı dağıtım oranına odaklanılması, kar payı dağıtım politikasına etki eden mikro ve makro faktörlerin bir arada incelenmesi gibi faktörler doğrultusunda çalışmanın özgünlük sunduğu ve literatüre katkı sağladığı düşünülmektedir.

2. KONUYA İLİŞKİN OLARAK GERÇEKLEŞTİRİLEN ÖNCEKİ ÇALIŞMALARDA ELDE EDİLEN ARAŞTIRMA BULGULARI

Nakit kar payı dağıtım politikasına etki eden mikro faktörlere ilişkin olarak ulusal ve uluslararası literatürde birçok çalışma söz konusudur. Ancak kar payı dağıtım politikasına etki eden makro faktörlerin incelendiği çalışma sayısı sınırlıdır. Gelişmekte olan ülke konumunda olan Türkiye'nin majör borsa endeksinin araştırmaya konu olması doğrultusunda literatür taraması ağırlıklı olarak gelişmekte olan ülkeler kapsamında gerçekleştirilmiştir. Bu bağlamda konuya ilişkin olarak gerçekleştirilen önceki çalışmaların kapsamı ve ulaşılan bulguların yer aldığı literatür taraması kronolojik sıralama esas alınarak aşağıda Tablo 1'de açıklanmıştır.

Tablo 1: Kar Payı Dağıtım Politikasını Etkileyen Faktörlere İlişkin Literatür Özeti

Yıl	Yazarlar	Ülke	Kapsam	Yöntem	Değişkenler	Bulgular
2006	Amidu ve Abor	Gana	1998-2003 Dönemi Borsada işlem gören 22 firma	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı, ▪ Karlılık, ▪ Serbest nakit akışı, ▪ Vergi oranı, ▪ Büyüme, ▪ Holdingleşme, ▪ Risk ▪ Piyasa değeri/defter değeri 	Kar payı dağıtım oranı ile karlılık, serbest nakit akışı ve vergi arasında istatistikî olarak anlamlı ve pozitif ilişki belirlenirken, büyüme, holdingleşme, risk ve piyasa değeri/defter değeri ile kar payı dağıtım oranı arasında istatistikî olarak anlamlı ve negatif ilişki belirlenmiştir.
2007	Al	Amman	1992-2002	Tobit regresyon	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Firma büyüklüğü 	Kar payı dağıtım oranı ile firma büyüklüğü, yaşı ve karlılık arasında istatistikî olarak

	Malkawi		Dönemi	analizi	<ul style="list-style-type: none"> Firma yaşı Karlılık Finansal kaldıraç 	anlamli ve pozitif ilişki, finansal kaldıraç ile kar payı dağıtım oranı arasında anlamli ve negatif ilişki tespit edilmiştir.
			Borsada farklı sektörlerde işlem gören firmalar			
2008	Ahmed ve Javid	Pakistan	2001-2006 dönemi	Dinamik panel veri modeli	<ul style="list-style-type: none"> Kar payı dağıtım oranı Karlılık Serbest nakit akışı Firma büyüklüğü Yatırım fırsatları Sahiplik yapısı Likidite Büyüme fırsatı Finansal kaldıraç 	İstikrarlı ve karlılık düzeyi yüksek olan firmaların daha fazla serbest nakit akışına ve kar payı dağıtım oranına sahip oldukları belirlenmesinin yanı sıra, firma büyüklüğü ve yatırım fırsatları ile kar payı dağıtım oranı arasında anlamli ve negatif ilişki tespit edilirken, sahiplik yapısı ve likidite ile anlamli ve pozitif ilişki tespit edilmiştir. Bu karşın çalışmada, büyüme fırsatı ve finansal kaldıraç ile kar payı dağıtım oranı arasında anlamli bir ilişki bulunamamıştır.
2008	Anil ve Kapoor	Hindistan	2000-2006 dönemi	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı Karlılık Kurumlar vergisi Büyüme Piyasa değeri/defter değeri Nakit akışı Beta 	Karlılık, kurumlar vergisi, büyüme ve piyasa değeri/defter değeri ile kar payı dağıtım oranı arasında anlamli bir ilişki bulunamazken, nakit akışı ve beta ile kar payı dağıtım oranı arasında ise anlamli ilişki bulunmuştur.
			Hindistan'da faaliyet gösteren teknoloji firmaları			
2010	Gill vd.	ABD	Amerika Birleşik Devletleri'nde hizmet ve imalat sektöründe faaliyet gösteren 266 firma	OLS regresyon	<ul style="list-style-type: none"> Kar payı dağıtım oranı Aktif karlılık oranı Büyüme fırsatı Vergi Endüstri Nakit akımı Piyasa değeri/defter değeri Finansal kaldıraç oranı 	Aktif karlılık oranı ve büyüme fırsatı ile kar payı dağıtım oranı arasında anlamli ve negatif ilişkinin varlığı ortaya çıkarılırken, vergi ve endüstri ile kar payı dağıtım oranı arasında ise anlamli ve pozitif ilişkinin varlığı ortaya çıkarılmıştır. Diğer taraftan çalışmada, nakit akımı, piyasa değeri/defter değeri ve finansal kaldıraç oranı ile kar payı dağıtım oranı arasında anlamli herhangi bir ilişki bulunamamıştır
2010	Afza ve Mirza	Pakistan	2005-2007 Dönemi Borsada işlem gören firmalar	En küçük kareler regresyon analizi	<ul style="list-style-type: none"> Kar payı dağıtım ödemeleri Sahiplik yapısı Yönetim yapısı Finansal kaldıraç oranı Firma büyüklüğü Nakit akımı Serbest nakit akışı Karlılık 	Analiz neticesinde, kar payı dağıtım ödemeleri ile sahiplik ve yönetim yapısı, finansal kaldıraç oranı, firma büyüklüğü ve nakit akımı arasında istatistikî olarak anlamli ve negatif ilişki tespit edilirken, serbest nakit akışı ve karlılık ile kar payı dağıtım oranı arasında anlamli ve pozitif ilişki tespit edilmiştir.
2011	Imran	Pakistan	1996-2008 Dönemi	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı Geçmiş yıl kar payı dağıtım oranı, Hisse başı kazanç Karlılık Büyüme fırsatı Firma büyüklüğü Nakit akımları Likidite oranı 	Kar payı dağıtım oranı ile geçmiş yıl kar payı dağıtım oranı, hisse başı kazanç, karlılık, büyüme fırsatı ve firma büyüklüğü arasında anlamli ve pozitif ilişki tespit edilirken, kar payı dağıtım oranı ile nakit akımları arasında ise anlamli ve negatif ilişki tespit edilmiştir. Buna karşın çalışmada, likidite oranı ile kar payı dağıtım oranı arasında ise anlamli bir ilişki bulunamamıştır.
2011	Al Shubiri	Ürdün	2005-2009	Tobit ve	<ul style="list-style-type: none"> Kar payı dağıtım oranı Finansal kaldıraç oranı 	Kar payı dağıtım oranı ile finansal kaldıraç oranı, sahiplik yapısı, firma riski ve varlık

			Dönemi	Logit regresyon yöntemleri	<ul style="list-style-type: none"> Sahiplik yapısı Firma riski Varlık yapısı Karlılık Büyüme fırsatı Serbest nakit akışı 	yapısı arasında istatistikî olarak anlamlı ve negatif ilişki belirlenirken, karlılık, büyüme fırsatı ve serbest nakit akışı ile kar payı dağıtım oranı arasında ise anlamlı ve pozitif ilişki belirlenmiştir.
2012	Patra vd.	Yunanistan	Mali sektör dışında faaliyet gösteren 63 firma	Dinamik panel veri modeli	<ul style="list-style-type: none"> Kar payı dağıtım oranı ROE (Özsermaye Karlılık Oranı) Firma büyüklüğü Likidite oranı Yatırım fırsatı Finansal kaldıraç Firma riski 	Analiz neticesinde ROE, firma büyüklüğü ve likidite oranı ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişkinin varlığı ortaya çıkarılırken, yatırım fırsatı, finansal kaldıraç ve firma riski ile kar payı dağıtım oranı arasında ise anlamlı ve negatif ilişkinin varlığı ortaya çıkarılmıştır.
2012	Mehta	Birleşik Arap Emirlikleri	2005-2009 Dönemi Abu Dhabi Borsası'nda işlem gören ve farklı sektörlerde faaliyet gösteren firmaları	Korelasyon ve çoklu regresyon analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı Finansal kaldıraç oranı ROE Fiyat/kazanç oranı Kar payı dağıtım oranı ROA (Aktif Karlılık Oranı) Hisse başı kazanç Likidite oranı 	Firma büyüklüğü ile kar payı dağıtım oranı arasında pozitif ilişki belirlenirken, ROE ve risk ölçütü olarak ele alınan fiyat/kazanç oranı ile kar payı dağıtım oranı arasında ise negatif ilişki belirlenmiştir. Buna karşın ROA, hisse başı kazanç, likidite ve finansal kaldıraç oranı ile kar payı dağıtım oranı arasında anlamlı bir ilişki tespit edilmemiştir.
2013	Komratta napanya	Tayland	2006-2010 Dönemi Borsada pay senetleri işlem gören 435 firma	Tobit regresyon analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı Satışların büyüklüğü Kaldıraç oranı Firma büyüklüğü Karlılık Likidite oranı Firma riski 	Kar payı dağıtım oranı ile yatırım fırsatları, satışların büyüklüğü ve kaldıraç oranı arasında istatistikî olarak anlamlı ve negatif ilişki tespit edilirken, firma büyüklüğü ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki tespit edilmiştir. Ayrıca çalışmada, kar payı dağıtım oranı ile karlılık, likidite oranı ve firma riski arasında istatistikî olarak anlamlı herhangi bir ilişki bulunmamıştır.
2013	Uwuigbe	Nijerya	2006-2011 dönemi Borsada pay senetleri işlem gören 50 firma	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı ROE Firma büyüklüğü Finansal kaldıraç Yönetim kurulu bağımsızlığı 	Analiz neticesinde, ROE, firma büyüklüğü ve yönetim kurulu bağımsızlığı ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki belirlenirken, finansal kaldıraç ile kar payı dağıtım oranı arasında ise anlamlı ve negatif ilişki belirlenmiştir.
2013	Musiega vd.	Kenya	2007-2011 dönemi Nairobi Borsası'nda işlem gören ve mali sektörde faaliyet göstermeyen 50 firma	Tanımlı ayıcı istatistik ve çoklu regresyon analizi	<ul style="list-style-type: none"> Kar payı dağıtım oranı ROE Mevcut kazançlar Büyüme fırsatları 	ROE, mevcut kazançlar ve büyüme fırsatları ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki tespit edilmiştir.

2014	Yıldız vd.	Türkiye	2003-2010 dönemi	Borsa İstanbul sanayii sektöründe faaliyet gösteren 118 firma	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Karlılık ▪ Büyüme fırsatları ▪ Firma büyüklüğü ▪ Halka açıklık oranı ▪ Sahiplik yapısı ▪ Finansal kaldıraç ▪ Vergi oranı ▪ Yatırımlar ▪ Likidite oranı ▪ Yönetim bağımsızlığı ▪ Serbest nakit akışı ▪ Faaliyet riskleri 	Kar payı dağıtım politikaları ile vergi, karlılık, büyüme fırsatları, firma büyüklüğü ve likidite arasında istatistikî olarak anlamlı ve pozitif ilişki tespit edilirken, finansal kaldıraç ile anlamlı ve negatif ilişki tespit edilmiştir. buna karşın halka açıklık oranı, yatırım, sahiplik yapısı, faiz, vergi ve amortisman öncesi kar marjı ve nakit akışı ile kar payı dağıtım politikaları arasında istatistikî olarak herhangi bir ilişki tespit edilmemiştir.
2014	Sanjari ve Zarei	İran	2009-2013 dönemi	Tahran Borsası'nda pay senetleri işlem gören firmalar	Korelasyon ve çoklu regresyon analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ ROA ▪ Büyüme fırsatı ▪ Finansal kaldıraç ▪ Firma büyüklüğü ▪ Likidite oranı 	Finansal kaldıraç, firma büyüklüğü ve likidite ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki belirlenirken, büyüme ve ROA ile kar payı dağıtım oranı arasında anlamlı ve negatif ilişki belirlenmiştir.
2015	Kuzucu	Türkiye	2006-2013 dönemi	Pay senetleri Borsa İstanbul'da işlem gören 142 firma	Panel veri analiz yöntemi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Büyüme oranı ▪ Karlılık ▪ Finansal kaldıraç ▪ Firma büyüklüğü ▪ Fiyat/kazanç oranı ▪ Firma yaşı 	Kar payı dağıtım oranı ile büyüme oranı, karlılık ve finansal kaldıraç arasında istatistikî olarak anlamlı ve negatif ilişkinin varlığı ortaya çıkarılırken; firma büyüklüğü, fiyat/kazanç oranı ve firma yaşı ile kar payı dağıtım oranı arasında ise anlamlı ve pozitif ilişkinin varlığı ortaya çıkarılmıştır.
2016	Yusuf ve İsmail	Malezya	2006-2010 dönemi	Borsada işlem gören 147 firma	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Hisse başı kazanç ▪ Serbest nakit akımı ▪ Finansal kaldıraç ▪ Büyüme fırsatı ▪ Firma büyüklüğü ▪ Sahiplik yapısı ▪ Risk ▪ Gecikmeli kar payı dağıtımı 	Hisse başı kazanç, firma büyüklüğü ve yatırım fırsatı ile kar payı dağıtım politikası arasında anlamlı ve pozitif ilişki tespit edilirken, finansal kaldıraç ve sahiplik yapısı ile kar payı dağıtım politikası arasında ise anlamlı ve negatif ilişki tespit edilmiştir.
2016	Banerjee	Hindistan	2010-2014 dönemi	4 teknoloji firması	Çoklu regresyon analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Finansal kaldıraç ▪ Fiyat/kazanç oranı ▪ ROE 	Kar payı dağıtım oranı ile finansal kaldıraç, fiyat/kazanç oranı ve ROE arasında anlamlı ve pozitif ilişkinin varlığı ortaya çıkarılmıştır.
2016	Labhane ve Mahakud	Hindistan	1994-1995 ile 2012-2013 dönemleri	Borsada pay senetleri devamlı olarak işlem gören firmalar	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ ROA ▪ Vergi oranı ▪ Yatırım fırsatı ▪ Finansal kaldıraç ▪ Varlık yapısı ▪ Firma riski ▪ Firma büyüklüğü 	Kar payı dağıtım oranı ile likidite, ROA ve firma büyüklüğü arasında anlamlı ve pozitif ilişki tespit edilirken, yatırım fırsatı, finansal kaldıraç, varlık yapısı, firma riski ve vergi ile kar payı dağıtım oranı arasında anlamlı ve negatif ilişki tespit edilmiştir. Buna karşın çalışmada, kar payı dağıtım oranı ile serbest nakit akışı arasında anlamlı herhangi bir ilişki bulunamamıştır.
2016	Sheikh vd.	Pakistan	2005-2014 dönemi		En küçük kareler yöntemi ve panel veri	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Karlılık ▪ Firma büyüklüğü 	Karlılık, firma büyüklüğü ve finansal kaldıraç ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişkinin varlığı ortaya çıkarılırken,

			KSE Borsası'nda işlem gören ve mali sektörde faaliyet gösteremeyen 272 firma	analizi	<ul style="list-style-type: none"> ▪ Kazançlardaki volatilité ▪ Varlık yapısı ▪ Likidite ▪ Büyüme olanakları ▪ Finansal kaldıraç 	varlık yapısı ve likidite ile kar payı dağıtım oranı arasında ise anlamlı ve negatif ilişkinin varlığı ortaya çıkarılmıştır. Buna karşın çalışmada, büyüme olanakları ve kazançlardaki volatilité ile kar payı dağıtım oranı arasında anlamlı herhangi bir ilişki bulunmamıştır.
2017	Erdaş	Türkiye	2010-2015 dönemi 12 farklı sektörde faaliyet gösteren ve devamlı olarak kar payı dağıtım yapan Borsa İstanbul 30 Endeksi'nde işlem gören firmalar	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Aktif karlılık oranı ▪ Firma büyüklüğü ▪ Firma yaşı ▪ Finansal kaldıraç oranı ▪ Nakit oran ▪ Pay başına kazanç ▪ Büyüme fırsatı ▪ Pay senedi piyasa değeri, ▪ İşlem hacmi ▪ Halka açıklık oranı 	Firma büyüklüğü, nakit oran, pay başına kazanç ve pay senedi piyasa değeri ile kar payı dağıtım oranı arasında istatistikî olarak anlamlı ve pozitif ilişki belirlenirken, finansal kaldıraç ve firma yaşı ile anlamlı ve negatif ilişki belirlenmiştir. Diğer taraftan büyüme fırsatı, işlem hacmi, aktif karlılık oranı ve halka açıklık oranı ile kar payı dağıtım oranı arasında istatistikî olarak anlamlı bir sonuç elde edilememiştir.
2017	Sasu vd.	Gana	2009-2014 dönemi Borsada pay senetleri işlem gören firmalar	En küçük kareler yöntemi ve panel veri analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ Kurumlar vergisi ▪ ROE ▪ Firma yaşı ▪ Varlık yapısı ▪ Faiz oranı 	Kurumlar vergisi, ROE, firma yaşı ve varlık yapısı ile kar payı dağıtım politikası arasında anlamlı ve negatif ilişki tespit edilirken, faiz oranı ile kar payı dağıtım politikası arasında anlamlı ve pozitif ilişki tespit edilmiştir.
2017	Khan ve Ahmad	Pakistan	2009-2014 dönemi Borsada işlem gören ilaç firmaları	Korelasyon ve çoklu regresyon analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ ROA ▪ Denetim şekli ▪ Büyüme olanakları ▪ Likidite ▪ Vergi ▪ Firma riski ▪ Finansal kaldıraç ▪ Firma büyüklüğü 	ROA ve denetim şekli ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki belirlenirken, büyüme olanakları ve likidite ile kar payı dağıtım oranı arasında ise anlamlı ve negatif ilişki belirlenmiştir. Buna karşın çalışmada, vergi, firma riski, finansal kaldıraç ve firma büyüklüğü ile kar payı dağıtım oranı arasında istatistikî olarak anlamlı herhangi bir ilişki bulunmamıştır.
2017	Alber ve Alhabetour	Suudi Arabistan	2006-2014 dönemi Borsada işlem gören 67 firma	Lojistik regresyon analizi	<ul style="list-style-type: none"> ▪ Kar payı dağıtım oranı ▪ ROA ▪ Firma büyüklüğü ▪ Firma yaşı ▪ Geçmiş yıl kar payı dağıtım oranı ▪ Finansal kaldıraç ▪ Yatırım fırsatları 	Finansal olmayan firmalarda ROA, firma büyüklüğü, firma yaşı ve geçmiş yıl kar payı dağıtım oranı ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki belirlenirken, finansal kaldıraç ve yatırım fırsatları ile kar payı dağıtım oranı arasında ise anlamlı ve negatif ilişki belirlenmiştir. Finansal firmalarda ise firma büyüklüğü, firma yaşı ve geçmiş yıl kar payı dağıtım oranı ile kar payı dağıtım oranı arasında anlamlı ve pozitif ilişki belirlenirken, finansal kaldıraç ile kar payı dağıtım oranı arasında anlamlı ve negatif ilişki belirlenmiştir. Buna karşın yatırım fırsatları ile kar payı dağıtım oranı arasında ise istatistikî olarak herhangi bir anlamlı ilişki tespit edilmemiştir.

3. VERİ SETİ, MODEL, YÖNTEM VE TAHMİN SONUÇLARI

Çalışmanın bu kısmında, panel veri analiz yöntemi kullanılarak Borsa İstanbul (BIST) 100 Endeksi'nde payları devamlı olarak işlem gören, BIST 100 kapsamından incelenen dönem itibarıyla çıkarılmamış olan ve verilerine tam olarak ulaşılabilen 33 firmanın nakit kar payı dağıtım politikalarına etki eden mikro ve makro faktörler belirlenmeye çalışılmıştır. BIST 100 Endeksi'nin Türkiye'nin en büyük firmalarını kapsaması ve bu firmaların diğer firmalara göre daha düzenli kar payı dağıtımları, çalışmada bu endeksin tercih edilmesinin sebebidir. Bu doğrultuda firma verileri, 2010-2016 yılları itibarıyla toplanarak analizde kullanılmıştır. Firmaların kar payı dağıtım politikalarına ve firmaya özgü mikro faktörlere ilişkin veriler, Borsa İstanbul (www.borsaistanbul.com) ve Kamuyu Aydınlatma Platformu (www.kap.org.tr) veri tabanlarından elde edilmiştir. Makroekonomik faktörlere ilişkin verilere ise Merkez Bankası (www.tcmb.gov.tr) veri tabanından ulaşılmıştır. Bu doğrultuda firma verileri yıllar itibarıyla toplanarak, 7 yılı içeren panel veri seti oluşturulmuştur. Çalışmada incelenen firmalar Tablo 2'de gösterilmektedir.

Tablo 2: Çalışmaya Dâhil Edilen Firmalar

BIST KODU	FİRMA	BIST KODU	FİRMA
AEFES	ANADOLU EFES BIRACILIK	KARSN	KARSAN OTOMOTIV SAN TIC
AFYON	AFYON CIMENTO	KARTN	KARTONSAN
AKENR	AK ENERJİ ELEKTRİK ÜRETİM	KRDMD	KARDEMİR D GRUBU
AKSA	AKSA AKRILIK	MGROS	MIGROS TİCARET
ARCLK	ARCELİK	NETAS	NORTEL NETWORKS NETAS TELEKOM
ASELS	ASELSAN	NTTUR	NET TURİZM TİC VE SAN
AYGAZ	AYGAZ	OTKAR	OTOKAR OTOMOTIV VE SAVUNMA SANAI
BAGFS	BAGFAS	PETKM	PETKİM
BFREN	BOSH FREN SİSTEMLERİ	PRKME	PARK ELEKTRİK ÜRETİM MAD SAN
BIMAS	BİM BİRLİK MİGAZLARI	TCELL	TURKCELL İLETİŞİM HİZMETLERİ
DOAS	DOGUS OTOMOTİV	THYAO	TURK HAVA YOLLARI
ENKAI	ENKA İNŞAAT VE BAYINDIRLIK	TOASO	TOFAS TURK OTOMOTİV FABRİKASI
EREGL	EREĞLİ DEMİR ÇELİK	TRKCM	TRAKYA CAM
FROTO	FORD OTOMOTİV SANAYİ	TTKOM	TURK TELEKOMÜNİKASYON
GOLTS	GOLTAS GOLLER BOLGESİ CİMENTO	TUPRS	TUPRS TÜRKİYE PETROL
GUBRF	GUBRE FABRİKALARI	ULKER	ULKER BİSKUVİ SANAYİ
		ZOREN	ZORLU ENERJİ ELEK ÜRET OTOPRD GR

Kaynak: www.borsaistanbul.com

Firmaların nakit kar payı dağıtım politikalarına ilişkin teorik çerçeve ve literatürde yer alan, daha önceki çalışmalar dikkate alınarak, çalışmada kullanılan değişkenler belirlenmiş ve araştırma modeli oluşturulmuştur. Türkiye'de para politikalarının enflasyon ve faiz oranları esas alınarak belirlenmesi, çalışmada makro faktör olarak faiz oranı ve enflasyon oranının kullanılmasını açıklamaktadır. Diğer taraftan döviz kurlarındaki volatilitenin yüksek olması doğrultusunda döviz kuru, makro değişken olarak analize dâhil edilmemiştir. Bu bağlamda firmaların nakit kar payı dağıtım politikaları ile mikro ve makro faktörler arasındaki ilişki, panel veri analiz yöntemi ile incelenmiştir. Çalışmada kullanılan açıklayıcı değişkenlere yönelik formüller ve tanımlamalar Tablo 3'te sunulmaktadır.

Tablo 3: Modelde kullanılan Değişkenler ve Tanımlamalar

Açıklayıcı Değişken	Notasyon	Tanımlama
Nakit Kar Payı Dağıtım Oranı	NKPDO	Nakit Kar Payı Ödemeleri / Dönem Net Karı
Varlık Yapısı	VY	Maddi Duran Varlıklar / Toplam Varlıklar
Aktif Karlılık Oranı	ROA	Net Dönem Karı / Toplam Varlıklar
Likidite Oranı	LKDT	(Dönen Varlıklar – Stoklar) / Kısa Vadeli Borçlar
Finansal Kaldiraç	FINK	(Kısa Vadeli Borçlar + Uzun Vadeli Borçlar) / Toplam Varlıklar
Büyüme Fırsatı	BUYF	(Dönem Sonu Satış Gelirleri / Dönem Başı Satış Gelirleri) - 1
Firma Büyüklüğü	BUY	Toplam Varlıkların Logaritması
Piyasa Değeri	PD	Hisse Senedi Sayısı × Hisse Senedi Fiyatı
Altın	ALT	1 Ons Altın Londra Satış Fiyatı (ABD Doları/Ons) Altın Fiyatları % Değişim (Ortalama)-Serbest Piyasa
Enflasyon	ENF	Yurt İçi Üretici Fiyat Endeksi % Değişim
Faiz Oranı	FAIZ	(ON) Gerçekleşen Basit Faiz Oranı Ağırlıklı Ortalama (%) (1 Gecelik işlem)

Nakit kar payı dağıtım oranı ile kar payı dağıtım politikasına etki eden ve makro düzeydeki faktörler arasındaki ilişkiler ve bu ilişkiler sonrasında beklenen etkiler, ilintisizlik teorisi, eldeki kuş teorisi, vergi etkisi teorisi, müşteri etkisi teorisi, sinyal etkisi teorisi ve temsil maliyeti teorisi doğrultusunda Tablo 4'te gösterilmektedir.

Tablo 4: Nakit Kar Payı Dağıtım Politikası ile Mikro ve Makro Faktörler Arasındaki İlişkinin Kar Payı Dağıtım Teorileri Doğrultusunda Öngörülere

Değişkenler	İlintisizlik Teorisi	Eldeki Kuş Teorisi	Vergi Etkisi Teorisi	Müşteri Etkisi Teorisi	Sinyal Teorisi	Temsil Maliyeti Teorisi
Varlık Yapısı	+/-	+	+	+/-	-	-
Aktif Karlılık	+/-	-	-	+/-	+	+
Likidite Oranı	+/-	-	-	+/-	+	+
Finansal Kaldıraç	+/-	+	+	+/-	-	-
Büyüme Fırsatı	+/-	+	+	+/-	-	-
Büyükklük	+/-	-	-	+/-	+	+
Piyasa Değeri	Yok	+	+	+/-	-	-
Altın	+/-	+	+	+/-	-	-
Enflasyon	+/-	+	+	+/-	+	+
Faiz	+/-	+	+	+/-	+	+

Kaynak: Konuya ilişkin teorik altyapı ve literatürde yer alan çalışmalardan elde edilen bulgular doğrultusunda yazarlar tarafından oluşturulmuştur.

Kar payı dağıtım politikasına etki eden mikro ve makro faktörler ile firmaların piyasa değerleri arasındaki ilişkileri açıklamaya çalışan teoriler doğrultusunda öngörülen ilişkinin yönü, değişken bazında farklılaşabilmektedir. Çalışmada mikro ve makro faktörler ayrı ayrı ele alınarak firmaların nakit kar payı dağıtım politikalarına olan etkileri teorik olarak ilişkilendirilmeye çalışılmıştır. Kar payı dağıtım teorileri doğrultusunda çalışmada kullanılan bağımlı ve bağımsız değişkenler arasındaki ilişkinin test edilmesi için oluşturulan hipotezler ise Tablo 5'te yer almaktadır.

Tablo 5: Çalışmada Test Edilen Hipotezler

Mikro Faktörler	H ₁	Nakit kar payı dağıtım oranı ile mikro değişkenlerden en az birisi arasında pozitif/negatif yönlü doğrusal ilişki vardır.
Makro Faktörler	H ₂	Nakit kar payı dağıtım oranı ile makro değişkenlerden en az birisi arasında pozitif/negatif yönlü doğrusal ilişki vardır.
Varlık Yapısı	H ₃	Nakit kar payı dağıtım oranı ile varlık yapısı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₄	Nakit kar payı dağıtım oranı ile varlık yapısı arasında negatif yönlü doğrusal ilişki vardır.
Aktif Karlılık	H ₅	Nakit kar payı dağıtım oranı ile aktif karlılık oranı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₆	Nakit kar payı dağıtım oranı ile aktif karlılık oranı arasında negatif yönlü doğrusal ilişki vardır.
Likidite Oranı	H ₇	Nakit kar payı dağıtım oranı ile likidite oranı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₈	Nakit kar payı dağıtım oranı ile likidite oranı arasında negatif yönlü doğrusal ilişki vardır.
Finansal Kaldıraç	H ₉	Nakit kar payı dağıtım oranı ile finansal kaldıraç arasında pozitif yönlü doğrusal ilişki vardır.
	H ₁₀	Nakit kar payı dağıtım oranı ile finansal kaldıraç arasında negatif yönlü doğrusal ilişki vardır.
Büyüme Fırsatı	H ₁₁	Nakit kar payı dağıtım oranı ile büyüme fırsatı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₁₂	Nakit kar payı dağıtım oranı ile büyüme fırsatı arasında negatif yönlü doğrusal ilişki vardır.
Büyükklük	H ₁₃	Nakit kar payı dağıtım oranı ile büyükklük arasında pozitif yönlü doğrusal ilişki vardır.
	H ₁₄	Nakit kar payı dağıtım oranı ile büyükklük arasında negatif yönlü doğrusal ilişki vardır.
Piyasa Değeri	H ₁₅	Nakit kar payı dağıtım oranı ile piyasa değeri arasında pozitif yönlü doğrusal ilişki vardır.
	H ₁₆	Nakit kar payı dağıtım oranı ile piyasa değeri arasında negatif yönlü doğrusal ilişki vardır.
Altın	H ₁₇	Nakit kar payı dağıtım oranı ile altın fiyatı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₁₈	Nakit kar payı dağıtım oranı ile altın fiyatı arasında negatif yönlü doğrusal ilişki vardır.
Enflasyon	H ₁₉	Nakit kar payı dağıtım oranı ile enflasyon arasında pozitif yönlü doğrusal ilişki vardır.
	H ₂₀	Nakit kar payı dağıtım oranı ile enflasyon arasında negatif yönlü doğrusal ilişki vardır.
Faiz	H ₂₁	Nakit kar payı dağıtım oranı ile faiz oranı arasında pozitif yönlü doğrusal ilişki vardır.
	H ₂₂	Nakit kar payı dağıtım oranı ile faiz oranı arasında negatif yönlü doğrusal ilişki vardır.

Çalışmada kullanılan veri setinin, yatay kesit verileri ile zaman serilerini bir araya getirmesi ve dolayısıyla panel veri analizine uygun formatta olması, firmaların kar payı dağıtım politikalarına etki eden faktörlerin panel veri analizi ile tespit edilebilmesine imkân tanımaktadır. Bu bağlamda oluşturulan ekonometrik model aşağıdaki gibi formüle edilmiştir.

$$NKPDO_{it} = \beta_{0it} + \beta_1 VY_{it} + \beta_2 ROA_{it} + \beta_3 LKDT_{it} + \beta_4 FINK_{it} + \beta_5 BUYF_{it} + \beta_6 BUY_{it} + \beta_7 PD_{it} + \beta_8 ALTIN_{it} + \beta_9 ENF_{it} + \beta_{10} FAİZ_{it} + \epsilon_{it} \quad (1)$$

Denklemden, $i = 1, 2, 3, \dots, N$ yatay kesit birimlerini ifade ederken, $t = 1, 2, 3, \dots, T$ zaman boyutunu, ϵ ise panel hata terimini ifade etmektedir.

Panel veri analizi kapsamında öncelikle bağımsız değişkenler arasında çoklu doğrusal bağlantı sorununun olup olmadığına yönelik olarak Spearman korelasyon analizi ve varyans şişirme testi gerçekleştirilmiştir. Çoklu doğrusal bağlantı sorununa yol açabilecek kritik değerlerin üzerinde değer alan değişkenler analizden çıkarılmıştır. Analizde kullanılacak değişkenlerin belirlenmesi sonrasında serilerin durağanlıkları incelenmektedir. Zaman serilerinin durağanlıkları, Im-Peseran-Shin W istatistiği, Fisher-ADF ve Levin, Lin ve Chu t testleri ile sınınanmıştır. Serilerin durağanlıkları sağlandıktan sonra, Breusch-Pagan ve Peseran CD testleri ile yatay kesit bağımlılığı, Breusch-Godfrey testi ile otokorelasyon, White testi ile değişen varyans problemlerinin olup olmadığı araştırılmıştır. Model tahmini için sabit etkiler, rassal etkiler veya havuzlanmış tahmin modellerinden hangisinin kullanılacağına ise F testi ve Breusch-Pagan LM testi ile karar verilmiştir. Tahmin modeline karar verilmesinin ardından, oluşturulan modelde yatay kesit bağımlılığı, otokorelasyon ya da değişen varyans sorunlarının varlığı incelenmiştir. Modelin tahmin edilme aşamasında değişen varyans ve/veya otokorelasyon sorunlarından birinin bulunması halinde, genelleştirilmiş en küçük kareler yönteminin (EGLS) veya Uygulanabilir Genelleştirilmiş En Küçük Kareler (FGSL) yönteminin kullanılmasının daha uygun olduğu öngörülmektedir. Çalışmada bu sorunları ortadan kaldıran White standart hataların düzeltilmesi yöntemi ile tahminleme yapılmıştır. Bu yöntem, yatay kesitler arasındaki farklı hata varyanslarının yanı sıra korelasyon sorununa da çözüm sunmaktadır (Korkmaz vd., 2010: 102).

4. BULGULAR

Yukarıda yönteme dair yapılan açıklamalar doğrultusunda, panel veri analizine geçmeden önce bağımsız değişkenler arasında çoklu doğrusal bağlantı probleminin olup olmadığını belirleyebilmek için, en az bir değişkenin normal dağılıma sahip olmadığı varsayımı altında kullanılan, Spearman korelasyon analizi ve varyans şişirme faktör testi gerçekleştirilmiştir. Analiz sonuçları Tablo 6'da ve Tablo 7'de gösterilmektedir.

Tablo 6: Spearman Korelasyon Analiz Sonuçları

Korelasyon t-İstatistik Olasılık	VY	ROA	LKDT	FINK	BUYF	BUY	ALTIN	ENF	FAİZ	PD
VY	1.000000									

ROA	-0.299049	1.000000								
	-4.742455	----								
	0.0000	----								
LKDT	-0.262183	0.213328	1.000000							
	-4.111370	3.304297	----							
	0.0001	0.0011	----							
FINK	0.092873	-0.365753	-0.642217	1.000000						
	1.411520	-5.946893	-12.67868	----						
	0.1594	0.0000	0.0000	----						
BUYF	-0.047176	0.150166	-0.068901	0.066375	1.000000					
	-0.714695	2.298494	-1.045149	1.006655	----					
	0.4755	0.0224	0.2971	0.3152	----					
BUY	0.068581	-0.020714	-0.129221	0.332180	-0.056273	1.000000				
	1.040275	-0.313527	-1.972007	5.329429	-0.852909	----				
	0.2993	0.7542	0.0498	0.0000	0.3946	----				
ALTIN	-0.056739	0.125034	0.015288	-0.067256	0.059433	-0.093175	1.000000			
	-0.860003	1.907069	0.231382	-1.020076	0.900980	-1.416151	----			
	0.3907	0.0578	0.8172	0.3088	0.3685	0.1581	----			
ENF	-0.008797	-0.183785	-0.097119	0.150774	-0.183526	0.231225	-0.357143	1.000000		

	-0.133120	-2.829369	-1.476651	2.308009	-2.825232	3.596530	-5.786150	-----	
	0.8942	0.0051	0.1411	0.0219	0.0051	0.0004	0.0000	-----	
FAIZ	0.029895	-0.167263	-0.066964	0.116659	-0.190082	0.174421	-0.714286	0.750000	1.000000
	0.452598	-2.567322	-1.015626	1.777510	-2.929885	2.680554	-15.44479	17.15892	-----
	0.6513	0.0109	0.3109	0.0768	0.0037	0.0079	0.0000	0.0000	-----
PD	-0.042718	0.202395	-0.025242	0.197119	-0.057184	0.872094	-0.072660	0.159149	0.146879
	-0.647031	3.127520	-0.382102	3.042657	-0.866766	26.96941	-1.102466	2.439448	2.247053
	0.5183	0.0020	0.7027	0.0026	0.3870	0.0000	0.2714	0.0155	0.0256

Not: Tabloda; Nakit Kar Payı Dağıtım Oranı (NKPDO), Varlık Yapısı (VY), Aktif Karlılık Oranı (ROA), Likidite Oranı (LKDT), Finansal Kaldıraç (FINK), Büyüme Fırsatı (BUYF), Büyüklük (BUY), Piyasa Değeri (PD), Altın Fiyatı (ALTIN), Enflasyon Oranı (ENF), Faiz Oranı (FAIZ) ile gösterilmektedir.

Tablo 6'da bağımsız değişkenler arasında tam ilişki olmaması gerekliliğine işaret eden çoklu doğrusal bağlantı varsayımını test etmek için bağımsız değişkenler arasındaki korelasyon katsayıları incelenmiştir. Değişkenler arasındaki korelasyon katsayısının 0.90'ın üzerinde olması sorun yaratmaktadır (Tabachnick ve Fidell, 2001). Çalışmada kullanılan değişkenler arasında en yüksek korelasyon katsayısı 0.87 olarak hesaplanmıştır. Çoklu doğrusal bağlantı sorununu belirleyebilmek amacıyla kullanılan bir diğer ölçüt ise Varyans Şişirme Faktörü (VIF) değerleridir. VIF değerinin 10'dan küçük olması, değişkenler arasında çoklu doğrusal bağlantı sorununun olmadığına işaret etmektedir (Hair, vd. 1998).

Tablo 7: Varyans Şişirme Faktör (VIF) Değerleri

Değişken	Varyans Katsayısı	Merkezi VIF
VY	0.063731	1.214828
ROA	0.498028	1.447568
LKDT	0.001775	1.737824
FINK	0.075442	1.935043
BUYF	0.030846	1.073939
BUY	0.002705	3.452755
PD	0.002762	3.275996
ALTIN	0.396969	3.392018
ENF	0.394260	3.673601
FAIZ	0.002489	7.479156
C	17.30553	NA

Not: Tabloda; Varlık Yapısı (VY), Aktif Karlılık Oranı (ROA), Likidite Oranı (LKDT), Finansal Kaldıraç (FINK), Büyüme Fırsatı (BUYF), Büyüklük (BUY), Piyasa Değeri (PD), Altın Fiyatı (ALTIN), Enflasyon Oranı (ENF) ve Faiz Oranı (FAIZ) ile gösterilmektedir.

Tablo 7'de yer alan VIF değerleri incelendiğinde, çalışmada kullanılan bağımsız değişkenlerin VIF değerleri 1.07 ile 7.47 arasında değer aldıkları tespit edilmiştir. Dolayısıyla bağımsız değişkenler arasında çoklu doğrusal bağlantı probleminin olmadığı söylenebilir. Bu bulgular, korelasyon analizinden elde edilen sonuçları destekler niteliktedir.

Nakit kar payı dağıtım politikasına etki eden mikro ve makro faktörlere ilişkin tanımlayıcı istatistikî bilgiler Tablo 8'de verilmektedir.

Tablo 8: Tanımlayıcı İstatistikler

	NKPDO	VY	ROA	LKDT	FINK	BUYF	BUY	PD	ALTIN	ENF	FAIZ
Ortalama	0.462	0.349	0.061	1.462	0.524	0.162	21.74	21.51	7.209	5.372	6.454
Medyan	0.273	0.318	0.064	1.077	0.557	0.127	21.88	21.39	7.143	5.361	5.804
Maksimum	4.975	0.876	0.435	10.99	1.038	1.863	24.89	24.17	7.420	5.546	9.452
Minimum	0.000	0.029	-0.151	0.112	0.075	-0.607	17.67	14.17	7.054	5.152	2.998
Std.S ap.	0.662	0.188	0.073	1.350	0.218	0.254	1.542	1.487	0.126	0.131	2.367
Çarpıklık	3.040	0.521	0.339	3.329	-0.152	1.892	-0.551	-0.386	0.503	-0.225	0.020
Basıklık	15.96	2.376	5.786	18.20	2.283	12.72	2.938	4.022	1.787	1.826	1.476

Not: Tabloda; Nakit Kar Payı Dağıtım Oranı (NKPDO), Varlık Yapısı (VY), Aktif Karlılık Oranı (ROA), Likidite Oranı (LKDT), Finansal Kaldıraç (FINK), Büyüme Fırsatı (BUYF), Büyüklük (BUY), Piyasa Değeri (PD), Altın Fiyatı (ALTIN), Enflasyon Oranı (ENF), Faiz Oranı (FAIZ) ile gösterilmektedir.

Tablo 8’de Türkiye’nin en büyük firmaları konumunda olan ve Borsa İstanbul 100 Endeksi’nde payları devamlı olarak işlem gören firmaların nakit kar payı dağıtım politikalarına etki eden çeşitli faktörlere ilişkin tanımlayıcı istatistikler sunulmaktadır. Endekste yer alan firmaların ortalama 0.462 oranında nakit kar payı dağıttıklarını söylemek mümkündür. Analize dâhil edilen firmaların büyük ölçekli firmalar olması ve karlılıkları doğrultusunda devamlı olarak kar payı dağıttıkları dikkate alındığında, bu oranın normal seviyede olduğu ifade edilebilir. Diğer değişkenlere ilişkin ortalama değerler incelendiğinde; varlık yapısının 0.349, aktif karlılık oranının 0.061, likidite oranının 1.462, finansal kaldıraç oranının 0.524, büyüme fırsatının 0.162, firma büyüklüğünün 21.74, altın fiyatının 7.209, enflasyon oranının 5.372, faiz oranının 6.454 ve piyasa değerinin 21.51 olduğu görülmüştür. Tanımlayıcı istatistikî bilgiler genel olarak analiz edildiğinde, firmaların aktif karlılıklarının pozitif olduğu, sermaye yapılarının yarıdan fazlasını yabancı kaynakla finanse edildiği, aktif büyüklüklerinin ve likidite durumlarının yeterli, piyasa değerlerinin ise pozitif olduğu görülmektedir.

Panel veri analizini gerçekleştirebilmek ve doğru sonuçlar elde edebilmek için değişkenlere ilişkin zaman serilerinin durağanlığının sağlanması gerekmektedir (Gujarati, 2003). Bu bağlamda çalışmada, zaman serilerinin sabitli ve sabitli/trendli modeller kapsamında durağanlıkları, Levin, Lin ve Chu t, Im-Peseran-Shin W istatistiği ve Fisher-ADF testleri ile sınanmıştır. Birim kök analiz sonuçları Tablo 9’da gösterilmektedir.

Tablo 9: Panel Birim Kök Testi İstatistik Sonuçları

Değişken	Sabitli Terim											
	LLC				IPS				Fisher-ADF			
	Düzye I(0)		Düzye I(1)		Düzye I(0)		Düzye I(1)		Düzye I(0)		Düzye I(1)	
	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.
NKPDO	-9.821	0.000***			-2.529	0.005***			94.41	0.001***		
VY	-15.16	0.000***			-1.985	0.023**			91.32	0.021**		
ROA	-7.853	0.000***			-1.579	0.057*			89.64	0.028**		
LKDT	-7.201	0.000***			-0.685	0.246	-3.142	0.000***	79.25	0.126	116.5	0.000***
FİNK	-7.789	0.000***			-0.020	0.491	-4.295	0.000***	77.24	0.162	135.1	0.000***
BUYF	-12.06	0.000***			-3.425	0.000***			20.90	0.000***		
BUY	1.437	0.924	-12.22	0.000***	4.972	1.000	-3.517	0.000***	29.36	1.000	124.8	0.000***
PD	-18.05	0.000***			-2.231	0.012**			86.18	0.048**		
ALTIN	-1.015	0.155	-9.723	0.000***	0.723	0.765	-2.215	0.013**	41.93	0.990	97.61	0.006***
ENF	-12.01	0.000***			-0.694	0.243	-3.316	0.000***	65.23	0.503	119.6	0.000***
FAIZ	1.743	0.959	-26.03	0.000***	3.475	0.999	-9.058	0.000***	15.45	1.000	223.2	0.000***

Değişken	Sabitli /Trendli Terim											
	LLC				IPS				Fisher-ADF			
	Düzye I(0)		Düzye I(1)		Düzye I(0)		Düzye I(1)		Düzye I(0)		Düzye I(1)	
	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.	T-İst.	Prob.
NKPDO	-8.449	0.000***			-0.784	0.216	-1.153	0.124	82.58	0.028**		
VY	-15.59	0.000***			-3.056	0.001***			137.8	0.000***		
ROA	-13.62	0.000***			-0.721	0.235	-2.724	0.003***	90.43	0.024**		
LKDT	-8.004	0.000***			0.535	0.703	-3.484	0.000***	59.08	0.714	104.2	0.001***
FİNK	-12.63	0.000***			0.251	0.599	-1.743	0.040**	69.51	0.359	114.8	0.000***
BUYF	-19.36	0.000***			-1.245	0.106	-2.931	0.001***	104.64	0.001***		
BUY	-7.328	0.000***			0.744	0.771	-0.894	0.185	57.66	0.757	93.91	0.013**
PD	-25.62	0.000***			-1.690	0.045**			114.4	0.000***		
ALTIN	-17.04	0.000***			-1.202	0.114	3.132	0.999	101.41	0.003***		
ENF	-14.08	0.000***			-0.102	0.459	0.315	0.623	72.17	0.281	60.10	0.681
FAİZ	-21.40	0.000***			-2.381	0.008***			143.9	0.000***		

Not 1: ***, **, ve * sembelleri katsayıların sırasıyla %1, %5 ve %10 önem düzeylerinde anlamlı olduğunu göstermektedir.

Not 2: Tabloda; Nakit Kar Payı Dağıtım Oranı (NKPDO), Varlık Yapısı (VY), Aktif Karlılık Oranı (ROA), Likidite Oranı (LKDT), Finansal Kaldıraç (FİNK), Büyüme Fırsatı (BUYF), Büyüklük (BUY), Piyasa Değeri (PD), Altın Fiyatı (ALTIN), Enflasyon Oranı (ENF), Faiz Oranı (FAİZ) ile gösterilmektedir.

Tablo 9'dan da görüleceği üzere, tüm serilerin sabitli ve sabitli/trendli terimde en az bir testte farklı anlamlılık düzeylerinde durağan oldukları belirlenmiştir. Düzeyde durağan olmayan değişkenler için fark alma işlemi uygulanarak tüm seriler için durağanlık sağlanmıştır. Dolayısıyla değişkenlere ilişkin zaman serilerinin analiz için uygun olduğu belirlenmiştir.

Birim kök analizi sonrasında panel veri analizini gerçekleştirebilmek için gerekli diğer varsayımlar ise serilerde yatay kesit bağımlılığı, otokorelasyon ve değişen varyans sorunlarının olup olmadığıdır. Çalışmada, yatay kesit ve zaman boyutu doğrultusunda yatay kesit bağımlılığı Pesaran CD testi ile araştırılırken, otokorelasyon ve değişen varyans ise Breusch-Godfrey LM ve White testleri ile araştırılmıştır. Diagnostik testlere ilişkin analizler sonrasında, tahminleme için hangi model tahmin yönteminin kullanılacağına dair Breusch-Pagan LM, Hausman ve F testleri gerçekleştirilmiştir. Analiz sonuçları Tablo 10'da yer almaktadır.

Tablo 10: Diagnostik ve Tahmin Modeli Seçim Test Sonuçları

Diagnostik Test Sonuçları			
Test		İstatistik	Prob.
Pesaran scaled LM		1.463047	0.1435
Pesaran CD	Yatay Kesit Bağımlılığı	-0.112133	0.9107
Breusch-Godfrey LM Testi	Otokorelasyon	Prob. F(1,218)	0.0388
		Prob. Chi-Square(1)	0.0345
		Prob. F(62,167)	0.8366
White Testi	Değişen Varyans	Prob. Chi-Square(62)	0.7880
		Prob. Chi-Square(62)	0.0000
Tahmin Modeli Seçim Test Sonuçları			
<i>Breusch-Pagan LM Testi</i>			
	Cross-section	8.445225	0.0037
	Test Hypothesis Time	1.124228	0.2890
	Both	9.569453	0.0020
<i>Hausman Testi</i>			
	Chi-Sq. Statistic	0.000000	
	Chi-Sq. d.f.	10	
	Prob	1.0000	
* Cross-section test variance is invalid. Hausman statistic set to zero.			
<i>F Testi</i>			
	Statistic	2.035524	
	d.f.	(32,155)	
	Prob.	0.0023	
Cross-section	Statistic	69.463122	

Chi-square	d.f.	32
	Prob.	0.0001

Tablo 10'daki Diagnostik test sonuçları incelendiğinde, Pesaran CD test istatistiğinin kritik değer olan 0.05'ten büyük olduğu ve modelde yatay kesit bağımlılığının olmadığı belirlenmiştir. Breusch-Godfrey LM otokorelasyon ve White değişen varyans test istatistik değerinin ise kritik değerden düşük olduğu tespit edilmiştir. Dolayısıyla modelde otokorelasyon ve değişen varyans sorunlarının varlığı belirlenmiştir. Tahmin modelinin belirlenmesi için gerçekleştirilen analiz sonuçları değerlendirildiğinde, tahmin modeli olarak havuzlanmış model/rassal etkiler modellerinden hangisinin tercih edileceği Breusch-Pagan LM testi ile sınanırken, sabit etkiler modeline karşı rassal etkiler modelinin tercih edilip edilmeyeceği ise Hausman testi ile sınanmıştır. Havuzlanmış/sabit etkiler modellerinden hangisinin tercih edilmesi gerektiğine ise F testi kullanılarak karar verilmiştir. F testinde zaman ve/veya yatay kesit etkilerinin olup olmadığı diğer bir deyişle tek ya da çift yönlü sabit etkiler modelinin geçerliliği incelenmektedir. Ancak çalışmanın zaman boyutunun dar olması, sabit etkiler modelinde yalnızca yatay kesit etkisinin incelenmesine imkân tanırken, zaman etkisinin varlığı test edilememektedir. Herhangi bir çalışmada kullanılan veriler, belirli spesifik bir gruptan ve belirli bir dönem esas alınarak oluşturulmuş ise modellerin nihai tahminlemede sabit etkiler modelinin kullanılması gerekmektedir (Baltagi, 2005: 12). Bu bağlamda testlerde elde edilen bulgular ve çalışmanın kapsamı doğrultusunda, modelin anlamlılığı araştırılmış ve sabit etkiler modeli esas alınarak tahmin yapılmasına karar verilmiştir.

Panel FGLS doğrultusunda otokorelasyon ve değişen varyans sorunları, White'ın standart hataların düzeltilmesi yöntemi kullanılarak giderilmeye çalışılmıştır. Bu metod, yatay kesitler arasındaki farklı hata varyanslarının yanı sıra korelasyon sorununa da çözüm üretmektedir. Ulaşılan sonuçlar, Tablo 11'de gösterilmektedir.

Tablo 11: Panel Veri Analiz Sonuçları

Bağımlı Değişken: NKPDO				
Yöntem: White				
Örnekleme: 2010-2016				
Değişken	Katsayı	Std. Hata	t-İstatistiği	Prob.
VY	-0.366	0.094	-3.871	0.000***
ROA	1.290	0.199	6.478	0.000***
LKDT	0.033	0.054	0.624	0.532
FINK	3.290	0.555	5.922	0.000***
BUYF	-0.307	0.152	-2.017	0.045**
BUY	-0.803	0.141	-5.698	0.000***
PD	0.030	0.011	2.797	0.005***
ALTIN	-0.089	0.099	-0.901	0.368
ENF	-1.225	0.435	-2.817	0.005***
FAIZ	-0.005	0.006	-0.827	0.408
C	-0.001	0.256	-0.004	0.996
	R-Kare		0.374	
	Düzeltilmiş R-Kare		0.341	
	S.E. of regression		0.594	
	F-statistic		11.205	
	Prob (F-statistic)		0.000***	

Not 1: ***, **, ve * simgeleri katsayıların sırasıyla %1, %5 ve %10 önem düzeylerinde anlamlı olduğunu göstermektedir.

Not 2: Tabloda; Nakit Kar Payı Dağıtım Oranı (NKPDO), Varlık Yapısı (VY), Aktif Karlılık Oranı (ROA), Likidite Oranı (LKDT), Finansal Kaldracı (FINK), Büyüme Fırsatı (BUYF), Büyüklük (BUY), Piyasa Değeri (PD), Altın Fiyatı (ALTIN), Enflasyon Oranı (ENF), Faiz Oranı (FAIZ) ile gösterilmektedir.

Nakit kar payı dağıtım politikasına etki eden mikro ve makro faktörlerin araştırıldığı çalışmada, havuzlanmış model doğrultusunda elde edilen panel veri analiz sonuçları Tablo 10'da gösterilmektedir. Modelin bir bütün olarak anlamlılığını ifade eden F istatistiği olasılık değeri %99 güven aralığında anlamlıdır. Analiz kapsamında incelenen bağımsız değişkenler, nakit kar payı dağıtım politikasında meydana gelen değişimin %34'ünü açıklamaktadır.

Modelde yer alan açıklayıcı değişkenlerin olasılık değerleri incelendiğinde, varlık yapısı, aktif karlılık oranı, finansal kaldıraç oranı, firma büyüklüğü, enflasyon oranı ve piyasa değeri değişkenlerinin %1, büyüme fırsatı değişkeninin ise %5 anlamlılık düzeyinde istatistikî olarak anlamlı olduğu tespit edilmiştir. Buna karşın likidite oranı, altın fiyatı ve faiz oranı değişkenlerinin istatistikî olarak anlamlı olmadığı da belirlenmiştir.

5. SONUÇ DEĞERLENDİRME VE ÖNERİLER

Bu çalışmada, payları Borsa İstanbul'da işlem gören ve BİST 100 Endeksine dâhil olan firmaların nakit kar payı dağıtım politikalarına etki eden mikro ve makro faktörlerin belirlenmesi amaçlanmıştır. Firmaların nakit kar payı dağıtım politikası, nakit kar payı dağıtım oranı ile temsil edilirken, kar payı dağıtım politikasını etkilediği düşünülen mikro faktörler; varlık yapısı, aktif karlılık oranı, likidite oranı, finansal kaldıraç oranı, büyüme fırsatı, firma büyüklüğü ve piyasa değeri ile; makro değişkenler ise altın fiyatı, enflasyon oranı ve faiz oranı ile temsil edilmiştir. Bu doğrultuda, BİST'te payları sürekli olarak işlem gören ve mali sektörde faaliyet göstermeyen firmaların 2010-2016 yılları arasındaki verileri, panel veri analiz yöntemi ile incelenmiştir.

Yapılan analizler neticesinde, oluşturulan modelin bir bütün olarak %99 güven aralığında anlamlı olduğu ve bağımsız değişkenlerin bağımlı değişkende meydana gelen değişimin %34'ünü açıkladığı tespit edilmiştir. Modelde yer alan açıklayıcı değişkenlerin olasılık değerleri incelendiğinde, nakit kar payı dağıtım oranı ile varlık yapısı arasında istatistikî olarak anlamlı ve negatif ilişki belirlenmiştir. Firmaların varlık yapılarındaki bir birim değişim nakit kar payı dağıtım oranında yaklaşık 0.36 birimlik azalışa neden olmaktadır. Firmaların maddi duran varlıklarındaki azalış, daha düşük kar payı ödemesi yapılmasına neden olmaktadır. Bu bulgu, nakit kar payı dağıtım politikası ile kar payı dağıtım teorileri arasındaki öngörüler doğrultusunda, sinyal teorisi ve temsil maliyeti teorisini desteklediği söylenebilir. Ayrıca elde edilen bu bulgu, Al Shubiri (2011), Labhane ve Mahakud (2016), Sheikh vd. (2016) ve Sasu vd. (2017) tarafından gerçekleştirilen çalışmalarda elde edilen bulgular ile benzerlik göstermektedir. Dolayısıyla çalışmada test edilen hipotez 4 kabul edilmektedir.

Nakit kar payı dağıtım oranı ile aktif karlılık oranı arasında istatistikî olarak anlamlı ve pozitif ilişki belirlenmiştir. Firmaların aktif karlılığındaki bir birim değişim nakit kar payı dağıtım oranında yaklaşık 1.29 birimlik artışa yol açmaktadır. Diğer taraftan firmaların karlılık düzeyleri arttıkça daha fazla kar payı ödemesi yapabildikleri de söylenebilir. Bu bulgu, sinyal teorisi ve temsil maliyeti teorisini desteklemektedir. Ayrıca elde edilen bu bulgu, Amidu ve Abor (2006), Al Malkawi (2007), Afza ve Mirza (2010), Imran (2011), Al Shubiri (2011), Yıldız vd. (2014), Labhane ve Mahakud (2016), Sheikh vd. (2016), Khan ve Ahmad (2017), Alber ve Alhabtour (2017) tarafından gerçekleştirilen çalışmalarda elde edilen bulguları desteklemektedir. Dolayısıyla çalışmada test edilen hipotez 5 kabul edilmektedir.

Analiz sonucunda elde edilen bir diğer bulgu ise, nakit kar payı dağıtım oranı ile finansal kaldıraç oranı arasındaki istatistikî olarak anlamlı ve pozitif yönlü ilişkidir. Firmaların finansal kaldıraç oranındaki bir birim değişim nakit kar payı dağıtım oranında yaklaşık 3.29 birimlik artışa yol açmaktadır. Yüksek kar payı dağıtım yapan firmaların sermaye yapılarını oluşturmada yabancı kaynaklardan daha fazla yararlandığı ifade edilebilir. Diğer bir ifadeyle, nakit kar payı dağıtım oranı yüksek olan firmaların daha fazla borçlandıkları ve finansman ihtiyaçlarını yabancı kaynaklardan finanse ettikleri söylenebilir. Bu bulgunun, eldeki kuş teorisi ve vergi etkisi teorisini desteklediğini söylemek mümkündür. Ayrıca elde edilen bu bulgu, Sanjari ve Zarei (2014), Banerjee (2016) ve Sheikh vd. (2016) tarafından yapılan çalışmalarda elde edilen bulgular ile benzerlik göstermektedir. Ancak literatürde kar payı dağıtım oranı ile finansal kaldıraç arasında ağırlıklı olarak negatif ilişkinin varlığı ortaya çıkarılmıştır. Bu bağlamda çalışmada elde edilen anlamlı ve pozitif ilişki, literatür ile farklılık göstermektedir. Dolayısıyla çalışmada test edilen hipotez 9 kabul edilmektedir.

Nakit kar payı dağıtım oranı ile büyüme fırsatı arasında istatistikî olarak anlamlı ve negatif ilişki tespit edilmiştir. Büyüme fırsatındaki bir birim değişim nakit kar payı dağıtım oranında yaklaşık 0.31 birimlik azalışa sebep olmaktadır. Diğer bir deyişle, firmaların satışlarında yaşanan değişim nakit kar payı dağıtım oranında düşüşe neden olmaktadır. Bu bulgu, sinyal ve temsil maliyeti teorilerini desteklemektedir. Ayrıca elde edilen bu bulgu, literatürde daha önce gerçekleştirilen Amidu ve Abor (2006), Gill vd. (2010), Komrattanapanya (2013), Sanjari ve Zarei (2014), Kuzucu (2015), Khan ve Ahmad (2017) çalışmalarda elde edilen bulgular ile paralellik göstermektedir. Bu bulgu doğrultusunda çalışmada oluşturulan ve test edilen hipotez 12 kabul edilmektedir.

Çalışmada elde edilen bir başka bulgu da nakit kar payı dağıtım oranı ile firma büyüklüğü arasındaki anlamlı ve negatif ilişkidir. Firma büyüklüğündeki bir birim değişim nakit kar payı dağıtım oranında 0.80 birimlik azalışa neden olmaktadır. Kar payı dağıtım

oranı yüksek olan firmalarda otofinansman düzeyinin düşük olması, yatırıma yönlendiren kaynak miktarının az olmasına sebep olmaktadır. Dolayısıyla daha yüksek kar payı ödeyen ve daha az yatırım yapan firmalarda büyüklük daha düşük düzeyde ve azalma eğiliminde olacaktır. Bu bulgu, eldeki kuş ve vergi etkisi teorileri destekler niteliktedir ve Ahmed ve Javid (2008), Afza ve Mirza (2010) tarafından yapılan çalışmalarda elde edilen bulgular ile benzerlik göstermektedir. Dolayısıyla hipotez 14 kabul edilmektedir.

Yapılan analiz neticesine piyasa değeri ile nakit kar payı dağıtım oranı arasında istatistikî olarak anlamlı ve pozitif ilişki ortaya çıkarılmıştır. Piyasa değerindeki bir birim değişim nakit kar payı dağıtım oranını 0.03 birim artırmaktadır. Diğer bir deyişle, piyasa değeri artan bir firmanın daha yüksek kar payı ödemesi öngörülmektedir. Piyasalarda yüksek kar payı dağıtımı gerçekleştiren firmalar, yatırımcılar tarafından daha fazla talep görmekte ve bu durum da firmanın piyasa değerini olumlu yönde etkilemektedir. Piyasa değeri ile kar payı dağıtım oranları arasındaki ilişkiyi açıklamaya çalışan temel iki teori konumunda olan Modigliani ve Miller tarafından ortaya atılan ilintisizlik teorisi ve Gordon-Lintner tarafından desteklenen eldeki kuş teorisidir. Dolayısıyla elde edilen piyasa değeri ile nakit kar payı dağıtım oranı arasındaki pozitif ilişki, eldeki kuş teorisinin yanı sıra vergi etkisi teorisini de desteklemektedir. Bu bağlamda çalışmada test edilen hipotez 15 kabul edilmektedir.

Nakit kar payı dağıtım politikasını etkilediği tespit edilen son faktör, enflasyon oranıdır. Kar payı dağıtım politikasını etkileyen makro değişkenlerden biri olan enflasyon oranı ile nakit kar payı dağıtım oranı arasında istatistikî olarak anlamlı ve negatif ilişki belirlenmiştir. Enflasyon oranındaki bir birim değişim nakit kar payı dağıtım oranında 1.22 birimlik azalışa neden olmaktadır. Paranın satın alma gücünün düşmesi ve fiyatlar genel düzeyinin yükselmesi, firmaların kazançlarının değerinde düşüşe yol açmakta ve daha az kar payı ödemesi yapmalarına sebep olabilmektedir. Bu bulgu, müşteri etkisi ve ilintisizlik teorileri ile tutarlılık göstermektedir. Dolayısıyla hipotez 20 kabul edilmektedir.

Analiz sonucunda elde edilen bulgular genel olarak incelendiğinde, nakit kar payı dağıtım politikasına etki eden mikro faktörlerin, varlık yapısı, aktif karlılık oranı, finansal kaldıraç oranı, büyüme fırsatı, firma büyüklüğü olduğu belirlenirken; nakit kar payı dağıtım politikasına etki eden makro faktörlerin ise enflasyon oranı ve piyasa değeri olduğu belirlenmiştir. Dolayısıyla çalışma kapsamında oluşturulan hipotez 1 ve 2 kabul edilmektedir.

Çalışmada, nakit kar payı dağıtım politikasını etkileyen faktörlere ilişkin bulgulara karşın, likidite oranı ile nakit kar payı dağıtım oranı arasında istatistikî olarak anlamlı herhangi bir ilişki tespit edilememiştir. Bu bulgu, Imran (2011), Mehta (2012) ve Komrattanapanya (2013) tarafından yapılan elde edilen bulgular ile paralellik göstermektedir. Diğer taraftan altın fiyatı ve faiz oranı ile nakit kar payı dağıtım oranı arasında istatistikî olarak anlamlı bir ilişki bulunmamıştır. Bu doğrultuda çalışmada test edilen hipotez 7, 8, 17, 18, 21 ve 22 reddedilmektedir.

Firmaların varlıklarını devam ettirebilmelerinde kritik öneme sahip olan finansman ve yatırım kararlarının yanı sıra kar payı dağıtım kararları da firmaların geleceği açısından son derece önemlidir. Çalışmada, nakit kar payı dağıtım politikası ile firma değeri arasındaki pozitif ilişki doğrultusunda, elde edilen bulguların, başta yatırımcılar olmak üzere firmada karar verici ve uygulayıcı konumunda olan yönetim kuruluna ve üst düzey yönetim kademesine yol gösterici nitelikte olduğu düşünülmektedir. Yöneticiler açısından kar payı dağıtım politikası oluşturulurken, kar payı dağıtım oranını etkilediği tespit edilen mikro ve makro faktörlerin dikkate alınarak karar alınması firmanın uzun vadede değerini olumlu yönde etkileyecektir. Yatırımcılar açısından ise elde edilen bulgular, yatırım yapacakları firmaların seçiminde, kaynaklarını etkin ve verimli şekilde değerlendirebilmelerinde yatırımcılara önemli bilgiler sunmaktadır.

Bu çalışmada, BIST 100 Endeksi'nde devamlı olarak işlem gören ve mali sektörde faaliyet göstermeyen firmaların nakit kar payı dağıtım politikalarına etki eden mikro ve makro faktörler panel veri yöntemi ile analiz edilmiştir. Çalışmada nakit kar payı dağıtım oranına odaklanılması, kar payı dağıtım politikasına etki eden mikro ve makro faktörlerin bir arada incelenmesi gibi faktörler doğrultusunda çalışmanın konuyla ilişkili diğer çalışmalardan ayrıştığı düşünülmektedir. Bu çalışma, nakit kar payı ödemelerinin yanı sıra bedelsiz kar payı dağıtımları ve pay geri alımlarının birlikte ele alındığı kar payı dağıtım politikalarına etki edebilecek farklı mikro ve makro değişkenlerin analize dâhil edilmesi, farklı endekslerin ve dönemlerin incelenmesi, gelişmekte olan diğer ülkelerin endeksleri ile kıyaslama yapılması ve farklı ekonometrik yöntemlerin kullanılması suretiyle sonraki çalışmalarca geliştirilebilir.

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INTEREST RATE RISK OF BANKING SECTOR: THE EFFECT OF MATURITY GAP ON NET INTEREST INCOME IN INDONESIA

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ABSTRACT

Purpose - This study aims to examine how the interest rate risk management that has been reflected in banks' maturity gaps affect the net interest income (NII).

Methodology - The population in this study is all conventional commercial (non-Sharia) banks in Indonesia as many as 99 banks. Of the 99 banks, 57 banks were selected as the sample of in the study. Determination of the sample is based on these criteria: the availability of the bank's annual report containing financial statements providing data about the descriptions of interest rate risk management, which also provides complete data about bank's RSA and RSL from 2013 - 2017. There are five years of the research period, so 285 unit observations are used in the analysis. The study employs multiple regression analysis with panel data. Net interest income is derived from the difference between interest income and interest expense. The maturity gap is calculated as the difference between RSA and Risk RSL. The study uses a dummy variable of IRS, LDR, net NPL and ownership status of banks.

Findings - The results of the study show that maturity gap has a negative effect on NII and banks with positive gaps have higher NII than banks with negative gaps. These results imply that when the interest rate decreases, the widened positive gap will lower NII.

Conclusion - The conclusion of the research is that in conditions of declining interest rates, the more positive gap between RSA and RSL has decreased banks' NII. The practical implication of the results is that banks need to think about lowering the RSA by means of managing their assets, such as banks need to buy long-term securities, extend the loan maturity, and change the interest rate from the floating rate to a fixed rate. In terms of management liabilities, banks need to think about increasing RSL by giving premium interest rates for deposits with a maturity of less than one year, and by borrowing funds at fair interest rates.

Keywords: Indonesian banks, interest rate risk, interest rate sensitivity, maturity gap, net interest income.

JEL Codes: E43, G21, M21

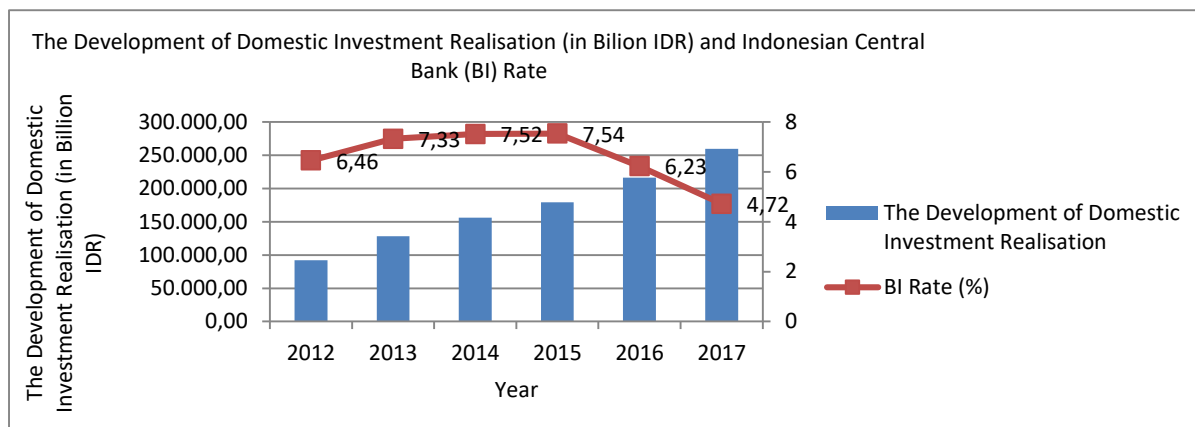
1. INTRODUCTION

Adequate capital is not the only prerequisite for banks to be able to cope with pressure at crisis time. This was demonstrated by the experience during the period of the global financial crisis in 2007/2008 which was marked by the collapse of major financial institutions in the United States and the UK, which had strong capital, such as: Lehman Brothers, American International Group (AIG), Merrill Lynch, Morgan Stanley, Citigroup, UBS, Fannie Mae, Freddie Mac, and others (Acharya, Cooley, Richardson, & Walter, 2011). The collapse of this large financial institution has a systemic impact on the business world throughout the world, including Indonesia. This slowdown economic growth has still been felt today. The uncertainty of global economic conditions puts pressure on Indonesia's economic growth (Budoyo, 2017).

To drive the level of economic growth, various policies are taken by the Indonesian Government whose goal is to encourage improvements in the investment climate. The policy is to simplify investment permits in order to accelerate the period of processing permits. The policy is also enabled investors to get fiscal incentives such as tax allowances, tax holidays, and tax rate cuts in certain sectors. The government's efforts gain good momentum when UNCTAD in its latest report "2016 World Investment Report" places Indonesia as the third country of foreign direct investment (FDI) goals (Budoyo, 2017). This rating is better than the previous year, which was ranked the fifth.

FDI investment in Indonesia grew 46% in January-July 2016 from \$ 19.4 billion in 2015 to \$ 28.0 billion in 2016 (Budoyo, 2017). Likewise, investment in domestic investment has increased from year to year. Meanwhile, Bank Indonesia is also consistent with optimizing the domestic economic recovery while maintaining macroeconomic stability, amidst uncertain global financial markets, namely by lowering the BI rate. Figure 1 below illustrates the development of domestic investment and the BI rate growth.

Figure 1: The Development of Domestic Investment Realisation (in Billion Indonesian Rupiah, IDR) and Indonesian Central Bank (BI) Rate from 2012 – 2017

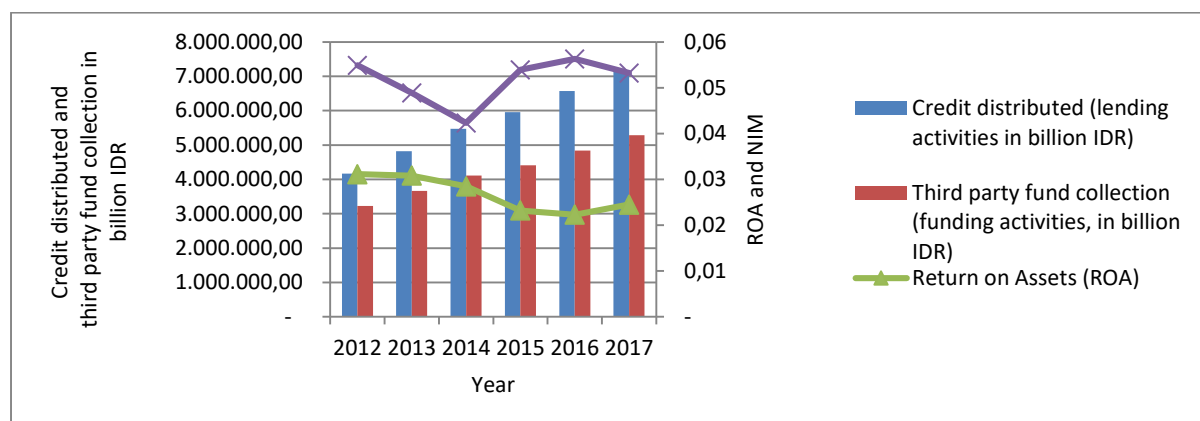


Source: Bank Indonesia, 2017 and BPS, 2017

From Figure 1, it can be seen that government policies in creating an investment climate show results which are proven by an increase in domestic investment realization from year to year. The increase in the value of this investment was supported by a decrease in the BI rate, which was followed by a decrease in loan interest rates. The increase in investment value was also accompanied by an increase in the number of distributed loans by banks to finance the investment and by an increase in third-party funds collected by Indonesian banks. The data can be seen in Figure 2 below.

As known from Figure 2, the activities of rising funds (funding activities) and distributing funds (lending activities) by Indonesian commercial banks have increased. However, the increase in fund collecting activities and fund distributing activities is not automatically followed by the increase in Net Interest Margin (NIM) or Return on Assets (ROA). NIM is the ratio between net interest incomes divided by productive assets. Although the NIM has increased from 2014 to 2016, in 2017 it has decreased. Likewise, ROA has a downward trend. ROA measures the company's ability to generate profits before interest and taxes on assets used (Bank-Indonesia, 2001). The decrease in these ratios indicates that there is a decrease in the ability of the banks to manage the funds distributed and the funds raised from the community due to the decline in interest rates.

Management of funds distributed and funds collected from the community is known as Asset Liability Management (ALM) (Byrne, 2000). ALM gets the most attention from banks because of uncertainty and volatility in the market and the unpredictable influence of domestic and global market forces. This condition can reduce bank assets. ALM is an integrated approach towards the effective balance sheet management that can be achieved through restructuring the portfolio of assets and liability portfolios that are appropriate from time to time. In today's rapidly changing market environment, ALM is important (Byrne, 2000). The main objective of ALM is to manage net interest income in such a way that the level and risk align with the company's risk-return objectives. This technique does not eliminate risk but tries to manage it in such a way that fluctuations in net interest income are minimized in the short term and the long-term survival of the organization is achieved.

Figure 2: Development of Funds Distribution (Billions of Rupiah), Collection of Third Party Funds (Billions of IDR), ROA, and NIM, 2012-2017

Source: OJK, 2017a

Efficient interest rate risk management is an important activity of banks in maximizing their income while controlling risk exposure. Thus, evaluating the bank's resilience to the risk exposure of interest rate changes is very important. This is because of the vulnerability of banking operations to the risk of external pressure. This pressure will ultimately affect the interest rate that must be set for lending and funding activities and affect the level of liquidity that the bank must maintain.

There are many studies that analyze interest rate risk. Most of them are related to identifying determinants of interest rate risk (Ahmed, Beatty, & Takeda, 1997; Esposito, Nobili, & Ropele, 2015; Holston, Laubach, & Williams, 2017; Rachel & Smith, 2015). As a result of the studies, they suggested several strategies to reduce interest rate risk. In addition, other studies also concluded that interest rate risk must be managed together with credit and liquidity risks (Esposito, et al., 2015; Singh, 2013).

Furthermore, other researchers analysed the gap management between RSA and RSL from several individual banks. Without doing a statistical procedure test, they provide a descriptive analysis that explains how the gap between RSA and RSL of several individual banks and compares one bank to another bank. Then, they provide recommendations that should be done by banks, see (Baser, 2014; Meena & Dhar, 2014; Prathap, 2013; Singh, 2013).

In the absence of statistical testing, this means that the results of the studies are only applied to the individual bank that is being observed. Furthermore, the results of the analysis cannot be used for generalisation purposes. Meanwhile, it has been still rare research analysing how the RSA and RSL gap management influence the NII. Thus, this study aims to examine how the interest rate risk management that has been implemented by banks affect the net interest income (NII). Management of interest rate will be measured with Interest Rate Sensitivity (IRS) and with the gap between rate sensitivity assets (RSA) and rate sensitivity liability (RSL). The research gap will be filled by this research. The next contribution is that this research will also analyse how the NII of banks with a positive gap responds to the decline of the interest rate. This study includes control variables: NPL, LDR, and dummy variables of three bank ownership status, namely conventional banks owned by the government, national private banks, and foreign banks operating in Indonesia. This grouping aims to see how the risk management of each bank group has an impact on their NII. Which group that has the highest NII. This study will also include a dummy variable of years covering the period time of the study to consider how NII of each year.

The paper proceeds as follows. Section 2 presents the literature review underpinnings of the study and the hypothesis development. Section 3 describes the data and methodology. Section 4 presents findings and discussions. The last section provides the conclusion.

2. LITERATURE REVIEW

2.1. Gap Sensitivity to Interest Rate Change

The intermediary function is still the most important type of banks' business (Doran & Fitzpatrick, 2003). This intermediary function makes banks vulnerable to interest rate risk exposure because of a gap in the maturity or duration when banks borrow and lend (Murphy, 2013).

Kuncoro and Suhardjono (2004) stated that interest rate risk refers to the risk posed by changes in interest rates that have a direct impact on interest earned from lending activities and interest paid for financing activities. Interest rate risk is about managing the net interest margin (interest income reduced by interest costs) and controlling the risk caused by changes in

interest rates. They also stated that when there is a change in interest rates, banks can control interest rate risk by matching asset maturity and liability maturity. If the assets and liabilities have the same maturity, the bank will be able to maintain a net interest margin because the increase or decrease in interest costs and interest income occur simultaneously.

However, the reality of the market is such that the bank cannot balance the maturity of assets and liabilities. A decrease in interest rates will benefit the bank. Conversely, an increase in interest rates will harm the bank. This happens when banks finance long-term loans with short-term deposits (Mishkin & Eakins, 2012). Bank risk is increasingly difficult to assess because of the nature of the loan portfolio held by banks and derivative transactions that they trade in financial markets (J.P.Morgan, 1997). Interest rate risk is the main risk that must be managed by banks because it has an impact on potential costs and income deviations (Djohanputro, 2004).

Furthermore, Djohanputro (2004) said that management's preventive action in controlling interest rate risk can be conducted by implementing Asset Liability Management (ALM). ALM is basically the coordination of reciprocity that is carried out in an integrated manner between the two sides of the bank's balance sheet based on plans and short-term decisions (Siamat, 2004).

The main function of ALM according to Djinarto (2000) is used to structuring asset and liability in order to optimise NII and to achieve stable growth. One of which is through gap management. Interest rate risk measurement is an activity that must be carried out by the bank to see how much potential loss will be borne by the bank (Djohanputro, 2004). The interest rate risk measurement technique commonly used by banks is gap analysis (Esposito, et al., 2015). This method requires a price gap report of asset sensitive to changes in interest rates based on their maturity distributions, and a gap report of liabilities sensitive to changes in interest rates based on their maturity distributions. These reports are provided off the balance sheet. Assets and liabilities that do not have intervals or time periods for re-signing contracts are assigned to the maturing list based on statistical analysis or valuation.

Interest rate risk is measured by calculating maturity gaps. The gap is defined as the absolute difference between the rate of sensitive assets (RSA) and the rate of sensitive liabilities (RSL) (Vij, 2005). Signs and the magnitude of the gap at various times can be used to assess the potential volatility of income arising from the changes in interest rates. A positive gap indicates that RSA is more than RSL and from an income perspective; this position benefits the bank in the event of an interest rate increase. The negative gap indicates that the RSL is more than RSA and from an income perspective; this condition will benefit the bank if there is a decrease in interest rates (Vij, 2005). Banks must manage the gap between RSA and RSL because the wider the gap, the riskier the bank against interest rate changes. The wider the gap, the more sensitive the NII of the bank is to interest rate changes. The gap is a measure of the sensitivity of net interest income in relation to interest rate changes (Koch & Macdonald, 2003; Riyadi, 2006). In brief, if the bank wants to keep its net interest income immune from changes in interest rates, it must monitor and manage the gap carefully. Net interest income is the difference between interest income and interest expense.

2.2. Hypothesis Development

Indonesia as a country with an open economy could be affected by global economic pressures and the global crisis. The crisis variables affect the Indonesian economy, especially through the banking industry interest rate changes. The function of banks is an intermediary that channel public funds to other parties that need funding. In carrying out the intermediary function, banks faced with various uncertainty conditions. Interest rates are one of the market variables that are very influential on the bank.

Banks are businesses whose profits are based on spread-based income and fee-based income, where the benefits are derived from the difference in fees for lending and funding interest, as well as fees obtained for services provided. So that changes in interest rates will affect bank income. The benchmark interest rate in Indonesia is the interest rate of Bank Indonesia Certificates (SBI). SBI is used as an instrument to control the level of market liquidity, inflation rates, and overall macroeconomic conditions. Policy changes set by Bank Indonesia will affect the direction of SBI movements. SBI interest rates become a reference for other domestic interest rates so that changes in SBI interest rates will affect other domestic interest rates.

The increase in SBI interest rates will also lead to an increase in deposit, and credit interest rates directly, where an increase in loan interest rates will move slower than deposit rates. When market interest rates increase and banking competition gets tighter, banks will increase their deposit rates to keep their customers. This is done because customer deposits are the largest source of funds to finance banks' productive assets. An increase in deposit interest rates will increase the cost of funds so that the bank will increase its lending rates. The increase in lending rates will cause changes in bank assets, especially from credit position, both working capital loans, investment loans, and consumer loans. The increase in deposit rates will also cause changes in the position of bank liabilities, especially from time deposits, demand deposits and savings accounts. Assets and liabilities changes in a contradicting direction will cause a gap between the two sides, where the gap will affect the bank's profitability along with changes in market interest rates.

Changes in SBI interest rates also have an impact on changes in people's preferences in terms of investing in deposits, as well as investing in other financial instruments because SBI is considered a risk-free interest rate. Therefore, in the bank balance sheet position, there are categories of assets and liabilities that are sensitive to interest rate changes. So, the change in interest rates will affect the position of assets and liabilities of the bank, which will ultimately affect the profit of the bank. This can be caused by the mismatch between the maturity of RSA and the maturity of RSL of the banks.

The impact of the above risks can be managed using the Asset and Liability Management (ALM) approach and the method of sensitivity gap management. The purpose of sensitivity gap management is to adjust assets and liabilities so that the source of funding and the uses of funding are able to produce predetermined spreads and get the same maturing. By managing assets and liabilities through the ALM approach, it is expected that the spread between income and risk can be maintained so that changes in the value of sensitive assets and liabilities can be anticipated to prevent losses. Based on the gap analysis that has been done, it will be known how the potential increase of NII is. Based on the explanation above, the hypothesis can be drawn:

Ha1: Gap between RSA and RSL has a significant effect on NII.

Ha2: Banks with a positive gap (RSA and RSL) have a different NII with banks with a negative gap

Based on the gap analysis, it will be known how the potential of NII improvement, so that it can be recommended the right strategy to anticipate the risk of interest rate changes in the next period.

3. DATA AND METHODOLOGY

The population in this study is all conventional (not Sharia) commercial banks in Indonesia as many as 99 banks. Of the 99 banks, 57 banks were selected as the sample of in the study. Determination of the sample is by using purposive sampling, based on the following criteria:

- a. The bank is a conventional commercial bank (non-sharia) operating in Indonesia. The reason is that sharia banks do not adopt an interest rate in their business practices.
- b. Availability of the bank's annual report that contains financial statements and presents data about the descriptions of interest rate risk management, which also provides complete data about bank's RSA and RSL from 2013 - 2017.

There are five years of the research period, so there are 285 unit observations used in the analysis.

3.1. Net Interest Income

Net Interest Income (NII) is the bank's performance ratio that measures how much the company benefits from the bank's operational activities as a mediator, namely lending and funding activities. NII is the difference between interest income gained from lending activities that are subtracted with interest costs of collecting funds activities (funding activities) from the third parties (Winarso & Salim, 2017). Net interest income is derived from the difference between interest income and interest expense.

$NII = \text{Interest Income} - \text{Interest Expense}$

3.2. Gap Sensitivity

The sensitivity-gap analysis measures assets and liabilities that are sensitive to changes in interest rates. The steps in the sensitivity gap analysis are as follows:

Compile Mismatch-Rate Sensitivity

Compile Mismatch-Rate Sensitivity by grouping re-pricing/maturity schedule, namely the preparation of assets and liabilities based on the determination of new interest rates and based on maturity, and asset grouping (RSA) and liabilities (RSL) based on their sensitivity (Ali, 2004). This data has been provided in the bank's annual report on interest rate risk management.

Rate Sensitive Assets (RSA) are all assets, including fixed rate assets, which have a short-term maturity of less than 1 year or assets with a floating interest rate which must be renewed every 1 month, 3 (three) months, 6 (six) months, and a maximum of 1 year.

Liabilities classified as rate sensitive liabilities (RSL) are all liabilities, including fixed rate liabilities, which have a maturity of not more than 1 year, or loans with floating interest that must be renewed every 1 month, 3 (three) months, or 6 (six) months, or no more than 1 year.

Perform Risk analysis

Risk analysis is done by calculating the gap sensitivity to interest rate changes which are proxied by the interest sensitivity ratio (interest rate sensitivity, IRS) with the following formula (Ali, 2004):

$$IRS = \frac{RSA}{RSL}$$

This calculation is used to determine the comparison between RSA and RSL. The $IRS > 1$ means that $RSA > RSL$, whereas $IRS < 1$ indicates that $RSA < RSL$. This IRS value is used to measure the sensitivity of NII to the interest rate. An analysis of gap that occurs due to interest rate changes is done by calculating the difference between RSA and RSL, which is formulated as follows:

$$\text{Gap} = \text{RSA} - \text{RSL},$$

Where:

RSA = Rate Sensitive Asset (in Indonesian Rupiah, IDR)

RSL = Rate Sensitive Liabilities (in IDR)

This calculation is to classify between banks that have a positive gap with a negative gap. Banks with a positive gap are given a value of one and banks with a negative gap are given a value of zero.

3.3. Control Variables

The research includes several control variables as follows

1. Non-Performing Loans (NPL) show how much the level of non-performing loans is from the total amount of loans disbursed (Winarso & Salim, 2017). NPL includes less successful collectability, doubtful, and bad debt. The decreasing total NPL shows the decreased effectiveness of banking performance in credit management and vice versa. The higher the NPL will affect the NII because the creditors are unable to pay off the interest or principal of the loan with the bank.
2. Loan to Deposit Ratio (LDR) is an indicator ratio to determine bank liquidity. This ratio measures a bank's ability to fulfill its obligations (Winarso & Salim, 2017). LDR is the ratio between the total amounts of credit given by the bank divided by the funds received by the bank. The LDR implies how strong the bank's ability to repay funds-withdrawal by depositors by controlling the credit provided in which these depositors' savings are the sources of banks' liquidity. The higher the LDR reflects the lower level of liquidity. The higher LDR means the higher third-party funds are distributed to debtors. Logically, if there is a change in interest rates, the bank will adjust the interest rate on lending and funding. This change in lending and funding interest rates will affect NII. This magnitude of changes in the NII is related to how the bank manages its RSA and RSL.
3. Banks are grouped based on bank ownership status: Owned by the Government (central government ownership or local government ownership), National Private Bank, and Foreign Bank. The purpose of this grouping is to find out the difference in risk management of interest rate changes. Considering, each ownership status has characteristics in terms of corporate culture in responding to risk, it is interesting to analyze banks' NII; whether banks with different corporate culture have different NII in responding to interest rate risks. This variable will be measured by a dummy variable, where the ownership of the government banks will be used as a baseline. So there will be two dummy variables. The measurement of the dummy variable is as follows:
 - a. The first dummy variable is a national private bank, the bank with a national private ownership status will be assigned with a value of one and the status of the other bank is given a value of zero.
 - b. The second dummy variable is a foreign bank, the bank with foreign ownership status will be assigned with a value of one and the status of the other bank is given a value of zero.
4. This study also looks at how the development of NII every year. This variable will be measured by a dummy variable, where the year 2013 will become the baseline. So there will be four dummy variables. The assessment of the dummy variable is as follows:
 - a. The first dummy variable is the year 2014, then the year 2014 is given a value of one and the other years are given a value of zero.
 - b. The second dummy variable is the year 2015, then the year 2015 is given a value of one and the other years are given a value of zero.

- c. The third dummy variable is the year 2016, then the year 2016 will be given a value of one and the other years are given a value of zero.
- d. The fourth dummy variable is the year 2017, then the year 2017 will be given a value of one and the other years are given a value of zero.

A regression model for the relationship between the management sensitivity of the RSA gap and RSL with the NII can be developed as follows:

$$NII = \alpha + \beta_1 IRS + \beta_2 DummyGap + \beta_3 NPL + \beta_4 LDR + \beta_5 DummyPRIVATE + \beta_6 DummyFOREIGN + \beta_7 Dummy2014 + \beta_8 Dummy2015 + \beta_9 Dummy2016 + \beta_{10} Dummy2017 + \varepsilon_i$$

Where,

α	: Constant variables
β_1 - β_{10}	: Regression coefficient
NII	: Net interest income
IRS	: Interest rate sensitivity
DummyGap	: Dummy variable difference between RSA and RSL
NPL	: Non-performing Loan
LDR	: Loan to Deposit Ratio
DummyPRIVATE	: Dummy variable status of national private banks
DummyFOREIGN	: Dummy variable status of a foreign-owned bank
Dummy2014	: Dummy variable of the year 2014
Dummy2015	: Dummy variable of the year 2015
Dummy2016	: Dummy variable of the year 2016
Dummy2017	: Dummy variable of the year 2017
ε_i	: Error term

3.4. Classical Assumption Tests

The classic assumption test that underlies a multiple regression model is done to get an accurate model. The classic assumption tests in this study consist of residual normality, multicollinearity, heteroscedasticity and autocorrelation (Ghozali, 2013; Hair Jr, Black, Babin, & Anderson, 2010). The result is provided in the appendix.

4. FINDINGS AND DISCUSSIONS

After the regression models passed from the normality, multicollinearity, heteroscedasticity, and autocorrelation tests (the results of the series tests can be seen in Appendix), a regression analysis can be conducted. The regression result can be seen as follows.

4.1. Findings

To smooth the data so that the data has a normal distribution, this research transforms the data of NII, into the natural log (Ln) form. The descriptive statistics can be seen in Table 1. Descriptive statistics showed in Table 1 do not provide data of dummy variables. This is because a dummy variable is only to dichotomize one group with other groups. It does not have the value of mean, minimum, maximum, neither std. deviation.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NII	285	23.0330	30.5897	26.7348	1.3830
IRS	285	0.2154	2.2062	1.2421	0.2908
NPL	285	0.0000	0.9360	0.9180	0.0548
LDR	285	0.4225	1.9696	1.0154	0.1306
Valid N (listwise)	285				

Source: computed data based on the data collected

The statistical test of regression analysis with panel data has been performed and the result can be seen in Table 2.

Table 2: Results of Statistical Tests

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.705 ^a	.497	.479	.99831365	2.127

a. Predictors: (Constant), Y2017, FOREIGN, NPL, IRS, Y2014, GAP, LDR, Y2015, PRIVATE, Y2016

b. Dependent Variable: NII

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	270.103	10	27.010	27.102	.000 ^b
1 Residual	273.077	274	.997		
Total	543.180	284			

a. Dependent Variable: NII

b. Predictors: (Constant), Y2017, FOREIGN, NPL, IRS, Y2014, GAP, LDR, Y2015, PRIVATE, Y2016

Coefficients ^a									
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	90.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	26.639	1.185		22.472	.000	24.682	28.595		
IRS	-.413	.224	-.087	-1.844	.066	-.782	-.043	.828	1.207
GAP	.295	.150	.089	1.959	.051	.046	.543	.899	1.112
NPL	.096	1.102	.004	.087	.931	-1.722	1.914	.964	1.038
LDR	.884	.500	.083	1.766	.079	.058	1.710	.822	1.217
PRIVATE	-2.025	.144	-.732	-14.052	.000	-2.263	-1.787	.676	1.480
FOREIGN	-.689	.157	-.224	-4.377	.000	-.948	-.429	.700	1.429
Y2014	.156	.187	.045	.834	.405	-.153	.465	.624	1.602
Y2015	.311	.188	.090	1.660	.098	.002	.621	.621	1.609
Y2016	.512	.188	.148	2.729	.007	.202	.822	.621	1.611
Y2017	.677	.189	.196	3.582	.000	.365	.988	.612	1.633

a. Dependent Variable: NII

From Table 2, a research model can be formulated as follows:

$$NII = 26.639 - 0.413 IRS + 0.295 DummyGap + 0.096 NPL + 0.884 LDR - 2.025 DummyPRIVATE - 0.689 DummyFOREIGN + 0.156 Dummy2014 + 0.311 Dummy2015 + 0.512 Dummy2016 + 0.677 Dummy2017 + \varepsilon_i$$

4.2. Discussions

4.2.1. The Effect of Interest Rate Sensitivity (ISL) on NII

Interest rate sensitivity (ISL) is measured by comparing RSA divided by RSL. When ISL value is equal to one, it means that RSA is equal to RSL that it is called a zero gap. The ISL value is more than one meaning that the RSA is greater than RSL that it is known as a positive gap. Conversely, the ISL value less than one means that RSA is smaller than RSL that it is known as a negative gap (Ali, 2004).

From Table 2, it can be seen that IRS has a negative and significant effect on NII. It means that the increase in IRS will decrease NII. Based on the research model above, it can read that when the value of other independent variables are constant, a one percent increase in IRS will decrease NII by 0.413 percent and the effect is significant at the confidence level of 90 percent. The negative relationship means that the more positive gap between RSA and RSL, the lower NII or the more negative gap between RSA and RSL, the higher NII. The negative relationship means that the gap between RSA and RSL has the opposite direction from the NII.

The positive gap indicates that assets sensitive to interest rates are greater than the liabilities sensitive to interest rates (RSA > RSL). As it is known that from 2013 to 2017, there is a decreasing trend in the interest rate. When there is a decreasing trend in interest rate, a positive gap between RSA and RSL will decline. This decrease in NII was due to a decline in income that was faster than a decrease in funding costs (Riyadi, 2006).

This condition provides several indications: first, banks are likely to conduct lending activities in RSA that provide fluctuating income or distributing credit by setting interest based on market interest (floating rate). Thus, in the event of a decrease in SBI interest, the interest earned by the banks from their lending activities will decrease. On the other hand, the banks might finance their majority assets (RSA) from a fixed source of funds (RSL). Thus, when a decrease in SBI interest rates occurs, the banks cannot immediately respond to the decrease in SBI interest and cannot immediately decline its saving interest. In brief, the decline in SBI causes interest income from bank lending activities to decline, but this is not followed by a decrease in interest rates on liabilities because the interest rate on liabilities is fixed rate, so that NII experiences a decline.

Second, many banks might have a portfolio in short-term securities. On the other hand, the banks might carry out a portfolio financing strategy that is derived from long-term financing sources. The difference in the maturity of asset and liabilities will result in changes in income and costs. The bank cannot immediately and simultaneously implement a strategy to achieve the desired gap in accordance with the desired strategy.

Third, it seems that the positive gap between RSA and RSL is that liabilities widely spread over the maturity tenor at less than one year. A positive gap indicates that assets that are soon due are partly financed by long-term funding. The spread of maturity of assets, which are in less than one year, indicates that many bank investments (assets) are soon due. This means that the source of income has ended up flowing; on the other hand, some of the funding sources come from the source of long-term funds that the banks still have to pay interest. This is what makes the negative relationship between the positive gap of RSA_RSL and NII when the SBI interest rate decreases.

The implication of this result is that banks need to think about steps to reduce RSA and increase RSL. Kuncoro and Suhardjono (2004) suggest various ways for banks to reduce RSA by buying long-term securities, extending loan maturity, and changing the interest rate from a floating rate to a fixed rate. While the way to increase RSL is by giving premium interest rates for deposits with a maturity of less than one year and borrowing funds with a reasonable interest rate.

4.2.2. The Effect of Bank Gap Status (Positive Gap or Negative Gap) on NII

Positive gap or negative gap is proxied as a dummy variable, where banks with positive gaps are given a value of one and the bank with a negative gap is given a zero value. From Table 2, it can be seen that the estimation of DummyGap is 0.295. It means that banks with a positive gap will have a higher NII than banks with negative gap. Banks with positive-gap will have NII 0.295 higher than the NII of banks with negative-gap.

This statistical result seems to contradict with the statistical results of the effect of ISL on NII. Where, when the SBI interest rate decreases, the more positive RSA and RSL gap, the lower the NII. The statistic results indicate that banks that have a positive gap and RSL will experience a decrease in NII. However, this condition is not supported by the statistical results provided in Table 2. Banks that have a positive gap turn out to have a higher NII than banks with a negative gap.

The above conditions could be caused by the following explanation. First, even though the bank's NII with a positive gap experienced a decline and the bank's NII with a negative gap experienced an increase, it seems that the bank's NII with a positive gap is still higher than the bank's NII with a negative gap. This may be because through UU No 23/2014 about good corporate governance for state-owned banks that require the banks to meet the guidelines provided the government. The guidelines include that banks should report their performance and level of risks (Kementerian-Dalam-Negeri, 2017; OJK, 2017b).

Second, measuring NII with IDR nominal value may contain weaknesses. Banks with positive gaps have a higher nominal NII compared to banks that have a negative gap. This NII is calculated from the difference between interest incomes minus interest costs. When a bank group with a positive gap consists of banks with large total assets, it is natural that the nominal NII is also large. On the contrary, when the bank group with a negative gap consists of banks with smaller total assets, then a smaller NII nominal is also a natural thing. This weakness is a note for improvement in future research.

4.2.3. Control Variables

Net non-performing loans (net NPLs) of banks do not have a significant effect on the NII. The insignificant effect may be because the average level of net NPL is very low at 0.918% (see Table 1) when this figure is compared to 2%, the net NPL requirement of the Indonesian Financial Services Authority (OJK, 2017b). Because banks are able to maintain their net NPL below 2% at least in a period time of this study, the net NPLs do not have a significant effect on NII.

Loan to deposit ratio (LDR) has a positive and significant impact on the NII at a 90% confidence level. The higher the LDR will increase the NII. This is because bank interest income is obtained from credit distributed, in which the funds are collected from the third parties and communities. The greater the credit distributed, the greater the bank's interest income. The mean of banks' LDR included in the sample is 101.54%, while the regulations set the LDR should be in between 80% and 92% (OJK, 2017b). LDR above 100% means that banks are categorized as less liquid. This bank finances its credit using call money, where call-money is a source of short-term loan funds that have high costs.

The national private bank group has a lower 2.025% NII compared to the government-owned NII bank. Furthermore, the NII of foreign banks is 0.689% lower than the NII of state-owned banks. Government-owned banks have a higher NII than other ownership, probably due to the presence of state-owned banks classified as large banks. Hence, a higher NII nominal makes that this condition is normal for bigger banks to have higher NII than those smaller banks. This nominal measurement of NII may have to be corrected due to homogeneity problems.

Finally, the NII of the year 2014 was higher than the NII of the year 2013. When viewed from the beta coefficient value of each year, the beta value is positive and from year to year it increases. This means that from 2013 to 2017 NII banks experienced an increase. This is contradictory with the real data of NIM that from 2014 to 2016, the NIM has increased, but in 2017 the NIM has decreased. So, this means that the measurement of the gap by using the nominal IDR value of NII may contain weaknesses in terms of homogeneity. In the sense that a large NII nominal does not necessarily reflect the performance of efficient lending and funding activities if the performance also considers the amount of credit disbursed and the total assets owned by the banks. So, it needs to be reviewed for measuring the variable in the ratio scale.

5. CONCLUSION

From the above explanation, it can be concluded that in conditions of declining interest rates, the enlarged positive gap between RSA and RSL has decreased banks' NII. Based on these results, logically, in the condition of declining interest rates, banks that have a positive gap should have a lower NII than the bank with a negative gap. But the empirical results do not support this statement. Even, banks with positive gap have higher NII than banks with a negative gap.

The practical implication of the results is that under the condition of decreasing interest rates, banks with positive gap need to think about lowering the RSA by means of managing their assets, such as banks need to buy long-term securities; extend the loan maturity; and change the interest rate from a floating rate to a fixed rate. In terms of management liabilities, banks with positive gap need to think about increasing RSL by giving premium interest rates for deposits with a maturity of less than one year; and by borrowing funds at fair interest rates.

Implications for future research, it is necessary to improve weaknesses in this study, namely measuring variable not based on NII nominal value, but based on ratio measurement, for example, NIM or NII divided by total assets or NII divided by total funds collected from the third parties. To avoid homogeneity problems, it is also necessary to classify banks based on their total assets to see how NII of different total asset groups.

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Appendix: Results of Classical Assumption Tests

1. Normality Test

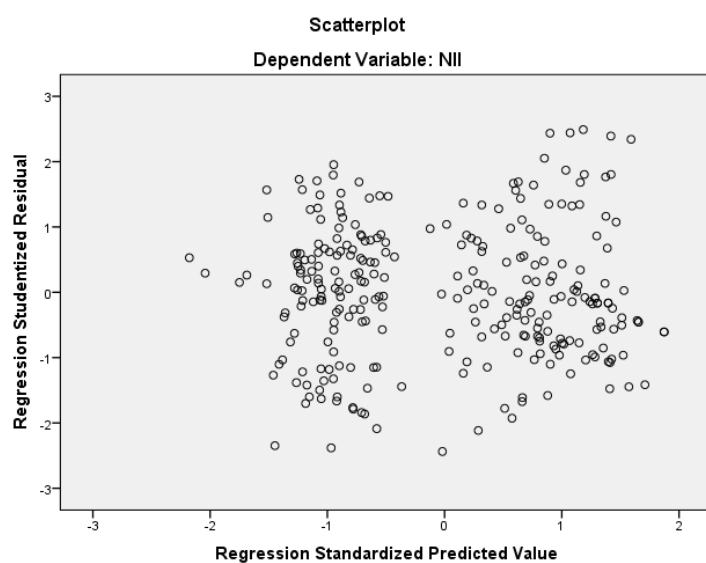
	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.029	285	.200*	.995	285	.443

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Kolmogorov-Smirnov and Shapiro-Wilk test provide significance value more than 0.05. Hence, it can be concluded that the residual is normally distributed.

2. Heteroscedasticity Test



Based on the graph that the graph does not have a certain pattern and the dot is scattered randomly. Hence, there is no heteroscedasticity issue.

3. Multicollinearity Test

Multicollinearity problem can be checked from the value of VIF. Multicollinearity occurred when the value of the VIF is more than 10. The following table provides the result of multicollinearity test.

Model	Coefficients ^a								
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	90.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	26.639	1.185		22.472	.000	24.682	28.595		
IRS	-.413	.224	-.087	-1.844	.066	-.782	-.043	.828	1.207
GAP	.295	.150	.089	1.959	.051	.046	.543	.899	1.112
NPL	.096	1.102	.004	.087	.931	-1.722	1.914	.964	1.038
LDR	.884	.500	.083	1.766	.079	.058	1.710	.822	1.217
PRIVATE	-2.025	.144	-.732	-14.052	.000	-2.263	-1.787	.676	1.480
FOREIGN	-.689	.157	-.224	-4.377	.000	-.948	-.429	.700	1.429
Y2014	.156	.187	.045	.834	.405	-.153	.465	.624	1.602
Y2015	.311	.188	.090	1.660	.098	.002	.621	.621	1.609
Y2016	.512	.188	.148	2.729	.007	.202	.822	.621	1.611
Y2017	.677	.189	.196	3.582	.000	.365	.988	.612	1.633

a. Dependent Variable: NII

About the value of VIF, there is no VIF more than 10 so that it can be concluded that there is no multicollinearity.

4. Autocorrelation Test

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.705 ^a	.497	.479	.99831365	2.127

a. Predictors: (Constant), Y2017, FOREIGN, NPL, IRS, Y2014, GAP, LDR, Y2015, PRIVATE, Y2016

b. Dependent Variable: NII

N : 285

K : 10

Du : 1.834105

DL : 1.70423

Dw : 2.127

If $Dw > Du$ there is no positive autocorrelation. The result is that $Dw = 2.127 > Du = 1.834105$. If $(4 - Dw) > Du$ there is no negative autocorrelation. The result is that $1.873 > Du = 1.834105$. Hence, there is no autocorrelation issue.



DETERMINANTS OF JORDAN-TURKISH BILATERAL TRADE BALANCE

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ABSTRACT

Purpose - This paper explores empirically the determinants of the bilateral trade balance for Jordan-Turkish economy, and the impact of the free trade agreement between Jordan and Turkey on the Jordanian-Turkish trade balance.

Methodology - The study used Autoregressive Distribution Lag (ARDL) model to estimate the long run relationship between Jordanian- Turkish bilateral trade balance and its determinants during the period from 1978 until 2017.

Findings - The result of the analysis found that the real effective exchange rate has a positive effect on the trade balance in the long run, and negative effect on the trade balance in the short run, while the relative money supply and relative GDP have a weak effect on the trade balance in the short and long run. Also, the result points out that the impact of the free trade agreement is insignificant on the trade balance in the long run, which supports the position of the Jordanian government, which has revoked the work in this agreement.

Conclusion - The most important policy implication to be concluded from these empirical findings is that devaluation of Jordan Dinar against Turkish Lira can be used to accomplish an improvement in the trade balance of Jordan against Turkey. However, increasing the relative money supply or relative income will not achieve the desired goal.

Keywords: Trade balance, free trade, ARDL, Jordan, Turkey.

JEL Codes: F14, F53.

1. INTRODUCTION

In order to stimulate the economy and encourage economic development, Jordan sought to liberalize its markets to open up to the regional and international economies. In order to achieve this, it signed a number of agreements with various countries, particularly those with larger economies.

At the end of 2009, Jordan signed a free trade agreement with Turkey and entered into force in 2011. The agreement includes the framework for the development of bilateral trade relations between Jordan and Turkey through the establishment of a free trade zone, which includes customs duties, quotas, anti-dumping and anti-monopoly.

In 2018, the Jordanian government announced that the free trade Agreement with Turkey did not achieve the desired results, but on the contrary, contributed to the increase in trade balance deficit for the Turkish side, and the failure of the Turkish side to make a difference in the volume of Turkish investment flows into Jordan, Which prompted the Jordanian government to terminate this agreement. This decision created a debate between the economic sectors about its effects on the Jordan- Turkish trade balance and on the economic performance in general.

In literatures, there are three approaches to explain the difference in the trade balance deficit between countries. Which are the Elasticities, Absorption, and Monetary approach. Each of these approaches depend on different factors. The Elasticities

approach is based on the devaluation currency to improve the trade balance, while the Absorption approach is based on the effect of the income and the relative price on the trade balance, and the Monetary approach proposes that the monetary factors have an effect on the trade balance.

The aim of this paper is to explore empirically the determinants of the bilateral trade balance model for Jordan-Turkish economy during the period from 1978 until 2017, and the impact of the free trade agreement with Turkey on the Jordanian-Turkish trade balance.

To achieve the objective of the study in determining the factors that appear to affect the Jordanian- Turkish trade balance, the paper follows several studies that use the ARDL model to analyze the Jordanian- Turkish bilateral trade balance during the period from 1978 until 2017, Unrestricted Error Correction model (UECM) of the ARDL used to determine a stable long-run relationship between trade balance and its determinants. One of The ARDL features is that it has the potential to be applied in the case of small samples, regardless of the degree of integration of the variables. This paper is different from other relevant studies, as we use the ARDL model to analyze the bilateral trade balance between Jordan and Turkish specifically.

This paper consists of five sections. The first section is introduction, in the second section presents the theoretical background and the relevant studies. Section three discusses the model used in the analysis. The fourth section gives empirical analyses and the final section include the conclusion.

2. LITERATURE REVIEW

There are several Approaches to confirm the determinants of the trade balance, which are Elasticity, Absorption, and the Monetary approach. The Elasticity approach, which forms its origin by Bickerdike (1920), Robinson (1947) and Metzler (1948), supports the view that the exchange rate is the determinant of the trade balance (Ogbonna, 2011). This effect can be verified by the Marshal-Lerner condition. Accordingly, devaluation will improve the trade balance only if the total elasticity of imports and exports to the exchange rate is greater than one. If the total of the elasticities is less than one, the value of the currency will improve the trade balance, but by a small percentage, not enough to achieve the desired effect. After Marshall Lerner's condition, there was the J-Curve effect that discusses the relationship between the real exchange rate and the trade balance. It indicates that the deterioration of the trade balance resulting from the devaluation of a given currency may be temporary and may cause only a short-term problem, then improves later to a higher level than it was before the currency devaluation process took place (Bahmani-Oskooee and Ratha, 2004).

Absorption approach suggests that any improvement in the trade balance requires an increase in revenues over total domestic spending. In other words, the economy is analyzed from the point of view of the total expenditure. Thus, any improvement in the trade balance is assumed to require an increase in domestic revenues over the total expenditure, and it analyzes the direct effects of exchange rate changes on relative prices and income and their impact on the trade balance (Duasa, 2007). The Monetary approach also suggests that the trade balance is essentially a monetary phenomenon, and imbalances in the trade balance, reflect the imbalance in the money market (Prais, 1961; Mundell, 1971). So the trade balance is analyzed from the point of view of the supply and demand of money. If people demand more money than the central bank supplied, the demand will be met by the inflow of money from abroad, in this case, the trade balance will improve. If the central bank supply more money than demanded, the surplus will be eliminated by outflows of money to other countries and this will worsen the trade balance.

In the empirical side, there have been numerous studies that attempt to determine the factors that affect the trade balance. Kyereme (2002), who examined the determinants of the trade balance between the United States and Australia over the period 1965-1998, 1975-1998, found that the relative price is the most important determinants of the trade balance, followed by the lending rate, the GDP ratio, the money supply ratio, and real exchange rate.

Shawa and Shen (2013) based on data for the period of 1980 to 2012, found that foreign direct investment and human capital development as well as consumer spending and government expenditure are the most important determinants of Tanzania's trade balance. In addition, Duasa (2007) employed ARDL approach in Malaysia during the period 1974 to 2003, she concluded that money supply and income play a major role in determining the long-run behavior of Malaysian trade balance as compared to the exchange rate.

On the Turkish side, Cergibozan and Ari (2017) study the determinants of the trade balance in the short and long term over the period 1987-2015. They found that in the appreciation of the real exchange rate in the long-run increases the trade balance, as well as an increase in domestic income, while an increase in foreign income reduces the trade balance. In the short run, the increase in the real exchange rate has no effect on the trade balance, while both domestic income and foreign income

negatively affect the deterioration of the trade balance. The study of Celik and kaya (2010) aimed to analyze the dynamics of bilateral trade of Turkey with seven countries (France, Germany, Netherlands, Italy, Japan, United States, United Kingdom) using cross-sectional data during the period 1985 to 2006. The results showed that there is a long-run relationship between real exchange rates and real income with the trade balance, as the devaluation of the Turkish currency will improve the trade balance of Turkey.

In Jordan, the study of Abu-Lila and Jdaitawi (2015) aimed to measure the price and income elasticity of Jordan's foreign trade with the most important trading partners (The Arab countries, the United States, China and India) in order to determine the effect of both income and relative prices and the real exchange rate on the Jordanian trade balance during the period (1980-2013). The main findings of the study were, that the results show a high price elasticity of Jordanian exports to these countries, and therefore, the lower the relative prices of exports will lead to an increase in Jordanian exports and improve the trade balance.

Alhanom (2016) examined the determinants of Jordan's trade balance during the period (1970-2010), He found that foreign income is an important determinant of the trade balance in the long run, unlike domestic income and real exchange rate which appear insignificant determinant of the trade balance in either short or long run. In the same context, the study (Al-Sawaie, 2017) examined the short and the long run relationship between the balance of trade, income, money supply, and the real effective exchange rate of Jordan during the period 1976-2013. The results show that the money supply and the income, play a strong role in determining the behavior of the trade balance, and the exchange rate improves the trade balance.

3. MODEL SPECIFICATION

The main objective of this study is to investigate the effect of the relative GDP, the relative real exchange rate, and the relative money supply on the trade balance between Jordan and Turkey. This paper modifies the model used by (Kyereme, 2002; Duasa, 2007) which adapt the three approaches (Elasticities, Absorption and Monetary) to identify the determinants of the trade balance. We introduce a dummy variable to identify the effect of Jordan-Turkey free trade agreement on the trade balance. The modified model can be written as follows:

$$LTB = c + LGDP + LMs + LREER + DU + e_t \quad (1)$$

Where:

LTB: is the logarithm of trade balance between Jordan and Turkey.

LGDP: is the logarithm of the real gross domestic product of the Jordan relative to that of Turkey.

LMs: is the logarithm of relative money supply in Jordan relative to that of Turkey.

LREER : is the logarithm of relative Jordan Dinar relative to Turkish Lira real effective exchange rate.

DU: is a Dummy variable equal to 1 for the years when the free trade agreement between Jordan and Turkey is valid, and 0 if not.

e : is the error term.

In terms of methodology, the paper adopts the framework that was developed by Pesaran and Shin (1995, 1999) and extended by Pesaran et al (2001) by using Autoregressive Distribution Lag (ARDL) Model to estimate the long run relationship between the dependent variable and the independent variables. This modern model has a numerous advantages, which make it preferable to other models in estimating the long run co integration relationship, one of the main advantages is that it has a potential to be applied in the case of small samples, regardless of the degree of integration of the variables.

The determinants of the Jordanian-Turkish trade balance will be estimated through a model that measures the long-term relationship between the variables of that model, to examine the existence of that long run relationship, the bound co integration test will be used. To apply the bound test procedure for the equation (1), the Error Correction version of the ARDL model is given respectively by the Unrestricted Error correction representation (UECM) of the ARDL as follows:

$$\begin{aligned} \Delta LTB = & \alpha + \sum_{i=1}^m \beta_1, i \Delta LTB_{t-i} + \sum_{i=0}^n \beta_2, i \Delta LREER_{t-i} + \sum_{i=0}^o \beta_3, i \Delta LGDP_{t-i} + \sum_{i=0}^p \beta_4, i \Delta LMs_{t-i} + \sum_{i=1}^q \beta_5, i \Delta DU_{t-i} + \delta_1 LTB_{t-1} \\ & + \delta_2 LREER_{t-1} + \delta_3 LGDP_{t-1} + \delta_4 LMs_{t-1} + \delta_5 DU_{t-1} \\ & + \varepsilon_t \end{aligned} \quad (2)$$

Where Δ denotes first difference, α is constant and ε_t is white noise errors.

As a pre request to perform ARDL model, stationary of the variables must be tested to ensure that all variables stationary on I (0), I (1), and there are no variables integrated of order (2) or more. The next step is to estimate the long run relationship using ARDL approach, which involves two steps: the first step is to examine the existence of the long run relationship among all variables in the estimated equation by using the bound co integration test based on critical value. If we find a long run relationship, then we will go to the second step, which is estimating the long and short run coefficients of the equation.

Various diagnostic tests have to be applied to confirm the validity of the model, we implement various residual tests, starting with the Breusch-Godfrey LM test for serial correlation, white and ARCH tests for heteroscedasticity, Jarque-Bera test for Normality of data, and Ramsey's RESET to test the functional form misspecification. Also, CUSUM and CUSUMQ test the stability of the long-run parameters.

4. EMPIRICAL RESULTS

The study used annual data over the period 1978-2017. The data was collected from the Central Bank of Jordan and from the World Bank database.

4.1. Unit Root Test

To examine the stationary properties of the included Time series, we will use the Augmented Dickey-Fuller (ADF) as well as the Phillips Peron (PP) tests, as presented in table (1). As shown from the table, all variables are integrated at the first difference I (1), except the LTB integrated at the level I (0).

Table 1: Unit Root Test

Variables	Tests	Level		First difference		Order of integration
		Intercept	Intercept & trend	Intercept	Intercept & trend	
LTB	ADF	-3.2347 **	-3.3606	-7.6604*	-7.6197*	I(0)
	PP	-3.1838**	-3.3370	-7.9768*	-8.0082*	
LREER	ADF	-2.2214	-2.5669	-6.7645*	-5.0385*	I(1)
	PP	-2.1777	-2.5546	-6.7645*	-6.6729*	
LRGDP	ADF	-1.6712	-2.0016	-5.3826*	-5.3045*	I(1)
	PP	-1.7868	-2.2947	-5.3826*	-5.3045*	
LMS	ADF	-1.0047	-2.6434	-5.6720*	-3.0596	I(1)
	PP	-1.0976	-2.7948	-5.6623*	-5.6071*	

ADF: Augmented Dickey-Fuller test statistic. PP: Phillips-Perron test statistic.

Note: *, ** indicates significant at 1%, 5% level, respectively

4.2. ARDL Results

To estimate the coefficient of the long run relationships and associated error correction model (ECM) using the ARDL model, the order of distributed lag on the dependent variables were selected by the Akaike information criterion (AIC), which selects an ARDL (3,4,1,4,4,) for the variable included in the model.

4.2.1 Cointegration Analysis (Bound Testing)

In order to examine the long run co integration relationship among the variables, , the bound test using calculated F-statistics from the joint significance of lagged levels of the variables employed to confirm the presence of co integration. The result of the Wald test (F-statistics) is presented in the Table (2).

Table 2: Bound Testing

Dependent Variable: LTB Log of Trade Balance Jordan Turkey	Wald test (F-Statistic) Calculated Value	
$LTBJT = f(Lreer, Lrgdp, Lms, du)$	7.735661*	
Significance level Unrestricted Intercept and no Trend No. of Regressors (k) = (4)	Lower Critical Bounds (LCB) I(0)	Upper Critical Bounds (LCB) I(1)
1%	3.74	5.06
5%	2.86	4.01
10%	2.45	3.52

* Significant at 1%.

**Pesaranet. al. (2001), Table Cl. Iii: case III: Unrestricted Intercept and no Trend

It is observed in Table (2) that there is a co integration among the trade balance and the explanatory variables, and the real GDP the explanatory variables, where that the F statistics calculated in the table is higher than upper critical value statistically significant at less than 1% level. Since the existence of the co integration relationship is determined by this way, the process of the estimation of Autoregressive Distributed lag (ARDL) models began in order to search the long and short-term relationships

4.2.2 Short and Long-Term Analysis

The estimation result of the long run ARDL model is presented in Table (3) which shows the long run coefficients.

Table 3: Estimated Long Run Coefficients Using the ARDL Approach

Long Run Coefficients				
Dependent Variable: LTB	Coefficient	Std. Error	t-Statistic	Prob.
LREER	1.452	0.352	4.118	0.001
LMS	1.150	0.579	1.985	0.067
LGDP	-1.797	0.924	-1.944	0.072
DU	0.259	0.301	0.860	0.404
C	-1.822	1.695	-1.075	0.300

The variable of REER is found to have positive and statistically significant at the 1% level, implying that in the long run, the greater the relative exchange rate by 1% will lead to a rise in the trade balance deficit by 1.452%. In the short run (Table 4), the relative exchange rate has a negative effect on the trade balance, as 1% increase in the relative exchange rate, will lead to decrease in the trade deficit by 1.096%. All other coefficients were statically insignificant in the short run.

The coefficients of relative money supply MS and relative GDP was at a low level of significance compared with the Real exchange rate REER, at less than 10% significance level. Despite the signs of those coefficients, accordance with the theoretical and the empirical assumption of absorption and monetary approaches, which indicates that the real exchange rate of the Jordanian Dinar against the Turkish Lira, is the main variable in the interpretation of the behavior of trade balance between Jordan and Turkey in the long and short term, Which is in line with the economic theory, as the high exchange, the rate of the Jordanian Dinar in the long term will increase the competitiveness of the Turkish product to the Jordanian product in the Jordanian and Turkish market, which will lead to a decrease in Jordanian exports to the Turkish market (due to an increase in the cost of the Jordanian product) and replace the Turkish products instead of Jordanian imports, In addition to the substitution of Turkish imports instead of national products in the Jordanian economy (due to the lower cost).

In the short term, the increase in the Jordanian Dinar exchange rate against the Turkish Lira will lead to an increase in the purchasing power of the Jordanian Dinar from the Turkish products (increase in Jordanian consumption) and the decrease in the purchasing power of the Turkish Lira, Which will lead to an increase in the value of the invoice for Turkish imports from Jordan, and therefore, a decrease in the value of the bill of Jordanian imports from Turkey, thus reducing the short-term Jordanian-Turkish trade deficit.

The estimation result also points out that the impact of dummy variable (The free trade agreement between Jordan and Turkey) is a positive statically insignificance on the trade balance in the long run. This indicates that the free trade agreement does not affect the trade balance between the two countries. It is worth noting that the positive relationship (non-significant) is consistent with the economic theory in the liberalization of international trade. This result also supports the position of the government, which has revoked the work in this agreement.

In the short term, it was noticed that the coefficient of the dummy variable (free trade agreement) is significant at a low statistical level of less than 10%. Therefore, the increase in the liberalization of Jordanian-Turkish trade by 1% will increase the Jordanian-Turkish trade deficit by 0.632%. Which indicates that the trade relationship between the two countries for the benefit of the Turkish side, which its economy characterized by large size and high productivity compared to the Jordanian economy.

The Error Correction term (ECT) indicates the direction and the speed of the adjustment in the model due to any short run disequilibrium by examining sign and the statistical significance of the ECT. The appearance of ECT with a negative and significance makes sure, that an integrated long run relationship can be attained among the variables in the model, so the correcting of short run deviation of trade balance from the long run equilibrium needs 1.088 years.

$$Cointeq = LTB - (1.4530 * LREER + 1.1506 * LMS - 1.7971 * LGDP + 0.2597 * DU - 1.8224)$$

Table 4: Error Correction Representation ARDL Model

Co integrating Form				
Dependent Variable:	D(LTB)			
Selected lags**	ARDL(3,4,1,4,4)			
Regressor	Coefficient	Std. Error	t-Statistic	Prob.
D(LTB(-1))	0.367	0.145	2.531	0.024
D(LTB(-2))	0.157	0.137	1.147	0.270
D(LREER)	-1.096	0.373	-2.931	0.010
D(LREER(-1))	0.370	0.451	0.819	0.426
D(LREER(-2))	-0.250	0.398	-0.629	0.539
D(LREER(-3))	-0.893	0.305	-2.925	0.011
D(LMS)	-0.390	0.834	-0.467	0.647
D(LGDP)	0.815	0.726	1.122	0.280
D(LGDP(-1))	0.431	0.531	0.811	0.430
D(LGDP(-2))	-0.801	0.482	-1.659	0.119
D(LGDP(-3))	1.343	0.455	2.950	0.010
D(DU)	0.632	0.349	1.811	0.091
D(DU(-1))	0.456	0.453	1.005	0.331
D(DU(-2))	-0.835	0.457	-1.825	0.089
D(DU(-3))	1.051	0.382	2.746	0.015
CointEq(-1)	-0.919	0.167	-5.475	0.000

** : Selected basd in Akaike information criterion (AIC).

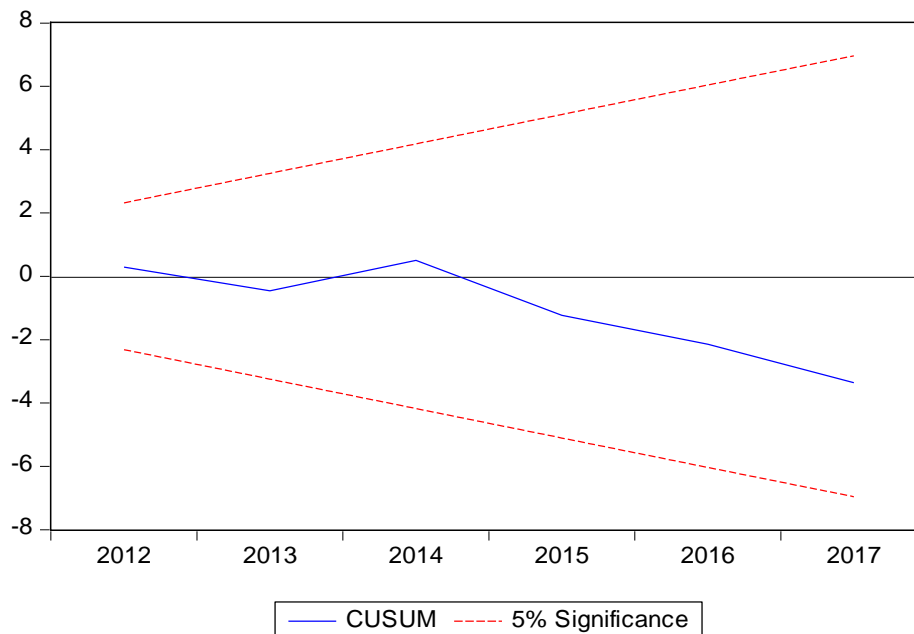
The ARDL model passes the standard diagnostic tests as shown in Table 5 , which was by the rejection of the null hypothesis which indicates that the residual data is normally distributed through Jarque-Bera Test with a probability of 0.625 no serial correlation detected through LM Test with a probability of 0.439, no heteroscedasticity through white test with a probability of 0.883, no autoregressive conditional heteroscedastic through the ARCH test with a probability of 0.468, and finally the Ramsey RESET Test indicates that there is no problem in the model identification.

Table 5: Diagnostic Test

Diagnostic Test	value	Probability
Breusch-Godfrey Serial Correlation LM Test	0.882	0.439
Heteroscedasticity Test: White	0.562	0.883
Normality: Jarque-Bera Test	0.939	0.625
Autoregressive Conditional Heteroscedasticity (ARCH) Test	0.539	0.468
Ramsey RESET Test	0.770	0.395

4.2.3 Stability of the Parameters

To examine the stability of the long-run parameters together with the short-run dynamics to ensure the robustness of our result, cumulative sum (CUSUM) and the cumulative sum of square (CUSUMQ) is used. A graphical representation of CUSUM and CUSUMQ statistics are provided in figure (1) and figure (2) respectively. If the plot of CUSUM and CUSUMQ remains with the 5% critical bound, then the null hypothesis is that all coefficients that are stable cannot be rejected. The plots indicate that none of the straight lines (drawn at the 5% level) are crossed by CUSUM and CUSUMQ, so they are within the boundaries and therefore these statistics confirm the stability of the long run coefficients of the estimated equation.

Graph 1: Plot of CUSUM Statistics for Stability Test

Graph 2: Plot of CUSUMQ Statistics for Stability Test

5. CONCLUSION

This study aimed to explore empirically the determinants of the bilateral trade balance model for Jordan-Turkish economy, and the impact of the free trade Agreement with Turkey on the Jordanian-Turkish trade balance covers the period from 1978 to 2017. The study used Autoregressive Distribution Lag (ARDL) model to estimate the long run relationship between the dependent variable and the independent variables.

Based on the modified model which adapt the three approaches (Elasticities, Absorption and Monetary) to identify the determinants of the trade balance. The result of the analysis found that the real effective exchange rate has a positive and statistically significant effect on the trade balance in the long run, and negative effect on the trade balance in the short run, in a way that supports the existence of the J-Curve effect of the elasticity approach.

The result also showed that the relative money supply (MS) and relative GDP have a weak effect on the trade balance in the short and long run, which indicates that the absorption and monetary approach not valid for explaining the bilateral trade balance deficit between Jordan and Turkey. The estimation result points out that the impact of the free trade agreement between Jordan and Turkey is insignificant on the trade balance in the long run, which supports the position of the government, which has revoked the work in this agreement.

The most important policy implication to be concluded from these empirical findings, is that devaluation of Jordan Dinar against Turkish Lira can be used to accomplish an improvement in the trade balance of Jordan against Turkey. However, increasing the relative money supply or relative Income will not achieve the desired goal.

For the further studies, Data from different countries like (Saudi, Palestine, Britain, etc., or EU countries, Asian countries, Arab countries, etc.) can be taken instead of one country into trade balance. Moreover, instead of total export and import values as aggregate, specific sector data (industrial, and etc.) values may be used in determining the determinants of trade balance.

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ECONOMIC SANCTIONS AND GLOBALIZATION: ASSESSING THE IMPACT OF THE GLOBALIZATION LEVEL OF TARGET STATE ON SANCTIONS EFFICACY¹

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ABSTRACT

Purpose - When do states resist the threat of sanctions or comply with the demands of the political unit imposing sanctions? This article argues that if the target has a high globalization index, it conforms to the demands of the sender. Therefore, the article examines the impact of target's globalization level on the initiation and success of economic sanctions as a frequently used foreign policy tool.

Methodology - In combination of two datasets, (for sanctions cases, Hufbauer et al, 2007; and for globalization index Raab et al, 2007), this article, uses 72 sanctions cases from Hufbauer et al. (2007) dataset to examine some indicators of sanctions efficacy. A probit model is used to analyze the hypotheses.

Findings - The findings of the empirical models presented in the article, reveal a positive relationship between the efficacy of economic sanctions and the high level of globalization in target state. Thus, as targets become globalized, the efficacy of sanctions increases. Empirical evidence has been found in the models as the relationship between sanctions success and globalization has been indicated, since cultural globalization index is used as an indicator of regime type and, most importantly, due to the presumed relationship between winning coalitions and cultural globalization.

Conclusion - It has been found that cultural globalization leads to political change that causes transitional political systems to emerge for such states. Referring to the selectorate theory, it is claimed that the winning coalition is possibly wider and the scope of this coalition can be determined without identifying a regime type for the target. In addition, cultural globalization leads to social change that may affect public opinion. As such the audience costs are higher in culturally globalized targets because it requires a publicly accepted foreign policy behavior.

Keywords: Economic sanctions, globalization, sanctions efficacy, compliance, human rights, financial sanctions.

JEL Codes: D80, F10, F51, F60, N40

1. INTRODUCTION

One of the main challenges for a sanctioning state is to effectively influence the sanctions behavior of the target state. In general, sanctions have long been used by state and non-state actors as an important foreign policy tool for this purpose (Eland, 1995). Imposing economic sanctions became widespread in the 1990s (see Cortright and Lopez, 2000), and the international community has started to pay more attention to the effectiveness of sanctions since then as sanctions often failed to achieve the policy goals. Also, in the past decades, social scientists have been trying to explain why states resist or fail to comply with sanction demands. As a result of this dilemma, sanctions have been highly criticized for failing to change the behavior of the target state (see Knorr, 1975; Pape, 1997). On the contrary, the claims of the advocates that sanction is an effective means are that sanctions can, in some cases, reach certain policy goals (see Hufbauer et al., 1990). These different points of view arise from a fundamental problem: Why do some target states respond to the demands of the sanctioning state, while some other states resist the consequences of economic sanctions?

¹ This manuscript is part of author's master's thesis of Florida State University.

Historically, sanctions are similar to a medieval siege (Simons, 1999). As any siege may indicate, the result of such a strategy is determined by the isolation and the costs incurred on the encircled political entity. The empirical relationship between the target costs and sanctions success is confirmed in line with negative reflections of siege (see Hufbauer et al., 1990; Lam, 1990; Dashti-Gibson et al., 1997; Drury, 1998). However, the only factor for sanctions success is not to increase the target costs as much as possible. Among other determinants, it was argued that the outcome of a sanctions episode is highly dependent on the internal political characteristics of the target state (Morgan and Schwebach, 1996; Allen, 2005; Lektzian and Souva, 2007; Cox and Drury, 2006; Bolks and Al-Sowayel, 2000; Nooruddin, 2002). Political negotiations within a state, which are limited by the demands of the sanctioning state and the interests of domestic political actors, may affect the outcome of sanctions (Morgan and Schwebach, 1996: 250). In particular, the differences between the interests of political actors refer to the regime type of the sender and target states. In other words, the impact of the regime type on sanctions, is partly due to the relationship between leadership and constituencies. In democracies, the size of individual actors (selectorate) and constituencies who choose political leaders (winning coalition) are higher than in autocratic states (Buena de Mesquita et al., 1999).

Democratic states try to maintain a broad winning coalition. As such, democratic leaders often tend to pursue “friendly” foreign policy strategies to stay in the political office and avoid the impact of armed conflict on the general public (see McGillivray and Smith, 2000). Such an assumption leads to democratic accountability of the leaders. In this context, Nossal (1999), for example, argues that democratic leaders concede to sanctions in order to reduce the costs of sanctions imposed on the target population (p.130). Similarly, because sanctions inflict various and often increasing costs for the population of the target state; as Nooruddin (2002) argued, democratic leaders are responsible to the public for the cost of sanctions; therefore, when sanctions are imposed on a democratic target, the political behavior of the democratic leader changes (p.69-70). In case the sanctions are imposed on autocratic targets, as the autocratic leader is assumed to meet the needs and gain the support of a small winning coalition, they do not have any concerns or reasons for providing public goods to the target population to preserve their political statuses (Lektzian and Souva 2007, s.852-853). This situation, increases the likelihood of sanctions success when imposed on non-democratic states.

However, sanctions as a means of economic coercion are also similar to bargaining games. To this end, Fearon's (1994) audience costs approach assumes that leaders are limited to domestic public opinion. Audience costs are produced by local leaders who increase the expectations of the public during the crisis period and consequently these expectations limit the leader to follow the declared course of action. Fearon argues that democracies incur more audience costs than in autocratic states. However, due to the presence of wider size of winning coalition in democracies and its aforementioned relevance to sanctions success, autocratic leaders are more likely to change their political behavior when faced with economic sanctions because of relatively small audience costs, as autocrats have more maneuverability than democratic leaders (Kaempfer and Lowenberg 2007). In other words, when democratic leaders resist sanctions to avoid any possibility of a political failure, sanctions against autocratic targets become a more realistic option.

In the light of these claims, sanctions scholars provide controversial views on both the initiation and enforcement of sanctions. For example, as autocratic states are more likely to be targets of sanctions than democratic states (Cox and Drury 2006), and because democratic states impose sanctions more often than others (Lektzian and Souva 2007); the sanctions imposed against autocratic states, as a hypothetical but frequently occurring issue (democratic-autocratic sanctions dyads) must also be successful. The sanctions imposed by democratic political actors will increase the likelihood of success due to high audience costs. However, the correlation between the regime type and sanctions success requires a reassessment of the existing theories for their use in various sanctions cases.

This article develops a different context for understanding the effectiveness of sanctions with a special emphasis on target characteristics. The hypotheses associated with the impact of globalization on the domestic political structures of the target and its compliance with the sanction demands. In this regard, cultural globalization is used as a measure of the domestic political dynamics of the target. Moreover, assuming the structural characteristics of the internal political institutions of the target as an important criterion for sanctions success; the typology of regime type for target is a partly meaningful indicator for the target to comply with the sender's demands. Simply put, the classification of the target's regime type as democratic or autocratic, ignores the interaction between the preferences and expectations of the population and the leadership of the target. In other words, the winning coalition in autocratic regimes are wider than the one we may assume if the autocratic state has a higher globalization level. In the Hufbauer et al. (2007) dataset, some cases of sanctions, including democratic targets with relatively lower cultural globalization levels, were coded as a failure; on the contrary, others with autocratic states with higher cultural globalization levels were coded as successful sanctions cases. To this end, cultural globalization is used as a key measure of the “social and psychological circumstances in the target society” (Galtung 1967, p.28) that is expected to determine the extent of the target's response to sanctions.

Also, interest in public preferences requires an analysis of the perceptions of sanction in the public eye. In this sense, policy goals affect sanctions not only from sender's point of view, but also from the view of target population. For the population

of the target and domestic political actors, a trade-off exists between the target's policies and the sanctions goals, so they may have to decide which is more important. The changes anticipated by the sender with sanctions (such as human rights or democratization) may be more appealing to the public due to the difficulty of embracing domestic policies of the target state. The second assumption, then, should be that the public perception of sanctions should not be valued independently of the characteristics of the sender state's policy goals. In order to shed light on the differences in the perceptions of public regarding sanctions, the target's public support towards policy goals of the sender, such as the human rights conditions of the target can replace the support of the policies of the target's government. The policy objectives that will not address the interests of the target's population will have a negative impact on sanctions success.

To these ends, the following sections will elaborate on the nexus between sanctions success and globalization, and some correlates of efficacy of sanctions that are frequently discussed in the sanctions research, which are also included in the empirical models of the article.

2. SANCTIONS SUCCESS AND CULTURAL GLOBALIZATION

The effectiveness of sanctions is often articulated through the aspects of sanctions policy and bilateral relations between the sender and target. In addition, recent studies draw attention to the characteristics of target in terms of the impact of domestic political institutions of the target. A second stream of research refers to the regime type of both sides of sanctions as one of the main determinants of sanctions success. This section, therefore, presents a framework for the link between cultural globalization and sanctions success by evaluating both the policy features of sanctions and domestic political characteristics of the targets. In this context, this research combines, some of the independent variables presented in sanctions research, such as the economic cost to the target, international cooperation, and the economic and political stability of the target state, with the empirical models presented in this article. Indicators, such as policy goals and regime type, are considered as a part of the arguments that are supposed to be substituted or accompanied by the cultural globalization variable. For this reason, the following section describes the predicted relationship between the sanctions success and cultural globalization, and their relationship to bilateral relations and regime type. Next, the argument on the relationship between policy goals and public perceptions of sanctions will be examined.

2.1. Sanctions Success and Cultural Globalization

Globalization refers to the "real changes of fundamental importance" that may influence the political, economic and social structures of a society (Keohane and Nye 2000, p. 4). As such, the idea is about the transformation of domestic institutions, which is also exemplified as the penetration of global economic and financial assets into the local market. Developments in information and communication technology accelerated the spread and speed of globalization. These conditions lead to economic, social and political change in a given society. In contrast, such changes affect the target's political behavior and the perceptions of sanctions by the public in terms of sanctions. In other words, globalization level in a society increases the public consciousness about the sanctions to an extent in the target, that is to say, changes the preferences of the public about it. So, globalization increases both the exposure of target to external influence, and its adaptation to global values and standards. For example, the socio-political change in the ex-Soviet periphery, in the aftermath of the Cold War, through a shift to the market economy, shows how globalization has transformed the socio-political and economic infrastructure of the former Soviet republics.

In this regard, the cultural globalization level in a society becomes a measure of both state behavior and perceptions of the public, regardless of the effects of regime type on both concepts. In other words, cultural globalization refers to an 'invisible hand' that affects the resolve of the target state against sanctions and perceptions of it by the public once the sanctions is imposed. As a concept embedded in the political and social structures of a society, cultural globalization is thus regarded as an indicator that measures the general state of affairs in a society in the course of a transition from one state to another. In this sense, the target may have different levels of resolve, due to aforementioned domestic and external vulnerabilities, when sanctions are imposed over different time periods.

Therefore, it can be argued that there is evidence that globalization has an impact on the effectiveness of sanctions for two reasons. First, as it is more likely to punish an ally with economic measures than an adversary, cultural globalization concept is used to replace the alliance relationship between the target and sender. Because of the likely influence of globalization on state behavior, the globalized target is expected to act in accordance with the will of international community (such as compliance to the UN resolutions). Second, as sanctions success depends in part on the nature and extent of local political constraints, cultural globalization increases the target's audience costs, irrespective of the domestic political systems of the target.

Prior Relationship and Sanctions Success

In *Economic Sanctions Reconsidered*, Hufbauer et al. (1985), have proved that sanctions are more successful if the target is "either an ally, or at least neutral and on friendly terms" with the sender. For example, the index of prior relations in a

successful sanctions case, such as *the United States vs. the Netherlands*, is 2.3 out of 3. Similarly, Drezner (2001) argues that the sender take into account the opportunity cost and future conflict expectations when they impose economic coercion measures (p.390). As Drezner points out, the sender prefers to impose sanctions on adversaries rather than allies; however, the sender obtain more concessions from an adversary than an ally. Drezner's theory assumes that allies with low levels of conflict expectations prefer to prioritize 'relative gains' and try to maintain cordial relations with the sender. On the other hand, an adversary attach importance to its 'absolute gains' and have a high level of conflict expectations, so they prefer to adopt a more firm policy stance at present, to eliminate future concessions (Drezner 2001, s.390-391). In other words, in anticipation of a future hostile relationship, an adversary is less responsive to the threat of sanctions than an ally that are likely to maintain an alliance relationship in the near future. The US economic coercion against South Korea, for example, which hindered Korea's desire to develop nuclear weapons, can be considered as one of the examples of the theory of conflict expectations (p.251).

In addition to these assumptions, it is argued that as societies are more globalized, the commitment to universal values and standards, which may be considered as a substitute for the alliance relationship, will increase the effectiveness of economic sanctions. In fact, both globalization and some sanctions cases serve to similar purposes. For example, when the objective of sanctions is democratization, the target is often compelled to conform to the policy goal of the sender while accepting democratic norms as a natural process and as part of the social change through globalization. To sum up, measuring the target's compliance with a cultural globalization index variable, may substitute the ally and adversary dichotomy, which means that globalized states are supposed to adhere universal values and standards, and are part of a global informal alliance when it comes to the sender and target relations.

Regime Type and Sanctions Success

In addition to the central premise of Hufbauer et al. (1985), scholars also pay attention to the domestic political features of the target (Morgan and Schwebach 1996; Allen 2005; Lektzian and Souva 2007; Cox and Drury; Bolks and Al-Sowayel 2000; Nooruddin 2000). The assumption about the regime type and sanctions success is an extension of the democratic peace theory. Likewise, because of the lower likelihood of two democracies fighting each other, sanctions as a policy tool hardly take place between democratic dyads (Lektzian and Souva 2007). Moreover, democratic leaders seek to avoid the cost of sanctions imposed on the local population to preserve their political statuses (Bueno de Mesquita and Siverson 1995). Similarly, in relation to the selectorate theory, democratic leaders must meet the demands of a large winning coalition (key constituencies for re-election) and provide public goods such as national security. On the contrary, autocratic leaders only provide some special goods because the size of their key supporters is relatively small (Lektzian and Souva 2007; Allen 2005). Moreover, in order to eliminate the cost of sanctions to the public, leaders not only pursue peaceful foreign policies but also comply with the sanctions demands (Bolks and Al-Sowayel 2000; Nooruddin 2000).

Similarly, Fearon (1994) argues that democracies have higher audience costs and democratic leaders are more responsible for constituencies than in autocratic regimes. Thus, in the case of a crisis escalation situation that Fearon modeled in his study, following the escalation of crisis, the party whose audience costs are higher is more likely to back down than the one whose costs are lower. Because a leader increases the expectations of the local population for a specific foreign policy goal, leaders often bind themselves to the public to maintain the declared policy stance. Audience costs are then the penalties of the leader in the case of a policy failure. In spite of the presence of wider winning coalitions in democracies, autocratic leaders are more likely to change behavior, as autocrats can change adopted policies since they have lower audience costs (Kaempfer and Lowenberg 2007). Hence, the assumption of audience costs can be extended to cultural globalization, which points to the level of political and social structures of the target. This is a situation that assumes the existence of democratic norms in a society, and also takes into account the preferences of the target's population. In sum, it is expected that high level of cultural globalization increases audience costs, which in turn increases the likelihood of sanctions success.

Tomz (2007) finds empirical evidence to support the existence of audience costs on international political issues, concluding that these costs are "especially evident among politically active citizens" and "international reputation of a country or a leader" are of interest to those citizens. Tomz, using embedded experiments in public surveys, measures the degree of audience costs in crisis times. This article employs cultural globalization to assess the degree of audience costs in cases of sanctions (political crisis), especially in the absence of such data for each sanctions case. As already mentioned earlier, the typology of regime type can be misleading as an indicator of evaluation of target's public attitudes and political system, since the characteristics of such a dichotomous variable provide merely limited and sometimes censored information about the political and social structure of a given society. In other words, as Tomz points out the importance of politically active citizens, the use of cultural globalization as a criterion and indicator implies the existence of such features of a group of citizens within a society. As a sub-variable that measures the extent of political and civil rights of citizens and the impact of globalization on the social cohesion and change, cultural globalization as a composite index, therefore, refers to a crucial extent to the political characteristics of the target.

To illustrate this phenomenon, the regime type is coded as ‘authoritarian’ in any type of study when it comes to potential sanctions against Iran. This is considered as an indicator that reduces the likelihood of sanctions success. However, as the Iranian presidential elections and the news headlines showed, Iran’s public is more sensitive than we usually expect from an authoritarian regime’s citizens against sanctions or any analogous foreign interference. This means that Iranians may have the resources to challenge government policies, which is obviously dependent upon the political and social peculiar conditions. Also, Hufbauer et al. (2007) dataset point out the existence of comparable sanctions cases. During the US sanctions for human rights against Argentina (77-3), there was an authoritarian political system in Argentina. However, Argentina’s level of cultural globalization was reasonably high in *the US vs. Argentina* case, and the outcome of the sanctions was successful. Similarly, sanctions have been successful in *the US and the Netherlands / Indonesia (91-4)* and *Canada / Pakistan (74-3)* cases. In the former, an autocracy with a high level of cultural globalization; and a democracy with a low level of cultural globalization has been the target in the latter example, and the both sanctions cases were coded also successful.

Table 1: Sanctions Success with Cultural Globalization and Regime Type Measures

	Cultural Globalization			Regime Type		
	Low	Medium	High	Autocracy	Anocracy	Democracy
Success	3	20	8	7	12	12
Failure	6	20	11	13	12	13

Note: Classifications are from lowest to highest cultural globalization levels (1-3); and from autocratic to democratic regime types (1-3). Sources: Raab et al (2007); Hufbauer et al (2007).

In sum, it can be argued that cultural globalization is a practical indicator to predict the relationship between the nature of the political system of the target and sanctions success without specifying a regime type. Accordingly, this argument leads to the following hypothesis:

Hypothesis 1: When the target becomes more globalized, the effectiveness of sanctions increases.

2.2. Public Perceptions and Sanctions Success

In some sanctions episodes, the target’s leadership can transfer the economic hardship of the population into a resistance cause against the sender’s political demands. Galtung (1967) defines this situation as the “rally-around-the-flag-effect” (p. 388). To this end, the masses are often deceived and manipulated by the target’s leadership. With the exploitation of the distribution of public goods to the people, the target’s leadership generates a “general sense of siege...to maintain political control” (Haas 1997, p.80). For instance, the UN sanctions against Rhodesia and Iraq, produced the aftereffects resembling the symptoms of the “rally-around-the-flag-effect”. Therefore, when it comes to imposing sanctions, it can be argued that the ‘public effect’ may be determined by the target’s social development and informational connectedness levels in society. In particular, it is expected that the reasonably more globalized societies are more likely to be exposed to foreign economic and political interference that restricts the range of available strategies for domestic policymakers. Likewise, technological advances and global information flow leads to a more realistic assessment of the pros and cons of the sanctions regime, which may stimulate social awareness among the public that may reduce the “rally-around-the-flag-effect”. In other words, since one of the determinants of the effectiveness of sanctions is related to the target costs, perceptions of sanctions and pressure on government policies has an impact on the changes in target state’s sanctions behavior. Thus, for example, in authoritarian regimes, it is difficult to persuade the public in the streets to support government policies against sanctions. This argument is valid if the perceptions of sanctions among the public do not contradict the sender’s policy goals. How the public perceives sanctions depends, to some extent, on the degree of social change and the policy goals of the sanctions. Human rights as a policy goal, for example, is more likely to be appealing to the target’s population than sanctions imposed to realize the sender’s any non-appealing objectives.

Policy Goals and Sanctions Success

Sanctions are an alternative for warfare. Thus, bearing in mind the devastating human and material costs, it can be seen as a relatively peaceful policy option. However, recent experience with the UN sanctions, do not let us consider them as one of the best available policy options. The sanctions against Iraq, for instance, have led to a storm of humanitarian concerns and commenced a dubious debate in which some academics questioned the moral and legal aspects of the use of sanctions (Damrosch 1994; Pierce 1996; Simons 1999). It is true that they are coercive policy tools, aimed at changing the behavior of the target. In other words, in some cases sanctions are against a situation that may jeopardize international peace and security. Sanctions, therefore, substitute the armed conflict as a fundamental policy option. At this point, the role that sanctions play as an alternative to war, may be biased because of the policy goals of the sender. The relative “objectivity” of

sanctions, therefore, requires the approval of policy goals by the international community. Such a conclusion can be made with regards to the approval of sanctions by the population of the target.

However, the issue of policy goals regarding sanctions often leads to judgmental considerations about the effectiveness of sanctions. As discussed, these concerns may arise not only from the target's side but also from the sender or international actors. For example, the extradition of a terrorist from a country can be justified to the public by policy-makers. In contrast, the activities of a terrorist organization may indirectly serve the national interests of opposing political actors. In this case, terrorists, can be named as freedom fighters in a different context. Under these circumstances, the perceptions in question lead to disagreement over the policy goals of sanctions and the target's behavior towards policy goals. The sanctions would then be flawed that such difficulties can only be mitigated by international pressure on the target state and by the support of the sender's policy goals.

On the contrary, since sanctions are also foreign policy tools, sender may exercise economic coercion with only 'realpolitik' intentions that can lead to similar concerns about the sender's policy goals. Simons, for example, claims that sanctions are often used by the great powers to promote commercial interests to sustain their global hegemony (1999, p.117). Thus, the change in the target's behavior helps the sender to maintain national interests. Similarly, in line with the demonstrative use of sanctions, it can be concluded that the sender does not intend to change the target's initial behavior at all. The sanctions initiated by international and regional organizations may partially meet the necessities for an approval of policy goals. For example, when sanctions are imposed for violations of international peace and security, international support may change the target's behavior, even though sanctions are not successful, as the target finds support from the public and third parties against sanctions.

Policy goals such as the advancement of human rights or democratization have a more problematic nature with regards to international support and target's behavior. As such policy goals are often sought against autocratic regimes; public support against sanctions is thought to be easier to gain. However, not only the political elites manipulate people in the autocratic regimes; but also the public is able to perceive sanctions as against the national independence and well-being, which often leads to pervasive nationalism (Pape, 1996). Furthermore, third-party political actors identify policy goals with ideological pretexts. A policy goal such as human rights and democratization has altered interpretations in different contexts. In sum, if policymakers develop policy goals, arising from the maximization of national interests, the target will naturally find counter-policies to reduce the likelihood of sanctions success.

Since the focus of the article is the realization of the policy goal or target compliance, what are less disagreeable objectives and how to adjust these to change the target's political behavior and public perceptions of sanctions? The first argument of this research shows that if the level of cultural globalization of the target is high, the sanctions imposed against the target such as human rights will increase the likelihood of sanctions success. In other words, with the help of globalization of the target, the public perceptions of sanctions and the sender's policy goals will be matched, unless the population is satisfied with the target policies. Together with this argument, the public is considered not satisfied with the political system in autocratic regimes and globalization level is considered as a measure that allows the measurement of public approval of global values and standards, as well as a likely measure of public response to internationalized political issues. For example, it can be presumed that a political opposition group exists when sanctions were imposed against the Iranian government. The mobilization of masses against sanctions will be the case as long as the sanctions are against the policies of the existing government and when it is assumed that it is not against the Iranian people. Also, the sanctions against Iran, initiated by an international organization, will not have a positive impact on the outcome of sanctions, as frequently discussed with reference to the negative role of international cooperation on sanctions success.

Unlike the relationship between regime type and people's mobilization against sanctions, the interaction between cultural globalization and policy goals offers a different approach. In the previous explanation, it was argued that target compliance depends on the regime type and the capability of political elites to rally people against sanctions. In the second assumption, it is argued that people's perceptions of sanctions demarcates the conditions of target compliance. If the target population perceives sanctions as a "fair" intervention and not satisfied with the government policies, the outcome of sanctions may be successful. However, cultural globalization as an indicator of public preferences may not fully account for the variation in sanctions success. Evaluating target compliance within the framework of cultural globalization and its impact on the target's population may reflect the overall impact of globalization on the political and social structures of a country. However, public perceptions of sanctions as a variable needs further assessment. Public surveys on how target's population perceive sanctions can explain the impact of public opinion on sanction success more accurately, although the scope of the current analysis does not cover the overall impact of it on sanction success. Similarly, cultural globalization may not accurately measure the level of public awareness of the reflections on internationalization of political issues in a country. However, several variables in the cultural globalization index, such as the political and civil rights of citizens, may serve the necessity to measure the public perceptions of sanctions. In the context of the above discussion, therefore, the following hypothesis can be proposed:

Hypothesis 2: When the policy objective is human rights, the likelihood of sanctions success increases against a target state with a high level of cultural globalization.

2.3. Costs to Target, Sanctions Type and Sanctions Success

Economic costs to the target are considered as one of the priority objectives of sanctions. For that reason, sanctions are known as penalties to change the target's political behavior through economic costs inflicted on the target. Then, sanctions are considered successful when the cost-oriented policy goal is believed to change the target's behavior. However, contrary to the nature of coercive measures, target costs are relatively small. For example, target costs, measured as a percentage of the target's GNP, were 1.4 percent in pre-1985 sanctions episodes, and 3.3 percent in the post-1985 period (Hufbauer et al., 2007, p. 105). Target costs may be small due to the limits of policy goals or to the difficulty of expanding the scope of sanctions and the inclusion of target's some trading partners into the sanctions, and because of the leaks in sanctions that altogether reduce the costs to the target (pp. 105-106). Despite its limits, it can be said that sanctions success and target costs are positively correlated (Hufbauer et al. 2007; Dashti-Gibson et al., 1997; Drury, 1998).

Furthermore, costs to the target depends to "the ability or willingness of the sender to impose costs and the capability of the target to avoid or bear such costs" (Dashti-Gibson et al. 1997, p.609). However, target costs lead to a policy change if it aims the winning coalition of the target. Lektzian and Souva (2007) argue that the significance of economic costs imposed on autocratic leaders will not increase the likelihood of sanctions success. Instead, sanctions are efficacious if the heavy costs are imposed on democratic targets (p.854). Thus, it is argued that autocratic leaders often meet the needs of a small winning coalition and provide mostly special goods to their key constituents. In addition, large economic costs increase the rents in the target state, and therefore, lead to rent-seeking groups to emerge within the target state, benefiting from the consequences of sanctions (p. 852-853).

In this article, it is argued that economic costs imposed on autocratic regimes will be successful if the impact of sanctions is large enough. However, as long as the target has a "chronic" autocratic regime, such as North Korea, costs to the target are less likely to cause a change in target's political behavior. In other words, the argument about target costs continue to have a reasoning similar to the discussion on cultural globalization and regime type. Because of the similarities in regime type classification, having mixed characteristics of both democracy and autocracy, the size of winning coalitions in transitional regimes (anocracy) is a political "grey" area, and therefore, can be broader than expected from these regimes. Therefore, cultural globalization can be used as an indicator of the political behavior of such transitional regimes.

Therefore, it can be argued that wider winning coalitions are not only a feature of democratic states but also some of the autocratic ones. The increase in target costs, which are affected from the process of globalization, increases the likelihood of sanctions success. At this point, the effect of greater costs on target population makes it difficult to assess the main hypothesis in this article. A smaller winning coalition is a reasonable argument for the relationship between the costs imposed on autocratic regimes and the failure of sanctions. In practice, however, the impact of sanctions on the target population and the public's reaction to sanctions are not as indistinguishable as in theory. In sum, it is believed that increased costs will not increase the likelihood of sanctions success in globalized countries, as the increase in costs will lead to negative consequences. This discussion leads to the third hypothesis:

Hypothesis 3: The marginal effect of costs on the target reduces the likelihood of sanctions success when the level of globalization of the target increases

2.4. Financial Sanctions and Sanctions Success

The type of sanctions is an important determinant of sanctions success. Comprehensive sanctions include the restriction of export and import, and financial sanctions. Trade sanctions usually have a negative impact on sanctions success because they have more serious consequences on the target and sometimes have a devastating effect on the target population. On the other hand, financial sanctions aim only the interests of some groups within the target. Thus, an empirical evidence was found in favor of financial sanctions (Hufbauer et al. 1990; Drury 1998; Dashti-Gibson et al. 1997). In this article, the effect of financial sanctions will be taken into account and the hypothesis about the type of sanctions is as follows:

Hypothesis 4: Financial sanctions increase the likelihood of sanctions success

3. DATA AND METHODOLOGY

3.1 Data

Hufbauer et al. (2007) dataset examines 174 sanctions episodes from 1914 to 2000, which is the first large-n dataset and one of the primary references (Nooruddin 2002, p.61). Furthermore, in the empirical evaluation of sanctions success, cultural globalization (the Global Index by Raab et al. 2007) is used as an indicator of sanctions success. Second, the Global Index dataset includes globalization indexes of countries from 1970 to 2002. In the combination of these two datasets, the

temporal domain of the article is from 1970 to 2000. Therefore, in this article, 72 sanctions cases from Hufbauer et al. (2007) dataset is used to examine indicators of sanctions success. The unit of analysis is the sanction-dyad, composed of a sender and a target.

Although Hufbauer et al. dataset has been widely used and the application of their work has led to a significant improvement in the empirical study of sanctions, the dataset has both its strengths and weaknesses. In general, one of the limitations is the exclusion of pre-World War I sanctions cases. According to Hufbauer et al. (2007) these sanctions cases “are not well-documented and do not seem to address the priorities of today’s world” (Hufbauer et al. 2007, 49-50). Compared to the 1990 version of Hufbauer et al. dataset, the new study includes an addition to the temporal domain for a decade. The study increases the number of observations; however, the absence of sanctions concluded at the threat stage also limits the investigation only for implemented sanctions cases.

Defining actors in a sanctions episode vary according to the composition and analysis of each sanction-dyad. In this article, multilateral sanctions episodes were converted into separate observations following the works of Lektzian and Souva (2007) and Nooruddin (2002). Thus, when a sanctions case has multiple senders and targets, they become separate observations. In addition, 11 events have been excluded because of no observed target costs, and observations regarding Iraqi sanctions have also been dropped due to the size of costs to the target. There are also 6 more cases that are omitted due to missing data.

For the Global Index (Raab et al. 2007), the overall data consisted of 31 variables of different globalization indexes, and these indexes provide a standardized weight of each variable. The Global Index examines 116 countries from 1970 to 2002. According to Raab et al.’s (2007) methodology, if there are “more than three missing variables for the entire period”, and “up to a third of the variables within the respective sub-dimensions” are missing, these countries are also excluded from the dataset. Therefore, it is possible to use sanctions cases only after 1970 with the data from the Global Index. In addition, if sanctions include one of the countries that is not included in the Global Index dataset, these observations are excluded from the existing analysis. With this selection method, the number of observations are 72 sanctions cases.

3.2. Dependent Variable

The reliability of a variable is about the consistency and repeatability of the measurement. DeVaus (2001) defines reliability according to the repetition capacity of it in different situations (p.30). However, at the expense of validity, quantitative analysis leads to more precise but less accurate measures (King et al. 1994, p.151). In this sense, measuring sanctions success as dependent variable is one of the puzzling tasks. For this purpose, most scholars rely on Hufbauer et al. (2007) data, which has two different dependent variables, i.e. “result” and “contribution”. Each variable is based on a scale, ranging from 1 to 4. The “result” is a measure based on the four policy objectives of the sender: “failed outcome”, “unclear but possibly positive outcome”, “positive outcome” and “successful outcome”. The “contribution”, on the other hand, is a judgmental measure of the policy goal that ranges from “negative contribution” and “little or no contribution” to “substantial contribution”, “decisive contribution”. As a result, “success” is the multiplication of these two measures, ranging from 1 to 16 and distinguishes a score of 9 or higher as a successful outcome (pp.49-50).

Hufbauer et al. (2007) dataset “depends on the qualitative results achieved by the academicians of individual departments (p.49). Therefore, with regard to the use of the composite “success” measure, some scholars argue that “there is no theoretical, empirical or statistical reason for the policy outcome to be multiplied by another variable designed to assess the contribution of sanctions to the observed result” (Gibson et al., 1997). Therefore, the “success” measure as a composite variable, success as a dependent variable, and explanatory variables that are independent of the result of the contribution threaten the validity of the dependent variable (Hufbauer et al. 2007, p.183). Simply put, the addition of the contribution violates “the assumption that the dependent variable is exogenous” (Drury 1998, p.500). Consequently, using the same dataset, many scholars only use the “result” as the dependent variable. The “result” is also used in this article as a dependent variable to address the avoidance of systematic measurement errors that prevent descriptive inferences (see King et al. 1994, p.155-156).

Therefore, *RESULT*, as coded by Hufbauer et al. (2007), is scaled from one to four: “1= failed outcome”, “2= unclear but possibly positive outcome”, “3= positive outcome”, “4= successful outcome”. In this article, the logistic regression used in the empirical analysis requires a dichotomous dependent variable, which reduces this scale into two values. Observations with positive results (3 and 4) are coded as successful (1) and others (1 and 2) are coded as failure (0). In order to clarify this scaling, the “failure” can be cited as the Soviet’s attempt to destabilize the Tito regime in Yugoslavia (case-48). The US and Saudi efforts to reduce Jordan’s support for Iraq during the First Gulf War indicate “an uncertain but possibly positive outcome”. In addition, the United States’ attempts to promote democracy in Latin America in the 1970s are regarded as a “positive” outcome. The overthrow of the Idi Amin government in Uganda can be exemplified as a “successful” outcome (case 72-1) (Hufbauer et al. 2007, p. 49-50). Lektzian and Souva (2007), Dashti-Gibson et al. (1997) and Nooruddin (2002) are some of the examples of following similar coding rules for the dependent variable.

3.3. Independent Variables

3.3.1. Cultural Globalization

The main argument of this article is to measure sanctions success through the cultural globalization index, which substitutes the use of regime type as an independent variable. Moreover, cultural globalization indirectly affects policy goals and the type of sanctions. The secondary role of cultural globalization is discussed in the sections on human rights and financial sanctions. Thus, the level of cultural globalization of the target is a measure from the Raab et al. (2007) dataset. Cultural globalization is an index of 8 different variables. These are classified into sub-groups in which the “logic of expansion” includes variables such as the urban population and the percentage of high technology exports in manufactured exports. Second, the variables in the “values and standards” group include the Freedom House Index (civil liberties and political rights), primary school enrollment, total school enrollment, total education expenditure, and the number of McDonald's restaurants.

Cultural globalization reflects partly the political system of the target state, but more importantly, it gives an idea about the people's possible reflections about the sanctions in the target. The second component of cultural globalization represents an interactive measure of public preferences, as opposed to the implicit estimation of it in the regime-type typology. In other words, some autocratic regimes are assumed to have a larger winning coalition and higher audience costs than *prima facie* assumptions. Data for *CULGLOB* is from Raab et al. (2007), as a continuous variable ranging from 1 to 10. Instead of using a dichotomous variable in the article, the original coding style of the index serves the basic logic of globalization that points to a process of change in terms of socio-economic and political development.

Table 2: Distribution of Cultural Globalization Scores

	Cum.		Cum.		
1-1.5	0	0	5-5.5	14	66
1.5-2	1	1	5.5-6	10	76
2-2.5	3	4	6-6.5	6	82
2.5-3	6	10	6.5-7	10	92
3-3.5	4	14	7-7.5	3	95
3.5-4	7	21	7.5-8	2	97
4-4.5	14	35			
4.5-5	17	52			

Source: *Global Index*, Raab et al. (2007)

3.3.2. Costs to Target

In sanctions research, target costs are used as an important indicator of sanctions success (Hufbauer et al. 1990; Lam 1990, Dashti-Gibson et al. 1997, Hart 2000). These are the costs measured as a percentage of the GNP of the target. The expected cost for the target includes restrictions on exports and imports and the flow of financial assets (Hufbauer et al., P.44-45). The *TCOST* is used as an indicator of target costs. Data for *TCOST* comes from the Hufbauer et al. (2007) dataset. Moreover, to measure target costs as a separate explanatory variable, as the institutional theory suggests, the costs that are inflicted on the winning coalition of the target have an impact on sanctions success (Lektzian and Souva 2007). Thus, the same logic is used to analyze the costs of the target through cultural globalization levels. *CULCOST* is a product of the *CULGLOB* and *TCOST* variables.

3.3.3. Human Rights

Another key to sanctions success is the type of policy goals. In relation to a hypothesis on policy goals, it is assumed that the target's preferences and policy goals have a relationship with sanctions success. If policy objectives are not against the public preferences; and if domestic policies and the public opinion are in conflict, these two conditions may have an impact on sanctions success. The *HRGOAL* variable is included to measure such an impact on sanctions success. The *HRGOAL* variable is coded as, "1", otherwise "0". Both Hufbauer et al. and Raab et al. (2007) datasets were used to establish this dummy variable.

3.3.4. Control Variables

Sanctions success is often estimated through a number of other determinants such as the economic weakness of target state, assistance to the target and international cooperation. These variables are included in the empirical models of the article for two reasons: First, it is assumed that these three separate variables have an impact on the target compliance for theoretical purposes. Second, the use of these determinants helps to understand the general value and location of the empirical model, as such variables are frequently used in sanctions research.

Thus, political instability and the economic weakness of the target are one of the indicators of sanctions success. In cases where the political and economic indicators of the target are more unstable, the sanctions are more successful (Hufbauer et al. 1990; Lam 1990). Targets, with unhealthy economic and political conditions, are more likely to meet the demands of the sender (Drury 1998, p.500). Hufbauer et al. (2007) included economic weakness and political instability on a scale of 1 to 3 in their empirical analysis. Accordingly, this scale takes the following values: “distressed country (coded as 1)”; “country with significant problems (coded as 2)”; “strong and stable country (coded as 3)”. On this scale, the “distressed country” is characterized by acute economic problems such as high inflation and unemployment, and political turmoil. “Countries with significant problems” are associated with serious economic problems such as currency crisis and internal opposition. Finally, “normal economic indicators” can be attributed to a strong and stable country without all of these problems (p.62-63). For the *TSTABILITY* variable, Hufbauer et al. (2007) data and coding style is used in this article.

In order to reduce costs, the target often avoids the effects of sanctions by means of leaks in the sanctions regime, as long as they are able to maintain external partnerships and foreign assistance. Since the objective of this article is to examine the target compliance, third-party assistance to the target becomes part of the empirical models. The dichotomous *TASSIST* variable is used to measure the assistance to the target. Data for *TASSIST* comes from the Hufbauer et al. (2007) dataset, if there is assistance to the target, the dummy variable takes the value of “1”, otherwise “0”.

International cooperation has a positive relationship with sanctions success because more cooperation between sender states means that sanctions are going to be more effective with regards to restrictions on the target. With international cooperation, sanctions may set up trade conditions that generate rents for autocrats, as well as encourage others to leak and trade in the sanctions coalition (Kaempfer and Lowenberg 1999). Thus, international cooperation has no positive effect on sanctions success in practice. This article uses the *INTCOOP* variable to see if any such implications exist in the empirical model. International cooperation data comes from Hufbauer et al. (2007), ranges from 1 (no cooperation) to 4 (significant cooperation).

In the relationship between the type of sanctions and sanctions success, financial sanctions contribute more than other types of sanctions to the outcome. For example, import and export sanctions have a devastating effect on the target, as they are more likely to impact the general population. Instead, financial sanctions are aimed at political elites, especially in autocratic regimes. *FINS* variable is coded as “1” if they are financial, and “0” otherwise. Data for *FINS* comes from Hufbauer et al. (2007) dataset.

Finally, the US is included in the empirical model as a control variable. Since the United States is one of the leading sender states, the impact of the US on the success of sanctions thus should be taken into account.

Table 3: Descriptive Statistics

	Mean	Standard Deviation	Min.	Max
Dependent Variable				
Sanctions Success (RESULT) (N=72)	.4305556	.4986288	0	1
Independent Variables				
Cost to Target	.9241806	1.862233	-5.6	7.1
Political and Economic Stability of the Target	1.902778	.7152213	1	3
Assistance to Target	.0972222	.2983392	0	1
Cultural Globalization	3.9225	1.2531	1.33	6.41
Cultural Globalization x Cost to Target	3.469243	6.610613	-11.704	32.802
Human Rights	.2361111	.4276716	0	1
International Cooperation	1.75	.7827363	1	3
United States	.7638889	.4276716	0	1
Financial Sanctions	.0972222	.2983392	0	1

3.4. Empirical Model

The analysis of sanctions onset and success are based on case studies. Yet, empirical studies, especially after the Hufbauer et al. (1990) dataset, have gained importance. The dataset, which is the main source of empirical studies in this area of study, has been criticized for the model specification and judgmental success score. For example, Bonetti (1997) claims that the model in Hufbauer et al. study is weak in explaining the variation in the success score. The weaknesses in the evaluation

of the success in Hufbauer et al. are due to the use of OLS estimate. Thus, for example, among others, van Bergeijk (1994) and Drury (1998) used logistic regression models, and Lam (1990) used the probit model. Furthermore, van Bergeijk (1994) indicates that the arbitrary choice of the dependent variable in the regression model of Hufbauer et al. Bergeijk criticizes the inclusion of the contribution variable as part of the dependent variable since it is considered as one of the determining factors of sanctions success (p. 73). Hufbauer et al. (2007) use the binary logistic regression model in the last edition of the dataset. Though, they found that ordered logistic regression violates parallel regression assumptions (p.187). In this article, two probit models are used to analyze the hypotheses. In the model, dichotomous dependent variable "result" is also used at Hufbauer et al. (2007) study.

The probit model for the empirical analysis of sanctions success is as follows:

$$\text{prob}(\text{RESULT}) = \beta_1(\text{TCOST}) + \beta_2(\text{TSATIBILITY}) + \beta_3(\text{TASSIST}) + \beta_4(\text{CULGLOB}) + \beta_5(\text{CULCOST}) + e \quad (1)$$

$$\text{prob}(\text{RESULT}) = \beta_1(\text{TCOST}) + \beta_2(\text{TSATIBILITY}) + \beta_3(\text{TASSIST}) + \beta_4(\text{CULGLOB}) + \beta_5(\text{CULCOST}) + \beta_6(\text{HRGOAL}) + \beta_7(\text{INTCOOP}) + \beta_8(\text{US}) + \beta_9(\text{FINS}) + e \quad (2)$$

4. FINDINGS AND DISCUSSIONS

Table 5.1 presents the empirical findings of the article. In the first model, in addition to the TCOST, TSTABILITY and TASSIST variables, the main interest is based on the impact of cultural globalization on sanctions success and the conditional impact on target costs. The first probit model represents the arguments in the discussion of hypothesis 1. The second model has supplementary variables such as HRGOAL, INTCOOP, FINS, and US. For the first model, the aim is to understand the impact of cultural globalization and the impact of variables directly related to the target characteristics. In the second model, the attention is given to the assessment of the consistency of model 1 variables in a wider context.

In both, the overall significance of the empirical models is shown by considering the Wald Chi-square statistics. Pseudo R-square statistics are explanatory for variation in binary logistic regression models with 29 percent for the first model and 35 for the second model. Four of the five independent variables are statistically significant in the first model. 3 of these 4 variables were found to be significant at 99 percent level. In the second model, 6 variables out of 9 were found to be significant. Significant variables were also found to be significant in the second model. Finally, the constant terms in both models are also statistically significant. As expected, the hypothesis of the relationship between the target's level of cultural globalization and sanctions success is significant at 99 percent in both empirical models. Therefore, as target becomes more culturally globalized, the likelihood of sanctions success increases.

Table 4: Empirical Results for the Probability of Sanctions Success

	Model 1	Model 2
Dependent Variable		
Sanctions Success (RESULT) (N=72)		
Independent Variables		
Cost to Target (TCOST)	2.37** (0.949)	3.00 *** (1.026)
Political and Economic Stability of the Target (TSTABILITY)	-0.88*** (0.254)	-0.83*** (0.310)
Assistance to Target (TASSIST)	-0.04 (0.649)	-0.26 (0.670)
Cultural Globalization (CULGLOB)	0.82*** (0.202)	1.09*** (0.261)
Cultural Globalization x Cost to Target (CULCOST)	-0.53*** (0.205)	-0.66** (0.218)
Human Rights (HRGOAL)		0.20 (0.532)
International Cooperation (INTCOOP)		-0.42 (0.245)
United States (US)		1.29** (0.534)
Financial Sanctions (FINS)		1.10* (0.671)
constant	-2.07** (0.929)	-3.85** (1.510)
Observations	72	72

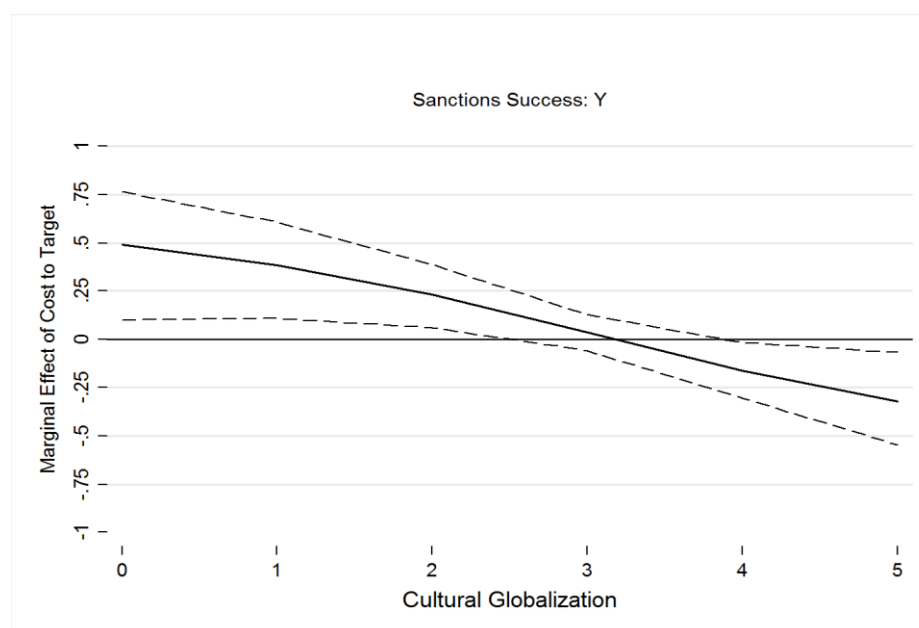
Pseudo R-squared	0.29	0.35
Wald Chi-squared	23.01	24.95

Notes: Statistical significance is as follows: $p < 0.10$ (*), $p < 0.05$ (**), and $p < 0.01$ (***).
Robust standard errors clustered by target and are given in parentheses.

Empirical evidence has been found in both empirical models as indicated in the relationship between sanctions success and cultural globalization, since cultural globalization is used as an indicator that replaced the regime type and also due to the presumed relationship between winning coalitions and cultural globalization. In fact, there are also examples in the dataset that help combine cultural globalization as a measure of target's features regardless of the regime type. For example, in the *United Kingdom vs. Argentina (1983)* and *the United States vs. Indonesia (1991)* cases, sanctions were successful when the sender was democratic and the target was non-democratic. Similarly, in the case of *Australia vs. France (1983)*, both sides are a democracy and the result of sanctions is successful. Finally, in *China vs. France*, the sanctions are successful while the sender is autocratic and the target is democratic. In other words, such examples support the hypothesis presented in this article.

As highlighted in some scholars' pieces (Hufbauer et al. 1990; Lam 1990; Jing et al. 2003; Dashti-Gibson et al. 1997), *TCOST* is statistically significant in the explanation of the *RESULT* in both models that an increase in target's economic costs increases the likelihood of sanctions success. The interaction term, *CULCOST*, is negatively significant. However, interpreting the interaction term from the results table can be misleading. The slope line in Figure 1 shows how the marginal effect of cost to target changes with the cultural globalization level. Cost to target has a positive impact on sanctions success when the cultural globalization level is quite low. This influence decreases as the level of cultural globalization increases. When the level of cultural globalization reaches 2.5, this effect is no longer significantly important. In contrast, when the level of cultural globalization is relatively high, costs to target have a negative impact on sanctions success. Also, when the cultural globalization score is above 4, the costs have a negative effect on sanctions success. However, in practice, there are only 4 countries under 2.5 level and 76 countries are over 4 level. Therefore, when the level of cultural globalization of the target is high, we can conclude that the costs to the target negatively influence the outcome of sanctions.

Figure 1: Marginal Effect of Target Costs Conditional on Cultural Globalization Level



Scholars have found empirical evidence to support the positive relationship between modest policy goals and sanctions success (Dashti-Gibson et al., 1997). Yet, as a separate measure, policy goals are not statistically significant. In this article, the impact of cultural globalization on public opinion has been evaluated. How the target's public perceives sanctions is a key to sanctions success. Therefore, since cultural globalization leads to social change, which means adapting to the global values and standards in the target's society, the kind of policy goals that are supported by the target population has become the main point of the hypotheses. In this context, it has been proposed that as the policy goal of sanctions is human rights, the likelihood of sanctions success may increase if the target is a more globalized country. Thus, a significant relationship was found between *HRGOAL* and sanctions success.

Financial sanctions are more effective tools than trade sanctions (Hufbauer et al., 1990; Drury 1998; Dashti-Gibson et al. 1997). An explanation for such an inference is that they reduce the target costs imposed on the target population, as financial sanctions mostly aim a country's political elites. On the contrary, trade sanctions have the opposite effect because costs are more likely to affect the target's population. Although *FINS* does not have any statistical significance, it is positively associated with sanctions success, thus, supports the existing conventional view in sanctions research.

Empirical findings of the link between political and economic stability of the target and sanctions success are similar to the studies of Hufbauer et al. (1990), Lam (1990) and Jing et al. (2003). In addition, the international cooperation *INTCOOP*, as found by the findings of Hufbauer et al. (1990) and Drury (1998), have a negative impact on sanctions success. However, in the second model, it was not statistically significant. Finally, assistance to target is not significant. However, it confirms the negative impact on the likelihood of sanctions success (Hufbauer et al., 1990; Drury, 1998).

5. CONCLUSION

Scholars of sanctions has long displayed an interest in the political and economic determining factors of sanctions efficacy, however, ignored cultural and historical determinants of target state's political behavior (Kaempfer and Lowenberg 2007, pp. 904-905). In this article, the impact of cultural globalization on state behavior and people's preferences, is examined. Economic globalization is highly represented in the literature, but cultural globalization has not been studied as an indicator of target's compliance. . In particular, cultural globalization leads to political change that paves the way for a transitional political system for these countries. Thus, in the case of culturally globalized targets, referring to the selectorate theory, it is claimed that the winning coalition is wider and the scope of this coalition can be determined without a regime type. In addition, cultural globalization leads to social change that transforms public preferences. Similarly, it can be argued that the audience costs are higher in culturally globalized states as these costs require a publicly accepted and known foreign policy behavior. As democratic leaders act with a motivation for re-election and the preferences of the population are taken into account in the decision-making, similar assumptions can be made for the leaders of culturally globalized states. At that point, culturally globalized states tend to comply with sender's demands on the grounds that the target resolve is not credible and the leaders do not change their declared policy behavior. In addition, hypotheses on the impact of policy goal on public perceptions of sanctions were also examined. Policy goals, such as human rights, are considered to be relatively acceptable sanctions objectives as they can be perceived as acceptable and in line with the target population's motivations.

Therefore, the hypotheses in this article provide empirical evidence of the relationship between cultural globalization and sanctions success, and in part, reflect the target's behavior and population's preferences. However, explaining the sanctions success based on a set of explanatory variables adopted by the traditional view is insufficient to explain the sanctions space. Although cultural globalization partly contributes to predict the variation in sanctions success, the estimation of sanctions success with explanatory variables continues to be beyond the acquisition of modern econometric methods and political and economic theories (Hufbauer et al. 2007, p.192). To these ends, measures such as public perceptions of sanctions should be included in the priorities of further research agenda.

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A RESEARCH ON INTERACTION BETWEEN BITCOIN AND FOREIGN EXCHANGE RATES

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ABSTRACT

Purpose - This study conducts an analysis to reveal the interaction between Bitcoin and Exchange Rates to find out whether Bitcoin is becoming a substitution for the exchange rates.

Methodology - To investigate the mutually interaction between the exchange rates and the Bitcoin, the interaction (relationship) between daily closing price of both exchange rates and Bitcoin was analyzed through the Var model. Thus, it was tried to show the sensitivity of the values of Bitcoin to the changes occurred in the exchange rates.

Findings - Based on Variance Decomposition analysis, BITCOIN and Euro can be considered as largely external variables and their prices are not significantly affected by USD. An interesting result in this study is that the USD exchange rate was found to be significantly sensitive to the Euro.

Conclusion - Findings obtained from analysis show that Bitcoin and Exchange Rates have not become an alternative tools for each other yet.

Keywords: Cryptocurrencies, bitcoin, variance decomposition, Var model, unit root test.

JEL Codes: C23, C58, G10, G32

1. INTRODUCTION

Bitcoin mostly called as digital money is a kind of platform that enables for using virtual money by electronic payment. Since 2009 when an anonymous people under the Nakamoto nickname developed it, Bitcoin has been used for around 2.5 million transactions between 109 million accounts (Böhme and Christin, 2015:213). As of March 2019, its market value is approximately 71 Billion USD. Bitcoin is simply a type of electronic money which is subject to transfer from one economic unit to another and is confirmed by a remaining balance that the owner of the currency holds (Dwyer, 2015:81).

As a crypto currency Bitcoin is differing from conventional money term based on these properties as follows (Çarkacıoğlu, 2016:15-16):

- The Bitcoin network is not centralized namely cannot be managed by a center. Therefore no supervisory institution exists. It consists of a network based on an end-to-end interconnected computers.
- While in other types of digital currency, users need a trusted agent Bitcoin does not need the broker and trust.
- Bitcoin does not mean the debt, it can be defined as the value carrier. However, money in bank deposit accounts is a type of debt and represents the debt of a bank to its client.
- No permission required. No one can interfere in the system.
- The system is safe. Security is ensured by using mathematically proven cryptographic digital signing methods.
- İşlemler geri alınmaz.
- No authority includes even government and system developer cannot change or take back a transaction that is made by a miner and accepted by the others and recorded to Block Chain.
- Transactions are transparent, fast and global. Transactions are anonymous. Transactions are not related to real persons, organizations and bank accounts. There is no influence of banks and states on bitcoin supply. No external money supply can be made to the system therefore, inflation issue does not occur.

What makes Bitcoin most popular is its price movement in other words its fluctuations. Bitcoin is the first cryptocurrency and has taken majority of the attention made for cryptocurrencies. Because it is considered as a cryptocurrency that has the potential to disrupt conventional payment methods and finally resulted in affecting all financial systems (Böhme and Christin, 2015:214). Therefore, in this study, we aimed to assess whether Bitcoin is becoming an alternative for the exchange rates.

2. DATA AND METHODOLOGY

2.1 Sample Construction

In this study as a cryptocurrency Bitcoin (BIT) and as exchange rates USD and EUR were used. The study was carried out with daily data of 27.10.2017-25.02.2019. The days of the data have been synchronized by us. Natural logarithms of all series were used in the analysis. By taking the natural logarithms of the data, the risk of heteroscedasticity problem has been reduced and the opportunity of the interpretation of the results (evident) as flexibility coefficients have been obtained. The data is obtained from www.investing.com.

2.2 Model

In this study, the stationarity of the series were analyzed with ADF (Augmented Dickey Fuller) and PP (Phillips Perron) unit root tests. Interactions between the series were analyzed by the Impulse-Response Function and Variance Decomposition methods based on the VAR (Vector Autoregressive) method.

3. FINDINGS AND DISCUSSIONS

3.1. Unit Root Test

In econometric analyzes, determining the stationary degrees of the series and carrying out the subsequent analyzes in the light of this information has vital importance for the analysis to produce reliable results (Cochrane, 1991). Stationarity of series can be determined by unit root tests. In the study, the stationary level of the series was tested with ADF and PP methods. Among these tests, ADF is preferred for being the most widely used test while PP is preferred because it is accepted stronger than ADF (Arltova ve Fedorová, 2016) in the analysis which includes trend.

The hypotheses of these tests are the same :

H_0 : Series are not stationary.

H_1 : Series are stationary.

As a result of these tests, series which become stationary without taking their first difference are called as I(0) and other series which become stationary after taking their first differences are called as I(1) (Dikmen, 2012: 304). In this study, ADF and PP unit root tests were performed and the results are presented in Table 1.

Table 1: Unit Root Test Results

Variable	Origin Level		First Difference		Decision
	Probability Value of the ADF Test	Probability Value of the PP Test	Probability Value of the ADF Test	Probability Value of the PP Test	
LnBIT	0.48	0.42	0.00***	0.00***	I(1)
LnUSD	0.90	0.87	0.00***	0.00***	I(1)
LnEUR	0.91	0.90	0.00***	0.00***	I(1)

Note: The optimum lag length in the ADF test is determined according to the Akaike Criterion and the optimum bandwidth in the PP test is determined according to the Newey-West method. Since the PP test is considered to be more robust, the decision is finalized based on the results of the PP test when different results are produced by the ADF and PP test methods. *** and * state that the related series is stationary at 1% and 10% significance level, respectively. The unit root tests were not performed for the series which were stationary in the origin level values.

3.2. VAR Analysis

The VAR analysis developed by Sims (1980) was preferred in this study because it allows to analyze the interactions between variables simultaneously (Trenca and Mutu, 2011: 33-37). The relationships between factors that move simultaneously especially like monetary theory and financial instruments can be analyzed effectively by the VAR method (Triacca, 2017). In order to analyze the relations between two variables such as Y and X by VAR method, the following simultaneous equation system is used:

$$Y_t = \alpha_0 + \sum_{i=1}^m \alpha_i Y_{t-i} + \sum_{i=1}^m \beta_i X_{t-i} + u_t \quad (1)$$

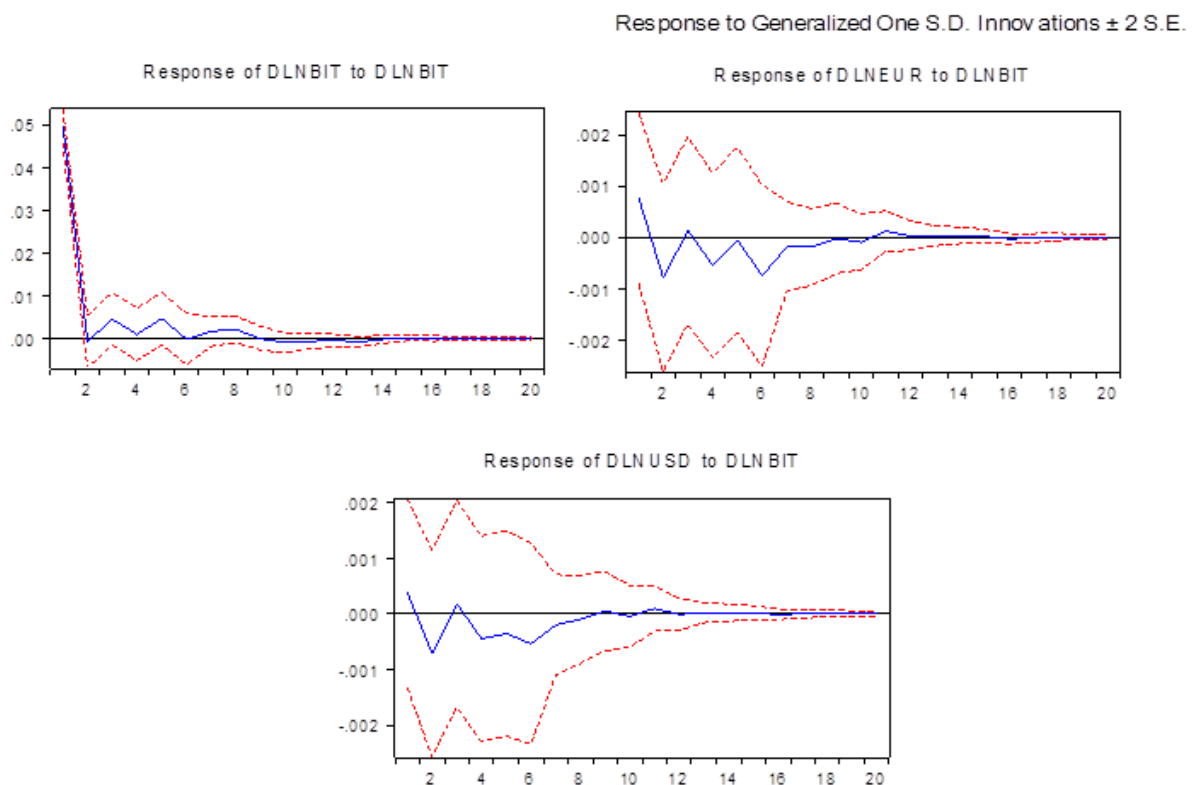
$$X_t = \gamma_0 + \sum_{i=1}^m \gamma_i X_{t-i} + \sum_{i=1}^m \varphi_i Y_{t-i} + \vartheta_t \quad (2)$$

Here, m denotes the optimal delay length. In this study, VAR estimates were made for Analysis 1 and Analysis 2 separately. In the VAR analysis, the optimal delay length was determined first, and the results of this transaction are presented in Appendix 1. In the VAR analysis, the findings are not directly interpreted and interpretations are made based on the results of Impact-Response Functions and Variance Decomposition.

3.2.1. Impact-Response Functions

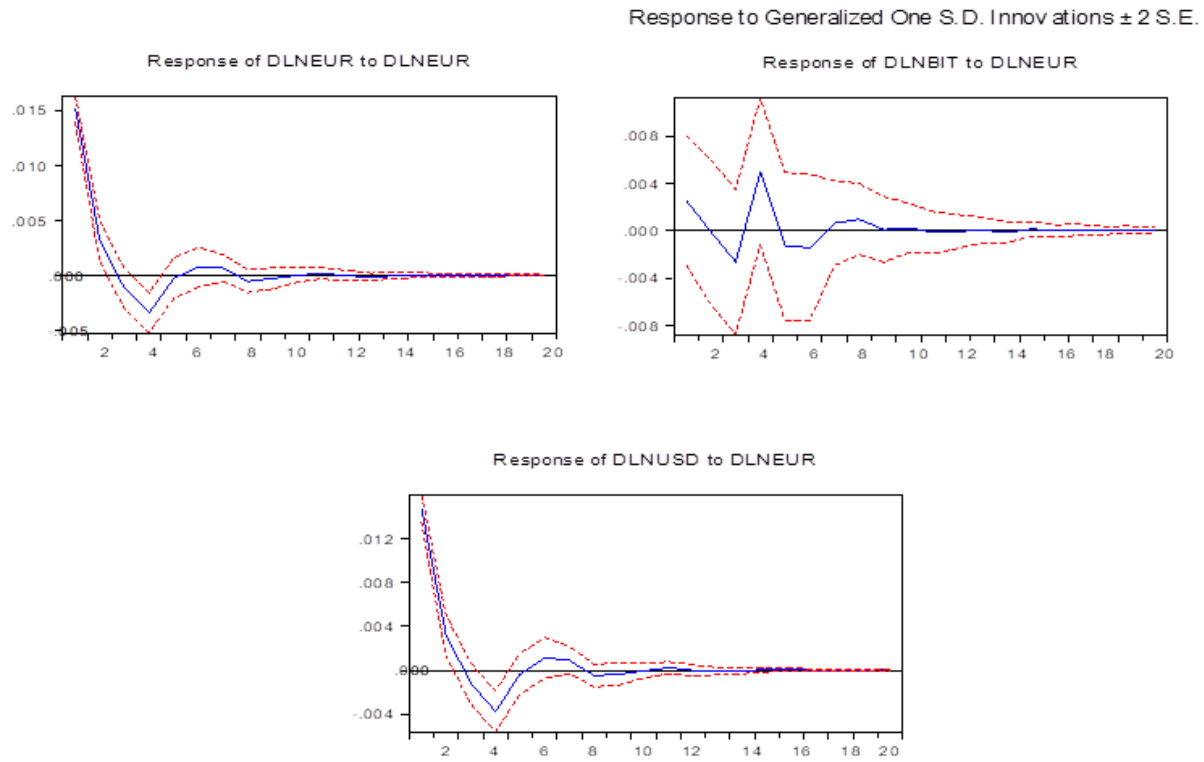
This analysis examines the responses of variables located in the VAR model to their own or other variables' shocks. A standard-error shock occurred in one of the variables is examined by the response of the series itself and other variables (Rossi, 2011). In the study, generalized shocks are given while creating effect-response functions. The results are presented below: The order of the graphs indicates: In the first graph in each group, it is decided a variable is giving a response to the shock coming to it and thus it is decided whether this shock creates decreasing or increasing effect. In the other graphs, the responses of the other variables to the shocks that come from the first variable are monitored.

Chart 1: The Reaction of Exchange Rates to a Reducing Shock in BITCOIN's Price



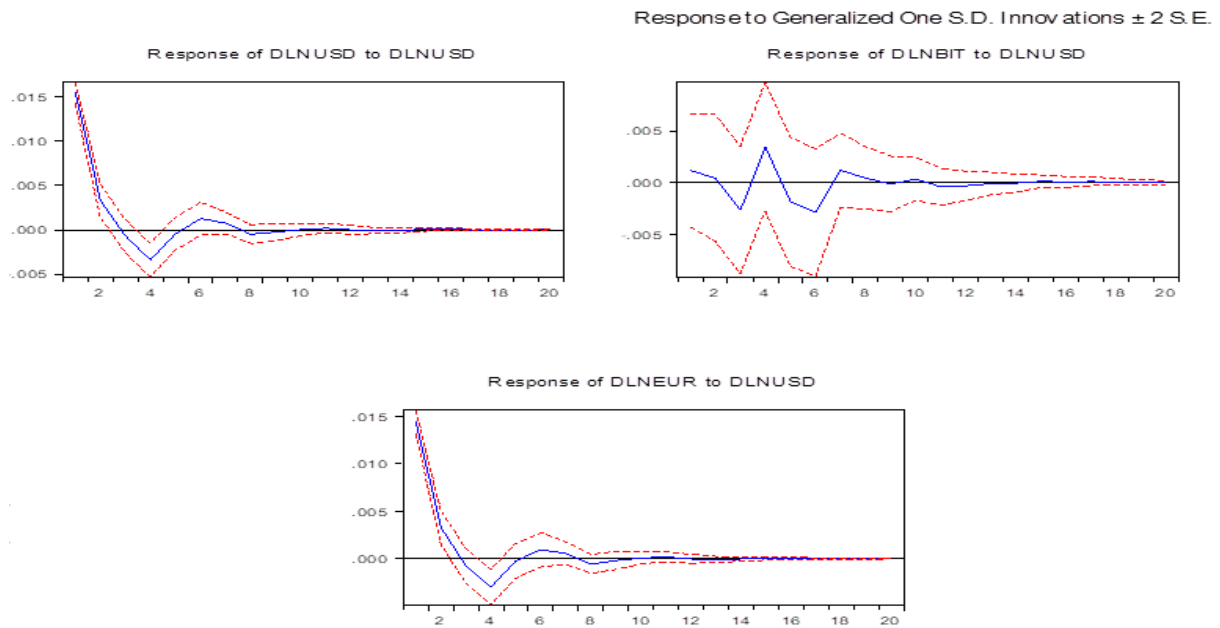
According to these graphs, it can be found that Euro and USD respond in reducing way to reducing shock occurred in Bitcoin's Prices. Therefore we can not conclude that Bitcoin and USD and Euro are substitution investment tools. Shocks have lost their effect on average in 12 days.

Chart 2: The Reaction of USD and Bitcoin to a Reducing Shock in Euro's Price



According to these graphs, it can be found that BITCOIN and USD respond in reducing way to reducing shock occurred in Euro's Prices. In this case, Euro, USD and Bitcoin cannot be expressed as substitution tools. Shocks have lost their effect on average in 14 days.

Chart 3: The Reaction of Euro and Bitcoin to a Reducing Shock in USD's Price



According to these graphs, it can be found that BITCOIN and Euro respond in reducing way to reducing shock occurred in USD 's Prices. In this case, USD, Bitcoin and Euro cannot be expressed as substitution currencies. Shocks have lost their effect on average in 10 days.

When the results obtained from the impact-response functions are evaluated together, it is difficult to say that exchange rates as USD and EUR and crypto money as Bitcoin cannot be regarded as alternative investment tool for each other.

3.2.2. Variance Decomposition

Variance decomposition method is used to determine how much of the change in each variable arises from changes in other variables and arises from itself (Tari, 2012: 469). In the variance decomposition, the values in the first period in which the distribution reaches equilibrium are interpreted. In this study, variance decomposition was made for each variable separately and the findings are presented in the tables below. The variable which is tried to be explained in each table is made bold and the data shows how much of the changes in this variable are caused by itself. Other columns refer to the effects of changes in other variables in the analysis on the variable to be explained.

Table 2: Results of Variance Decomposition for Determining the Causes of Changes in BITCOIN

Period	DLNBIT	DLNEUR	DLNUSD
1	100	0	0
2	90.67	0.00	0.03
3	88.65	0.36	0.03
4	83.69	1.16	0.80
5	82.20	1.19	0.81
6	80.72	1.23	1.73
7	80.18	1.23	1.90
8	79.96	1.25	1.94
9	79.27	1.24	1.93

According to Table 2, after 8th period, in the distribution, equilibrium was established. In this case, 79.96% of the changes in BITCOIN were caused by itself, 1.25% from Euro and 1.94% from USD. The reasons why the effects of the USD are higher than Euro's are USD's intensity of use (trade volume) in financial transactions worldwide and Bitcoin is being charged in terms of USD dollars.

Table 3: Results of Variance Decomposition for Determining the Causes of Changes in Euro

Period	DLNBIT	DLNEUR	DLNUSD
1	0.26	99.42	0
2	0.49	96.93	0.41
3	0.49	95.43	1.00
4	0.57	94.85	1.13
5	0.57	93.76	1.13
6	0.76	92.90	1.26
7	0.77	92.44	1.28

According to Table 3, after 6th period, in the distribution, equilibrium was established. In this case, 92.90% of the changes in Euro were caused by itself, 1.88% from BITCOIN and 1.26% from USD. Here Euro is an external variable and the value of the Euro is not determined by the variables included in the analysis.

Table 4: Results of Variance Decomposition for Determining the Causes of Changes in USD

Period	DLNBIT	DLNEUR	DLNUSD
1	0.06	90.49	8.75
2	0.25	88.82	8.45
3	0.26	87.46	9.00
4	0.32	87.60	8.57
5	0.36	86.60	8.60
6	0.45	85.96	8.59
7	0.46	85.63	8.55
8	0.47	85.61	8.55

According to Table 4, after 7th period, in the distribution, equilibrium was established. In this case, 8.55% of the changes in USD were caused by itself and 0.46% from BITCOIN and 85.63% from Euro. Here, the factors that best explain the changes in the USD are the changes in the Euro.

4. CONCLUSION

In this study, the interaction between the closing prices of the Bitcoin and the closing values of the exchange rates (USD and EUR) was analyzed using the daily data of 27.10.2017-25.0.2019 period. Since the data were daily and closely interrelated, simultaneous analysis methods such as the VAR method.

The series were examined by ADF and PP unit root tests and it was observed that all series were I(1). Since VAR analysis and Granger causality tests can be performed only via the stationary series then all series were analyzed by taking their first differences. According to the Impact-Response functions based on the VAR analysis, we cannot prove that Bitcoin, USD and EUR are alternative investment tool for each other.

According to the results of VAR analysis based on Variance Decomposition, BITCOIN and Euro are largely external variables and their prices are not significantly affected by USD. This evidence also shows that they haven't become alternative for each other yet. An interesting result in this study is that the USD exchange rate was found to be significantly sensitive to the Euro.

The causality relations between the series were examined by Granger (1969) method. However, in this study, the causality relationship between the variables could not be determined in line with the results of the VAR Analysis.

Based on the findings obtained from this study, it can be understood that there is no significant interactions between Bitcoin, USD and EUR. The result may be beneficial for investors to consider diversification their portfolios.

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Appendix 1: Optimal Delay Length Determination Results

VAR Lag Order Selection Criteria

Endogenous variables: DLNBIT DLNEUR DLNUSD

Exogenous variables: C

Date: 03/01/19 Time: 11:44

Sample: 1 334

Included observations: 325

Lag	LogL	LR	FPE	AIC	SC	HQ
0	5853.323	NA	3.30e-26	-35.97122	-35.87808*	-35.93404*
1	5920.588	130.8049	3.23e-26*	-35.99131*	-35.15305	-35.65676
2	5981.355	115.1776	3.30e-26	-35.97142	-34.38803	-35.33949
3	6040.707	109.5716	3.40e-26	-35.94281	-33.61430	-35.01350
4	6106.917	118.9748	3.36e-26	-35.95641	-32.88278	-34.72972
5	6159.995	92.76402*	3.62e-26	-35.88920	-32.07045	-34.36513
6	6204.740	75.99782	4.10e-26	-35.77071	-31.20683	-33.94926
7	6252.914	79.44922	4.57e-26	-35.67331	-30.36432	-33.55448
8	6301.369	77.52818	5.11e-26	-35.57765	-29.52353	-33.16144

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The optimum lag length is 1 according to FPE and AIC in this table. However, when the 1-delayed VAR model was estimated, an autocorrelation problem was detected in the model, and it was taken as an optimal delay length of 5 models determined according to the LR criteria. Autocorrelation test results for the 5-delayed VAR model:

VAR Residual Serial Correlation LM Tests

Date: 03/01/19 Time: 11:50

Sample: 1 334

Included observations: 328

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	72.76184	64	0.2119	1.140601	(64, 1575.4)	0.2121
2	74.69924	64	0.1696	1.171683	(64, 1575.4)	0.1698
3	62.48444	64	0.5303	0.976344	(64, 1575.4)	0.5306
4	71.51107	64	0.2426	1.120554	(64, 1575.4)	0.2428
5	92.24804	64	0.0119	1.454936	(64, 1575.4)	0.0120

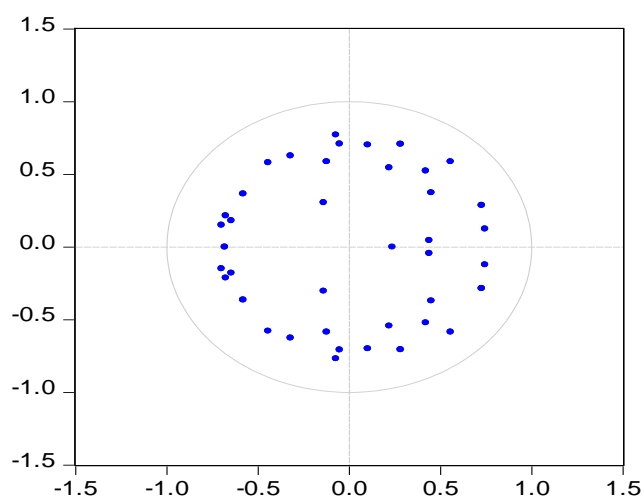
Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	72.76184	64	0.2119	1.140601	(64, 1575.4)	0.2121
2	152.2228	128	0.0709	1.196820	(128, 1916.4)	0.0714
3	217.3174	192	0.1015	1.138667	(192, 1965.9)	0.1029
4	286.5945	256	0.0916	1.127037	(256, 1946.0)	0.0942
5	364.0540	320	0.0452	1.148332	(320, 1903.3)	0.0479

*Edgeworth expansion corrected likelihood ratio statistic.

According to this table, there is no autocorrelation problem in the 5 - delayed VAR model. The graphic of inverse characteristic roots shows that the 5 - delayed VAR model is stable as follows :

Inverse Roots of AR Characteristic Polynomial



In this graph, it was decided that the 5 delayed VAR model was stable because the inverse characteristic polynomial roots remained within the unit circle.