TRADE LIBERALIZATION AND INCOME INEQUALITY IN TURKEY: AN EMPIRICAL ANALYSIS

Doç. Dr. İbrahim ÖRNEK
Kahramanmaraş Sütçü İmam Üniversitesi
İİBF, İktisat Bölümü
ornek@ksu.edu.tr

Yrd. Doç. Dr. Adem Y. ELVEREN
Kahramanmaraş Sütçü İmam Üniversitesi
İİBF, İktisat Bölümü
ademyavuzelveren@gmail.com

ABSTRACT
It is a fact that income inequality has increased both between and within countries in the neo-liberal era. The liberalization process in Turkey was started in 1980 with a stabilization program by IMF and followed by liberalization of the capital accounts in 1989 and the customs union agreement with the EU in 1995. During these decades, Turkey has experienced a deteriorating income inequality, particularly in 1990s. Considering this fact, this study aims to investigate the existence of relationship between trade openness and income inequality in Turkey between 1980 and 2001. We conduct a cointegration analysis to answer this question. Our findings reveal a strong causality between trade openness and income inequality.

Key Words: Turkey, inequality, trade openness, Engle-Granger cointegration test

ÖZET
Gelir eşitsizliği neo-liberal dönemde hem ülkeler arasında hem de ülke içinde artmıştır. Türkiye'de liberalizasyon süreci 1980 yılında IMF ile yapılan istikrar programı ile başlamış ve 1989'da sermaye hesaplarının liberalizasyonu ve 1995'de AB ile yapılan Gümrük Birliği Antlaşması ile devam etmiştir. Bu dönemde Türkiye'de gelir dağılımı özellikle 1990'larda bozulmuştur. Bu çalışma bu gerçeği gözönüne alarak Türkiye'de 1980-2001 döneminde gelir eşitsizliği ile dışa açıklık arasındaki ilişkinin varlığını araştırmayı hedeflemektedir. Bu soruyu cevaplamak için bir eşbütünleşme analizi yapılmıştır. Bulgularımız dışa açıklık ile gelir eşitsizliği arasında güçlü bir nedenselliği ortaya koymaktadır.

Anahtar Kelimeler: Türkiye, eşitsizlik, dışa açıklık, Engle-Granger eşbütünleşme testi

1. Introduction

The aim of this paper is to provide more evidence on cointegration between trade openness and income inequality in Turkey.

Impact of globalization on income inequality has been a crucial topic for economists. Advocates of the neo-liberal paradigm had ignored this facet of the model or simply refused the argument that the inequality had been increasing both between and within countries across the world. However, now it has been an indisputable fact that except for a few countries inequality has increased across the world.

Turkey was (is) not one of those few countries. There is a sizable literature on income inequality in Turkey. The main findings of this literature yield some not-

unexpected facts about income inequality in Turkey, such as that income inequality is greater in urban areas than rural areas, increasing inequality between coastal and interior provinces, a true dichotomy between the wealthier West and the poorer East, no convergence between regions and between provinces, increasing wage gap between skilled and unskilled workers (Elveren and Galbraith 2009).

The goal of this study is to analyse whether the trade openness led income inequality in Turkey. To answer this question, we use Engle-Granger's (1988) two step procedure. In the next section we briefly review the literature on income inequality in Turkey. In section three the methodology and data are presented. The results are provided in section four. Finally, the conclusion summarizes the findings.

2. A Brief Literature Review

Since the early 1980s income inequality has risen both between and within countries in the neo-liberal era. This is a widely accepted fact. However, the economists do not agree on impacts of causes. The core framework to analyse the effect of trade on the returns to different factors of production is the Heckscher-Ohlin's (HO) model, which assumes perfectly competitive markets and identical production functions with perfectly available technology for each country. The model in its simplest form assumes that there are two factors of production – skilled and unskilled labor – and two countries, namely developed and developing countries, both producing skilled and unskilled labor-intensive goods. According to the Stopler-Samuelson (SS) theorem, a corollary of the HO model, opennes to trade will benefit a country's relatively abundant factor since specialization in international trade will favor sectors with abundant factor. That is, in the case of a developing country, which is relatively abundant in unskilled labor and therefore has a comparative advantage in this production factor, openness to trade increases the demand for unskilled labor and thereby its wage. Therefore, this process norrows the wage gap between skilled and unskilled workers and decreases income inequality within the country. However, the SS theorem has been highly critisized due to its restrictive assumptions (Meschi and Vivarelli 2007).

A group of work questions the local validity of the theorem. According to this view, while a country can be considered as unskilled abundant in global terms, it may not be true in a local context. That is, particularly a middle-income countries are likely to be relatively unskilled-labor-abundant in comparison with high-income trading partners and relatively skilled-labor-abundant in comparison with low-income ones (ibid. p. 5). Therefore, a crucial consequence of this case is that demand for and wages of unskilled workers decreases and thereby widens the wage dispersion. Indeed, it has been showed that trade liberalisation in this context rises demand for skilled workers both in developed and developing countries (ibid. p. 6).

Another important assumption of the SS theorem is that countries have identical technologies. However, one need to analyse a more realistic case, where technology level is substantially different for developed and developing countries. In this case, technology diffuses easily from North to South as a result of free trade. The final outcome of this process in terms of demand for labor, both skilled and unskilled, and relative wages in economy, depends on the skill intensity of the transferred technology which currently in use in developing countries. Hence, the transferred technology, either by means of import or export, can increases demand for skilled labor

in developing countries as well. That means that trade liberalisation may create an outcome opposite to the SS theorem. Put it simple, trade openness can result in higher income inequality both in developing and developed countries. Indeed, this argument is supported by many empirical works and just a few studies show a decline in income inequality after trade liberalization in line with the prediction of the SS theorem (see Meschi and Vivarelli 2007 for a comprehensive literature review).

There are numerous empirical works, with different coverage of nations and time period, show increasing income inequality (see Wade 2001, 2004; Dowrick and Akmal 2001; Cornia and Kiiski 2001; Milanovic 2005; Föster and d'Ercole 2005; Benar, 2007 among many others). The exceptions were those few countries that were insulated from the global financial system: notably China, India, and Iran. A general exception to sharply rising inequality occurred in Scandinavia, where Denmark, notably, observed a substantial reduction in inequality from the 1970s through the 1990s (Galbraith 2007). Although some argued that this increase in income inequality across both developed and developing countries is not due to globalization but can be attributed mostly to technology (Jaumotte et. al. 2008), it is not the issue between users and non-users of new technology but between producers of technology and users of technology (Galbraith 1998).

Turkey has adopted the neo-liberal model in 1980. Since then Turkey, too, has experienced increasing income inequality. It has one of the most unequal income distributions among upper-middle income countries (World Bank 2000). The process of becoming an open economy has continued with liberalization of foreign capital accounts in 1989 and the customs union agreement with the EU in 1995. Figure 1 shows the ratio of total trade to GDP.

Figure 1: Total Trade/ GDP
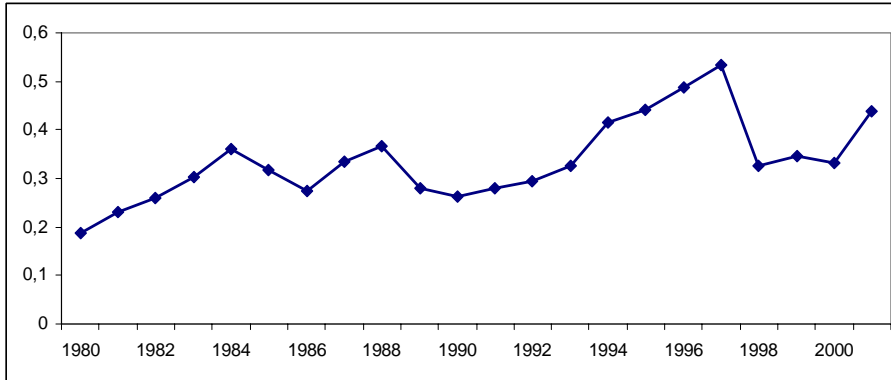
It has been showed that the terms of trade have turned against Turkey in this era (Bağımsız Sosyal Bilimciler 2005) and that declining share of wage and earnings of agricultural sector have accompanied by increasing share of profit, interest earnings and rant (Boratav 1991). Figure 2 shows that inequality rose in this period, particularly in the 1990s.

Figure 2: Pay Inequality in the Turkish Manufacturing Sector: 1980-2001
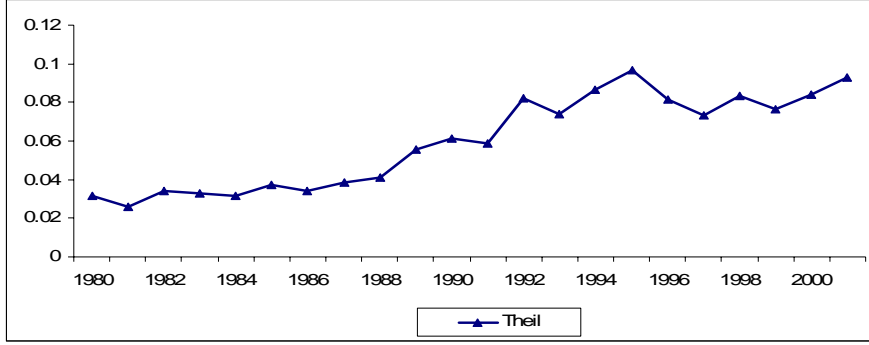
Source: Elveren and Galbraith (2009)

The main causes for this deterioration are the negative trend of real wages (Erdil 1996; Yeldan 2000; Memis 2008), a change in tax policies benefiting the rich (Yüce 2001), high real interest rates (World Bank 2000; Yeldan 2000; Şenses 2004), unequal education (Baş 2000; Köse and Güven 2007; Duygan and Guner 2006), and excessive migration to urban areas due both to economic and political pressure. Increasing wage gap between skilled and unskilled workers is one of the characteristics of this era (Köse and Yeldan 1998). Boratav et. all (1996) showed that for the 1979-1992 period, in line with other developing countries, wages in labor-intense export sectors such as textile have declined while earnings of relatively higher capital-intense import substitution sectors such as transportation have risen in Turkey. Kızılırmak (2003) also showed that the demand for and wages of unskilled labor declined while the opposite is true for skilled workers in 1990s. Overall, in this two decades of liberalization, while winner sectors were chemicals, machinery and equipment, glass and pottery, metals, and paper, the sectors of wood, food, and particularly textiles suffer from lower wages compared with the manufacturing sector in general and the wage gap increased particularly in the 1990s (Elveren and Galbraith 2009).

On the other hand, although income distribution has improved in 2000s according to the government authorities, some argue that this improvement is due to misrecorded, either mistakenly or intentionally, share of interest receipts (Bulutay, 2005 cited in Baş, 2009).

Although there are numerous empirical works that examine different aspects of the causality between trade openness and growth (see Özer and Erdoğan 2006; Utkulu and Özdemir 2005; Yapraklı 2007 among many others) there is only one work to the best of our knowledge that directly focuses on the relationship between openness and inequality. Gökalp et al. (2009) examine the cointegration between trade openness and pay inequality between skilled and unskilled workers. In an empirical analysis, they showed that, in opposite to argument of the Stolper-Samuelson theory, trade openness had a deteriorating effect on income distribution.

The findings of the present paper is relevant because considering pay inequality in the manufacturing sector as the overall income inequality in the economy

we provide new evidence on the relationship between trade openness and income inequality. It is true that the distribution of pay is only part of the distribution of income; in an ideal-data world the effects of capital income and entitlements should be also taken into account. However, it is a fact that, wages are a major component of income, and that measures of pay inequality are, in most cases, broadly consistent with survey-based income inequality measures. Indeed, Galbraith and Kum (2005) show that pay inequality in manufacturing sector is a highly significant determinant of the widely-used Deininger and Squire inequality measure, after controlling for survey type and for the share of manufacturing employment in population. Therefore, in this study, we argue that, the pay inequality index of Elveren and Galbraith (2009) is an appropriate indicator of general income distribution in Turkey.[12] Also, inequality indices that based on micro-level data are only available for a limited number of years. However, we also acknowledge a shortcoming of this study that it covers only the period of 1980-2001, for available years of inequality index by Elveren and Galbraith (2009).

3. Methodology and Data

The aim is to explore the existence of a long-run relationship between the variables namely, trade openness and income inequality. To do so, we use Engle-Granger's (1988) two step procedure. First, cointegrated regressions are estimated by the Ordinary Least Squares (OLS) method;

$$X_t = \alpha_0 + \beta_0 Y_t + \mu_t \qquad (1)$$

$$Y_t = \alpha_1 + \beta_1 X_t + \mu_t' \qquad (2)$$

where α_0 and α_1 are constants, and μ_t and μ_t' are error terms. In the paper, first, it is tested whether the series are cointegrated or not, and then, in the second step, using the Error Correction Model (ECM) we apply the Granger Causality Test for variables based on the significance of coefficients of the error terms. The ECM can be formulized as following

---

[1] See Elveren and Galbraith (2009) and Elveren (2010) for a comprehensive analysis of pay inequality in Turkey.

[2] Authors use the between-groups component of Theil's T statistic (Theil 1972) to analyze the overall evolution of pay inequality in the manufacturing sector in Turkey. Theil's T statistic has two components, the between-group (T^B), and the within-group component. The between group-component provides the lower-bound estimate of general pay inequality. T^B can be stated as

$T^B = \sum_{i=1}^{n} \left\{ \left(\frac{p_i}{P} \right) * \left(\frac{y_i}{\mu} \right) * \ln \left(\frac{y_i}{\mu} \right) \right\}$ where i indexes groups, p_i is the population of group i, P is the total population,

y_i is the average wage in group i, and μ is the average wage of the entire population. They use the Annual Manufacturing Industry Statistics (AMIS) provided by the Turkish Statistical Institute. The data is provided at a two-digit level and is disaggregated according to provinces.

$$\Delta X_t = a_0 + b_0 \mu_{t-1} + \sum_{i=1}^{m} c_{0i} \Delta X_{t-i} + \sum_{j=1}^{n} d_0 \Delta Y_{t-j} + e_t \qquad (3)$$

$$\Delta Y_t = a_1 + b_1 \mu'_{t-1} + \sum_{i=1}^{q} c_{1i} \Delta Y_{t-i} + \sum_{j=1}^{r} d_{1i} \Delta X_{t-j} + e'_t \qquad (4)$$

In equations μ_{t-1} and μ'_{t-1} the lagged residuals are estimated by the cointegrated regressions of equations of (3) and (4). "Δ" shows that we make the variables stationary by differencing variables. If b_0 and b_1 are statistically significant a time series X is said to be Granger-cause Y and Y is said to be Granger-cause X. The ECM states that if two variables are cointegrated there is at least one-way causality between variables.

In this paper, the causality relationship between trade openness (TO) and income inequality (INEQ) is examined. We use the ratio of total trade (i.e. export and import) to GDP as a common indicator of trade openness, and pay inequality in the manufacturing sector provided by Elveren and Galbraith (2009) as time series of income inequality. Data is calculated annually from 1980 to 2001.

The investigation of stationarity is closely related to the tests for unit roots. We employ Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) to test the stationarity. The results of DF and ADF unit roots tests are provided in Table 1. MacKinnon critical values are from E-views.

Table 1. DF and ADF Unit Roots Analysis

	Test Statistics		Critical Values		
	Level Value	First Difference	%1	%5	%10
TO	-2.25	-4.30	-3.78	-3.01	-2.64
INEQ	-0.70	-6.00	-3.78	-3.01	-2.64

The results of DF and ADF tests shows, in Table 1, that the levels of variables are non-stationary. Applying the same tests to first differences to determine the order of integration, it is concluded that series are stationary in first differences. That is, the series are integrated order of one, I(1). Therefore, the cointegration test can be applied in order to investigate the existence of a long-run relationship between variables.

4. Results

Table 2 shows result of the Engle-Granger (1988) cointegration test.

Table 2: Two-way Cointegrations Analysis

Cointegrated Regressions	Calculated ADF Residuals	Critical Value %5	%10	Results
TO = f (INEQ)	-3.23 [1]	-3,06	-2,67	**Cointegrated**

INEQ = f(TO)	-5.47 [1]	-3,02	-2,65	**Cointegrated**

[1] Number of Lagged Residuals with respect to the Akaike Information Criterion

As Table 2 shows, there is a two-way log-run relationship between trade openness and income inequality. However, existence of a long-run relationship does not necessarily imply a short-run relationship. Therefore, an error-correction mechanism as in equations (3) and (4) is needed.

Table 3: Error Correction Models and Granger Causality Test

Dependent Variable	Wald Test	ECM-1(t-test)	Wald Test
	$\Sigma\Delta$INEQ		(ΣDLPT, ECM-1)
ΔTO	$\chi^2_{***}(5)$=15,33(0,009)	**-0,86 (2,37)**	$\chi^2 (6)$=16(0,013)[**]
	ΔTO		(ΣFO, ECM-1)
$\Sigma\Delta$INEQ	$\chi^2 (3)$=2,04(0,56)	**-0,64 (-2,03)**	$\chi^2 (4)$=6,80(0,14)

*,** and ***, show 10%, 5% and 1% level of significances, respectively.

In Table 3 " Δ " shows first differences of variables and values in pharenthesis show t-statistic. Number of lags for variables were chosen by the Akaike Information Criterion. The Error Correction Model (ECM) shows the strenght of adjusment toward equilibrium in the short-run. As shown in Table 3, the sources of causality are examined in three ways. All these tests show a significant causality between trade openness and income inequality. The signs of coefficients of error correction terms of both variables are negative and t-value is statistically significant. Therefore, there is a strong two-way causality between variables in question.

5. Conclusion

The aim of this study was to investigate the existence of the cointegration between openness to trade and income inequality.

It is a fact that income inequality both in developed and developing countries has deteriorated in the neo-liberal era. Turkey, having adopted the neo-liberal model in 1980, has turn out to be an "open economy" through decades. There is a sizeable literature on pay/income inequality in Turkey. A high proportion of this deals with convergence/divergence among provinces/regions. A part of this literature shows that there is an increasing wage gap between skilled and unskilled workers.

In this study we attempt to provide some empirical evidence on the relationship between trade openness and income inequality for Turkey for the period of 1980-2001. While taking the ratio of total trade (i.e. export plus import) to GDP as a typical indicator of openness level of the country, we considered the pay inequality in the manufacturing sector as an accurate reflector of overall income inequality in Turkey. Our analysis shows that there is a strong causality between increasing trade openness

and deteriorating income distribution in Turkey from 1980 to 2001. The results support early findings in the literature.

References
Bağımsız Sosyal Bilimciler, (2005), "On Economic and Social Life in Turkey in Early 2005", available at http://www.bagimsizsosyalbilimciler.org/Yazilar_BSB/BSB2005July.pdf

Baş, K. (2009), "Küreselleşme ve Gelir Dağılımı Eşitsizliği", Ç.Ü. Sosyal Bilimler Enstitüsü Dergisi, 18 (1): 49-70.

Baş, K. (2000), "Education and Income Distribution: Evidence From Provinces of Turkey", *A.Ü. Siyasal Bilgiler Dergisi*, 55 (2): 21-36.

Benar, H. (2007). "Has Globalization Increased Income Inequality in the MENA Region?", *International Journal of Economic Perspectives*, 1 (4): 195-211.

Boratav, K. (1991), *Türkiye'de Sosyal Sınıflar ve Bölüşüm*, Gerçek Yayınevi.

Boratav, K., O. Türel and N. Yentürk. (1996), "Adjustment, Distribution and Accumulation", UNCTAD Araştırma Raporu, Ocak 1996, Cenevre.

Cornia, G. A., S. Kiiski. (2001), "Trends in Income Distribution in the Post World War II Period: Evidence and Interpretation", UNU/ WIDER Discussion Papers, Helsinki.

Dowrick, S., M. Akmal. (2001), "Contradictory Trends in Global Income Inequality: A Taleof Two Biases", Faculty of Economics and Commerce, Austrialian National University. Available at http://siteresources.worldbank.org/INTDECINEQ/Resources/1149208-1169141694589/Contradictory_TrendsinGlobalIncome.pdf

Elveren, A. Y. (2010). "Pay Inequality in the Turkish Manufacturing Sector by Statistical Regions: 1980-2001", The University of Texas Inequality Project Working Paper, No.59.

Elveren, A. Y. and James K. Galbraith (2009), "Pay Inequality in Turkey in the Neo-Liberal Era, 1980-2001" European Journal of Comparative Economics, Vol. 6, No. 2, pp. 177-206.

Erdil, E. (1996). Inter-industry wage differentials: An analysis of wages in Turkish manufacturing industry, 1980/1985. Middle East Technical University Studies in Development 23(1), 1-19.

Föster, M., M. M. e'Ercole. (2005), "Income Distribution and Poverty in OECD Countries in the Second Half of the 1990s", OECD Employment and Migration Working Papers No 22.

Galbraith, J. K. (1998), "Globalization and Pay", The University of Texas Inequality Project Working Paper, No.3.

Galbraith J. K. (2007), 'Global inequality and global macroeconomics', Journal of Policy Modeling, 29: 587-607.

Galbraith J. K., H. Kum, (2005), 'Estimating the inequality of households incomes: toward a dense and consistent global data set', Review of Income and Wealth, 51(1): 115-143.

Gökalp, M. Faysal, E. Baldemir and G. Akgün. (2009), "Türkiye Ekonomisinde Dışa Açılma ve Gelir Eşitsizlikleri İlişkisi", available at

http://idc.sdu.edu.tr/tammetinler/kalkinma/kalkinma27.pdf, last accessed on March 9, 2010.

Jaumotte, F., S. Lall and C. Papageorgiou. (2008), "Rising Income Inequality: Technology, or Trade and Financial Globalization ?", IMF Working Paper WP/08/185.

Kızılırmak A. B. (2003), 'Explaining Wage Inequality: Evidence from Turkey', Ankara University Faculty of Political Science Research Center for Development & Society Working Paper Series, No. 57.

Köse, A. H., E. Yeldan. (1998), "Turkish Economy in 1990s: An Assessment of Fiscal Policies, Labor Markets and Foreign Trade", New Perspectives on Turkey, 18 (spring).

Memis E., (2008), Inter and Intraclass Distribution of Income: Turkish Manufacturing, 1970-2000, VDM Verlag Dr. Muller, Saarbrucken, Germany.

Meschi, E. and M. Vivarelli. (2007), "Trade Openness and Income Inequality in Developing Countries", CSGR Working Paper Series 232/07, July 2007.

Milanovic, B. (2005), "Can We Discern the Effect of Globalization on Income Distribution? Evidence from Household Surveys Alone", *The World Bank Review*, 19(1): 21-44.

Özer, M., Erdoğan, L. (2006), "Türkiye'de İhracat, İthalat ve Ekonomik Büyüme Arasındaki İlişkilerin Zaman Serisi Analizi", Ekonomik Yaklaşım, Cilt 17, Sayı 60-61, ss. 93-110.

Şenses, F. (2004), "Neo-liberal Küreselleşme Kalkınma için Bir Fırsat mı, Engel mi?", METU ERC Working Papers in Economics, No: 04/09.

Theil, H. (1972), *Statistical Decompostion Analysis: With Applications in the Social and Administrative Sciences*, Amsterdam-London: North Holland Publishing

Utkulu, U., Özdemir, D. (2005), "Does Trade Liberalization Cause a Long Run Economic Growth in Turkey", Economics of Planning, Vol. 37, No. 3-4, pp. 245-266.

Wade, R. H. (2001), "The Rising Inequality of World Income Distribution", Finance & Development, 38 (4).

Wade, R. H. (2004), "Is Globalization Reducing Poverty and Inequality?", *World Development*, 32 (4): 567-589.

World Bank, (2000), "Turkey Economic Reforms, Living Standards and Social Welfare Study", Report No. 20029-TU, Poverty Reduction and Economic Management Unit, World Bank: Washington D.C.

Yapraklı, S. (2007), "Ticari ve Finansal Dışa Açıklık İle Ekonomik Büyüme Arasındaki İlişki: Türkiye Üzerine Bir Uygulama", Ekonometri ve İstatistik Dergisi, Sayı 5, 2007-06-08. http://eidergisi.istanbul.edu.tr/sayi5/iueis5m4.pdf

Yeldan, E. (2000), "The Impact of Financial Liberalization and the Rise of Financial Rents on Income Inequality The Case of Turkey", WIDER Working Papers No: 206.

Yüce, M. (2001), "Türkiye'de Gelir Dağılımındaki Adaletsizliğin İzlenen Vergi ve Harcama Politikaları ile Bağlantısı", İş-Güç, Endüstri İlişkileri ve İnsan Kaynakları Dergisi, 3 (2), available at http://www.isguc.org/?p=article&id=73&vol=3&num=2&year=2001