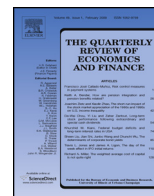




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# Exchange rate changes and income distribution in 41 countries: Asymmetry analysis<sup>☆</sup>

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### ABSTRACT

Due to the slow adjustment of wages to inflationary effects of currency depreciation, income could be shifted from workers to producers. Could currency appreciation do the opposite? We investigate the asymmetric effects of exchange rate changes on a measure of income distribution in each of the 41 countries for which a GINI coefficient is available. Applying recent asymmetry error-correction modeling and asymmetry cointegration of Shin et al. (2014) provides support for short-run asymmetric effects in 34 countries and long-run asymmetric effects in 22 countries, a unique discovery that was masked by previous research. The asymmetric effects revealed that while depreciations had unequalizing effects in 10 countries, they had equalizing effects in only five countries.

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### 1. Introduction

In explaining the notion that a devaluation or a currency depreciation could be contractionary, Alexander (1952) argued that if wages do not adjust to inflationary effects of a devaluation, profits will be gained at the cost of workers, implying that income will be shifted from workers to producers or from poor to rich. Although Alexander (1952) was trying to explain why consumption and eventually production could decline, we conjecture that if a devaluation shifts income from poor to rich, it should worsen income inequality.

Almost all studies that have studied income inequality in any country, have basically concentrated on testing the Kuznets' (1955) inverted-U hypothesis and have ignored including exchange rate as a determinant of income inequality.<sup>1</sup> Some examples are Paukert (1973), Chenery et al. (1974), Cline (1975), Ahluwalia (1976a, 1976b), Papanek and Kyn (1986), Ram (1991), Anand and Kanbur

(1993), Hsing and Smyth (1994), Jacobsen and Giles (1995), Li et al. (1998), Campano and Salvatore (1993), Deininger and Squire (1998), Barro (2000), Dollar and Kraay (2002), Bahmani-Oskooee et al. (2008), and Bahmani-Oskooee and Gelan (2008, 2012).

Three studies, however, have looked into the link between exchange rate changes and a measure of income inequality. Bahmani-Oskooee (1997) used cross-sectional data from 24 countries that devalued their currency or allowed their currency to depreciate and showed that indeed, devaluations have unequalizing effects on income distribution. Also considered a cross-sectional model in which in addition to Kuznets' terms they included black market premium as another factor affecting income inequality. They captured the impact of devaluation on income inequality by arguing that in countries where there is a black market for foreign currencies, the gap between the black market rate and the official rate reflects the degree of devaluation or depreciation. By using cross-sectional data from 28 countries in which there was a black market for foreign currencies, they showed that not only does increased premium worsen income inequality, but so does official devaluation as well as depreciation in the black market.

There are also two time-series studies which have looked into the effects of exchange rate changes on income distribution. Considered a time-series model and data from the United States only. By using annual data over the period 1952–2002 and error-correction modeling, they showed that while dollar depreciation in the U.S. worsens income inequality in the short run, its long-run effects are

<sup>☆</sup> Valuable comments of an anonymous referee and the editor are greatly appreciated. Remaining errors, however, are our own.

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<sup>1</sup> The hypothesis simply identifies the level of economic growth as the main determinant of income inequality and asserts that in the early stages of development, economic growth worsens income inequality and it only improves at the later stage of economic growth.

negligible. However, when [Shahbaz, Islam, and Butt \(2013\)](#) considered data from Pakistan, after establishing cointegration among the variables in their model, they found devaluation to worsen income inequality in Pakistan.

A common feature of all studies mentioned above (cross-sectional or time-series) is the assumption that the impact of exchange rate changes on income distribution is symmetric. However, there are reasons to believe that exchange rate changes could have asymmetric effects on income inequality. Suppose 1% depreciation worsens income inequality by 2%, does 1% appreciation improve inequality by 2%? Most likely not because of the downward rigidity of changes in prices. Currency appreciations are expected to lower prices and then wages. However, if due to minimum wage laws or labor contracts, wages do not decline in tandem with inflation, income will not be transferred from producers to workers, hence asymmetric effects. Put differently, since domestic prices could respond to exchange rate changes in an asymmetric manner, as demonstrated by [Delatte and Lopez-Villavicencio \(2012\)](#), we expect the response of income distribution to exchange rate changes to also be asymmetric. Therefore, our main goal in this paper, for the first time, is to show that exchange rate changes could have asymmetric impact on a measure of income distribution. To that end, in Section II we outline our model and introduce the methods. We then present our empirical evidence using data from each of the 41 countries for which a measure of income distribution is available. Sources of such data and definition of variables are provided in an Appendix. Before we move on, in order to gain some insight about performance of inequality index in each country, we plot them in [Fig. 1](#).

## 2. The models and methods

In testing any hypothesis associated with income inequality, all studies try to account for what are known as Kuznets' terms. [Kuznets \(1955\)](#) argued that economic growth worsens income inequality at the early stages of development and improves it at the later stages. Cross-sectional studies that tried to test this hypothesis included a measure of income and income-squared to account for the turning point, known as the inverted-U hypothesis. In time-series studies, however, [Bahmani-Oskooee and Gelan \(2012\)](#) have argued that the income-squared term should not be included since the short-run dynamics of the relationship between a measure of income distribution and income will reveal the turning point. To this end, we adopt the following long-run specification:

$$\ln GINI_t = a + b \ln RGDP_t + c \ln REX_t + \varepsilon_t \quad (1)$$

Where GINI is a measure of income inequality such that an increase reflects increased inequality, RGDP is the real GDP and REX is the real effective exchange rate. Since (1) is a long-run model, if an increase in real GDP is to improve or reduce income inequality, we expect an estimate of  $b$  to be negative. Furthermore, if a real depreciation or a decline in REX is to worsen income inequality in the long run, we expect an estimate of  $c$  to be negative.

In order to differentiate the short-run effects of RDGP and REX on GINI, we introduce short-run dynamics by specifying (1) as an error-correction model. To this end, we adopt [Pesaran, Shin, and](#)

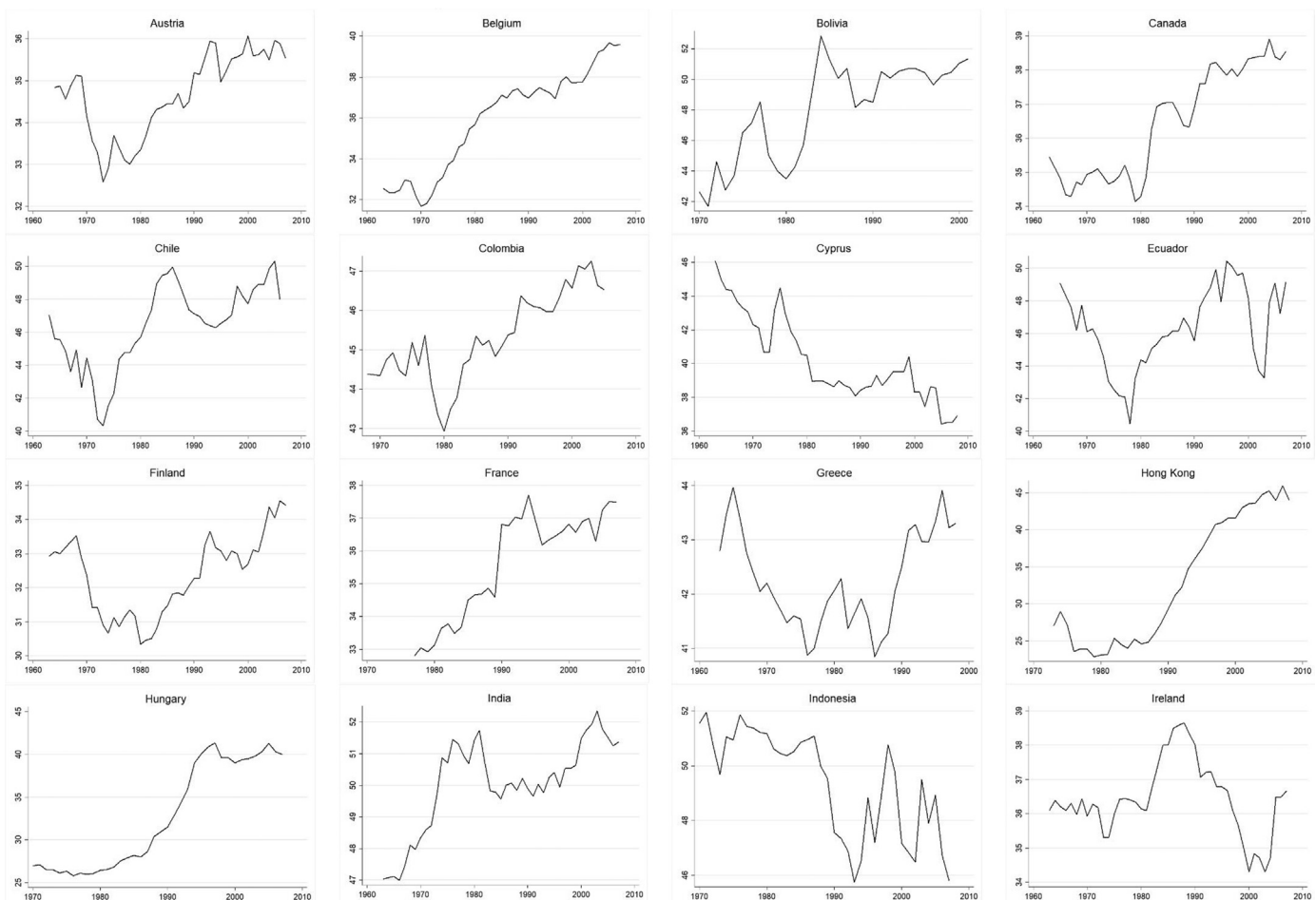


Fig. 1. Trends in GINI (measure of inequality).

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